

Single-Package Rooftop Heating/Cooling Units

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 may 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 1/2 psig. Pressures greater than 1/2 psig will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than 1/2 psig, it *must* be replaced before use. When pressure testing field-supplied gas piping at pressures of 1/2 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 50LJ900214 (48LJ008 and 009) or 50LJ900217 (48LJ012 and 014).

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: An external filter kit **MUST** be used or the filters must be field-installed outside the unit on horizontal discharge applications with accessory economizer or two-position damper. Otherwise, the economizer or two-position damper must be removed to access the filters. 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 counter flashing as shown. *Ductwork must be attached to curb.* 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 is set in roof curb.

IMPORTANT: The gasketing of the unit to the roof curb is critical for water integrity. Install gasket supplied with the roof curb as shown in Fig. 2. Improperly applied gasket can also 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.

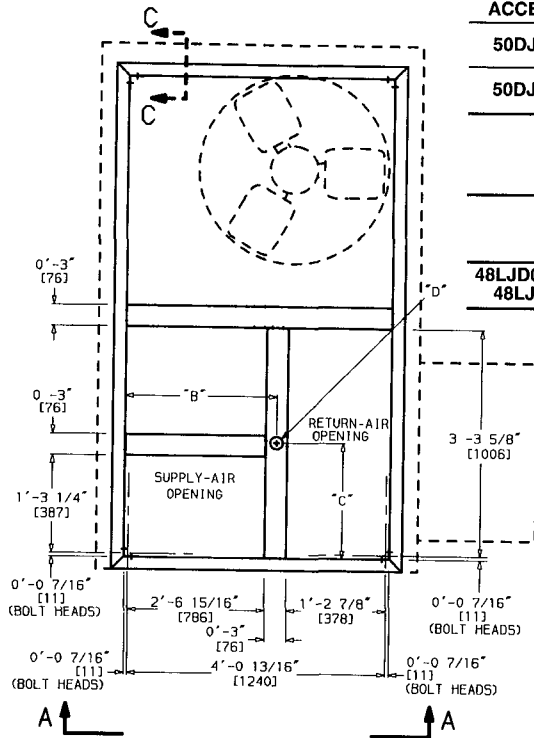
NOTE: Horizontal units may be installed on a roof curb if required.

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 secured to the flanges. Insulate and weatherproof all external duct-

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, NFPA (National Fuel Gas Code), ANSI (American National Standards Institute) 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.



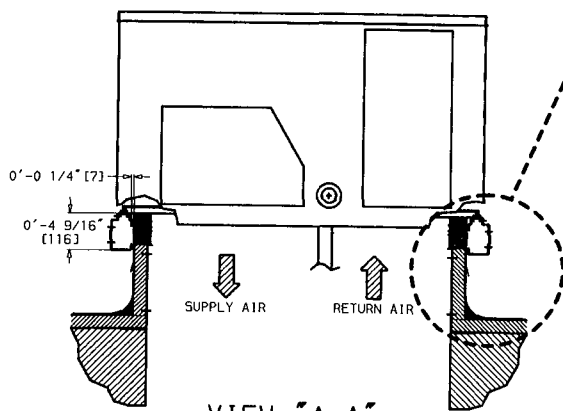
ROOF CURB ACCESSORY	"A"	UNIT SIZE
50DJ901371	1'-2" [356]	48LJD/LJE008-012
50DJ901381	2'-0" [610]	48LJD014

NOTES:

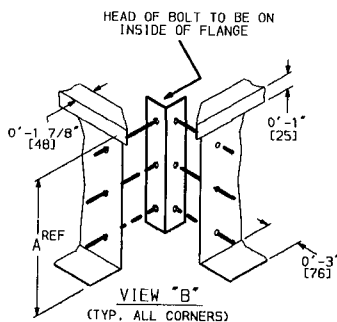
- 1 Roof curb accessory is shipped unassembled.
- 2 Insulated panels: one-in thick polyurethane foam, 1 3/4 lb density
- 3 Dimensions in [] are in millimeters
- 4 Roof curb: 16-gage steel
5. Attach ductwork to curb (flanges of duct rest on curb)
6. Service clearance 4 ft on each side
7. Direction of airflow

SERVICE PLATE SIZES

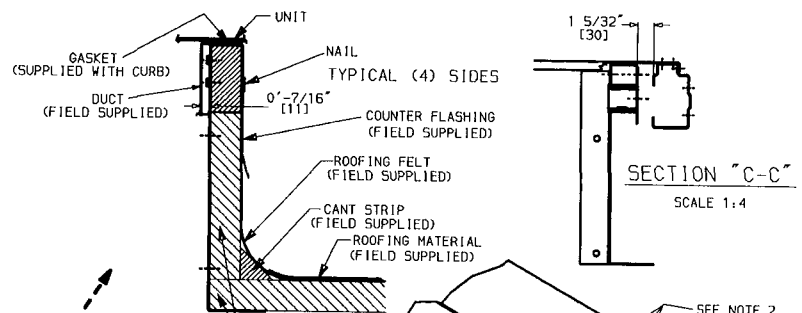
UNIT SIZE	"B"	"C"	"D" ALT DRAIN HOLE	"E" GAS	"F" POWER	"G" CONTROL	CONNECTOR PKG. ACY.
48LJD008,009,012 & 014 48LJE008,009 & 012	—	—	—	3/4" [19] NPT	1 [25] NPT	3/4" [19] NPT	50DJ901551



VIEW "A-A"

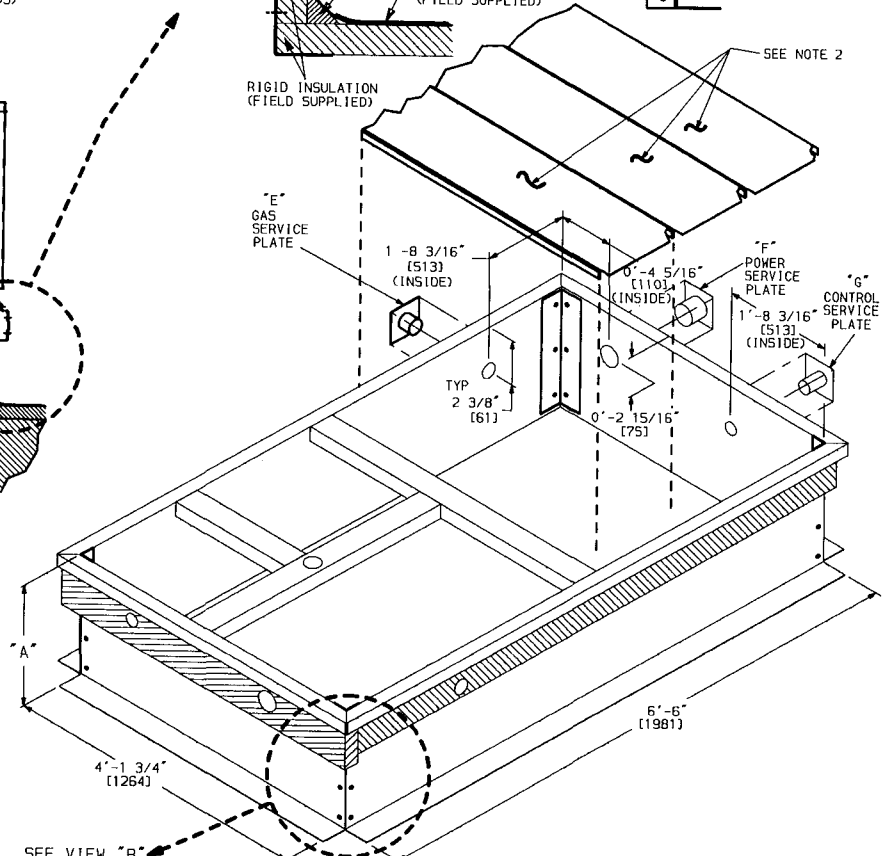


VIEW "B"



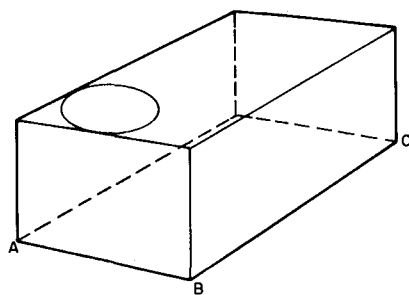
SECTION "C-C"

SCALE 1:4



SEE VIEW "B"

Fig. 2 — Roof Curb Details



MAXIMUM ALLOWABLE
DIFFERENCE (in)

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

Fig. 3 – Unit Leveling Tolerances

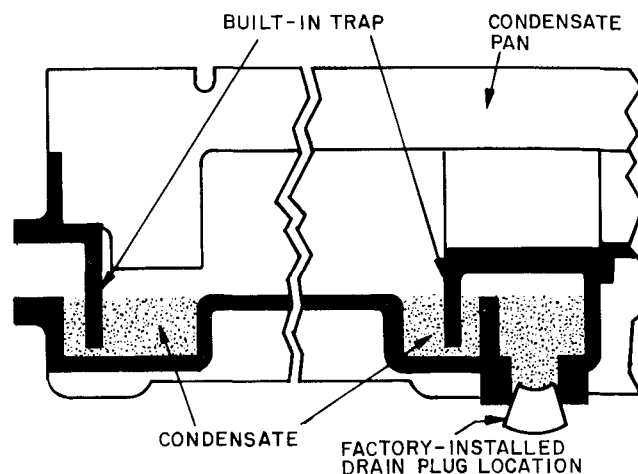
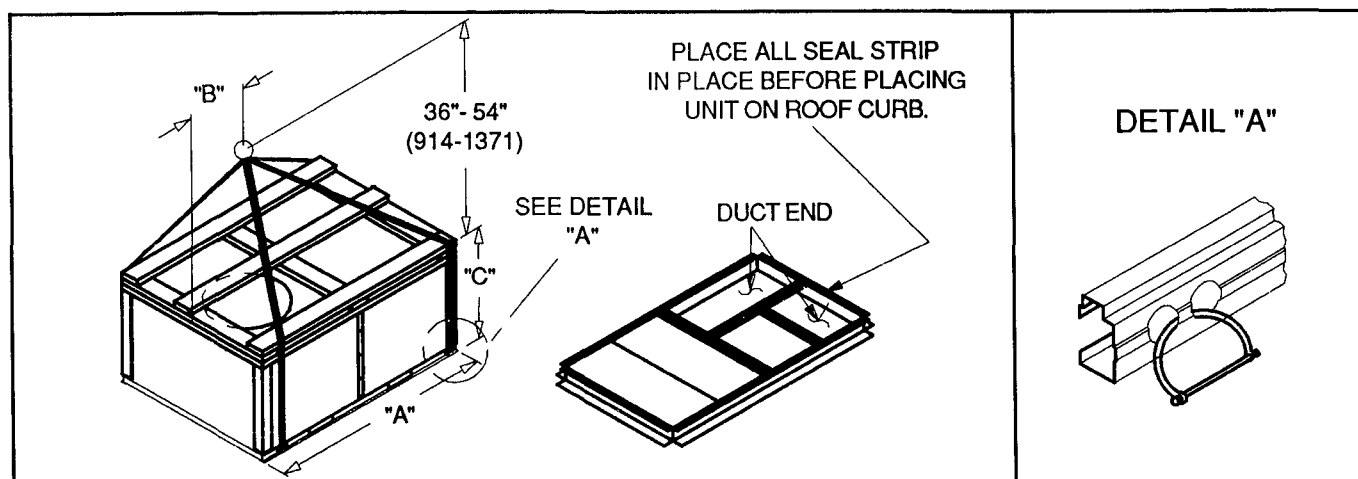


Fig. 4 – Internally-Trapped Condensate Drain



NOTES:

1. Dimensions in () 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.
3. Weights include base unit without economizer. See Table 1 for unit operating weights with accessory economizer.

CAUTION

All panels must be in place when rigging

UNIT	MAX WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
48LJD/LJE008	870	395	77.42	1967	41.5	1054	42.12	1070
48LJD/LJE009	880	399	77.42	1967	41.5	1054	42.12	1070
48LJD/LJE012	1035	469	77.42	1967	41.5	1054	50.12	1273
48LJD014	1050	476	77.42	1967	41.5	1054	50.12	1273

Fig. 5 – Rigging Details

Table 1 — Physical Data

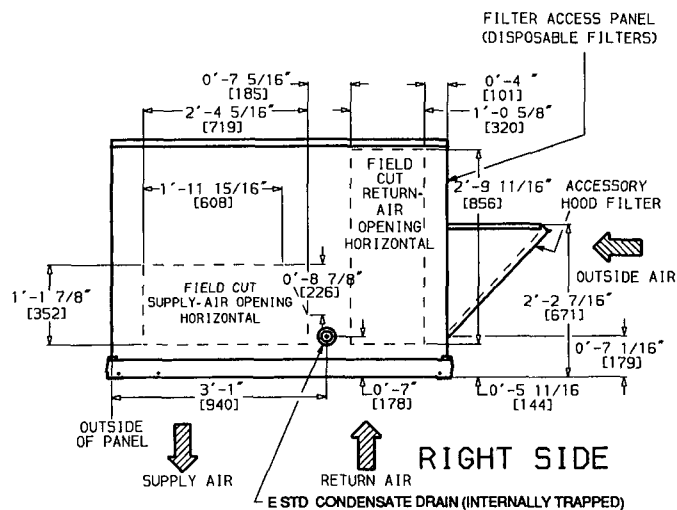
BASE UNIT 48	LJD/LJE008	LJD/LJE009	LJD/LDJE012	LDJD014
NOMINAL CAPACITY (tons)	7½	8½	10	12½
OPERATING WEIGHT (lb)				
Unit	870	880	1035	1050
With Economizer	914	924	1079	1094
Roof Curb	143	143	143	143
COMPRESSOR				
Quantity	2	2	2	2
Oil (oz) (each compr)	55	55	70	70
REFRIGERANT TYPE				
Operating Charge (lb-oz)				
Circuit 1	4-5	6-2	8-0	8- 3
Circuit 2	4-5	5-5	7-3	8-11
CONDENSER FAN				
Quantity...Diameter (in.)	1..26	1..26	1...26	1..26
Nominal Cfm	6500	6500	7000	8200
Motor Hp...Rpm	¾ . 1100	¾ 1100	¾ 1100	¾. 1100
CONDENSER COIL				
Rows...Fins/in.	1..17	2..17	2..17	2...17
Total Face Area (sq ft)	18 0	15.5	18 9	25 0
EVAPORATOR FAN				
Size (in.)	15 x 15	15 x 15	15 x 15	15 x 15
Type Drive	Belt	Belt	Belt	Belt
Nominal Cfm	3000	3400	4000	5000
Horsepower per NEC (National Electrical Code)*	1 5	1 5	1 5	3 5
Maximum Continuous Bhp	2 4	2 4	2 4	4 2
Motor Frame	56	56	56	56
Fan Rpm Range	600-800	600-800	700-950	860-1080
Motor Bearing Type	Ball	Ball	Ball	Ball
Maximum Fan Rpm	2100	2100	2100	2100
Motor Pulley Pitch Diameter A/B (in.)	2-4-3 4	2-4-3 4	2-8-3 8	4 0-5 0
Fan Pulley Pitch Diameter (in.)	7 0	7 0	7 0	8 0
Belt — Type...Length (in.)	A.. 48	A...48	A...51	A.. 57
Pulley Center Line Distance (in.)	16.75-19 25	16 75-19 25	18 25-20.75	18 25-20 75
Speed Change per Full Turn of Movable Pulley Flange (rpm)	40	40	50	44
Movable Pulley Maximum Full Turns from Closed Position	5	5	5	5
Factory Setting — Full Turns Open	5	5	5	5
Factory Speed Setting (rpm)	600	600	700	860
Fan Shaft Diameter at Pulley (in.)	1	1	1	1
EVAPORATOR COIL				
Rows...Fins/in.	3.. 15	3.. 15	3..15	4.. 15
Total Face Area (sq ft)	8.0	8 0	10 0	11 1
FURNACE SECTION				
Burner Orifice Diameter (in. ...drill size)				
Natural Gas — Std	120. 31/ 120 31	120 ..31/ 120 31	.120 .31/ 120.. 31	120.. 31
Liquid Propane — Alt	.096 .41/ 096 .41	096. 41/ 096 41	096. 41/ 096 41	096. 41
Thermostat Heat Anticipator Setting (amps)				
208/230/460-v Stage 1	1 0	1 0	1 0	1 0
Stage 2	0 6	0 6	0 6	0 6
Gas Input (Btuh) (Natural or Liquid Propane)	120,000/120,000-180,000	120,000/120,000-180,000	120,000-180,000/180,000-220,000	180,000-220,000
Efficiency (Steady State) (%)	80	80	80	80
Temperature Rise Range (°F)	20-50/35-65	20-50/35-65	20-50/35-65	20-50
Manifold Pressure (in. wg)	3 5	3 5	3.5	3 5
(Natural or Liquid Propane)				
Maximum Static Pressure (in. wg)	1.0	1 0	1 0	1.0
Field Gas Connection Size (in.)	5/ 75	5/ 75	75/ 75	75
OUTSIDE-AIR INLET SCREENS				
Quantity...Size (in.)			Cleanable 1 20 x 25 x 1 1 16 x 25 x 1	
RETURN-AIR FILTERS				
Quantity...Size (in.)	4 16 x 20 x 2	4 16 x 20 x 2	4 .20 x 20 x 2	4 20 x 20 x 2

LEGEND

Bhp — Brake Horsepower

*Used to determine wire sizing per NEC

UNIT	STD. UNIT WEIGHT		ECONOMIZER WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		"H"		"J"		"K"	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Ft-in.	mm	Ft-in.	mm	Ft-in.	mm
48LJE/LJD008	870	395	44	20	189	86	161	73	239	109	280	127	2- 0 ⁷ / ₈	632	3-5 ⁵ / ₁₆	1050	2-9 ¹ / ₁₆	856
48LJE/LJD009	880	399	44	20	191	87	163	74	242	110	284	129	1- 2 ⁷ / ₈	378	3-5 ⁵ / ₁₆	1050	2-9 ¹ / ₁₆	856
48LJE/LJD012	1035	469	44	20	225	102	192	87	285	129	333	151	2-10 ⁷ / ₈	885	4-1 ⁹ / ₁₆	1253	3-0 ³ / ₈	924
48LJD014	1050	476	44	20	228	103	195	88	289	131	338	153	1- 2 ⁷ / ₈	378	4-1 ⁹ / ₁₆	1253	3-0 ³ / ₈	924



CONNECTION SIZES	
A	1 ³ / ₈ " Dia [35] Field Power Supply Hole
B	2 ¹ / ₂ " Dia [64] Power Supply Knockout
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 48LJD008 & 009 3/4"-14 NPT Gas Connection 48LJE008,009,012, 48LJD012 & 014
G	2" Dia [51] Power Supply Knockout

NOTES:

- Dimensions in [] are in millimeters
- Center of Gravity
- Direction of airflow
- Ductwork to be attached to accessory roof curb only
- Minimum clearances (local codes or jurisdiction may prevail):
 - Between unit, flue side and combustible surfaces, 36 inches
 - Bottom to combustible surfaces (when not using curb), 14 inches
 - Condenser coil, for proper airflow, 36 in. one side, 12 in. the other. The side getting the greater clearance is optional
 - Overhead, 60 in. to assure proper condenser fan operation
 - Between units, control box side, 42 inches
 - Between unit and ungrounded surfaces, control box side, 36 inches
 - Between unit and block or concrete walls and other grounded surfaces, control box side, 42 inches
 - Horizontal supply and return end, zero inches
- With the exception of the clearance for the condenser coil and combustion side, as stated in notes 5a, b and c, a removable fence or barricade requires no clearance

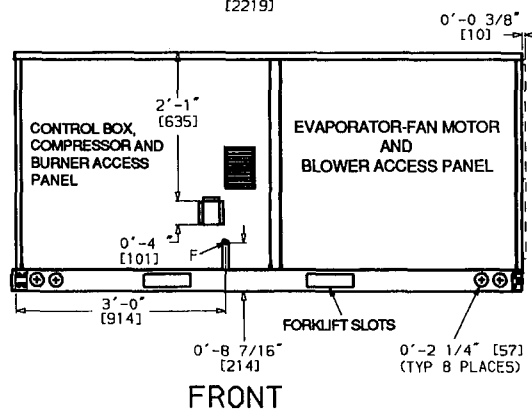
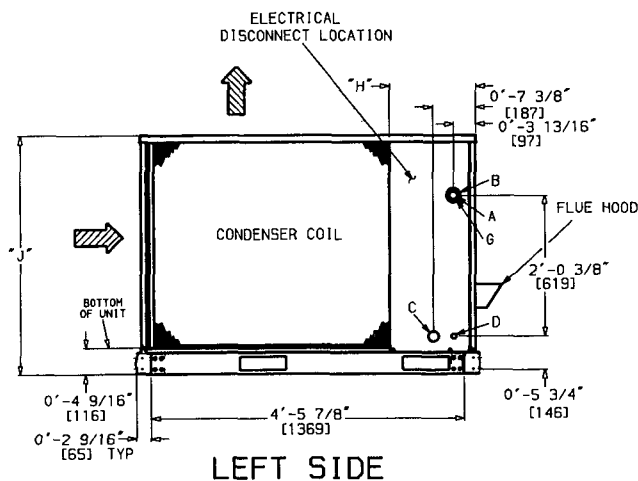
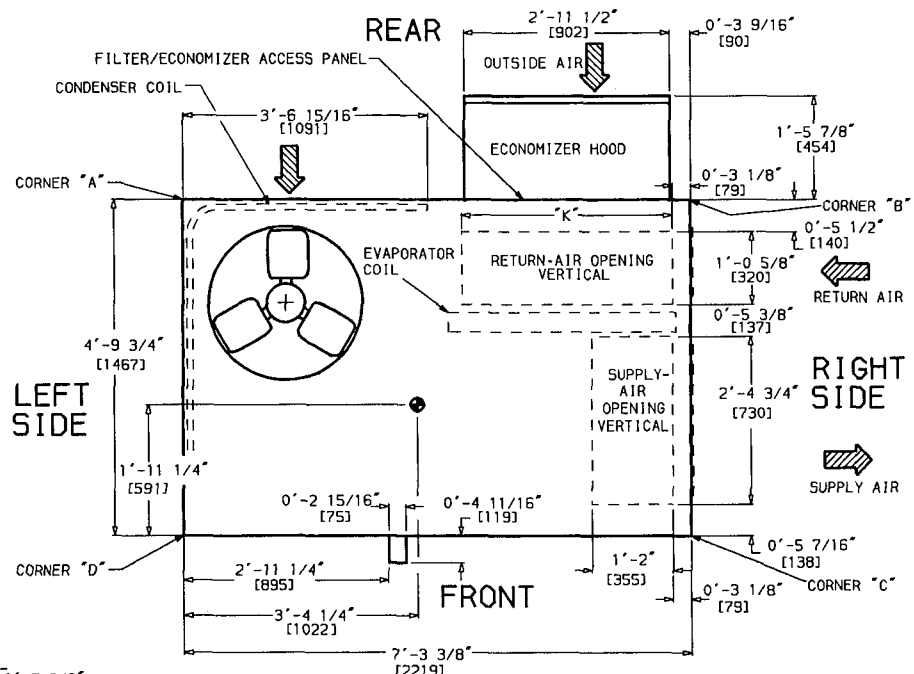


Fig. 6 – Base Unit Dimensions

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. 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 NFGC. 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 4.0 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, and 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 gas shutoff valve.

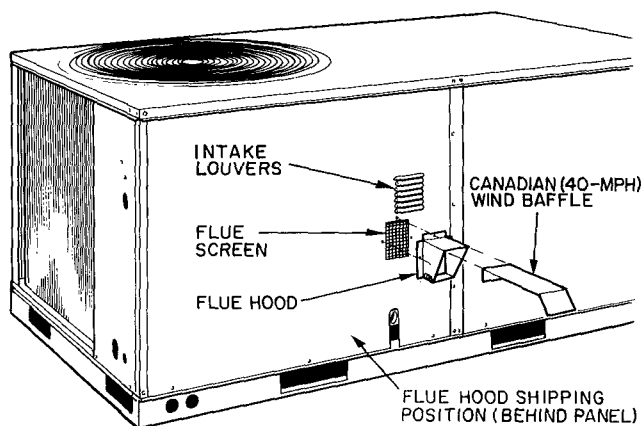
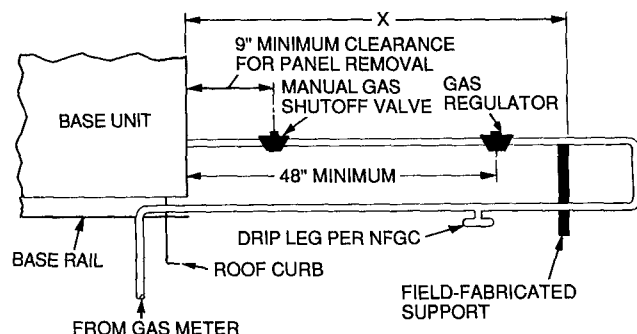


Fig. 7 — Flue Hood Details



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

SPACING OF SUPPORTS	
STEEL PIPE NOMINAL DIAMETER (in.)	X DIMENSION (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)

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 NEC (National Electrical Code) ANSI/NFPA (National Fire Protection Association) 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 orange wire then must be insulated.

Refer to unit label diagram for additional information. Pigtailed are provided for field service. Use factory-supplied splices or UL (Underwriters Laboratories) approved copper/aluminum connector.

When installing units, provide a disconnect per NEC.

All field wiring must comply with NEC and local requirements. In Canada, electrical connections must be in accordance with CSA (Canadian Standards Association) C22.1 Canadian Electrical Code Part One.

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

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 Carrier warranty.

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.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 10) as described in Steps 1 - 4 below.

1. If unit is mounted on roof curb and accessory thru-the-curb service plate connection is used, route wire through connection plate.
2. Pass control wires through the hole provided on unit (see connection D in Connection Sizes table in Fig. 6).
3. 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. 11. The raceway provides the UL-required clearance between high- and low-voltage wiring.

4. Connect thermostat wires to screw terminals on low voltage connector. The connector plugs into the control board and may be removed to make thermostat connection. Plug connector back into control board after making connection or unit will not operate.

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

HEAT ANTICIPATOR SETTINGS — Set heat anticipator settings at 1.0 amp for the first stage and 0.6 amp for second-stage heating.

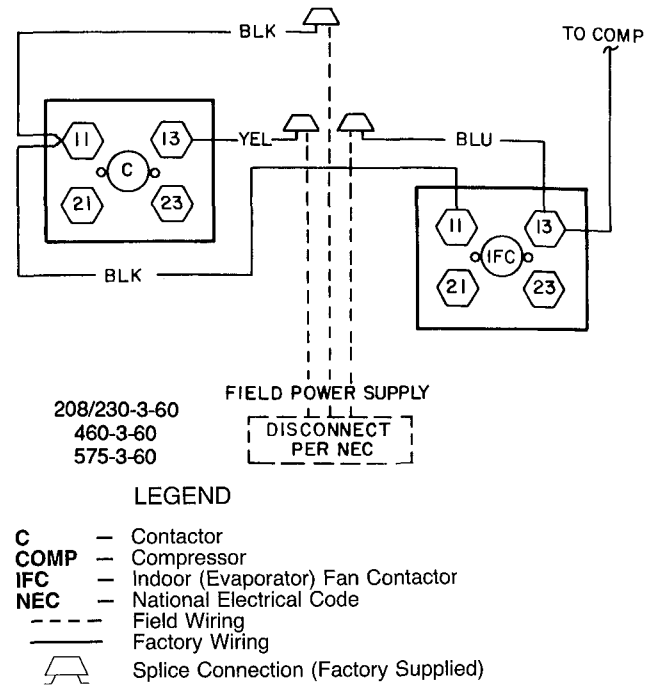


Fig. 9 — Power Wiring Connections

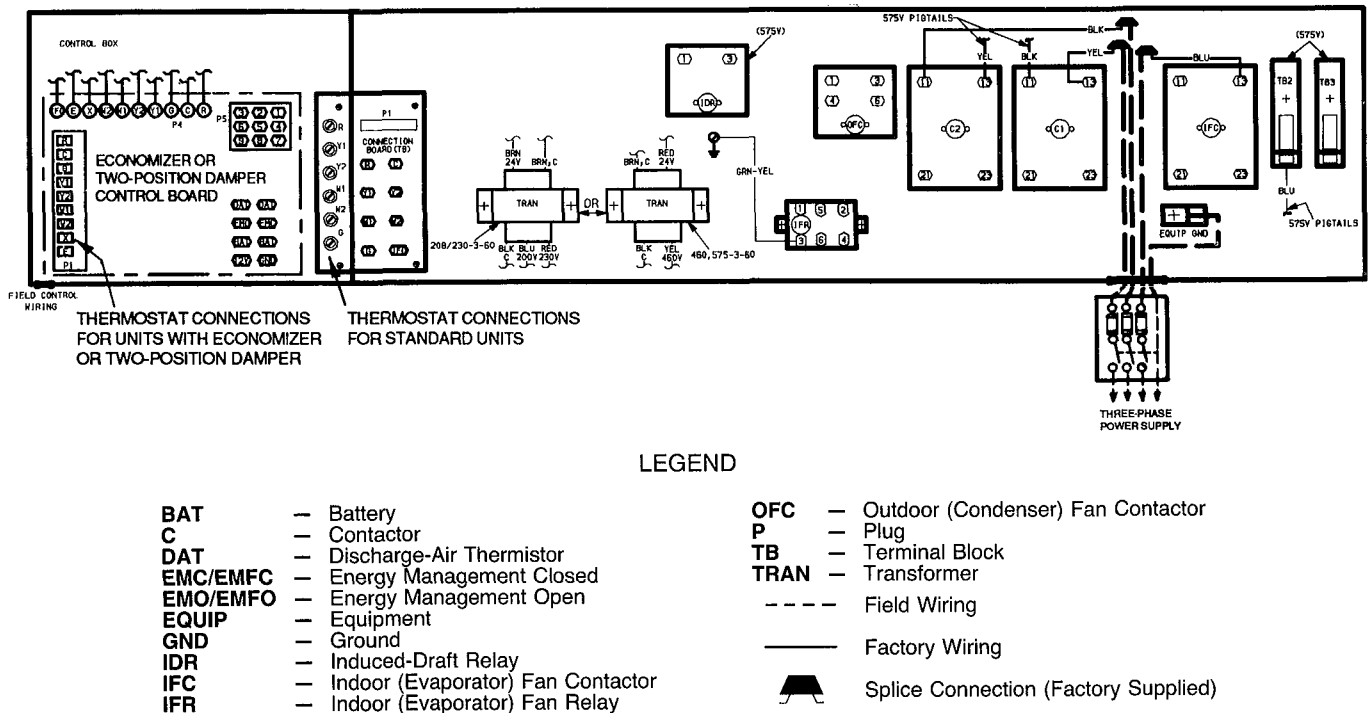


Fig. 10 — Control Wiring Connections

Table 2 — Electrical Data

UNIT 48	NOMINAL V-PH-HZ	VOLTAGE RANGE		COMPR (each)		OFM	IFM		COMBUSTION FAN MOTOR	POWER SUPPLY	
		Min	Max	RLA	LRA	FLA	Hp	FLA	FLA	MCA	MOCP*
48LJD/LJE008 (7½ Tons)	208/230-3-60	187	254	13.7	90.0	3.1	1.5	5.8	.51	39.7/39.7	45/45
	460-3-60	414	508	6.9	45.0	1.4	1.5	2.6	.51	19.5	25
	575-3-60	518	632	4.9	35.0	1.4	1.5	2.6	.51	14.2	20
48LJD/LJE009 (8½ Tons)	208/230-3-60	187	254	16.2	98.5	3.1	1.5	5.8	.51	45.4/45.4	50/50
	460-3-60	414	508	8.0	49.3	1.4	1.5	2.6	.51	22.0	25
	575-3-60	518	632	6.1	40.0	1.4	1.5	2.6	.51	16.9	20
48DJD/DJE012 (10 Tons)	208/230-3-60	187	254	19.2	105.0	3.1	1.5	5.8	.51	52.1/52.1	60/60
	460-3-60	414	508	9.6	55.0	1.4	1.5	2.6	.51	25.6	30
	575-3-60	518	632	8.3	45.0	1.4	1.5	2.6	.51	21.9	25
48LJD014 (12½ Tons)	208/230-3-60	187	254	22.3	137.0	3.1	3.5	12.0	.51	65.8/65.8	80/80
	460-3-60	414	508	10.4	69.0	1.4	3.5	5.4	.51	30.2	35
	575-3-60	518	632	9.6	55.0	1.4	3.5	5.4	.51	27.0	30

LEGEND

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

*Fuse or HACR circuit breaker.



NOTES:

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

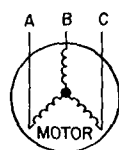
2. **Unbalanced 3-Phase Supply Voltage**

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

Voltage Imbalance

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

Example: Supply voltage is 460-3-60



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

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

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.

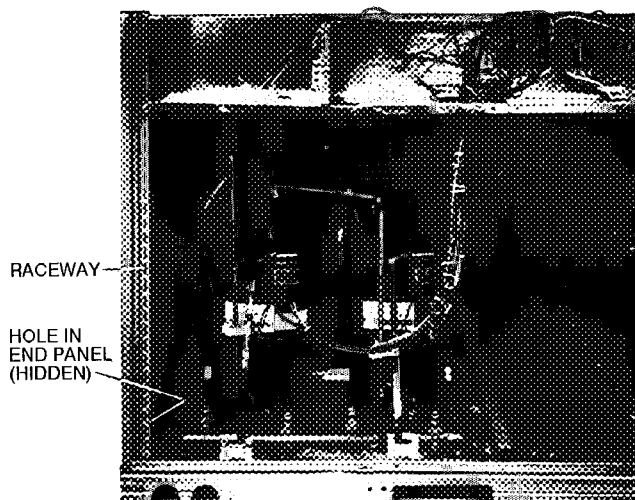


Fig. 11 — Field Control Wiring Raceway

Step 8 — Adjust Evaporator-Fan Speed — Adjust evaporator-fan speed to meet jobsite conditions. Table 3 shows fan rpm at motor pulley settings, Table 4 shows evaporator fan motor efficiencies and Table 5 gives economizer static pressure drops. Refer to tables 6 - 11 to determine fan speed settings. 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 acceptable air-temperature rise range on heating as shown in Table 1.

To change fan speeds:

1. Shut off unit power supply.
2. Loosen belt by loosening fan motor mounting nuts. See Fig. 12.
3. Loosen movable pulley flange setscrew (see Fig. 13).
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:

1. Loosen fan pulley setscrews.
2. Slide fan pulley along fan shaft.
3. Make angular alignment by loosening motor from mounting plate.

To adjust belt tension:

1. Loosen fan motor mounting nuts.
2. Slide motor mounting plate away from fan scroll for proper belt tension ($\frac{1}{2}$ -in. deflection with one finger) and tighten mounting nuts. Tension can be applied using $\frac{1}{2}$ -in. drive ratchet engaged into $\frac{1}{2}$ -in. square hole on motor mounting plate.
3. Adjust lock bolt and nut on mounting plate to secure in fixed position.

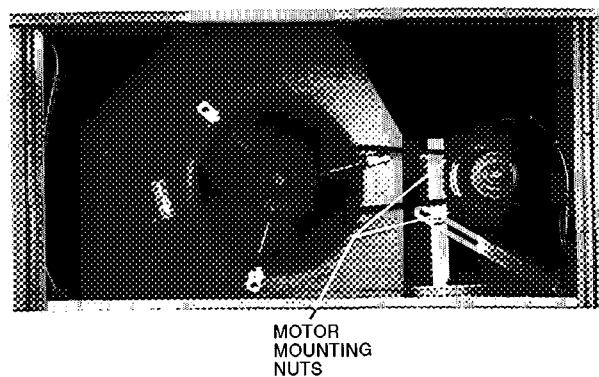


Fig. 12 — Belt-Drive Motor Mounting

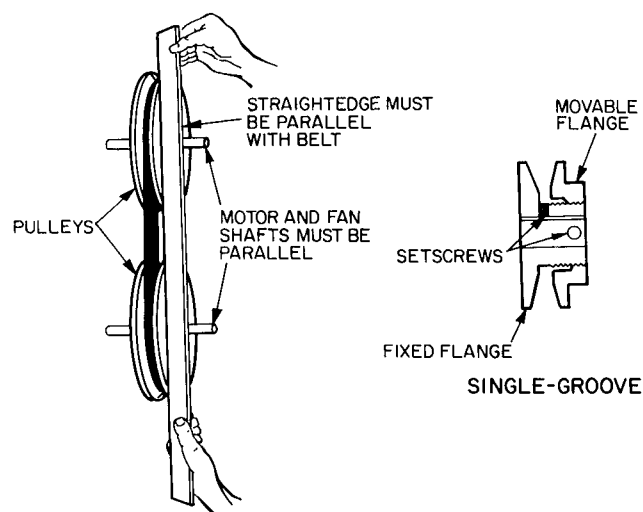


Fig. 13 — Evaporator-Fan Pulley Adjustment

Table 3 – Fan Rpm At Motor Pulley Settings

UNIT 48LJ	MOTOR PULLEY TURNS OPEN										
	0	½	1	1½	2	2½	3	3½	4	4½	5
008,009	800	780	760	740	720	700	680	660	640	620	600
012	950	925	900	875	850	825	800	775	750	725	700
014	1080	1060	1035	1015	990	970	950	930	905	885	860

Table 4 – Evaporator-Fan Motor Efficiency

MOTOR	EFFICIENCY (%)
1.5 HP, BELT DRIVE	.80
3.5 HP, BELT DRIVE	.85

NOTE: Convert bhp to Watts using the following formula:

$$\text{Watts} = \frac{746 \times \text{Bhp}}{\text{Motor Efficiency}}$$

Table 5 – Economizer Static Pressure Drop (in. wg) – 48LJ008-014

CFM								
2200	2500	3000	3500	4000	4500	5000	5500	6000
.02	.02	.03	.04	.05	.06	.07	.08	.09

Table 6 – Fan Performance, 48LJ008, 009 Vertical Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	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
2200	499	0.50	580	0.70	652	0.94	717	1.17	779	1.43	839	1.78	905	2.21	951	2.57
2300	513	0.55	592	0.76	663	1.00	727	1.26	786	1.49	846	1.84	910	2.28	959	2.61
2400	528	0.60	606	0.83	674	1.06	738	1.34	795	1.58	853	1.88	912	2.31	967	2.68
2500	542	0.66	619	0.90	686	1.13	748	1.41	806	1.68	859	1.94	919	2.37	971	2.73
2600	557	0.72	634	0.97	698	1.21	759	1.49	816	1.79	868	2.04	921	2.37	976	2.78
2700	573	0.79	648	1.05	711	1.29	770	1.58	827	1.88	878	2.16	928	2.45	983	2.88
2800	588	0.86	662	1.13	723	1.38	782	1.66	837	1.98	889	2.29	937	2.57	986	2.91
2900	604	0.94	676	1.21	737	1.48	794	1.76	848	2.08	900	2.41	947	2.70	993	3.01
3000	620	1.02	690	1.30	750	1.58	806	1.86	859	2.18	910	2.52	958	2.85	1002	3.15
3100	636	1.11	704	1.39	764	1.69	818	1.97	870	2.29	920	2.64	968	2.99	1012	3.30
3200	652	1.21	718	1.49	778	1.80	831	2.09	882	2.40	931	2.76	979	3.13	1023	3.47
3300	668	1.31	732	1.59	793	1.92	844	2.21	894	2.53	942	2.89	989	3.26	1034	3.63
3400	684	1.41	747	1.70	807	2.04	857	2.35	907	2.66	954	3.02	1000	3.40	1044	3.79
3500	701	1.53	762	1.82	821	2.16	871	2.48	919	2.80	966	3.15	1011	3.55	1054	3.94
3600	717	1.65	777	1.94	835	2.29	885	2.63	932	2.95	978	3.30	1022	3.69	1065	4.10
3700	733	1.77	792	2.07	849	2.42	899	2.78	945	3.11	990	3.45	1034	3.84	1076	4.26
3800	750	1.90	807	2.21	863	2.56	914	2.93	958	3.28	1003	3.62	1045	4.01	1087	4.43
3900	767	2.04	822	2.35	877	2.71	928	3.09	972	3.45	1015	3.80	1057	4.18	1098	4.60
4000	783	2.18	838	2.50	891	2.86	942	3.26	986	3.63	1029	3.99	1070	4.36	1110	4.78
4100	800	2.34	854	2.66	905	3.02	956	3.43	1000	3.81	1042	4.18	1082	4.56	1122	4.97
4200	817	2.49	869	2.82	920	3.19	970	3.60	1015	4.00	1055	4.38	1095	4.76	1134	5.16
4300	834	2.66	885	3.00	935	3.37	984	3.78	1029	4.20	1069	4.59	1108	4.98	1147	5.38

LEGEND

Bhp — Brake Horsepower

NOTES:

- Boldface** indicates field-supplied drive required. (See Note 6)
- Shading** indicates field-supplied motor and drive required.
- Maximum usable bhp is 2.4. Extensive motor and electrical testing on the Weathermaker® I units ensures 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.
- Use of field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
- Values include losses for filters, unit casing and wet coils.
- Motor drive range is 600 to 800 rpm. All other rpms require field-supplied drive.

Table 7 – Fan Performance, 48LJ012 Vertical Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	552	0.68	632	0.87	701	1.05	761	1.22	816	1.36	871	1.54	918	1.67	967	1.89	1010	2.09	1063	2.46
3100	565	0.74	644	0.93	711	1.12	772	1.31	825	1.45	879	1.63	928	1.78	973	1.94	1018	2.17	1070	2.51
3200	578	0.81	656	1.00	723	1.20	782	1.39	835	1.55	887	1.71	937	1.90	981	2.04	1026	2.26	1075	2.57
3300	591	0.88	668	1.08	734	1.28	793	1.47	845	1.65	895	1.80	946	2.00	991	2.16	1032	2.32	1080	2.64
3400	605	0.96	680	1.16	745	1.36	803	1.56	856	1.75	904	1.91	953	2.10	1000	2.29	1041	2.44	1083	2.65
3500	619	1.04	691	1.23	755	1.44	813	1.65	867	1.86	914	2.03	961	2.20	1009	2.41	1051	2.57	1090	2.74
3600	633	1.13	703	1.31	766	1.52	824	1.74	877	1.97	924	2.15	970	2.32	1017	2.53	1060	2.72	1099	2.88
3700	648	1.23	714	1.39	777	1.61	835	1.85	887	2.07	935	2.28	980	2.45	1024	2.64	1069	2.87	1109	3.03
3800	662	1.33	726	1.47	789	1.72	846	1.95	897	2.18	946	2.40	989	2.58	1033	2.76	1077	2.99	1118	3.20
3900	677	1.44	738	1.56	801	1.82	857	2.06	908	2.29	956	2.53	1000	2.73	1042	2.91	1085	3.12	1127	3.36
4000	692	1.55	750	1.66	813	1.94	868	2.17	918	2.40	967	2.66	1010	2.87	1052	3.06	1093	3.24	—	—
4100	707	1.67	762	1.76	825	2.05	878	2.28	929	2.53	977	2.78	1021	3.02	1062	3.22	1102	3.41	—	—
4200	722	1.80	775	1.87	837	2.16	889	2.40	941	2.66	987	2.91	1032	3.17	1072	3.38	—	—	—	—
4300	737	1.94	787	1.99	848	2.27	900	2.52	952	2.80	999	3.04	1042	3.32	—	—	—	—	—	—
4400	752	2.08	800	2.12	860	2.39	912	2.66	962	2.93	1008	3.19	—	—	—	—	—	—	—	—
4500	768	2.24	814	2.25	871	2.51	924	2.80	973	3.07	1019	3.34	—	—	—	—	—	—	—	—
4600	783	2.40	827	2.39	883	2.64	937	2.95	983	3.21	—	—	—	—	—	—	—	—	—	—
4700	799	2.56	841	2.54	894	2.77	949	3.10	994	3.36	—	—	—	—	—	—	—	—	—	—
4800	814	2.74	855	2.69	906	2.91	961	3.26	—	—	—	—	—	—	—	—	—	—	—	—
4900	830	2.92	868	2.86	918	3.05	972	3.40	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	883	3.03	931	3.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- Boldface** indicates field-supplied drive required. (See Note 6)
- Shading** indicates field-supplied motor and drive required.
- Maximum usable bhp is 2.4 Extensive motor and electrical testing on the Weathermaker I units ensures 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.
- Use of field-supplied motor may affect wire sizing. Contact Carrier representative to verify
- Values include losses for filters, unit casing and wet coils
- Motor drive range is 700 to 950 rpm. All other rpms require field-supplied drive

Table 8 – Fan Performance, 48LJ014 Vertical Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3700	729	1.36	790	1.58	847	1.79	902	2.06	955	2.29	1008	2.55	1060	2.80	1108	3.05	1152	3.27	1190	3.46
3800	745	1.46	805	1.69	861	1.89	915	2.17	967	2.41	1019	2.67	1070	2.94	1118	3.19	1163	3.44	1203	3.65
3900	761	1.56	820	1.80	875	2.01	928	2.29	979	2.55	1029	2.80	1079	3.07	1128	3.34	1173	3.60	1214	3.83
4000	777	1.67	836	1.92	889	2.14	941	2.40	991	2.68	1040	2.94	1089	3.22	1137	3.49	1183	3.76	1225	4.00
4100	793	1.79	851	2.05	904	2.27	955	2.52	1004	2.82	1052	3.08	1100	3.36	1147	3.65	1193	3.93	1236	4.19
4200	810	1.91	867	2.18	918	2.41	968	2.65	1017	2.96	1064	3.23	1110	3.51	1157	3.81	1202	4.09	1245	4.38
4300	826	2.04	883	2.32	933	2.55	982	2.79	1030	3.11	1076	3.40	1121	3.67	1167	3.97	1212	4.27	1255	4.56
4400	842	2.17	898	2.46	948	2.70	996	2.93	1043	3.25	1088	3.56	1133	3.84	1178	4.14	1222	4.44	1265	4.74
4500	859	2.31	914	2.60	962	2.85	1010	3.09	1056	3.40	1101	3.73	1144	4.00	1188	4.31	1232	4.62	1274	4.93
4600	876	2.45	930	2.76	977	3.01	1024	3.26	1070	3.55	1114	3.90	1157	4.19	1199	4.49	1242	4.81	1284	5.13
4700	892	2.60	945	2.91	992	3.18	1039	3.43	1083	3.71	1126	4.07	1169	4.38	1210	4.68	1252	5.00	1294	5.33
4800	909	2.77	961	3.07	1008	3.36	1053	3.61	1097	3.88	1140	4.25	1181	4.58	1222	4.87	1263	5.20	—	—
4900	926	2.93	977	3.24	1024	3.54	1068	3.80	1111	4.06	1153	4.41	1194	4.77	1234	5.09	1274	5.40	—	—
5000	942	3.11	993	3.41	1039	3.73	1082	3.99	1125	4.25	1166	4.59	1207	4.97	1247	5.30	1286	5.62	—	—
5100	959	3.29	1009	3.60	1055	3.92	1097	4.19	1139	4.46	1180	4.78	1220	5.18	1259	5.52	—	—	—	—
5200	976	3.47	1025	3.78	1071	4.12	1112	4.40	1153	4.67	1194	4.98	1233	5.38	1272	5.74	—	—	—	—
5300	993	3.67	1041	3.98	1086	4.33	1127	4.61	1168	4.90	1208	5.19	1246	5.58	—	—	—	—	—	—
5400	1010	3.87	1057	4.18	1102	4.54	1142	4.84	1182	5.13	1221	5.41	—	—	—	—	—	—	—	—
5500	1027	4.07	1073	4.39	1118	4.76	1157	5.07	1197	5.36	1235	5.64	—	—	—	—	—	—	—	—
5600	1043	4.29	1090	4.61	1133	4.99	1173	5.31	1211	5.61	—	—	—	—	—	—	—	—	—	—
5700	1060	4.51	1106	4.83	1149	5.22	1189	5.55	—	—	—	—	—	—	—	—	—	—	—	—
5800	1077	4.74	1122	5.07	1165	5.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5900	1094	4.98	1139	5.31	1181	5.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6000	1111	5.22	1155	5.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6100	1128	5.48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	1145	5.74	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- Boldface** indicates field-supplied drive required. (See Note 6)
- Shading** indicates field-supplied motor and drive required
- Maximum usable bhp is 4.2 Extensive motor and electrical testing on the Weathermaker® I units ensures 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
- Values include losses for filters, unit casing and wet coils.
- Use of a field-supplied motor may affect wire sizing. Contact a Carrier representative to verify
- Motor drive range is 860 to 1080 rpm. All other rpms require field-supplied drive

Table 9 – Fan Performance, 48LJ008, 009 Horizontal Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	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
2200	506	0.52	586	0.72	656	0.95	718	1.18	776	1.43	838	1.78	898	2.21	935	2.58
2300	521	0.57	600	0.79	668	1.02	730	1.26	786	1.50	843	1.83	905	2.28	943	2.62
2400	536	0.63	613	0.85	680	1.09	741	1.34	796	1.59	849	1.88	910	2.31	952	2.74
2500	551	0.69	626	0.93	693	1.17	753	1.43	808	1.69	859	1.96	912	2.31	963	2.81
2600	567	0.75	641	1.00	706	1.25	764	1.52	819	1.79	869	2.06	918	2.37	973	2.81
2700	582	0.83	655	1.08	719	1.34	776	1.61	831	1.89	880	2.17	927	2.47	976	2.84
2800	598	0.90	670	1.17	732	1.43	789	1.71	842	2.00	892	2.29	938	2.58	983	2.92
2900	614	0.98	684	1.25	745	1.53	802	1.81	854	2.11	903	2.42	949	2.71	993	3.03
3000	630	1.07	699	1.35	759	1.63	815	1.92	866	2.23	915	2.54	961	2.85	1003	3.17
3100	646	1.16	714	1.45	773	1.74	828	2.04	878	2.35	926	2.67	972	3.00	1015	3.32
3200	662	1.26	729	1.55	787	1.86	841	2.16	891	2.48	938	2.81	983	3.14	1026	3.47
3300	679	1.36	744	1.66	801	1.98	854	2.29	904	2.61	950	2.95	995	3.30	—	—
3400	695	1.47	759	1.78	816	2.10	867	2.42	917	2.75	963	3.10	1007	3.45	—	—
3500	712	1.59	774	1.90	830	2.23	881	2.56	930	2.90	976	3.25	—	—	—	—
3600	729	1.71	790	2.03	845	2.37	895	2.71	943	3.05	988	3.41	—	—	—	—
3700	745	1.84	805	2.17	860	2.52	909	2.87	956	3.22	—	—	—	—	—	—
3800	762	1.98	821	2.31	875	2.66	924	3.03	970	3.38	—	—	—	—	—	—
3900	779	2.12	836	2.46	890	2.82	938	3.19	—	—	—	—	—	—	—	—
4000	796	2.27	852	2.61	905	2.98	953	3.37	—	—	—	—	—	—	—	—
4100	813	2.42	868	2.78	920	3.15	—	—	—	—	—	—	—	—	—	—
4200	830	2.59	884	2.95	935	3.33	—	—	—	—	—	—	—	—	—	—
4300	847	2.76	900	3.13	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

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 2.4. Extensive motor and electrical testing on the Weathermaker® I units ensures 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. Use of field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
5. Values include losses for filters, unit casing and wet coils.
6. Motor drive range is 600 to 800 rpm. All other rpms require field-supplied drive.

Table 10 – Fan Performance, 48LJ012 Horizontal Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	592	0.76	661	0.93	722	1.09	779	1.26	829	1.42	880	1.58	924	1.73	970	1.89	1019	2.00	1066	2.30
3100	607	0.83	676	1.01	734	1.17	791	1.34	840	1.51	890	1.68	935	1.84	977	2.00	1026	2.17	1070	2.44
3200	622	0.90	690	1.09	746	1.25	803	1.43	852	1.60	900	1.77	946	1.95	987	2.11	1029	2.28	1075	2.51
3300	638	0.98	705	1.17	759	1.33	815	1.52	864	1.70	910	1.88	957	2.06	998	2.23	1037	2.40	1082	2.58
3400	653	1.06	719	1.26	772	1.43	826	1.62	876	1.81	921	1.98	967	2.17	1009	2.35	1047	2.53	1087	2.70
3500	669	1.15	733	1.35	786	1.53	838	1.72	888	1.91	933	2.10	976	2.29	1020	2.48	1058	2.66	1095	2.84
3600	684	1.24	747	1.44	800	1.64	850	1.82	900	2.03	945	2.22	986	2.41	1030	2.61	1069	2.80	1106	2.98
3700	700	1.33	760	1.54	814	1.75	863	1.92	912	2.14	957	2.34	998	2.54	1039	2.74	1081	2.94	1117	3.13
3800	715	1.43	774	1.64	828	1.86	875	2.04	924	2.26	969	2.47	1010	2.67	1049	2.87	1091	3.08	1128	3.29
3900	731	1.54	787	1.74	843	1.98	888	2.16	936	2.36	981	2.60	1022	2.81	1060	3.02	1100	3.23	—	—
4000	747	1.64	801	1.85	857	2.10	902	2.30	948	2.51	993	2.74	1034	2.96	1072	3.17	1110	3.38	—	—
4100	763	1.76	816	1.97	872	2.23	916	2.44	960	2.64	1005	2.88	1046	3.11	1084	3.32	—	—	—	—
4200	778	1.88	831	2.10	886	2.36	929	2.58	972	2.78	1016	3.03	1058	3.26	—	—	—	—	—	—
4300	794	2.00	846	2.23	900	2.50	943	2.73	985	2.93	1028	3.17	—	—	—	—	—	—	—	—
4400	810	2.13	861	2.37	913	2.64	956	2.89	999	3.09	1040	3.32	—	—	—	—	—	—	—	—
4500	826	2.27	876	2.52	927	2.78	973	3.04	1012	3.26	—	—	—	—	—	—	—	—	—	—
4600	842	2.41	892	2.67	940	2.92	987	3.21	—	—	—	—	—	—	—	—	—	—	—	—
4700	858	2.55	907	2.83	954	3.08	1002	3.38	—	—	—	—	—	—	—	—	—	—	—	—
4800	874	2.70	922	2.99	968	3.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4900	890	2.86	938	3.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	906	3.03	953	3.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

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 2.4. Extensive motor and electrical testing on the Weathermaker I units ensures 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. Use of field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
5. Values include losses for filters, unit casing and wet coils.
6. Motor drive range is 700 to 950 rpm. All other rpms require field-supplied drive.

Table 11 – Fan Performance, 48LJ014 Horizontal Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3700	677	1.20	748	1.43	810	1.65	869	1.89	928	2.17	984	2.43	1036	2.68	1080	2.90	1114	3.07	1135	3.17
3800	691	1.28	761	1.52	822	1.75	880	1.98	937	2.28	993	2.55	1046	2.81	1092	3.05	1129	3.25	1156	3.39
3900	705	1.37	773	1.62	834	1.86	891	2.08	947	2.39	1002	2.66	1055	2.94	1102	3.20	1143	3.42	1174	3.59
4000	720	1.47	786	1.71	847	1.97	902	2.19	957	2.50	1011	2.79	1064	3.07	1112	3.34	1155	3.59	1190	3.80
4100	734	1.56	800	1.82	860	2.09	914	2.31	967	2.60	1021	2.91	1072	3.20	1121	3.49	1165	3.76	1203	3.99
4200	749	1.66	813	1.92	873	2.21	926	2.44	978	2.71	1030	3.04	1081	3.34	1130	3.64	1175	3.92	1215	4.18
4300	764	1.77	826	2.04	886	2.33	938	2.57	989	2.83	1040	3.18	1090	3.48	1139	3.79	1185	4.08	1226	4.36
4400	778	1.88	840	2.16	899	2.46	951	2.71	1000	2.96	1050	3.31	1100	3.63	1148	3.94	1194	4.25	1236	4.54
4500	793	1.99	854	2.28	912	2.59	963	2.86	1012	3.09	1061	3.43	1109	3.78	1157	4.09	1203	4.42	1246	4.72
4600	808	2.11	868	2.42	925	2.73	975	3.00	1024	3.25	1071	3.56	1119	3.93	1166	4.26	1212	4.58	1255	4.91
4700	822	2.24	882	2.56	937	2.86	988	3.16	1036	3.42	1082	3.70	1129	4.09	1175	4.43	1221	4.76	1264	5.09
4800	837	2.37	896	2.71	950	3.00	1001	3.32	1048	3.59	1093	3.86	1139	4.24	1185	4.60	1230	4.93	1273	5.28
4900	852	2.51	910	2.86	963	3.15	1014	3.48	1060	3.76	1105	4.02	1150	4.38	1194	4.77	1239	5.12	1282	5.47
5000	867	2.65	924	3.01	977	3.30	1027	3.65	1073	3.94	1117	4.20	1161	4.54	1204	4.95	1248	5.31	1291	5.66
5100	882	2.79	938	3.17	990	3.46	1040	3.82	1085	4.12	1129	4.40	1172	4.71	1214	5.13	1257	5.51	—	—
5200	896	2.95	952	3.33	1003	3.63	1053	4.00	1098	4.30	1141	4.60	1183	4.89	1225	5.29	1267	5.70	—	—
5300	911	3.11	967	3.50	1017	3.80	1066	4.18	1111	4.50	1153	4.80	1194	5.08	1236	5.47	—	—	—	—
5400	926	3.27	981	3.68	1030	3.98	1079	4.35	1124	4.70	1166	5.01	1206	5.29	1247	5.65	—	—	—	—
5500	940	3.44	995	3.86	1044	4.17	1092	4.54	1137	4.91	1178	5.22	1218	5.52	—	—	—	—	—	—
5600	955	3.62	1010	4.04	1058	4.38	1105	4.73	1150	5.12	1190	5.44	1230	5.75	—	—	—	—	—	—
5700	970	3.80	1024	4.23	1072	4.59	1118	4.93	1163	5.34	1203	5.67	—	—	—	—	—	—	—	—
5800	985	3.99	1039	4.42	1086	4.80	1131	5.14	1176	5.56	—	—	—	—	—	—	—	—	—	—
5900	1000	4.18	1053	4.62	1100	5.02	1144	5.36	—	—	—	—	—	—	—	—	—	—	—	—
6000	1015	4.39	1068	4.83	1114	5.25	1158	5.58	—	—	—	—	—	—	—	—	—	—	—	—
6100	1030	4.59	1083	5.04	1128	5.48	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	1046	4.81	1097	5.26	1142	5.71	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	1061	5.03	1112	5.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

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 4.2 Extensive motor and electrical testing on the Weathermaker® I units ensures 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 a Carrier representative to verify

6 Motor drive range is 860 to 1080 rpm All other rpms require field-supplied drive

START-UP

IMPORTANT: Energize crankcase heater(s) 24 hours prior to base unit start-up to remove entrapped refrigerant from oil. Heater(s) is 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 holddown bolts.

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

Refrigerant Service Ports — Each refrigerant 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 — To start unit, turn on main power supply. Set system selector switch at COOL position and fan switch at AUTO. position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check unit charge. Refer to Service, Refrigerant Charge 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 evaporator 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 evaporator fan turn off (fan will turn off only if fan selector switch is in the AUTO. position).

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 open manual gas valve.
3. Set system switch selector at HEAT position and fan switch at AUTO. or ON position. 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. If the burners do not light, then there is a 60-second delay before another 4-second try. If the burners still do not light, the time delay is repeated. If the burners do not light on the third attempt, there is a lockout. To reset, break the 24-v power to W1.
6. The evaporator fan will turn on immediately after a call for heating.
7. The evaporator fan will turn off immediately after the thermostat temperature is satisfied.
8. Adjust airflow to obtain a temperature rise within the range specified on the unit nameplate and in Table 1.

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

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

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

Operating Sequence

COOLING, UNIT WITHOUT ECONOMIZER — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), compressor contactor no. 1 (C1) and outdoor (condenser) fan relay (OFR) are energized and the evaporator-fan motor, compressor no. 1 and condenser fan start. The condenser-fan motor runs continuously while unit is cooling. If the thermostat calls for a second stage of cooling by energizing Y2, compressor contactor no. 2 (C2) is energized and compressor no. 2 starts.

HEATING, UNIT WITHOUT ECONOMIZER — When thermostat calls for heating, terminal W1 and the induced-draft relay (IDR) are energized and burner ignition sequence begins. The IFC is energized and evaporator-fan motor starts. On unit equipped for 2 stages of heat, when additional heat is needed W2 is energized and the high-fire solenoid on the main gas valve is energized.

When the thermostat is satisfied and W1 is deenergized, evaporator-fan motor deenergizes.

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 each 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 more details.
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
6. Reconnect wiring.
7. 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 panel.

2-Row Coils — Clean coil as follows:

1. Turn off unit power.
2. Remove top panel screws on condenser end of unit.
3. Remove condenser coil corner post. See Fig. 14. To hold top panel open, place coil corner post between top panel and center post. See Fig. 15.
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. 16.
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 and remove the coil corner post from between the top panel and center post. Secure the sections together
7. Install the coil corner post and coil center post, and replace all screws.

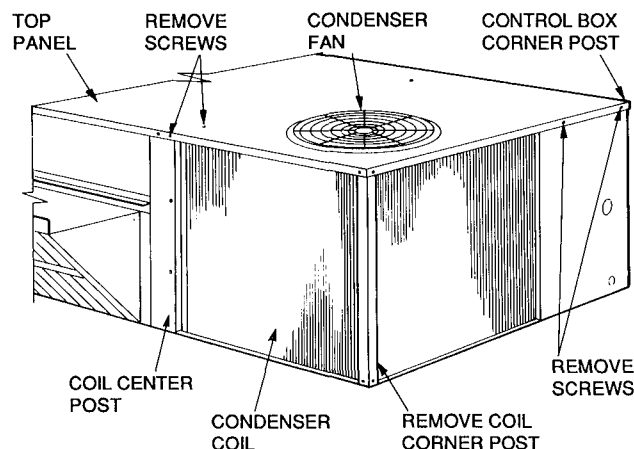


Fig. 14 — Cleaning Condenser Coil

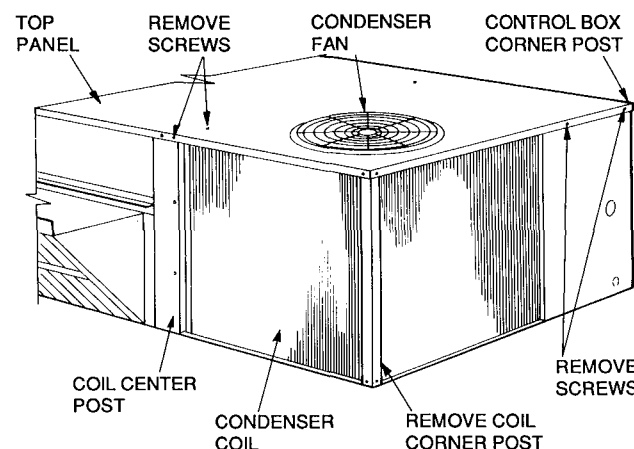


Fig. 15 — Propping Up Top Panel

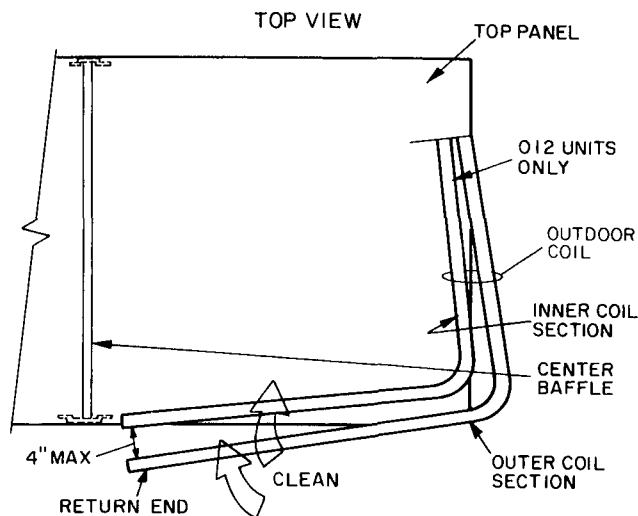


Fig. 16 – Separating Coil Sections

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. 17)

1. Shut off unit power supply.
2. Remove condenser fan assembly (grille, motor, motor cover and fan) and loosen fan hub setscrews.
3. Adjust fan height as shown in Fig. 17.
4. Tighten setscrews and replace condenser-fan assembly.

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 section.

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 Charts, Fig. 18 - 21, vary refrigerant until the conditions of the charts are met. Note the charging charts are different from the type normally used. The charts are 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 charts 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, Circuit 1):

Outdoor Temperature 85 F
Suction Pressure 70 psig
Suction Temperature should be 44 F
(Suction temperature may vary ± 5 F.)

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

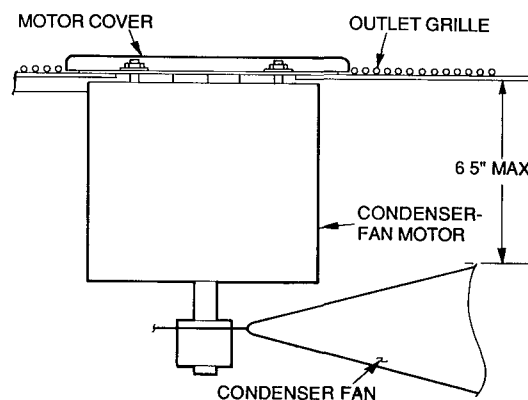


Fig. 17 – Condenser-Air Fan Adjustment

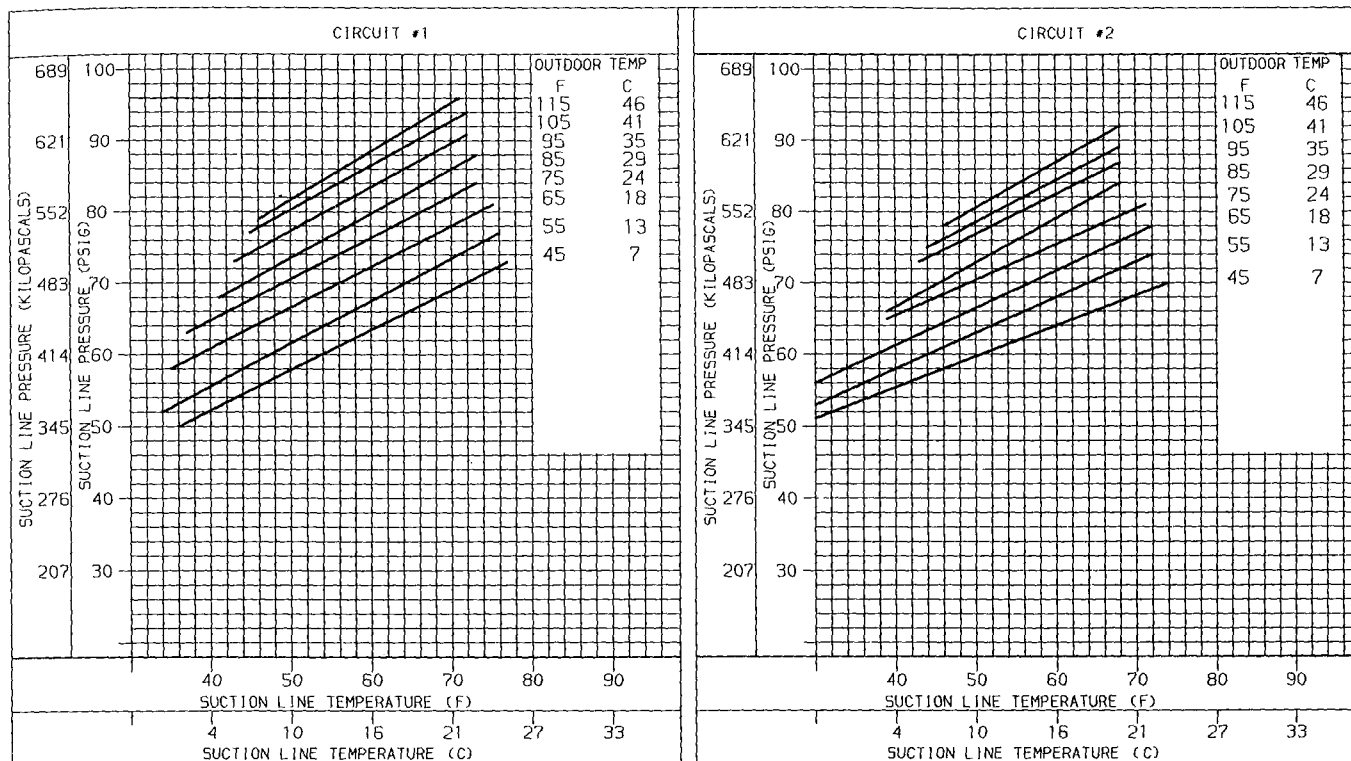


Fig. 18 – Cooling Charging Charts; 48LJD,LJE008

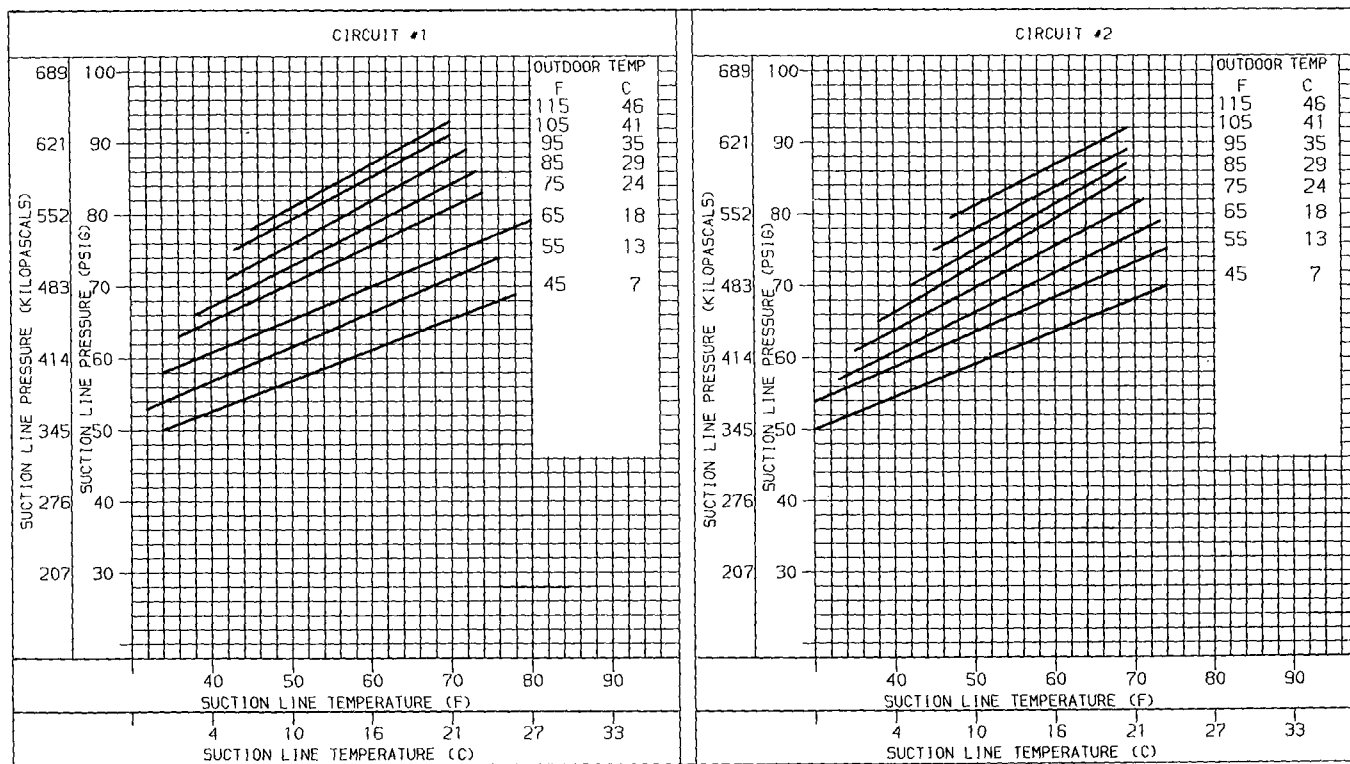


Fig. 19 – Cooling Charging Charts; 48LJD,LJE009

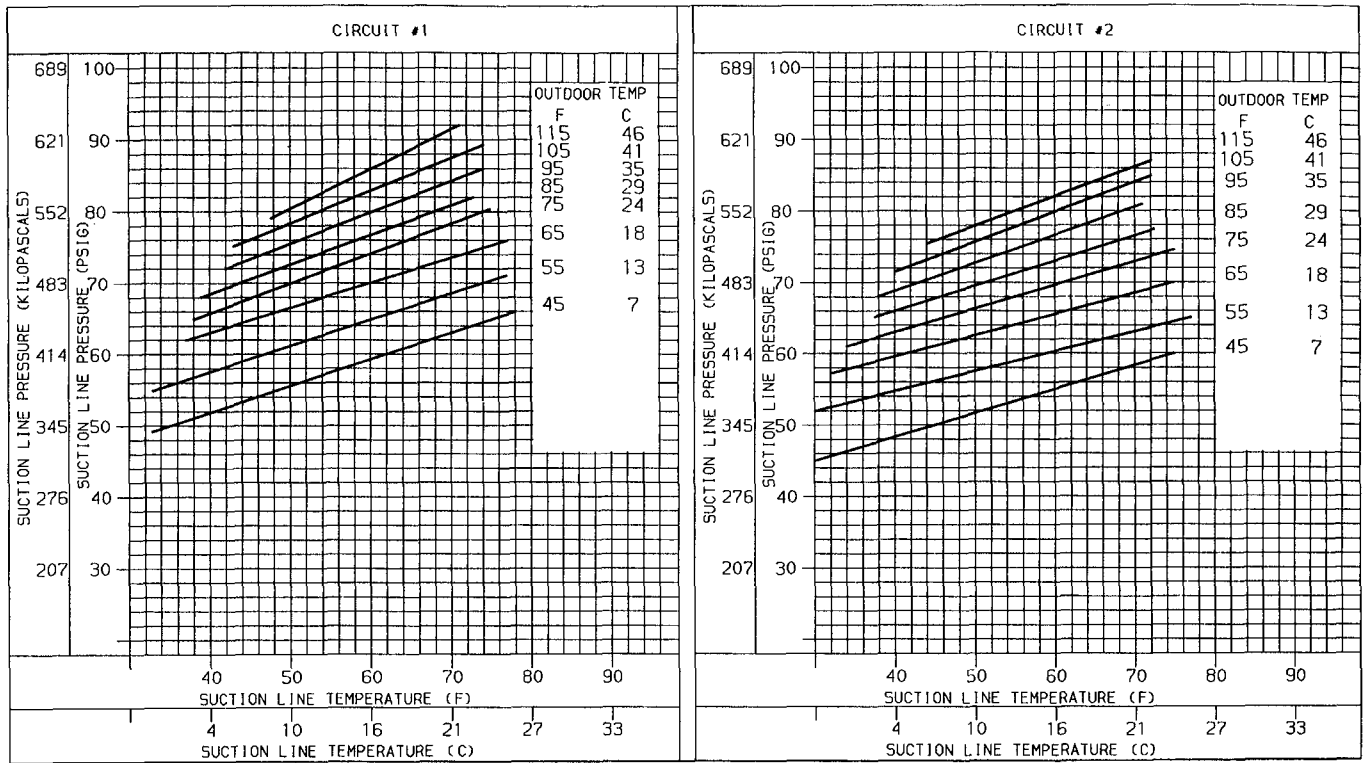


Fig. 20 – Cooling Charging Charts; 48LJD,LJE012

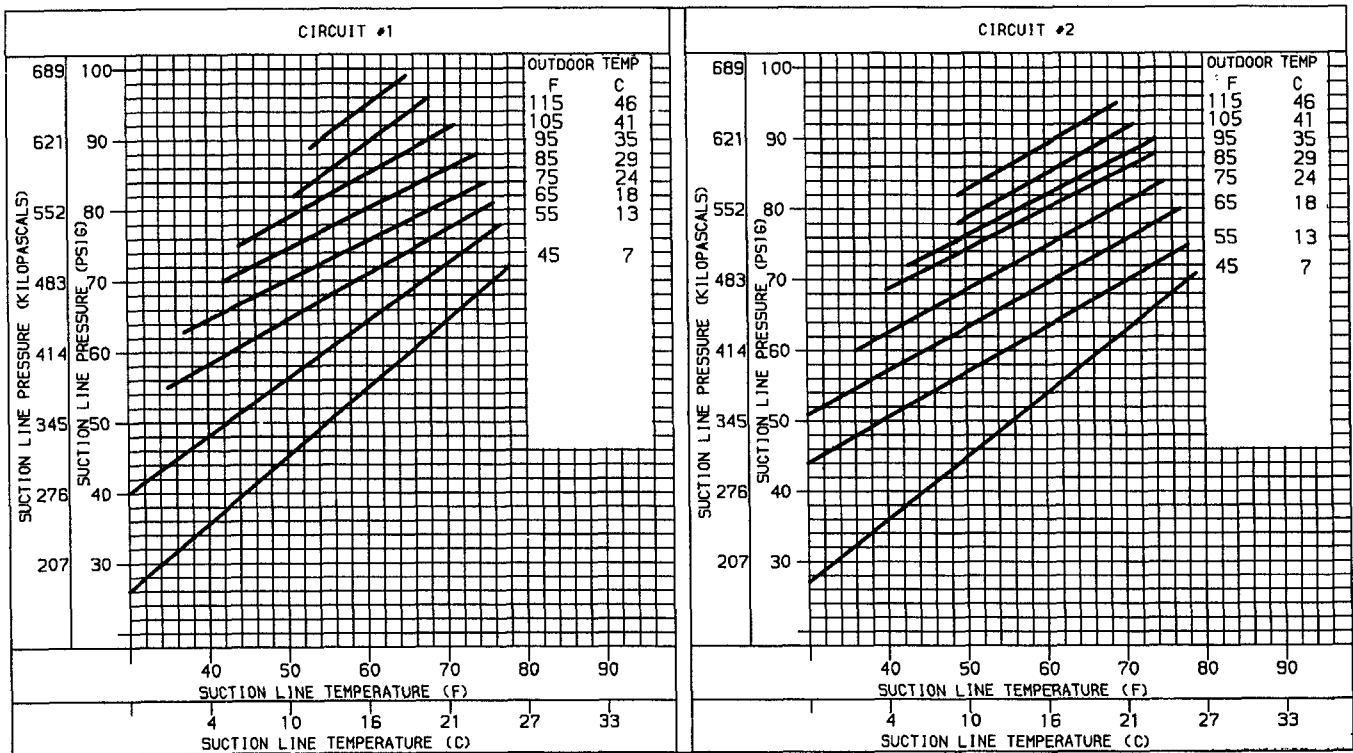


Fig. 21 – Cooling Charging Charts; 48LJD014

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. 22).
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 section (Fig. 22). Module contains a self-diagnostic LED (light-emitting diode). 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.

⚠ CAUTION

When working on gas train, do not hit or plug orifice spuds.

REMOVAL OF GAS TRAIN (See Fig. 22 and 23.)

1. Shut off manual gas valve.
2. Shut off power to unit.
3. Remove compressor access panel.
4. Remove burner section access panel.
5. Slide out burner section 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 2 screws that attach the burner rack to the vestibule plate.
10. Slide the burner tray out of the unit (Fig. 23).

REPLACEMENT OF GAS TRAIN (See Fig. 22 and 23.)

1. Slide the burner tray into the unit.
2. Attach burner rack to vestibule plate with 2 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 section side panel.
7. Reinstall the burner section access panel.
8. Replace compressor access panel.
9. Restore power to unit.
10. Turn on main gas valve.

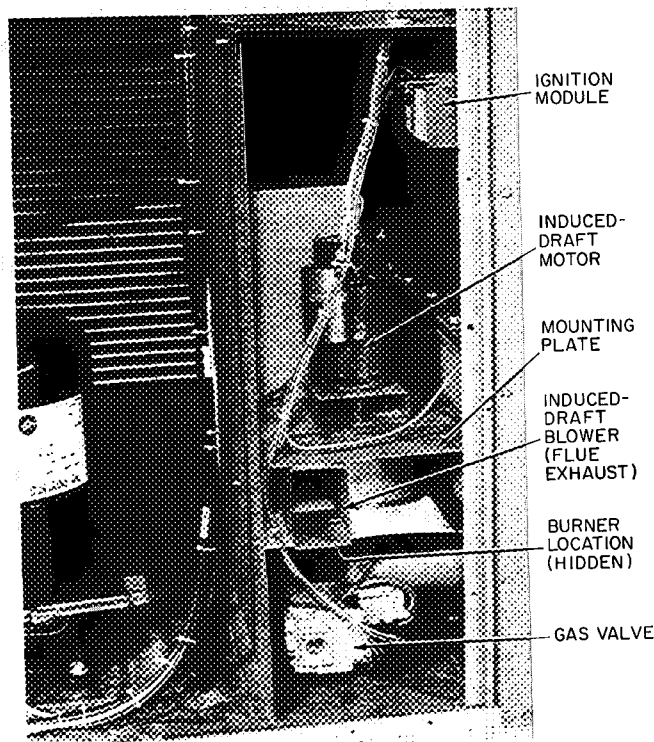


Fig. 22 — Burner Section Details

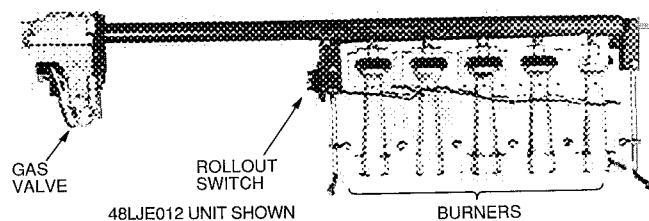


Fig. 23 — Burner Tray Details

CLEANING AND ADJUSTMENT

1. Remove burner rack from unit as described in Removal of Gas Train section, above.
2. Inspect burners; if dirty, remove burners from rack.
3. Using a soft brush, clean burners and crossover port as required.
4. Adjust spark gap. See Fig. 24.
5. Reinstall burners on rack.
6. Reinstall burner rack as described above.

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

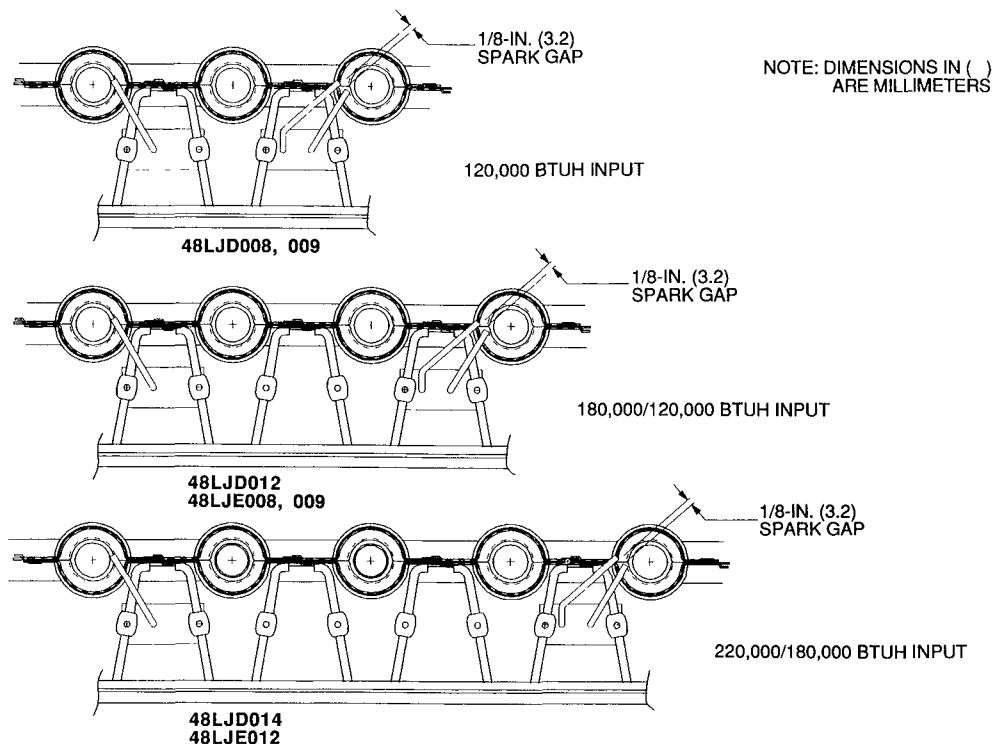
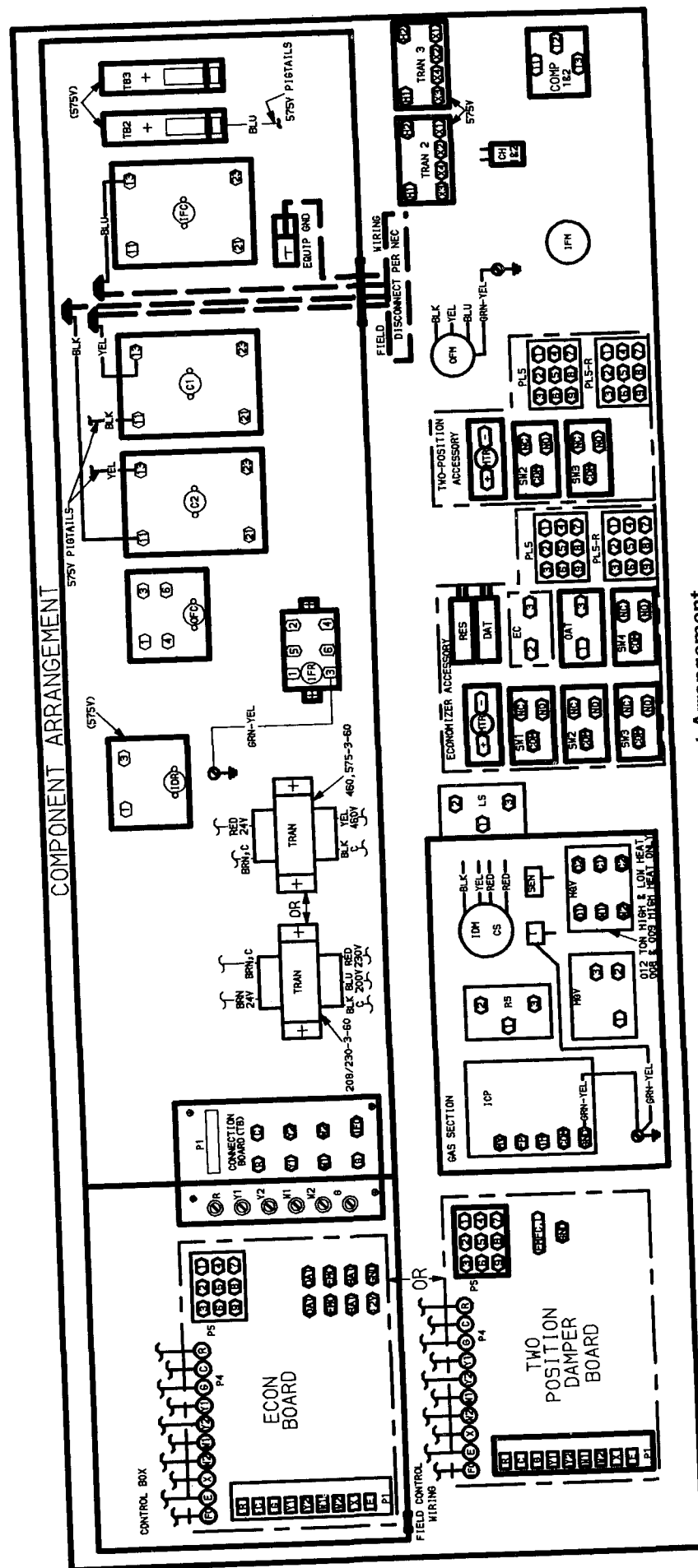


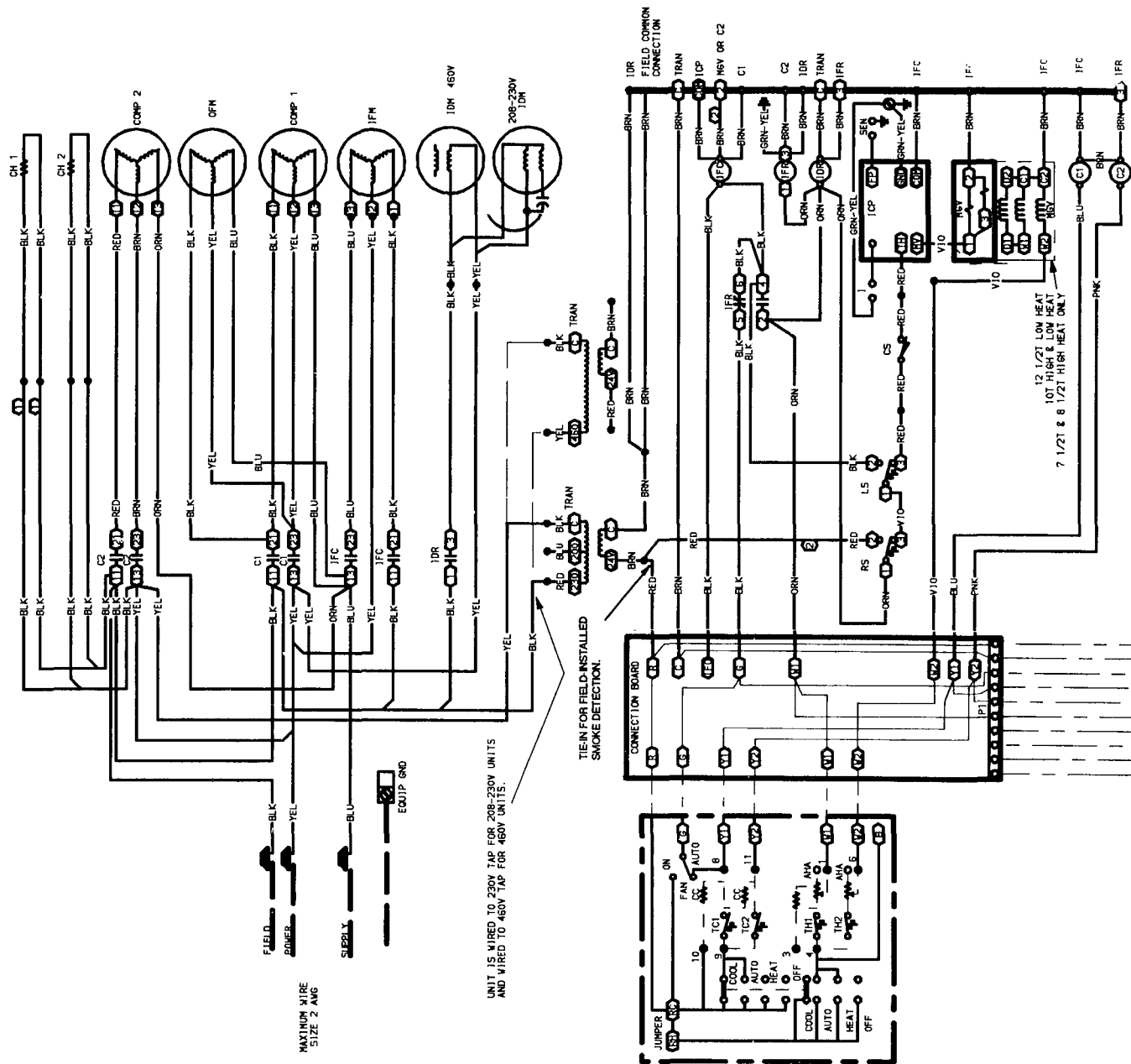
Fig. 24 — Spark Gap Adjustment

LEGEND AND NOTES FOR FIG. 25 AND 26

AHA	— Adjustable Heat Anticipator	RS	— Rollout Switch
AWG	— American Wire Gage	SEN	— Sensor
BAT	— Battery	SW	— Switch
C	— Contactor, Compressor	TB	— Terminal Block
CC	— Cooling Compensator	TC	— Thermostat-Cooling
CH	— Crankcase Heater	TH	— Thermostat-Heating
COM	— Common	TRAN	— Transformer
COMP	— Compressor		— Circuit Board Run
CS	— Centrifugal Switch		— Field Splice
CV	— Constant Volume		— Marked Wire
DAT	— Discharge-Air Thermistor		— Terminal (Marked)
EC	— Enthalpy Control		— Terminal (Unmarked)
ECON	— Economizer		— Terminal Block
EMC/EMFC	— Energy Management Closed		— Terminal Econ Two-Position Board
EMFC. L	— Energy Management Fully Closed		— Terminal CV Board
EMO/EMFO	— Energy Management Open		— Splice
EQUIP	— Equipment		— Splice (Marked)
FP	— Flame Prove		— Factory Wiring
FU	— Fuse		— Field Control Wiring
GND	— Ground		— Field Power Wiring
I	— Ignitor		— Accessory or Optional Wiring
ICP	— Ignitor Control Pack		— To indicate common potential only, not to represent wiring
IDM	— Induced-Draft Motor		
IDR	— Induced-Draft Relay		
IFC	— Indoor (Evaporator) Fan Contactor		
IFM	— Indoor (Evaporator) Fan Motor		
IFR	— Indoor (Evaporator) Fan Relay		
LS	— Limit Switch		
MGV	— Main Gas Valve		
MTR	— Motor		
MV	— Main Valve		
NEC	— National Electrical Code		
OAT	— Outdoor (Condenser) Air Thermostat		
OFC	— Outdoor (Condenser) Fan Contactor		
OFM	— Outdoor (Condenser)-Fan Motor		
P	— Plug		
PL	— Plug Assembly		
RES	— Resistor		

1. If any of the original wire furnished must be replaced, replace 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 against primary single-phasing conditions.
4. Set thermostat heat anticipator at 1.0 amp.
5. Use copper, copper-clad aluminum or aluminum conductors.





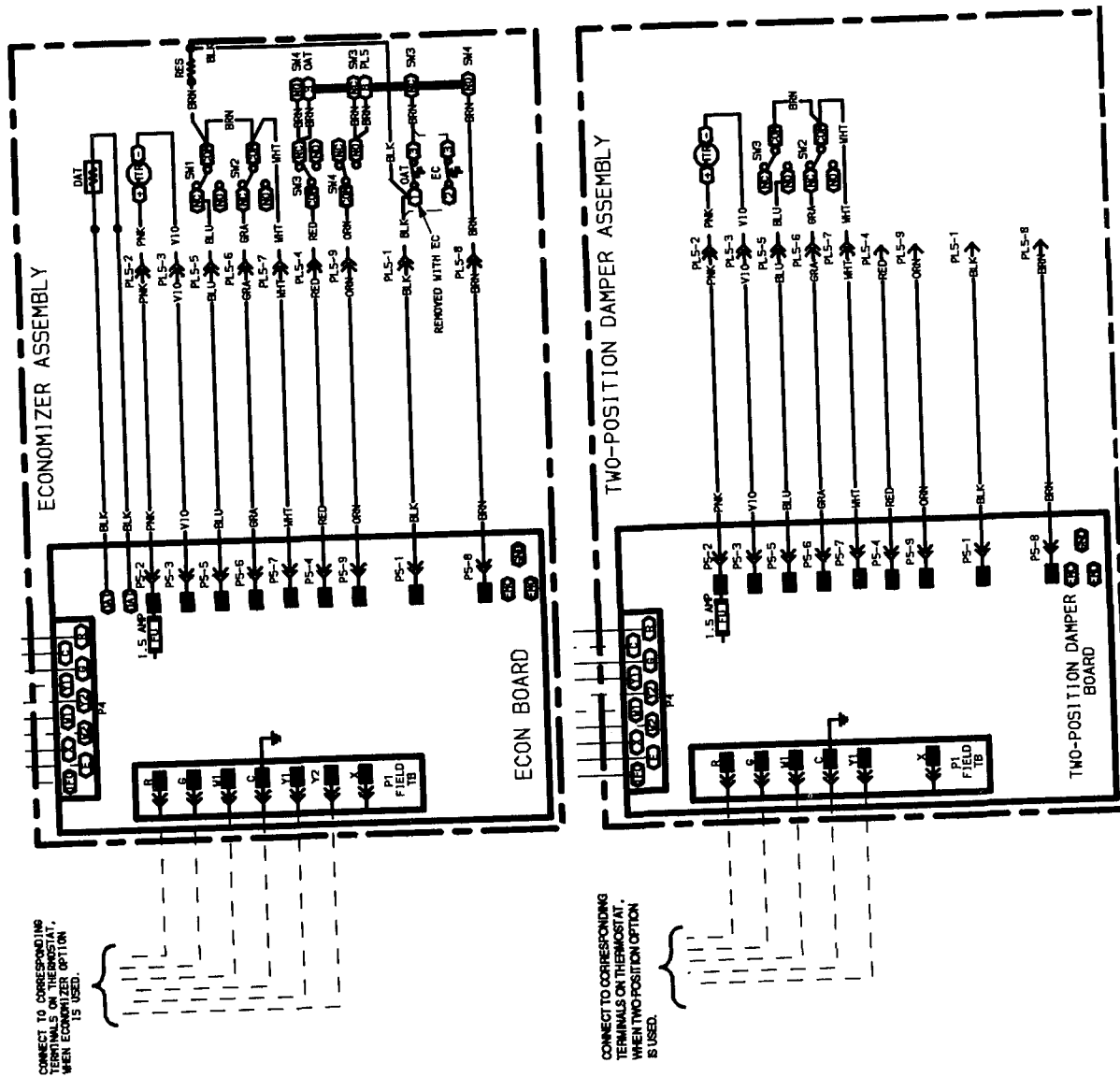


Fig. 26 — Typical Wiring Schematic

