

Installation, Start-Up and Service Instructions

CONTENTS

	Page
SAFETY CONSIDERATIONS	1
INSTALLATION	1-16
Step 1 — Provide Unit Support	1
• ROOF CURB	
• SLAB MOUNT	
Step 2 — Field Fabricate Ductwork	3
Step 3 — Determine Location of Drain Connection for Internally-Trapped Condensate Drain	3
Step 4 — Rig and Place Unit	3
• POSITIONING	
Step 5 — Install Flue Hood	7
Step 6 — Install Gas Piping	7
Step 7 — Make Electrical Connections	7
• FIELD POWER SUPPLY	
• FIELD CONTROL WIRING	
• HEAT ANTICIPATOR SETTINGS	
Step 8 — Make Outdoor-Air Inlet Adjustments and Install Outdoor-Air Hood	10
• OPTIONAL OUTDOOR-AIR DAMPER	
• OPTIONAL ECONOMIZER OR TWO-POSITION DAMPER	
Step 9 — Adjust Evaporator-Fan Speed	12
PRE-START-UP	17
START-UP	17,18
SERVICE	18-26

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 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 configuration. To convert to horizontal application, remove side duct opening covers. Using the same screws, install covers on vertical duct openings with the insulation-side down. Seals around duct 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 partially 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. 1. Install insulation, cant strips, roofing, and counter flashing as shown. *Ductwork must be attached to curb.* If gas, electric power, or control power is 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 watertightness. Install gasket supplied with the roof curb as shown in Fig. 1. Improperly applied gasket can also result in air leaks and poor unit performance.

Curb should be level. Unit leveling tolerances are shown in Fig. 2. 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. Install a gravel apron in front of condenser coil air inlet to prevent grass and foliage from obstructing airflow.

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

ROOF CURB ACCESSORY	"A"	UNIT SIZE
50DJ901371	1'-2" [356]	48HJD/HJE/HJF008,009 48HJD/HJE012 48HJD014
50DJ901381	2'-0" [610]	

NOTES:

- 1 Roof curb accessory is shipped unassembled.
- 2 Insulated panels
- 3 Dimensions in [] are in millimeters
4. Roof curb: galvanized steel.
- 5 Attach ductwork to curb (Flanges of duct rest on curb)
- 6 Service clearance 4 ft on each side.
7.  Direction of airflow

UNIT SIZE	"B"	"C"	"D" ALT DRAIN HOLE	"E" GAS	"F" POWER	"G" CONTROL	CONNECTOR PKG ACY
48HJD/HJE/HJF008,009 48HJD/HJE012 48HJD014	1-10 ¹⁵ / ₁₆ " [583]	1-10 ¹⁵ / ₁₆ " [583]	1-3/4" [45]	3/4" [19] NPT	1" [25] NPT	3/4" [19] NPT	50DJ901551

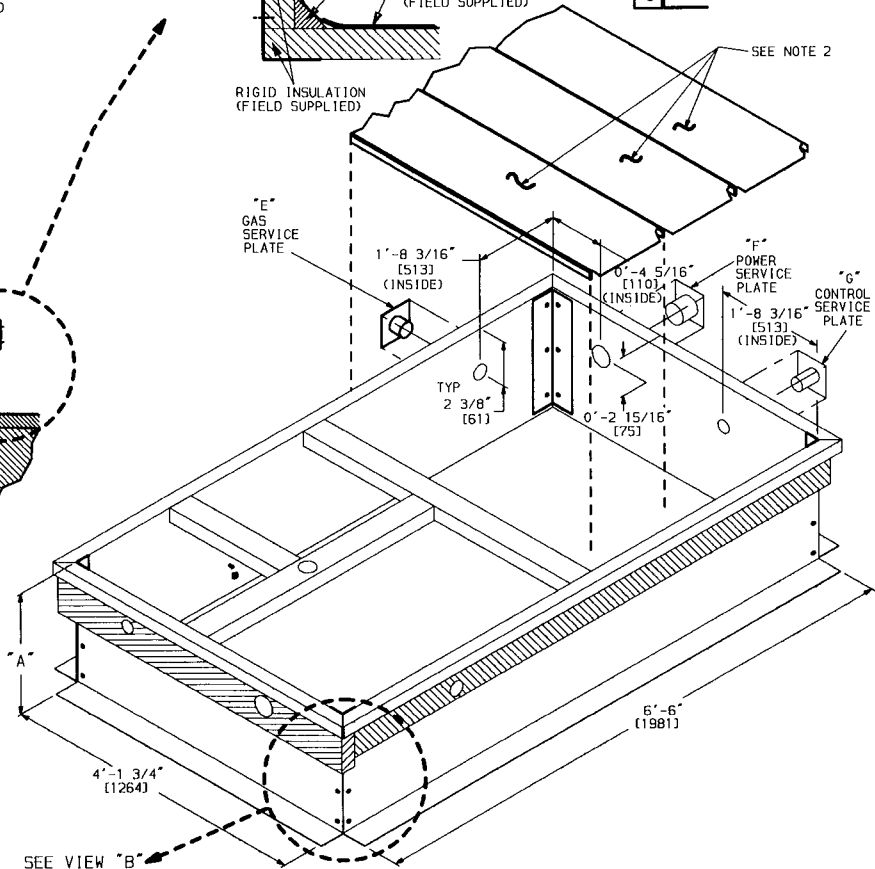
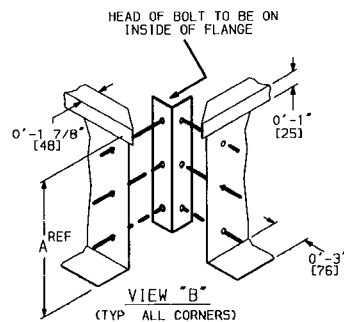
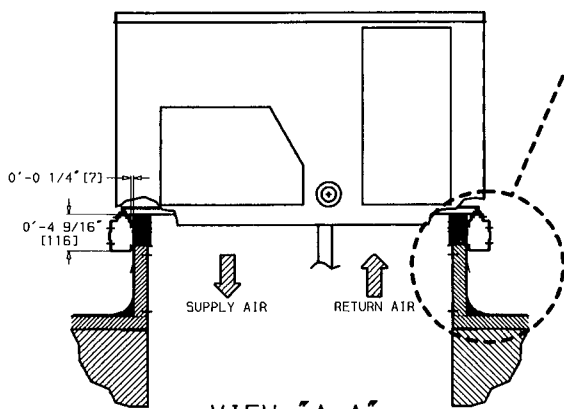
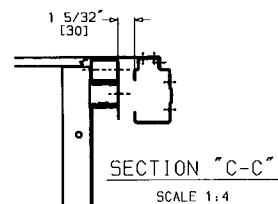
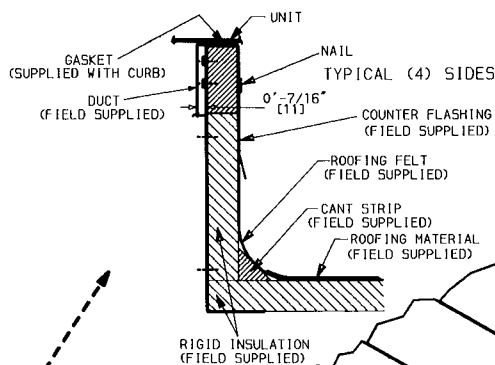
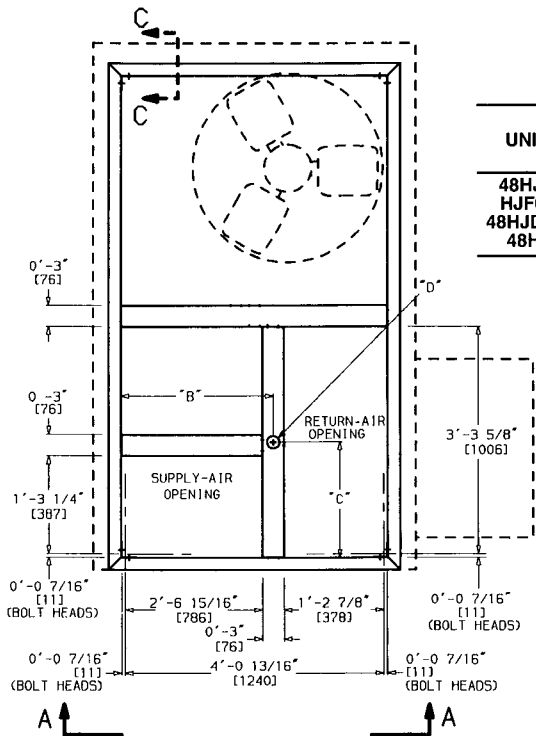


Fig. 1 – Roof Curb Details

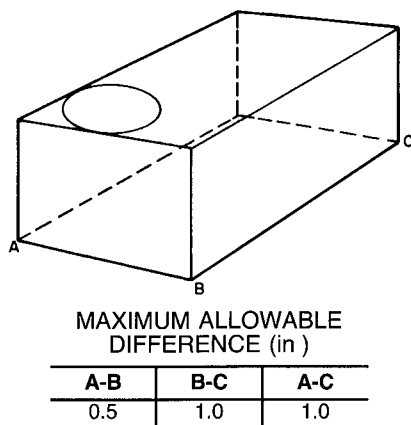


Fig. 2 — Unit Leveling Tolerances

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 weather-proof all external ductwork, joints, and roof openings with counter 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.

These units are designed for a minimum continuous return-air temperature of 50 F (dry bulb) or an intermittent operation down to 45 F (dry bulb), such as when used with a night setback thermostat.

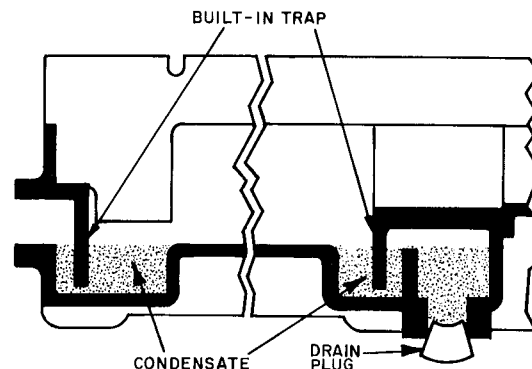
Step 3 — Determine Location of Drain Connection for Internally-Trapped Condensate Drain

— Units have internally-trapped condensate drains. (See Fig. 3.) The condensate can be drained through the basepan or through the side panel. A drain plug is shipped installed in the basepan drain connection. If condensate drain is to be through the bottom of unit, the plug must be relocated to the side panel drain connection before 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 side panel or basepan drain may be used with either vertical or horizontal units.

NOTE: Before installing unit, be sure drain plug is tight.

IMPORTANT: The condensate pan is internally trapped. An external trap is not required. If an external trap is attached, an air lock may develop between the traps causing the condensate pan to overflow.

Step 4 — Rig and Place Unit — Inspect unit for transportation damage. File any claim with transportation agency. Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be



NOTE: Drain plug is shown in factory-installed position

Fig. 3 — Internally-Trapped Condensate Drain

used to move unit across a roof. Level by using unit frame as a reference. See Table 1 and Fig. 4 for additional information. Operating weight is shown in Table 1 and Fig. 4.

Lifting holes are provided in base rails as shown in Fig. 4 and 5. Refer to rigging instructions on unit.

POSITIONING — Maintain clearance around and above unit to provide minimum distance from combustible materials, proper airflow, and service access. See Fig. 5.

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 so 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.

Position unit on roof curb so that the following clearances are maintained: $\frac{1}{4}$ -in. clearance between roof curb and base rails on each side and front of unit; $1\frac{5}{32}$ -in. clearance between roof curb and rear of unit. (See Fig. 1, section C-C.)

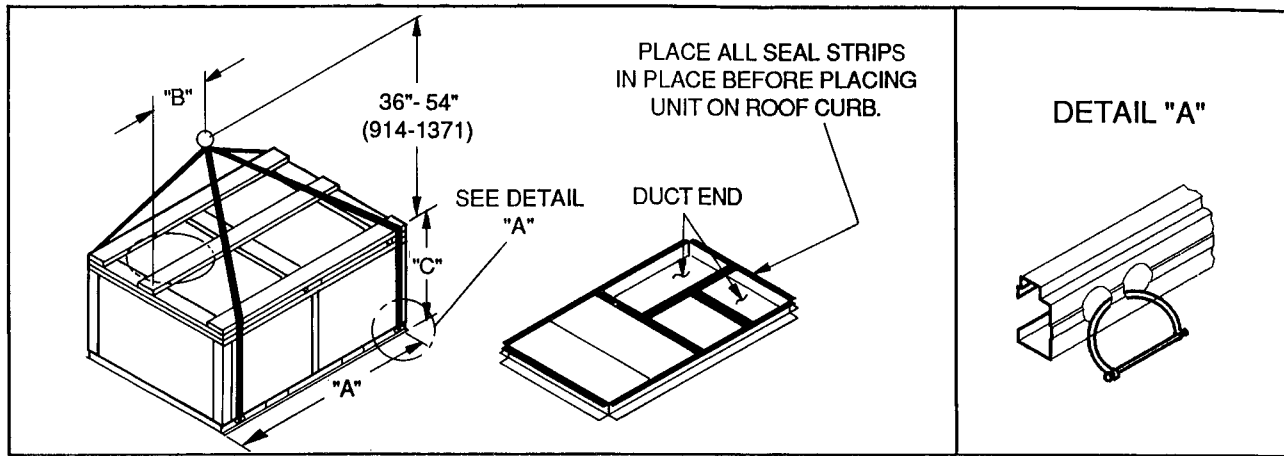
Locate mechanical draft system flue assembly at least 48 in. from any opening through which combustion products could enter the building, and at least 48 in. from an adjacent building or combustible material. When unit is located adjacent to public walkways, flue assembly must be at least 7 ft above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

Flue gas can deteriorate building materials. Orient unit so 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 per 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.

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

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



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
48HJD/HJE/HJF008	870	395	75.38	2219	40.25	1022	41.31	1050
48HJD/HJE/HJF009	880	399	75.38	2219	40.25	1022	41.31	1050
48HJD/HJE012	1035	469	75.38	2219	40.25	1022	49.31	1253
48HJD014	1050	476	75.38	2219	40.25	1022	49.31	1253

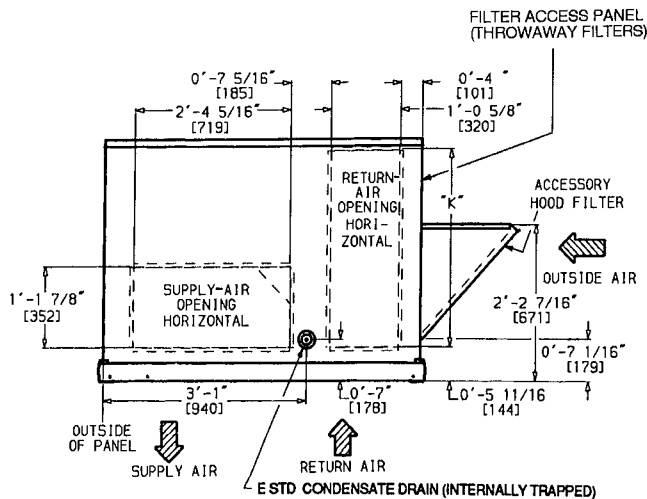
Fig. 4 — Rigging Details

Table 1 — Physical Data

BASE UNIT 48	HJD/HJE/HJF008	HJD/HJE/HJF009	HJD/HJE012	HJD014
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		Scroll		Reciprocating
Quantity	2	2	2	2
Oil (oz) (each compr)	60	65	64	65
REFRIGERANT TYPE		R-22		
Operating Charge (lb-oz)				
Circuit 1	6- 8	7-4	8-11	10-0
Circuit 2	5-14	6-4	8-3	9-3
CONDENSER FAN		Propeller		
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		Enhanced Copper Tubes, Aluminum Lanced Fins		
Rows...Fins/in.	2...17	2...17	2...17	2...17
Total Face Area (sq ft)	18 0	20.5	25 0	25.0
EVAPORATOR FAN		Centrifugal		
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
Maximum Continuous Bhp	2 4	2 4	2 4	4 2
Motor Frame	2.9	2 9	4 2	—
Fan Rpm Range	56	56	56	56
Motor Bearing Type	56	56	56	—
Maximum Fan Rpm	590-840	590-840	690- 935	860-1080
Motor Pulley Pitch Diameter	840-1085	840-1085	860-1080	—
A/B (in.)	Ball	Ball	Ball	Ball
Fan Pulley Pitch Diameter (in.)	2100	2100	2100	2100
Belt — Type...Length (in.)	2 4/3 4	2 4/3 4	2.8/3 8	4 0/5.0
Pulley Center Line Distance (in.)	3 4/4 4	3 4/4 4	4 0/5 0	—
Speed Change per Full Turn of Movable Pulley Flange (rpm)	7 0	7 0	7 0	8.0
Movable Pulley Maximum Full Turns from Closed Position	7 0	7 0	8 0	—
Factory Setting — Full Turns Open	A 48	A 48	A.. 51	A 57
Factory Speed Setting (rpm)	A...51	A.. 51	A.. 57	—
Fan Shaft Diameter at Pulley (in.)	16.75-19 25	16 75-19 25	18 25-20 75	18 25-20.75
	16.75-19 25	16 75-19 25	18 25-20 75	—
	50	50	50	45
	50	50	45	—
	5	5	5	5
	5	5	5	—
	5	5	5	5
	5	5	5	—
	590	590	690	860
	840	840	860	—
	1	1	1	1
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins		
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
Liquid Propane — Alt	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 Stage 1	90,000/120,000/180,000	90,000/120,000/180,000	120,000/180,000	180,000
Stage 2	125,000/180,000/220,000	125,000/180,000/220,000	180,000/225,000	225,000
Efficiency (Steady State) (%)	82	82	82	82
Temperature Rise Range	20-50/35-65/45-75	20-50/35-65/45-75	35-65/35-65	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
Field Gas Connection Size (in.)	.5/ .75/ .75	5/ .75/ 75	75/ .75	75
HIGH-PRESSURE SWITCH (psig)				
Cutout		428		
Reset (Auto.)		320		
LOSS-OF-CHARGE/LOW-PRESSURE SWITCH (Liquid Line) (psig)				
Cutout		7 ± 3		
Reset (Auto.)		22 ± 7		
OUTDOOR-AIR INLET SCREENS		Cleanable		
Quantity...Size (in.)		1 20 x 25 x 1		
		1...16 x 25 x 1		
RETURN-AIR FILTERS		Throwaway		
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



RIGHT SIDE

NOTES:

1 Dimensions in [] are in millimeters

2 Center of gravity

3 Direction of airflow

4 On vertical discharge units, ductwork to be attached to accessory roof curb only. For horizontal discharge units, field supplied flanges should be attached to horizontal discharge openings, and all ductwork should be attached to the flanges.

5 Minimum clearances are as follows (local codes or jurisdiction may prevail):
NOTE: When installing these units, use the maximum clearance stated for your application

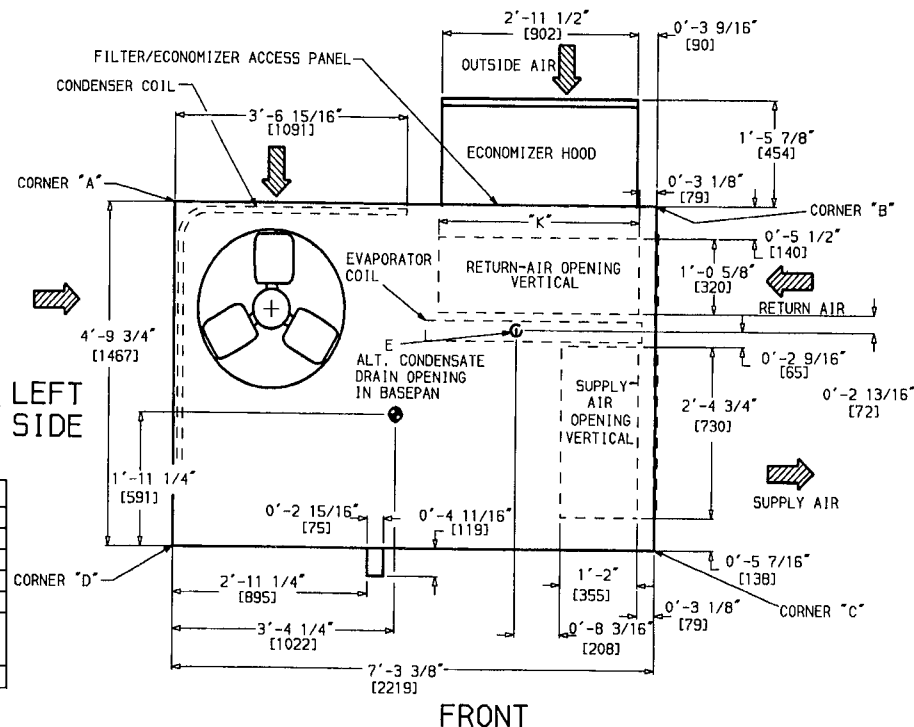
- Between unit, flue side and combustible surfaces, 48 inches (Minimum clearance to combustibles, flue side, is 18 in. for units with accessory flue discharge deflector)
- Bottom to combustible surfaces (when not using curb), 0 in. for HJD,HJE units and 1 in. for HJF units
- Condenser coil, for proper 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.

- Horizontal supply and return end, 0 inches
 - Between units, control box side, 42 inches
 - Between unit and ungrounded surfaces, control box side, 36 in. per NEC (National Electrical code)
 - Between unit and block or concrete walls and other grounded surfaces, control box side, 42 in. per NEC
- 6 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
- 7 Units may be installed on combustible floors made from wood or class A, B, or C roof covering material

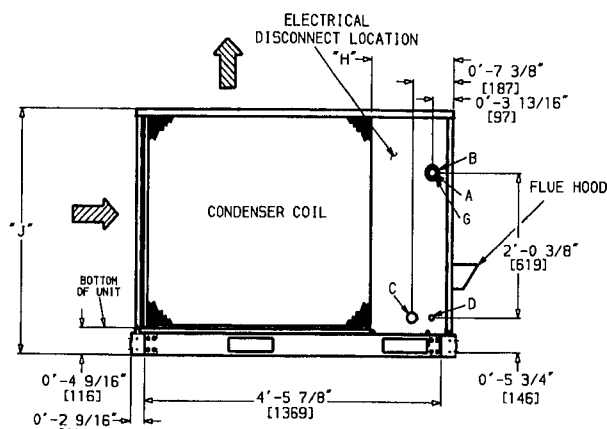
Connection Sizes	
A	1 1/8" Dia [35] Field Power Supply Hole
B	2 1/2" Dia [64] Power Supply Knockout
C	1 3/4" Dia [44] Charging-Port Hole
D	7/8" Dia [22] Field Control Wiring Hole
E	3/4"-14 NPT Condensate Drain
F	1/2"-14 NPT Gas Connection 48HJD008,009
F	3/4"-14 NPT Gas Connection 48HJE/HJF008,009,48HJD014, 48HJD/HJE012
G	2" Dia [51] Power Supply Knockout

UNIT	STD UNIT WEIGHT		ECONOMIZER WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg
48HJD/HJE/HJF008	870	395	44	20	189	86	161	73	239	109
48HJD/HJE/HJF009	880	399	44	20	191	87	163	74	242	110
48HJD/HJE012	1035	469	44	20	225	102	192	87	285	129
48HJD014	1050	476	44	20	228	103	195	88	289	131

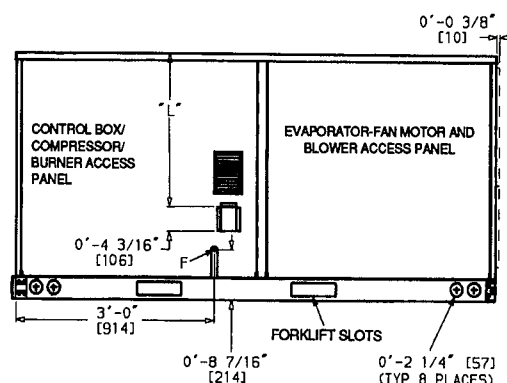
UNIT	CORNER WEIGHT (D)		"H"		"J"		"K"		"L"	
	Lb	Kg	Ft.-in.	mm	Ft.-in.	mm	Ft.-in.	mm	Ft.-in.	mm
48HJD/HJE/HJF008	280	127	2-0 7/8"	632	3-5 1/16"	1050	2-9 1/16"	856	2-2 1/8"	663
48HJD/HJE/HJF009	284	129	1-2 7/8"	378	3-5 1/16"	1050	2-9 1/16"	856	2-2 1/8"	663
48HJD/HJE012	333	151	1-2 7/8"	378	4-1 1/16"	1253	3-0 3/8"	924	2-10 1/16"	866
48HJD014	338	153	1-2 7/8"	378	4-1 1/16"	1253	3-0 3/8"	924	2-10 1/16"	866



FRONT



LEFT SIDE



FRONT

Fig. 5 – 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. 5 and 6.

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 in. wg or greater than 13 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. 7. 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 6 support beams. See Fig. 7 for typical pipe guide and locations of external manual gas shut-off valve.

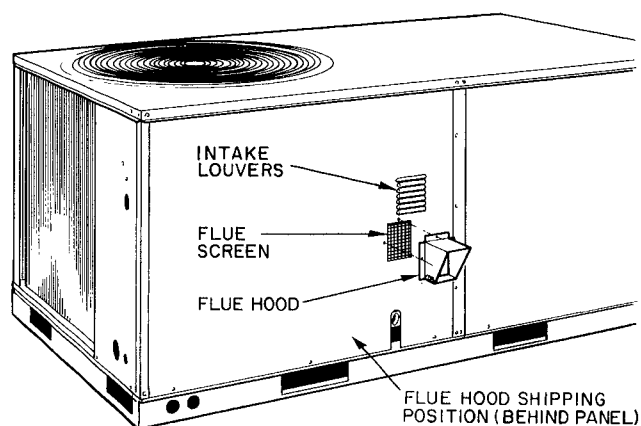
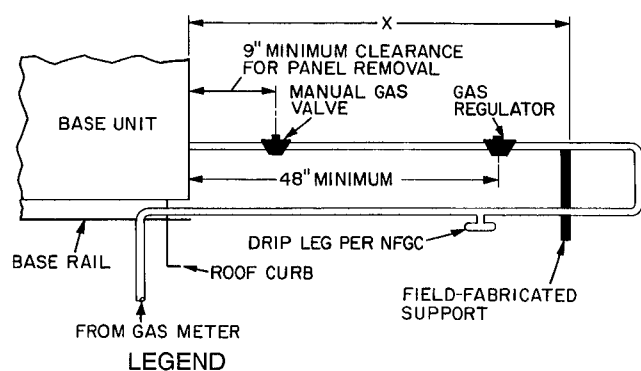


Fig. 6 — Flue Hood Details



NFGC — National Fuel Gas Code
*Field Supplied

NOTE: Follow all local codes

STEEL PIPE NOMINAL DIAMETER (in.)	SPACING OF SUPPORTS X DIMENSION (ft)
1/2	6
3/4 or 1	8
1 1/4 or Larger	10

**Fig. 7 — 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. Pigtails 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 made in accordance with CSA (Canadian Standards Association) C22.1 Canadian Electrical Code Part One.

Install conduit through side panel openings indicated in Fig. 5. Route power lines through connector to terminal connections as shown in Fig. 8.

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 percent 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.

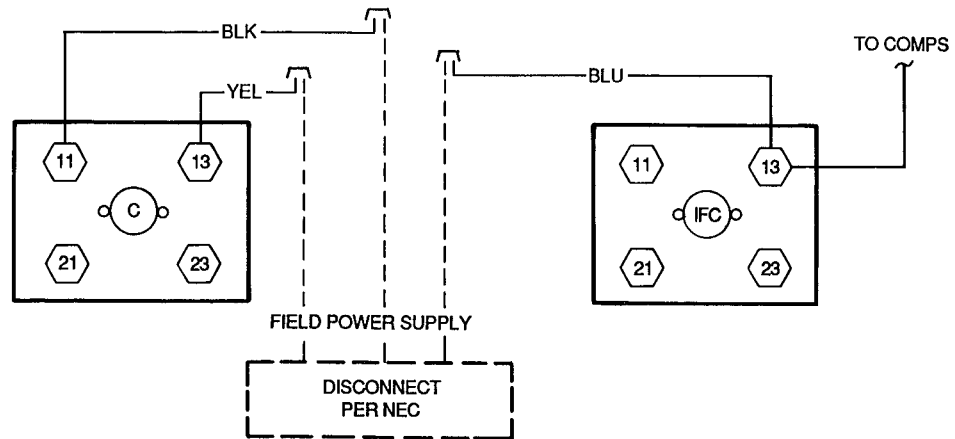
Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 9) as described in Steps 1 - 4 below.

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, Connection Sizes table, Fig. 5).
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. 10. The raceway provides the UL required clearance between high- and low-voltage wiring.
4. Connect thermostat wires to screw terminals of low voltage connection board (see Fig. 9).

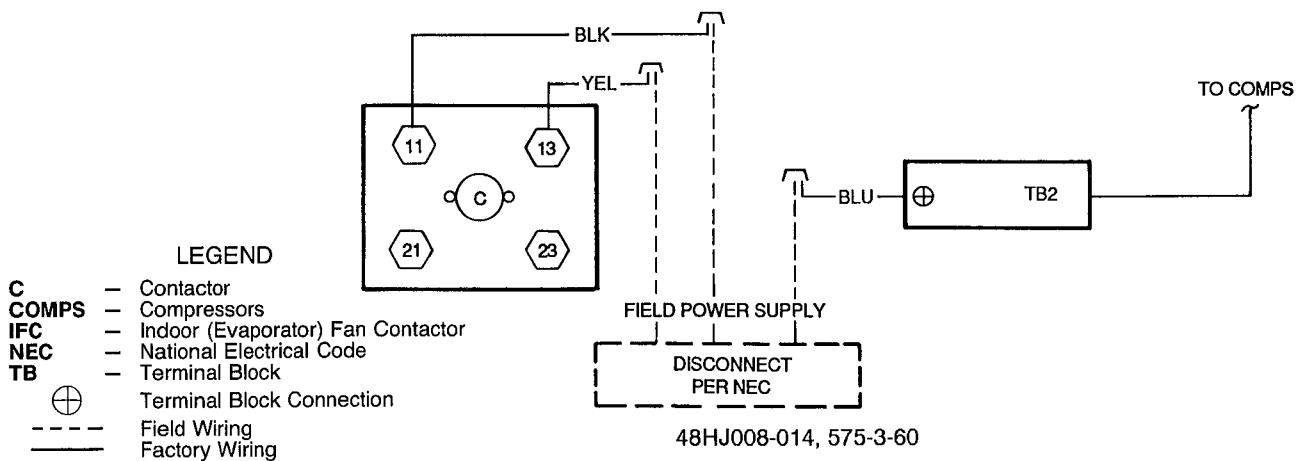
NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire Gage) insulated wire (35 C minimum). For 51 to 75 ft, use no.16 AWG insulated wire (35 C minimum). For over 75 ft, use no. 14 AWG insulated wire (35 C minimum).

NOTE: All wire larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

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

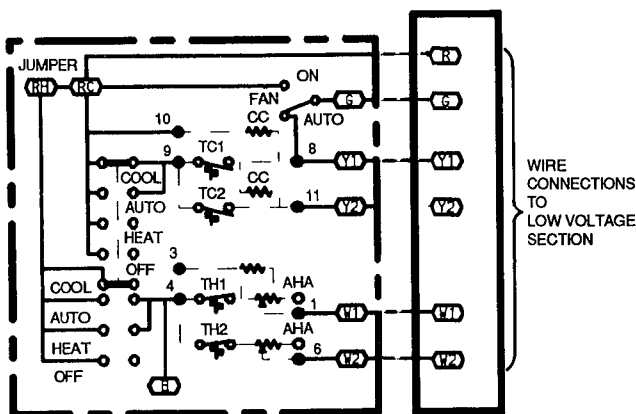


48HJ008-014, 208/230-3-60 AND 460-3-60



48HJ008-014, 575-3-60

Fig. 8 — Power Wiring Connections



TYPICAL THERMOSTAT

LEGEND

- AHA** — Adjustable Heat Anticipator
- CC** — Cooling Compensator
- TC** — Thermostat-Cooling
- TH** — Thermostat-Heating
- — Field Wiring
- — Factory Wiring

Fig. 9 — Low-Voltage Connections With or Without Economizer or Two-Position Damper

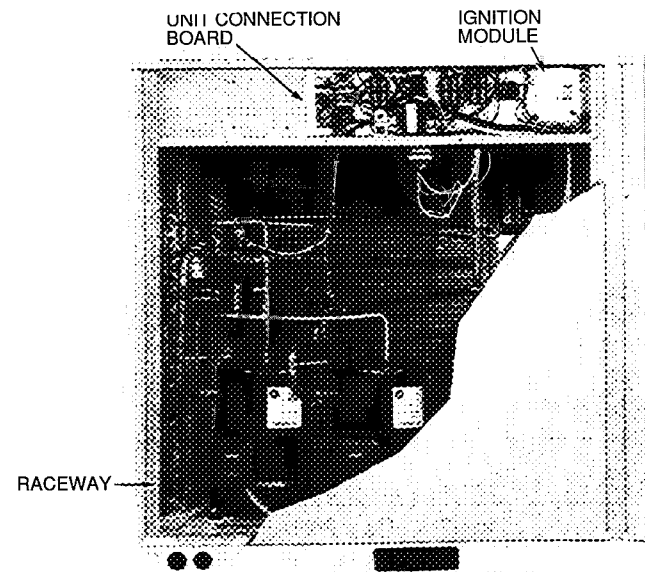


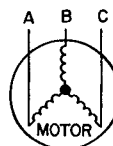
Fig. 10 — Field Control Wiring Raceway

Table 2 – Electrical Data

UNIT	NOMINAL V-PH-HZ	IFM TYPE	VOLTAGE RANGE		COMPR (each)		OFM		COMBUSTION FAN MOTOR	POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
			Min	Max	RLA	LRA	FLA	FLA		MCA	MOCP	FLA	LRA
48HJD/HJE/HJF 008 (7½ Tons)	208/230-3-60	Std Alt	187	254	13.5	99.0	3.8	5.8 7.5	.57	40.0/40.0 41.7/41.7	45/45* 50/50*	42/42 44/44	257/257 276/276
	460-3-60	Std Alt	414	508	7.4	49.5	1.9	2.6 3.4	.30	21.2 22.0	25* 25*	22 23	129 138
	575-3-60	Std Alt	518	632	5.8	40.0	1.9	2.6 3.4	.30	16.7 17.3	20* 20*	17 18	104 111
48HJD/HJE/HJF 009 (8½ Tons)	208/230-3-60	Std Alt	187	254	13.5	99.0	3.8	5.8 7.5	.57	40.0/40.0 41.7/41.7	45/45* 50/50*	42/42 44/44	257/257 276/276
	460-3-60	Std Alt	414	508	7.4	49.5	1.9	2.6 3.4	.30	21.2 22.0	25* 25*	22 23	129 138
	575-3-60	Std Alt	518	632	5.8	40.0	1.9	2.6 3.4	.30	16.7 17.3	20* 20*	17 18	104 111
48HJD/HJE 012 (10 Tons)	208/230-3-60	Std Alt	187	254	17.3	123.0	3.8	5.8 12.0	.57	48.5/48.5 54.7/54.7	60/60* 60/60*	51/51 58/58	305/305 348/348
	460-3-60	Std Alt	414	508	9.0	62.0	1.9	2.6 5.4	.30	24.8 27.6	30* 30*	26 29	154 175
	575-3-60	Std Alt	518	632	7.1	50.0	1.9	2.6 5.4	.30	19.6 21.8	25* 30*	20 23	124 141
48HJD 014 (12½ Tons)	208/230-3-60	Std	187	254	22.3	142.0	3.8	12.0	.57	66.0/66.0	80/80	69/69	386/386
	460-3-60	Std	414	508	10.4	72.0	1.9	5.4	.30	30.7	35*	32	195
	575-3-60	Std	518	632	9.6	58.5	1.9	5.4	.30	27.4	35*	29	158

LEGEND

CSA — Canadian Standards Association
 FLA — Full Load Amps
 HACR — Heating, Air Conditioning and Refrigeration
 IFM — Indoor (Evaporator) Fan Motor
 LRA — Locked Rotor Amps
 MCA — Minimum Circuit Amps
 MOCP — Maximum Overcurrent Protection
 NEC — National Electrical Code
 OFM — Outdoor (Condenser) Fan Motor
 RLA — Rated Load Amps



Example: Supply voltage is 460-3-60

AB = 452 v
 BC = 464 v
 AC = 455 v

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

Determine maximum deviation from average voltage

(AB) 457 – 452 = 5 v
 (BC) 464 – 457 = 7 v
 (AC) 457 – 455 = 2 v

Maximum deviation is 7 v.

Determine percent 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

*Fuse or HACR circuit breaker.

NOTES:

- 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.
- Unbalanced 3-phase Supply Voltage**
Never operate a motor where phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent voltage imbalance.

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

Step 8 – Make Outdoor-Air Inlet Adjustments and Install Outdoor-Air Hood

OPTIONAL OUTDOOR-AIR DAMPER — Optional outdoor-air damper hood is packaged and shipped strapped to the air filter tracks in the filter section.

To Assemble

1. Remove evaporator coil access panel. Save panel and screws. See Fig. 11.
2. Assemble outdoor-air hood top and side plates as shown in Fig. 12. Install seal strips on hood top and sides. Put aside screen retainer and retainer screw for later assembly. *Do not attach hood to unit at this time.*
3. Remove block-off panel from evaporator coil access panel and discard. Save screws. See Fig. 11.
4. Refer to Fig. 13. Adjust ventilation-air position setting of the outdoor damper blade by loosening the adjustable screws and sliding the metal panel until in the position determined by Fig. 14.
5. Fasten hood top and side plate assembly and bottom stop (Fig. 15) to unit with screws saved from Step 3.
6. Slide outdoor-air inlet screens into screen track on hood side plate. Using clasp provided, clamp screens together. While holding screens in place, fasten screen retainer to hood using screws provided. (see Fig. 15).

OPTIONAL ECONOMIZER OR TWO-POSITION DAMPER — The economizer or two-position damper hood assembly is packaged and shipped in the filter section. Damper blades and control boards are installed at the factory and the economizer or two-position damper is shipped in the vertical discharge position.

NOTE: Horizontal discharge block-off plate is shipped with the air hood package. If unit is to be used for vertical discharge application, discard this plate.

To Assemble

1. Determine if ventilation air is required in building. If so, record quantity of ventilation air needed for use in Step 7.
2. Remove evaporator coil access panel. Save panel and screws. See Fig. 11.
3. Assemble outdoor-air hood top and side plates as shown in Fig. 12. Install seal strips on hood top and sides. Put aside screen retainer and retainer screw for later assembly. *Do not attach hood to unit at this time.*
4. Remove block-off panel from evaporator coil access panel and discard. Save screws. See Fig. 11.

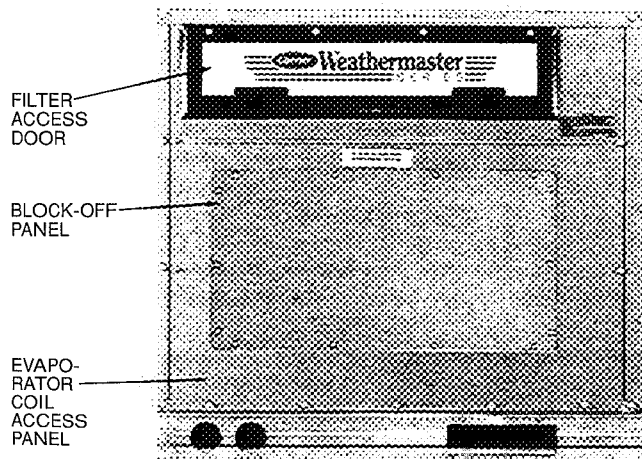


Fig. 11 – Access Panel Location

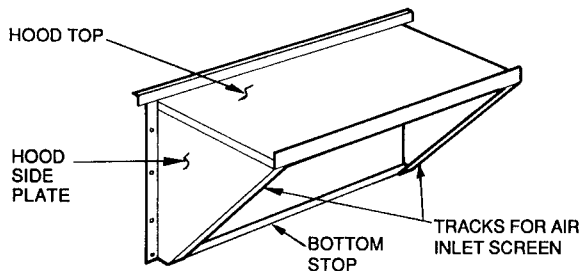
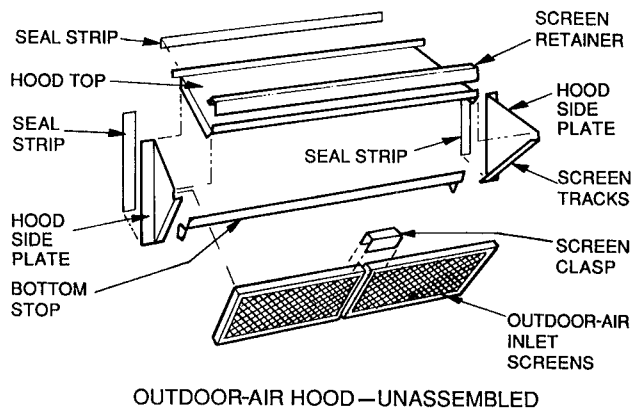


Fig. 12 – Outdoor-Air Hood Details

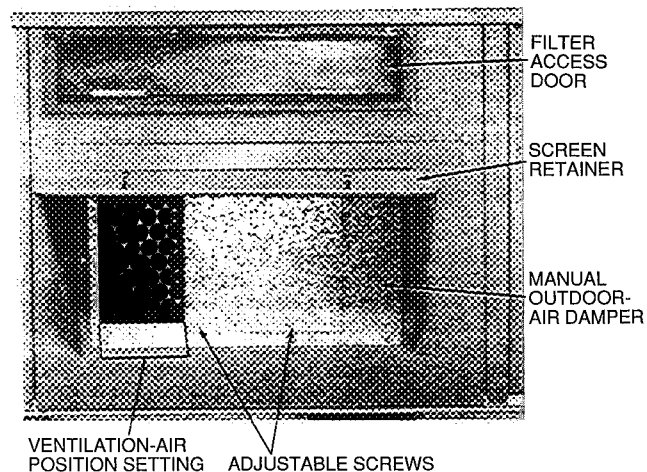


Fig. 13 – Manual Outdoor-Air Damper

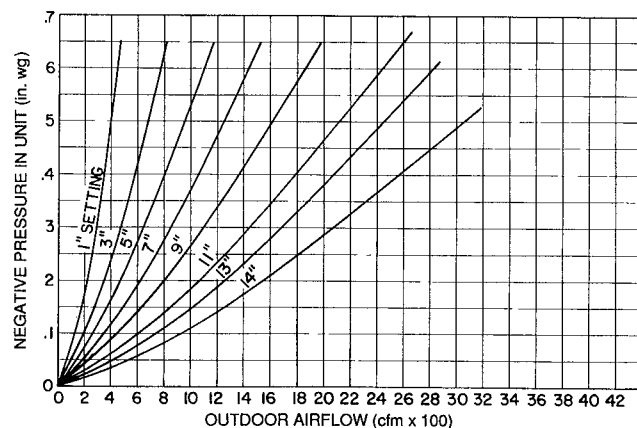


Fig. 14 – Outdoor-Air Intake Position Setting

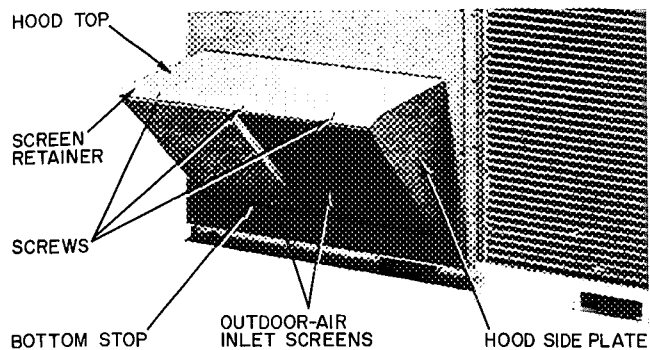


Fig. 15 - Air Hood Details

5. Slide economizer or two-position damper into unit and secure with screws. See Fig. 16. To convert to horizontal discharge application:
 - a. Rotate economizer/two-position damper clockwise 90 degrees until the economizer motor faces the condenser section (see Fig. 17).
 - b. Rotate the barometric relief damper cover 90 degrees.
 - c. Install horizontal block-off plate over the opening on the access panel. Plate is shipped in package with outdoor-air hood.

NOTE: Block-off plate **MUST** be installed before installing hood assembly.

IMPORTANT: Filters **MUST** be field-installed outside the unit on horizontal discharge applications with economizer or two-position damper. Otherwise, the economizer or two-position damper will have to be partially removed to access the filters. The area of the field-installed filters should be equal to the area of the factory-installed filters.

6. Insert economizer/two-position damper plug into economizer/two-position damper harness. Remove tape from barometric relief damper. See Fig. 16.
7. If ventilation air is not required, proceed to Step 8. If ventilation air is required, determine minimum position setting for required airflow. See Fig. 18.

Adjust minimum position setting by adjusting the screws on the position setting bracket. (See Fig. 16.) Slide bracket

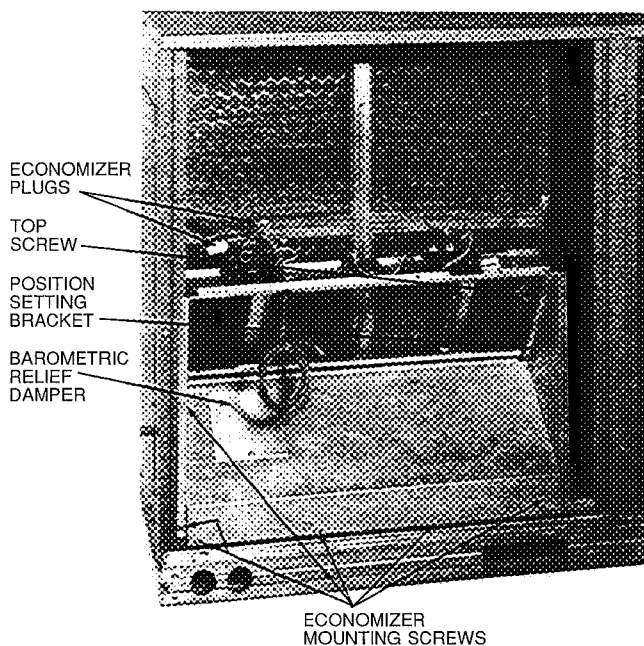


Fig. 16 - Economizer Installed in Unit

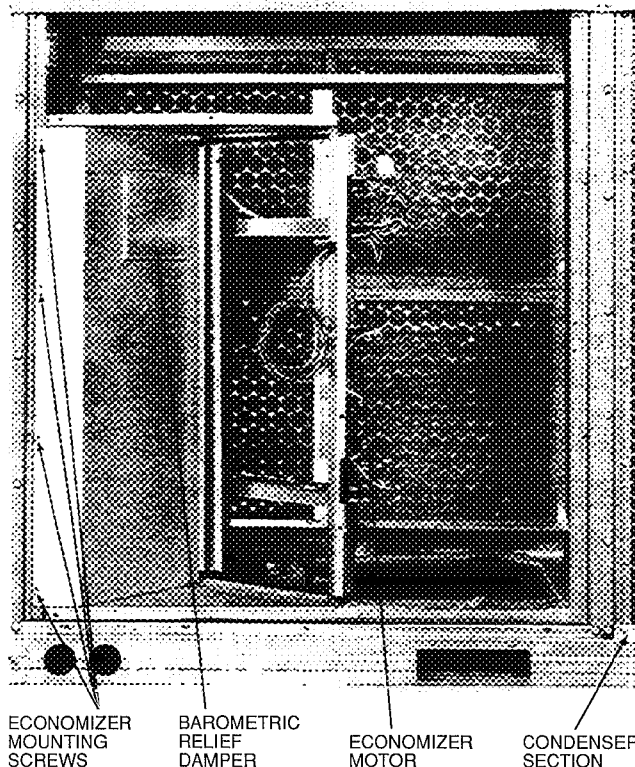
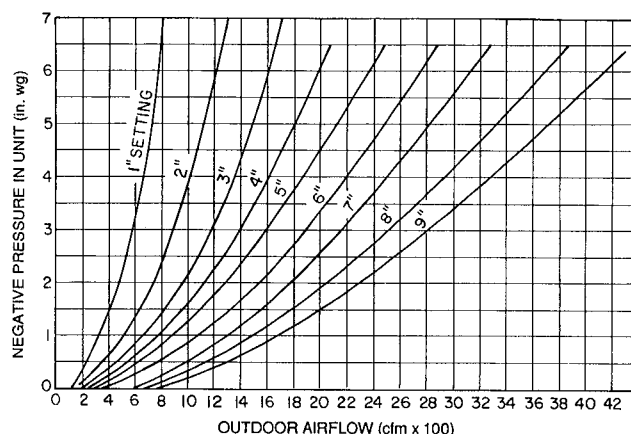


Fig. 17 - Horizontal Economizer Installation



Example:

Given —
 Negative Pressure 0.1 in. wg
 Outdoor Air 1100 cfm
 Determine — Setting = 6

Fig. 18 - Minimum Position Setting

until the top screw is in the position determined by Fig. 18. Tighten screws.

8. *Units with economizer only:* Remove tape from outdoor-air thermostat (OAT). Fasten OAT to inside of hood using screws and speed clips provided. See Fig. 19. Make sure OAT terminals are positioned up.
9. Replace evaporator coil access panel with screws saved from Step 2.
10. Fasten hood top and side plate assembly and bottom stop (Fig. 15) to unit with screws saved from Step 4.
11. *Units with economizer only:* Place knob supplied with economizer on OAT. See Fig. 19. Set for 3° F below indoor room thermostat setting. If accessory enthalpy control (EC) is used in place of OAT, see instructions shipped with EC for installation and adjustment. See Fig. 19. Make wiring connections for OAT (see Fig. 20).

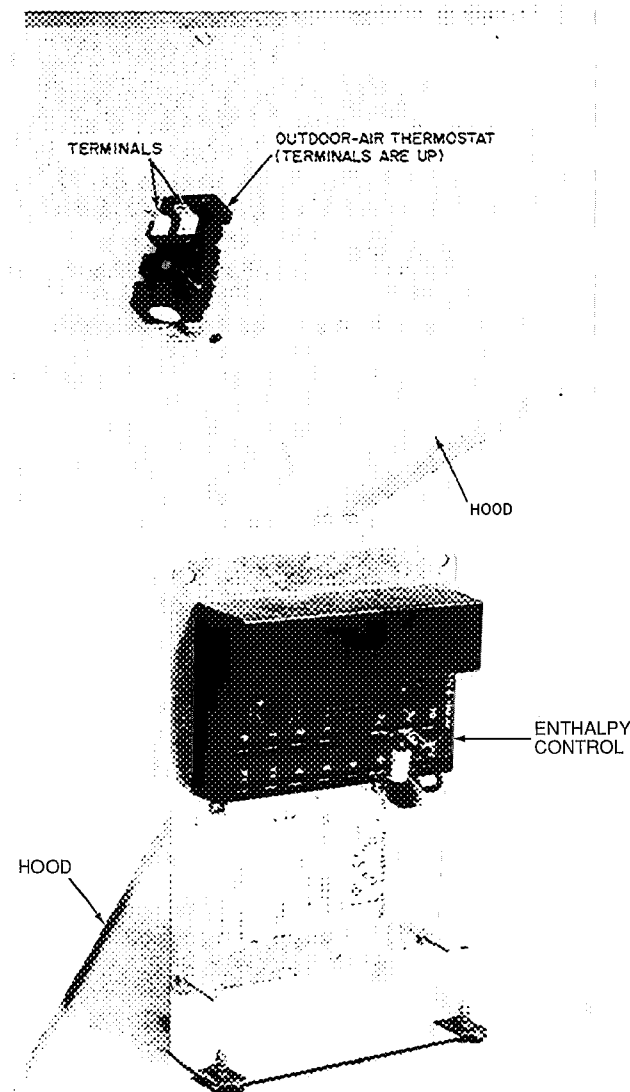
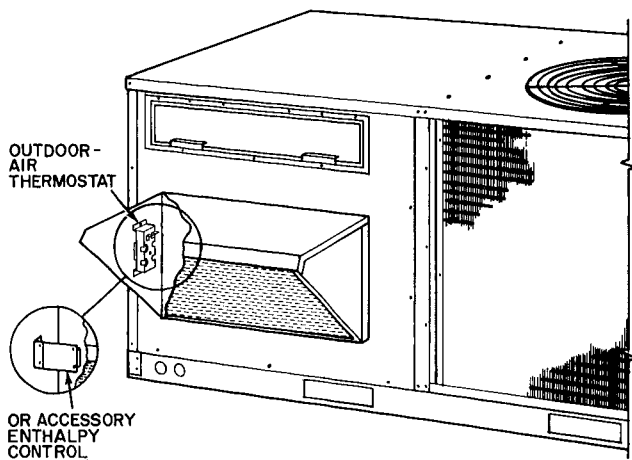


Fig. 19 — Outdoor-Air Thermostat/Enthalpy Control Installation

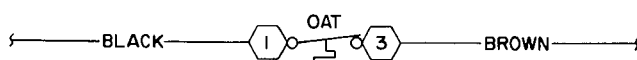


Fig. 20 — Wiring Connections for Outdoor-Air Thermostat

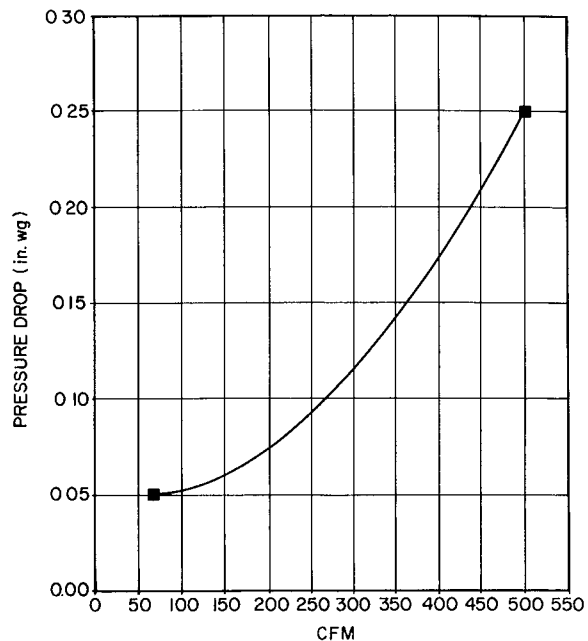


Fig. 21 — Economizer/Two-Position Damper Barometric Relief Damper Characteristics — 48HJ008-014

- Slide outdoor-air inlet screen into screen track on hood side plates. While holding screen in place, fasten screen retainer to hood using screws provided.

NOTE: Refer to Fig. 21 for economizer/two-position damper barometric relief characteristics.

Step 9 — Adjust Evaporator-Fan Speed — Adjust evaporator-fan speed to meet jobsite conditions. Table 3 shows fan rpm at motor pulley settings for standard and alternate motors. Refer to Tables 4 - 9 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:

- Shut off unit power supply.
- Loosen belt by loosening fan motor mounting nuts. See Fig. 22.
- Loosen movable pulley flange setscrew (see Fig. 23).
- 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.
- 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.
- Slide fan pulley along fan shaft.
- Make angular alignment by loosening motor from mounting plate.

To adjust belt tension:

- Loosen fan motor mounting nuts.
- 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.
- Adjust bolt and nut on mounting plate to secure motor in fixed position.

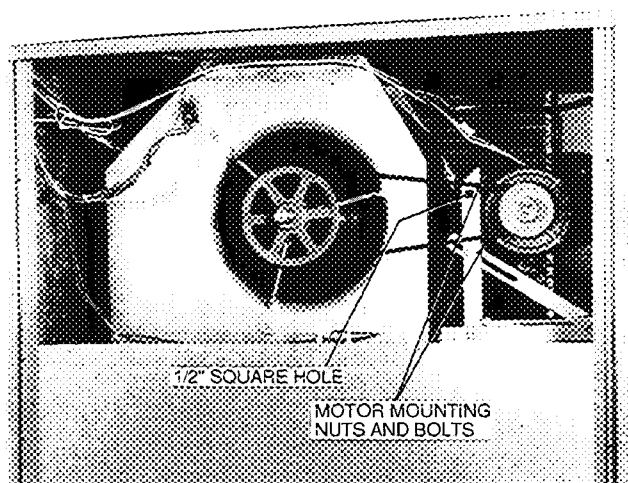


Fig. 22 – Belt Drive Motor Mounting

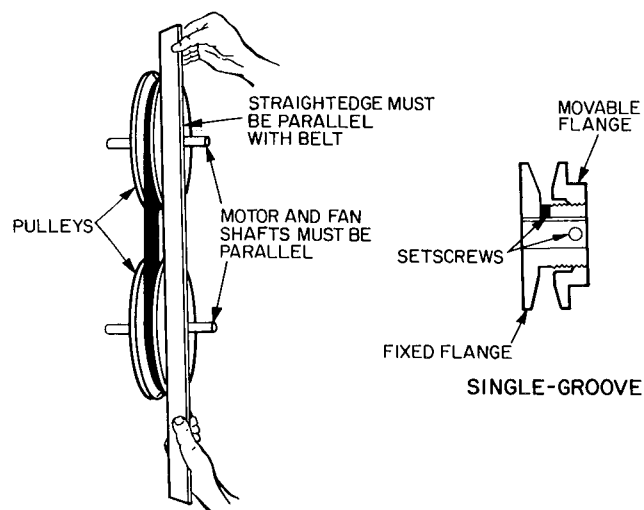


Fig. 23 – Evaporator-Fan Pulley Adjustment

Table 3 – Fan Rpm at Motor Pulley Settings

UNIT 48	MOTOR/ DRIVE	MOTOR PULLEY TURNS OPEN										
		0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5
HJD/HJE/HJF 008,009	Std	840	815	790	765	740	715	690	665	640	615	590
	Alt	1085	1060	1035	1010	985	960	935	910	890	865	840
HJD/HJE 012	Std	935	910	890	865	840	815	790	765	740	715	690
	Alt	1080	1060	1035	1015	990	970	950	930	905	885	860
HJD014	Std	1080	1060	1035	1015	990	970	950	930	905	885	860

Table 4 — Fan Performance, 48HJ008,009 — Vertical Discharge Units

48HJD/HJE/HJF008,009 (7½ AND 8½ TONS)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2		0.4		0.6		0.8		0.9		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
2200	499	0.50	580	0.70	652	0.94	717	1.17	748	1.30	779	1.43	839	1.78	905	2.21	951	2.57
2250	507	0.53	586	0.73	658	0.97	722	1.22	752	1.34	783	1.46	843	1.81	908	2.25	955	2.59
2300	513	0.55	592	0.76	663	1.00	727	1.26	756	1.37	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	766	1.46	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	777	1.54	806	1.68	859	1.94	919	2.37	971	2.73
2550	550	0.69	627	0.94	692	1.17	754	1.45	783	1.59	812	1.74	864	1.99	920	2.39	974	2.76
2600	557	0.72	634	0.97	698	1.21	759	1.49	787	1.64	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	798	1.73	827	1.88	878	2.16	928	2.45	983	2.82
2800	588	0.86	662	1.13	723	1.38	782	1.66	809	1.82	837	1.98	889	2.29	937	2.57	989	2.89
2900	604	0.94	676	1.21	737	1.48	794	1.76	821	1.92	848	2.08	900	2.41	947	2.70	995	2.94
3000	620	1.02	690	1.30	750	1.58	806	1.86	832	2.02	859	2.18	910	2.52	958	2.85	1002	3.05
3100	636	1.11	704	1.39	764	1.69	818	1.97	844	2.13	870	2.29	920	2.64	968	2.99	1012	3.08
3200	652	1.21	718	1.49	778	1.80	831	2.09	856	2.24	882	2.40	931	2.76	978	3.15	1022	3.17
3300	668	1.31	732	1.59	793	1.92	844	2.21	869	2.37	894	2.53	942	2.89	989	3.25	1032	3.25
3400	684	1.41	747	1.70	807	2.04	857	2.35	882	2.50	907	2.66	954	3.02	1000	3.34	1042	3.33
3500	701	1.53	762	1.82	821	2.16	871	2.48	895	2.64	919	2.80	966	3.15	1011	3.45	1052	3.41
3600	717	1.65	777	1.94	835	2.29	885	2.63	908	2.79	932	2.96	979	3.24	1022	3.59	1062	3.49
3700	733	1.77	792	2.07	849	2.42	899	2.78	922	2.94	945	3.11	992	3.45	1034	3.64	1072	3.56
3750	742	1.84	800	2.14	856	2.49	907	2.86	929	3.02	952	3.20	997	3.54	1040	3.73	1082	3.63
3800	750	1.90	807	2.21	863	2.56	914	2.93	936	3.10	958	3.28	1003	3.62	1047	3.81	1092	3.70
3900	767	2.04	822	2.35	877	2.71	929	3.09	950	3.27	972	3.45	1015	3.80	1057	4.10	1098	4.00
4000	783	2.18	838	2.50	891	2.86	945	3.22	964	3.44	986	3.61	1028	3.96	1070	4.36	1110	4.28
4100	800	2.34	854	2.66	905	3.02	959	3.42	978	3.62	1000	3.81	1042	4.16	1082	4.56	1122	4.50
4200	817	2.49	869	2.82	920	3.19	974	3.60	993	3.80	1015	4.00	1057	4.35	1095	4.76	1134	4.78
4250	826	2.58	873	2.91	925	3.28	979	3.69	998	3.89	1020	4.10	1062	4.45	1102	4.85	1140	5.07
4300	834	2.66	878	3.00	930	3.37	984	3.78	1003	3.98	1025	4.20	1067	4.55	1107	4.95	1147	5.16

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Shading** indicates alternate motor required (See Note 7)
- 2 **Boldface** indicates field-supplied drive required (See Note 7)
- 3 **Shading** indicates field-supplied motor and drive required.
- 4 **Maximum usable bhp is 2.4 with the standard motor and 2.9 with the alternate motor.** Extensive motor and electrical testing on the Weathermaster® 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.

- 5 Use of field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
- 6 Values include losses for filters, unit casing and wet coils.
7. Standard motor drive range: 590 to 840 rpm. Alternate drive range: 840 to 1085 rpm. All other rpms require field-supplied drive.

Table 5 — Fan Performance, 48HJ012 — Vertical Discharge Units

48HJD/HJE012 (10 TONS)

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	2.06	1063	2.40
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	1016	2.11	1070	2.57
3200	578	0.81	656	1.00	723	1.20	782	1.39	835	1.55	887	1.71	937	1.86	981	2.04	1025	2.25	1075	2.57
3300	591	0.88	668	1.08	734	1.28	793	1.47	845	1.65	895	1.80	945	2.00	989	2.15	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	2.33	1017	2.55	1059	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	2.69	1069	2.87	1109	3.03
3800	662	1.33	726	1.47	789	1.72	846	1.95	897	2.18	945	2.40	993	2.56	1037	2.75	1082	2.96	1118	3.20
3900	677	1.44	738	1.56	801	1.82	857	2.06	908	2.29	956	2.53	1005	2.72	1049	2.91	1095	3.12	1127	3.36
4000	692	1.55	750	1.66	813	1.94	868	2.17	918	2.40	967	2.66	1015	2.87	1059	3.06	1103	3.24	—	—
4100	707	1.67	762	1.76	825	2.05	878	2.28	929	2.53	977	2.78	1025	3.02	1069	3.22	1102	3.41	—	—
4200	722	1.80	775	1.87	837	2.16	889	2.40	941	2.66	989	2.81	1037	3.17	1082	3.38	—	—	—	—
4300	737	1.94	787	1.99	848	2.27	899	2.52	952	2.80	999	3.04	1047	3.32	—	—	—	—	—	—
4400	752	2.08	800	2.12	860	2.39	912	2.65	962	2.93	1009	3.19	—	—	—	—	—	—	—	—
4500	768	2.24	814	2.25	873	2.53	924	2.80	973	3.07	1020	3.34	—	—	—	—	—	—	—	—
4600	783	2.40	827	2.39	885	2.69	937	2.95	984	3.21	—	—	—	—	—	—	—	—	—	—
4700	798	2.56	841	2.54	897	2.84	949	3.10	994	3.36	—	—	—	—	—	—	—	—	—	—
4800	814	2.74	856	2.69	909	2.99	961	3.26	—	—	—	—	—	—	—	—	—	—	—	—
4900	830	2.92	870	2.86	918	3.05	972	3.40	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	883	3.03	931	3.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates field-supplied drive required (See Note 6)
- 2 **Shading** indicates alternate motor required (For underlined values, field-supplied drive required only with standard motor. See Note 6)
- 3 **Maximum usable bhp is 2.4 with standard motor and 4.2 with alternate motor.** Extensive motor and electrical testing on the Weathermaster 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 a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
5. Values include losses for filters, unit casing and wet coils.
6. Standard motor drive range: 690 to 935 rpm. Alternate motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

Table 6 – Fan Performance, 48HJ014 – Vertical Discharge Units

48HJD014 (12½ TONS)																				
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		
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				
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				
4500	859	2.31	914	2.60	962	2.85	1010	3.09	1056	3.40	1101	3.73	1144	4.00						
4600	876	2.45	930	2.76	977	3.01	1024	3.26	1070	3.55	1114	3.90	1157	4.19						
4700	892	2.60	945	2.91	992	3.18	1039	3.43	1083	3.71	1126	4.07								
4800	909	2.77	961	3.07	1008	3.36	1053	3.61	1097	3.88										
4900	926	2.93	977	3.24	1024	3.54	1068	3.80	1111	4.06										
5000	942	3.11	993	3.41	1039	3.73	1080	3.99												
5100	959	3.29	1009	3.60	1055	3.92	1097	4.19												
5200	976	3.47	1025	3.78	1071	4.12														
5300	993	3.67	1041	3.98																
5400	1010	3.87	1057	4.18																
5500	1027	4.07																		
5600																				
5700																				
5800																				
5900																				
6000																				
6100																				
6200																				

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 Weathermaster® units ensures that the full horsepower range of the motor can be utilized with confidence. Using your fan motors up to the horse-

power 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: 860 to 1080 rpm. All other rpms require field-supplied drive

Table 7 – Fan Performance, 48HJ008,009 – Horizontal Discharge Units

48HJD/HJE/HJF008,009 (7½ AND 8½ TONS)																	
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	
2250	514	0.55	593	0.76	662	0.99	724	1.22	781	1.78	841	1.81	902	2.25	939	2.60	
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	
2550	559	0.72	634	0.97	700	1.21	759	1.48	814	1.74	864	2.01	915	2.34	968	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	982	2.87	
2900	614	0.98	684	1.25	745	1.53	802	1.81	854	2.11	903	2.42	949	2.71	991	2.89	
3000	630	1.07	699	1.35	759	1.63	815	1.92	866	2.23	915	2.54	961	2.85	1004	2.97	
3100	646	1.16	714	1.45	773	1.74	828	2.04	878	2.35	926	2.67	972	3.00	1015	3.00	
3200	662	1.26	729	1.55	787	1.86	841	2.16	891	2.48	938	2.81	983	3.14	1026	3.07	
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	—	—	—	—	—	—	
3750	754	1.91	813	2.24	868	2.59	917	2.95	963	3.30	—	—	—	—	—	—	
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	952	3.37	—	—	—	—	—	—	—	—	
4100	813	2.42	868	2.78	920	3.15	—	—	—	—	—	—	—	—	—	—	
4200	830	2.59	884	2.95	935	3.33	—	—	—	—	—	—	—	—	—	—	
4250	839	2.68	893	3.04	—	—	—	—	—	—	—	—	—	—	—	—	
4300	847	2.76	900	3.13	—	—	—	—	—	—	—	—	—	—	—	—	

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1** **Shading** indicates alternate motor required. (See Note 7)
- 2** **Boldface** indicates field-supplied drive required. (See Note 7)
- 3** **Shading** indicates field-supplied motor and drive required
- 4.** *Maximum usable bhp is 2.4 with the standard motor and 2.9 with the alternate motor* Extensive motor and electrical testing on the Weathermaster 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.

- 5** Use of field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
- 6** Values include losses for filters, unit casing, and wet coils
- 7** Standard motor drive range: 590 to 840 rpm. Alternate motor drive range: 840 to 1085 rpm. All other rpms require field-supplied drive

Table 8 – Fan Performance, 48HJ012 – Horizontal Discharge Units

48HJD/HJE012 (10 TONS)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		0.9		1.0		1.2		1.4	
	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	804	1.34	829	1.42	880	1.58	924	1.73
3100	607	0.83	676	1.01	734	1.17	791	1.34	816	1.42	840	1.51	890	1.68	935	1.84
3200	622	0.90	690	1.09	746	1.25	803	1.43	827	1.52	852	1.60	900	1.77	946	1.95
3300	638	0.98	705	1.17	759	1.33	815	1.52	839	1.61	864	1.70	910	1.88	957	2.06
3400	653	1.06	719	1.26	772	1.43	826	1.62	851	1.71	876	1.81	921	1.98	967	2.17
3500	669	1.15	733	1.35	786	1.53	838	1.72	863	1.81	888	1.91	933	2.10	976	2.29
3600	684	1.24	747	1.44	800	1.64	850	1.82	875	1.92	900	2.03	945	2.22		
3700	700	1.33	760	1.54	814	1.75	863	1.92	887	2.03	912	2.14	957	2.34		
3800	715	1.43	774	1.64	828	1.86	875	2.04	899	2.15	924	2.26				
3900	731	1.54	787	1.74	843	1.98	888	2.16	912	2.27	936	2.38				
4000	747	1.64	801	1.85	857	2.10	902	2.30	925	2.40						
4100	763	1.76	816	1.97	872	2.23										
4200	778	1.88	831	2.10	886	2.36										
4300	794	2.00	846	2.23												
4400	810	2.13	861	2.37												
4500	826	2.27														
4600																
4700																
4800																
4900																
5000																

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1. Boldface** indicates field-supplied drive required.
- 2. [Shaded Box]** indicates alternate motor required (see Note 6)
- 3. Maximum usable bhp is 2.4 with the standard motor and 4.2 with the alternate motor.** Extensive motor and electrical testing on the Weathermas-

ter® 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 a field-supplied motor may affect wire sizing.** Contact Carrier representative to verify.
- 5. Values include losses for filters, unit casing, and wet coils.**
- 6. Standard motor drive range: 690 to 935 rpm. Alternate motor drive range: 860 to 1080 rpm.** All other rpms require field-supplied drive.

Table 9 – Fan Performance, 48HJ014 – Horizontal Discharge Units

48HJD014 (12½ TONS)

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
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
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
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
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
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
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
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
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
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
4600	808	2.11	868	2.42	925	2.73	975	3.00	1024	3.25	1071	3.56	1119	3.93		
4700	822	2.24	882	2.56	937	2.86	988	3.16	1036	3.42	1082	3.70	1129	4.09		
4800	837	2.37	896	2.71	950	3.00	1001	3.32	1048	3.59	1093	3.86	1139	4.24		
4900	852	2.51	910	2.86	963	3.15	1014	3.48	1060	3.76	1105	4.02				
5000	867	2.65	924	3.01	977	3.30	1027	3.65	1073	3.94	1117	4.20				
5100	882	2.79	938	3.17	990	3.46	1040	3.82	1085	4.12						
5200	896	2.95	952	3.33	1003	3.63	1053	4.00								
5300	911	3.11	967	3.50	1017	3.80	1066	4.18								
5400	926	3.27	981	3.68	1030	3.98										
5500	940	3.44	995	3.86	1044	4.17										
5600	955	3.62	1010	4.04												
5700	970	3.80														
5800	985	3.99														
5900	1000	4.18														
6000																
6100																
6200																
6300																

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1. Boldface** indicates field-supplied drive required (See Note 6)
- 2. [Shaded Box]** indicates field-supplied motor and drive required
- 3. Maximum usable bhp is 4.2.** Extensive motor and electrical testing on the Weathermaster units ensures that the full horsepower range of the motor can be utilized with confidence. Using your fan motors up to the horse-

power 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: 860 to 1080 rpm.** All other rpms require field-supplied drive.

PRE-START-UP

⚠ WARNING

Failure to observe the following warnings could result in serious personal injury:

1. Follow recognized safety practices and wear protective goggles when checking or servicing refrigerant system.
2. Do not operate compressor or provide any electric power to unit unless compressor terminal cover is in place and secured.
3. Do not remove compressor terminal cover until all electrical sources are disconnected.
4. Relieve all pressure from system before touching or disturbing anything inside terminal box if refrigerant leak is suspected around compressor terminals.
5. Never attempt to repair soldered connection while refrigerant system is under pressure.
6. Do not use torch to remove any component. System contains oil and refrigerant under pressure. To remove a component, wear protective goggles and proceed as follows:
 - a. Shut off gas and then electrical power to unit.
 - b. Relieve all pressure from system using both high- and low-pressure ports.
 - c. Cut component connecting tubing with tubing cutter and remove component from unit.
 - d. Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Proceed as follows to inspect and prepare the unit for initial start-up.

1. Remove all access panels.
2. Read and follow instructions on all WARNING, CAUTION, and INFORMATION labels attached to, or shipped with, unit.
3. Make the following inspections:
 - a. Inspect for shipping and handling damages such as broken lines, loose parts, disconnected wires, etc.
 - b. Inspect for oil at all refrigerant tubing connections and on unit base. Detecting oil generally indicates a refrigerant leak. Leak-test all refrigerant tubing connections using electronic leak detector, halide torch, or liquid-soap solution.
 - c. Inspect all field- and factory-wiring connections. Be sure that connections are completed and tight.
 - d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.
4. Verify the following conditions:
 - a. Make sure that condenser fan blade is correctly positioned in fan orifice. See Condenser-Fan Adjustment section on page 19 for more details.
 - b. Make sure that air filter(s) is in place.
 - c. Make sure that condensate drain trap is filled with water to ensure proper drainage.
 - d. Make sure that all tools and miscellaneous loose parts have been removed.

START-UP

Unit Preparation — Make sure that unit has been installed in accordance with these 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.

Outdoor-Air Inlet Screens — Outdoor-air inlet screen(s) must be in place before operating unit.

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 gage 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.

Compressor Rotation — It is important to be certain the compressors are rotating in the proper direction on units with scroll compressors. To determine whether or not compressors are rotating in the proper direction:

1. Connect service gages to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.

If the suction pressure does not drop and the discharge pressure does not rise to normal levels:

1. Note that the evaporator and condenser fans are probably also rotating in the wrong direction.
2. Turn off power to the unit.
3. Reverse any two of the unit power leads.
4. Reapply power to the compressor.

The suction and discharge pressure levels should now move to their normal start-up levels.

NOTE: When compressors are rotating in the wrong direction, the unit will have increased noise levels and will not provide heating/cooling.

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 Refrigerant Charge section on page 20.

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

TO SHUT OFF UNIT — Set system switch at OFF position. Resetting thermostat at a position above room temperature shuts unit off temporarily until space temperature exceeds thermostat setting. Units are equipped with Cycle-LOC™ protection device. Unit shuts down on any safety trip and remains off; an indicator light on the thermostat comes on. Check reason for safety trip.

Compressor restart is accomplished by manual reset at the thermostat by turning the selector switch to OFF position and then to ON position.

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 room temperature and verify that the burners and evaporator fan shut off.

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 eleventh attempt, there is a lockout. To reset, break the 24-v power to W1.
6. The evaporator fan will turn on 20 to 40 seconds after a call for heating.
7. The evaporator fan will turn off 30 to 90 seconds after the thermostat temperature is satisfied.
8. Adjust airflow to obtain a temperature rise within the range specified on the unit nameplate and Table 1.

TO SHUT OFF UNIT — Set system selector switch at OFF position. Resetting heating selector lever below room temperature will temporarily shut off unit 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 fan operates continuously to provide constant air circulation.

Operating Sequence

COOLING, UNITS 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, UNITS WITHOUT ECONOMIZER — When thermostat calls for heating, terminal W1 and the induced-draft relay (IDR) are energized and burner ignition sequence begins. When time delay sequence is complete (20 to 40 seconds after W1 is energized) IFC is energized and evaporator-fan motor starts. 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 remains on for 30 to 90 seconds.

COOLING UNITS WITH ECONOMIZER — When the outdoor ambient temperature is above the outdoor-air thermostat (OAT) or enthalpy control (EC) setting and the thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC) is energized and the economizer damper blade opens to the minimum position.

If the outdoor ambient temperature is below the OAT setting and the thermostat calls for cooling, the IFC is energized, the evaporator fan is started, and the economizer modulates open. The economizer acts as the first stage of cooling, providing free cooling with outdoor air. The position of the damper blade is determined by the discharge temperature sensor.

If outdoor air alone cannot satisfy the cooling requirements of the conditioned space, Y2 on the thermostat is energized and the compressor starts. The damper blade opens for 5 seconds and stops for 30 seconds until fully open.

As conditioned space temperature approaches the thermostat's cooling set point, the mechanical cooling stage cycles off. After mechanical cooling shuts off, the economizer modulates to maintain discharge-air temperature.

HEATING, UNITS WITH ECONOMIZER — Upon a call for heat through W1, the induced-draft relay is energized to start the induced-draft motor. The main burner lights. After a 20 to 40 second delay, the IFC energizes to start the evaporator fan and the economizer damper blade opens to the minimum position. If the two-position damper is used, the outdoor-air damper opens to the set position whenever the evaporator fan runs. If additional heat is needed, W2 is energized and the high-fire solenoid of the main gas valve is energized.

After W1 is deenergized, the evaporator-fan motor continues to run for 30 to 90 seconds.

As space temperature approaches the heating temperature set point, heating stage cycles off. Economizer or two-position damper returns to a fully closed position when fan shuts off.

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 (see Fig. 16 or 17). 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 result, backflush toward return-air section to remove foreign material.
5. Flush condensate pan after completion.
6. Reinstall economizer and filters.
7. Reconnect wiring.
8. Replace access panels.

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

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. 24. To hold top panel open, place coil corner post between top panel and center post. See Fig. 25.
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. 26.
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, coil center post, and replace all screws.

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.

OUTDOOR-AIR INLET SCREENS — Clean screens with steam or hot water and a mild detergent. Do not use disposable filters in place of screens.

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.

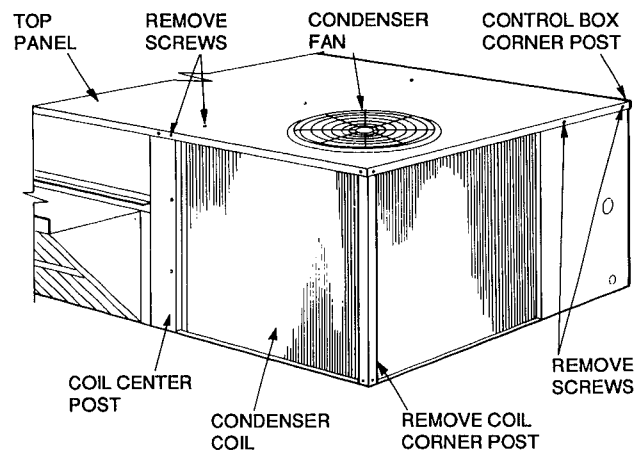


Fig. 24 — Cleaning Condenser Coil

Condenser-Fan Adjustment (Fig. 27)

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. 27.
4. Tighten setscrews and replace condenser-fan assembly.

Manual Outdoor-Air Damper — If outdoor-air damper blade adjustment is required, see Optional Outdoor-Air Damper section on page 10.

Economizer/Two-Position Damper Adjustment — Refer to Optional Economizer or Two-Position Damper section on page 10.

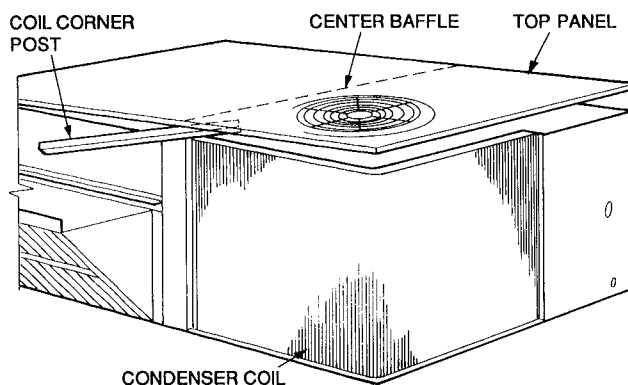


Fig. 25 — Propping Up Top Panel

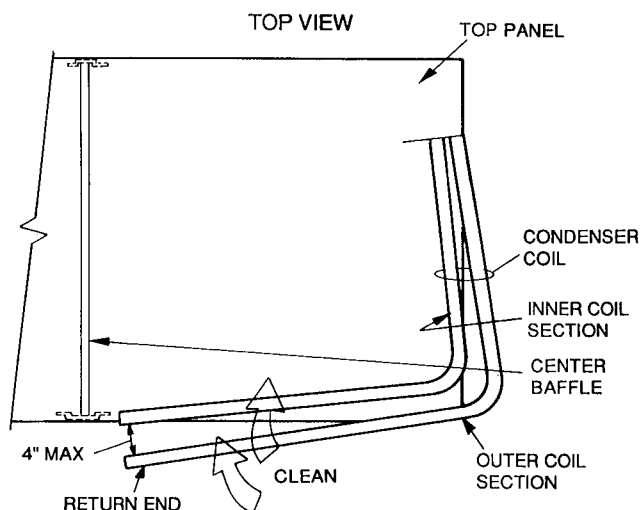


Fig. 26 — Separating Coil Sections

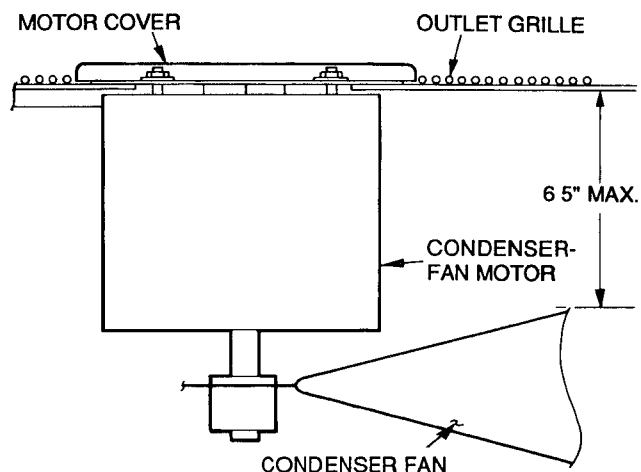


Fig. 27 — Condenser-Fan Adjustment

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 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. 28-31, vary refrigerant until the conditions of the charts are met. Note the charging charts are different from type normally used. 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 chart to determine what suction temperature should be. If suction temperature is high, add refrigerant. If suction temperature is low, carefully reclaim some of the charge. Recheck the suction pressure as charge is adjusted.

Example: (Fig 30, Circuit 1)

Outdoor Temperature. 85 F
Suction Pressure. 70 psig
Suction Temperature should be. 44 F
(Suction Temperature may vary $\pm 5^\circ$ F.)

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

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.

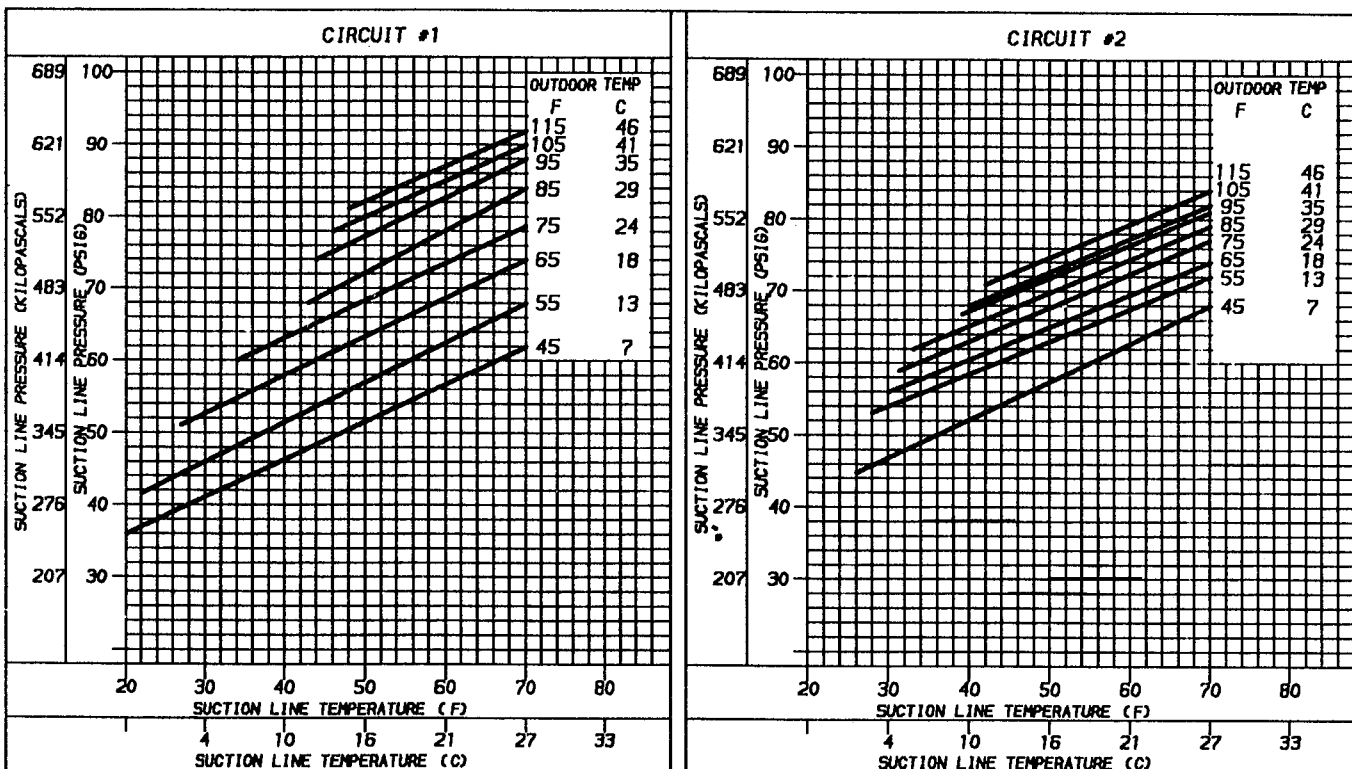


Fig. 28 — Cooling Charging Charts, 48HJ008

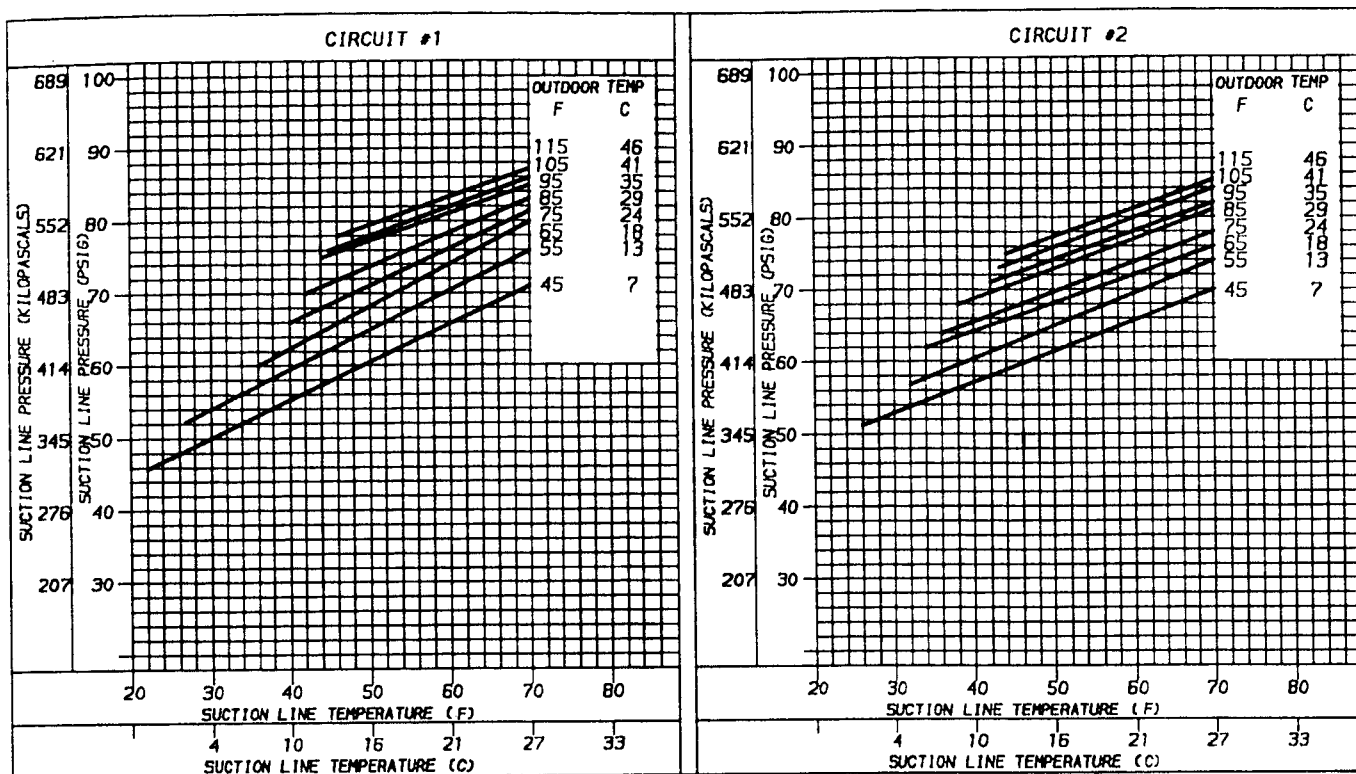


Fig. 29 – Cooling Charging Charts, 48HJ009

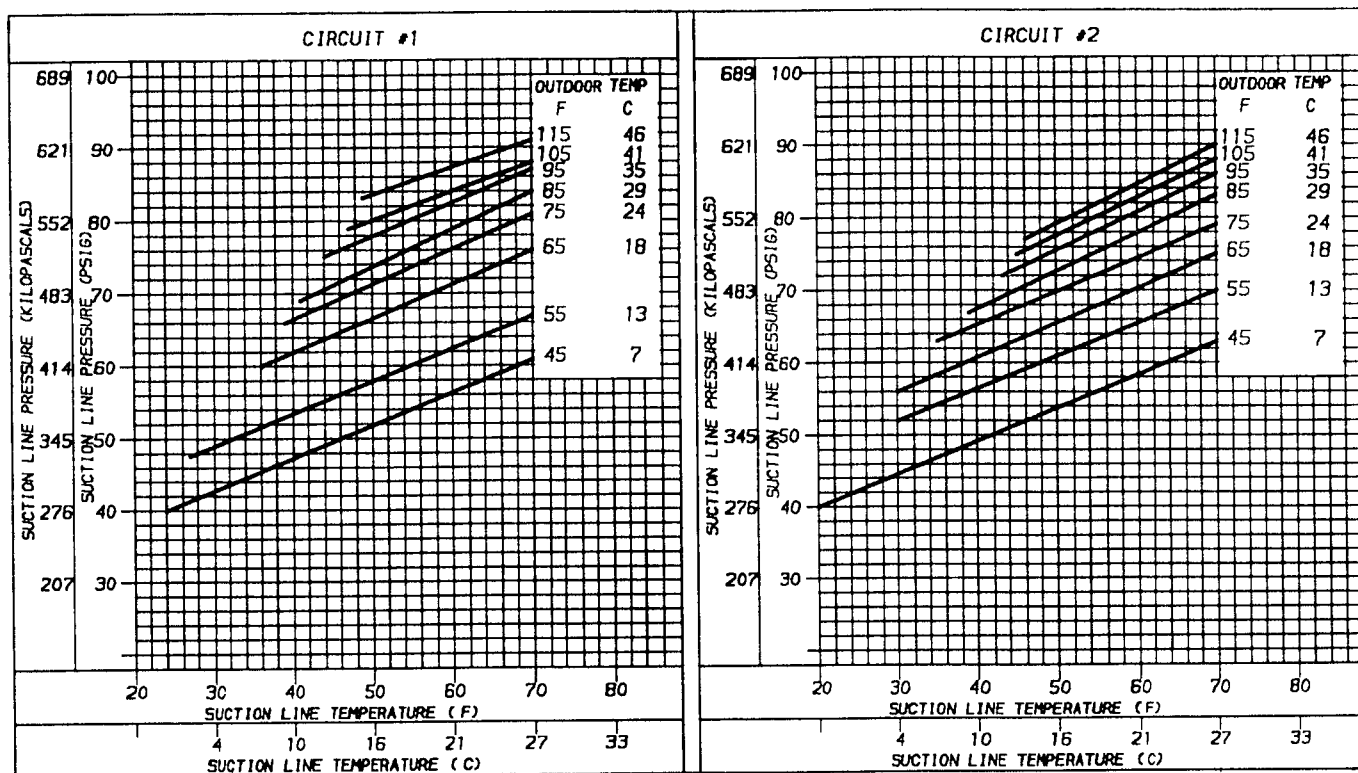


Fig. 30 – Cooling Charging Charts, 48HJ012

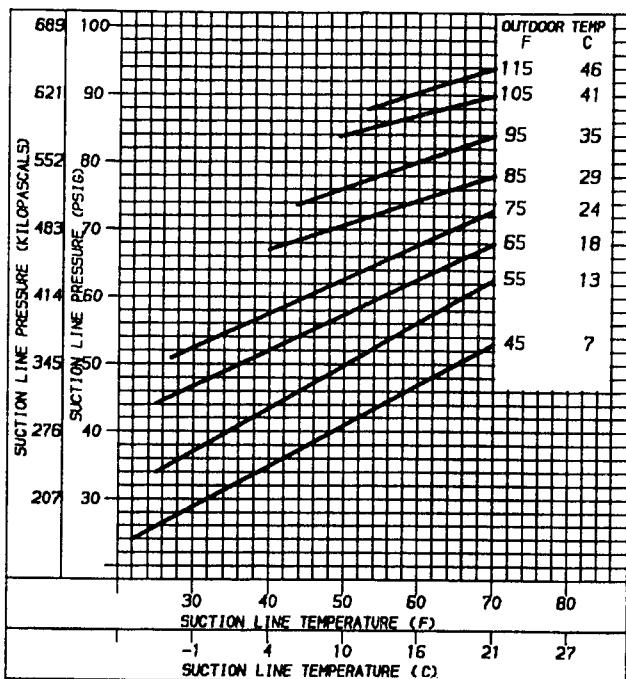


Fig. 31 – Cooling Charging Chart, 48HJ014

Flue Gas Passageways — To inspect the flue collector box and upper areas of the heat exchanger:

1. Remove the combustion blower wheel and motor assembly according to directions in Combustion-Air Blower section below.
2. Remove the 3 screws holding the blower housing to the flue cover.
3. Remove the flue cover to inspect the heat exchanger.
4. Clean all surfaces as required using a wire brush.

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. Slide burner access panel out.
2. Remove wires and pressure hose connected to pressure switch. Mark each wire.
3. Remove the 2 screws which hold the heat shield in place, and remove heat shield.
4. Remove the 7 screws that attach induced-draft motor mounting plate to blower housing (see Fig. 32).
5. Remove the 2 wires attached to the motor and remove assembly from unit.
6. Remove blower by removing 2 setscrews.
7. Remove motor by removing 4 screws that hold blower housing to mounting plate. Remove the motor cooling fan by removing one setscrew. Then remove nuts that hold motor to mounting plate.
8. To reinstall, reverse the procedure outlined above.

Limit Switch — Remove blower access panel (see Fig. 5). 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 the control box (see Fig. 10). 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 by turning selector switch to OFF position at the thermostat.

REMOVAL OF GAS TRAIN (see Fig. 32 and 33)

1. Shut off manual gas valve.
2. Shut off power to unit.
3. Remove compressor access panel.
4. Slide out burner compartment side panel.
5. Remove wires and pressure hose connected to pressure switch. Mark each wire.
6. Remove heat shield.
7. Disconnect gas piping at unit gas valve.
8. Remove wires connected to gas valve. Mark each wire.
9. Remove ignitor and sensor wires at the power pack.
10. Remove the 2 screws that attach the burner rack to the vestibule plate.
11. Remove the gas valve bracket.
12. Slide the burner tray out of the unit (see Fig. 33).

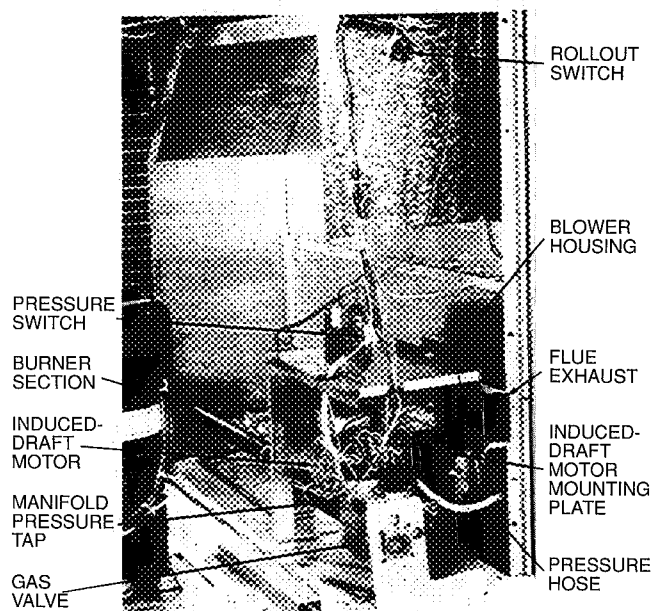


Fig. 32 – Burner Section Details

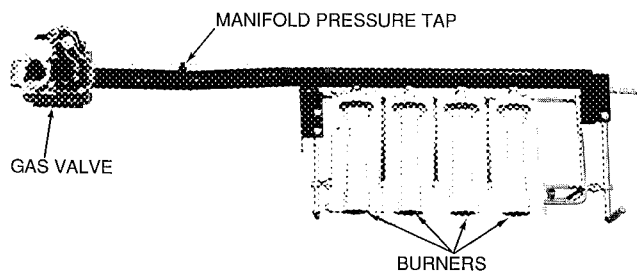


Fig. 33 – Burner Tray Details

REPLACEMENT OF GAS TRAIN (see Fig. 32 and 33).

1. Slide the burner tray into the unit.
2. Attach burner rack to vestibule plate with 2 screws.
3. Replace gas valve bracket.
4. Replace heat shield.
5. Reconnect wires and pressure hose to pressure switch.
6. Reconnect the ignitor and sensor wires to the power pack.
7. Reconnect wires to gas valve.
8. Connect gas piping to gas valve.
9. Reinstall burner compartment side panel.
10. Replace compressor access panel.

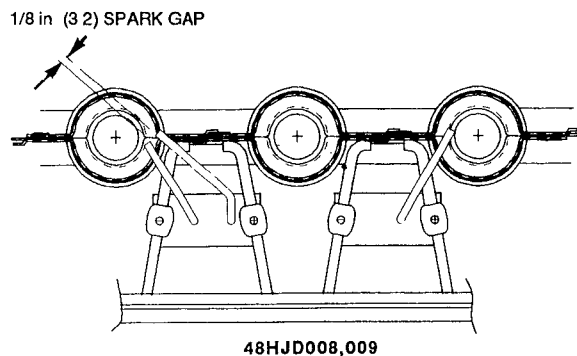
11. Restore power to unit.

12. Turn on main gas valve.

CLEANING AND ADJUSTMENT

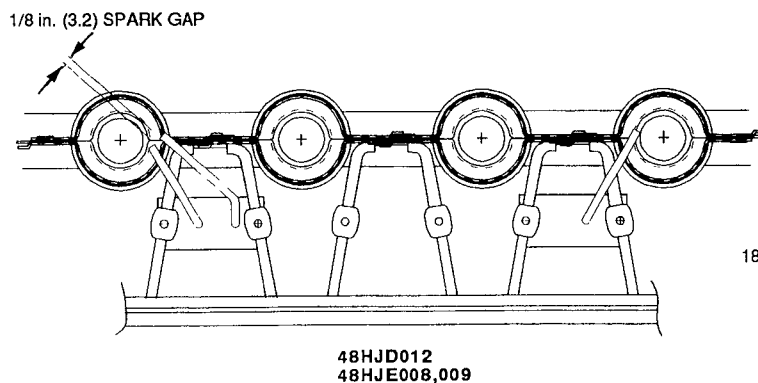
1. Remove burner rack from unit as described in Removal of Gas Train section above.
2. Inspect burners, and if dirty, remove burners from rack.
3. Using a soft brush, clean burners and crossover port as required.
4. Adjust spark gap. See Fig. 34.
5. Reinstall burners on rack.
6. Reinstall burner rack as described above.

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

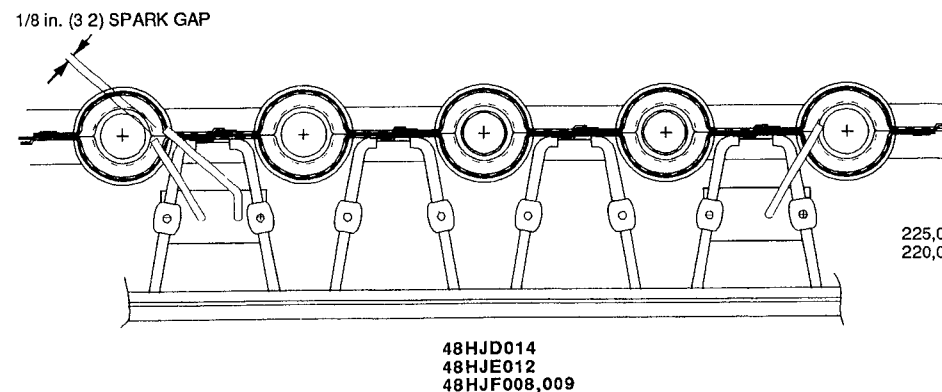


125,000/90,000 BTUH INPUT

NOTE: DIMENSIONS IN ()
ARE MILLIMETERS



180,000/120,000 BTUH INPUT



225,000/180,000 BTUH INPUT (012,014)
220,000/180,000 BTUH INPUT (008,009)

Fig. 34 — Spark Gap Adjustment

LEGEND FOR FIG. 35 AND 36

AHA	— Adjustable Heat Anticipator
AWG	— American Wire Gage
BAT	— Battery
C	— Contactor, Compressor
CB	— Circuit Breaker
CC	— Cooling Compensator
CH	— Crankcase Heater
CLO	— Compressor Lockout
COM	— Common
COMP	— Compressor
DAT	— Discharge-Air Thermistor
EC	— Enthalpy Control
ECON	— Economizer
EMC/EMFC	— Energy Management Closed (Economizer)
EMFC.L	— Energy Management Fully Closed (Two-Position Damper)
EMO/EMFO	— Energy Management Open
EPS	— Emergency Power Supply
ER	— Economizer Relay
EQUIP	— Equipment
FP	— Flame Prove
FPT	— Freeze Protection Thermostat
FSS	— Filter Status Switch
FU	— Fuse
GND	— Ground
HPS	— High-Pressure Switch
HR	— Holding Relay
I	— Ignitor
ICP	— Ignitor Control Pack
IDM	— Induced Draft Motor
IDR	— Induced Draft Relay
IFC	— Indoor (Evaporator) Fan Contactor
IFM	— Indoor (Evaporator) Fan Motor
IFR	— Indoor (Evaporator) Fan Relay
L	— Light
LPS	— Low-Pressure Switch
LS	— Limit Switch
MGV	— Main Gas Valve
MTR	— Motor
MV	— Main Valve
NC	— Normally Closed
NEC	— National Electrical Code
NO	— Normally Open
OAT	— Outdoor Air Thermostat
OFC	— Outdoor (Condenser) Fan Contactor
OFM	— Outdoor (Condenser) Fan Motor
P	— Plug
PL	— Plug Assembly
PS	— Pressure Switch

RES	— Resistor
RS	— Rollout Switch
SAT	— Supply-Air Thermostat
SEN	— Sensor
SPDT	— Single-Pole Double-Throw
SW	— Switch
SW1	— Switch, Fully Open
SW2	— Switch, Fully Closed
SW3	— Switch, Maximum Vent Position
SW4	— Switch, Minimum Vent Position
TB	— Terminal Block
TC	— Thermostat-Cooling
TDR	— Time Delay Relay
TG	— Time Guard
TH	— Thermostat-Heating
TL	— Timer Logic
TRAN	— Transformer
	Circuit Board Run
	Field Splice
	Marked Wire
	Terminal (Marked)
	Terminal (Unmarked)
	Terminal Block
	Terminal Econ Two-Position Board
	Splice
	Splice (Marked)
	Factory Wiring
	Field Control Wiring
	Field Power Wiring
	Accessory or Optional Wiring
	To indicate common potential only, 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 SPDT 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. Thermostat: Part No. HH07AT172
Subbase: Part No. HH93AZ177 and 179

5. Set heat anticipator at 1.0 amp for first stage and 0.6 amp for second stage of heating.

VOLTAGE RATING	CB Mfg Part No. Potter & Brumfield	MUST TRIP AMPS
24 v	W28X-1024-3.2	3.2

7. Use copper, copper clad aluminum, or aluminum conductors.

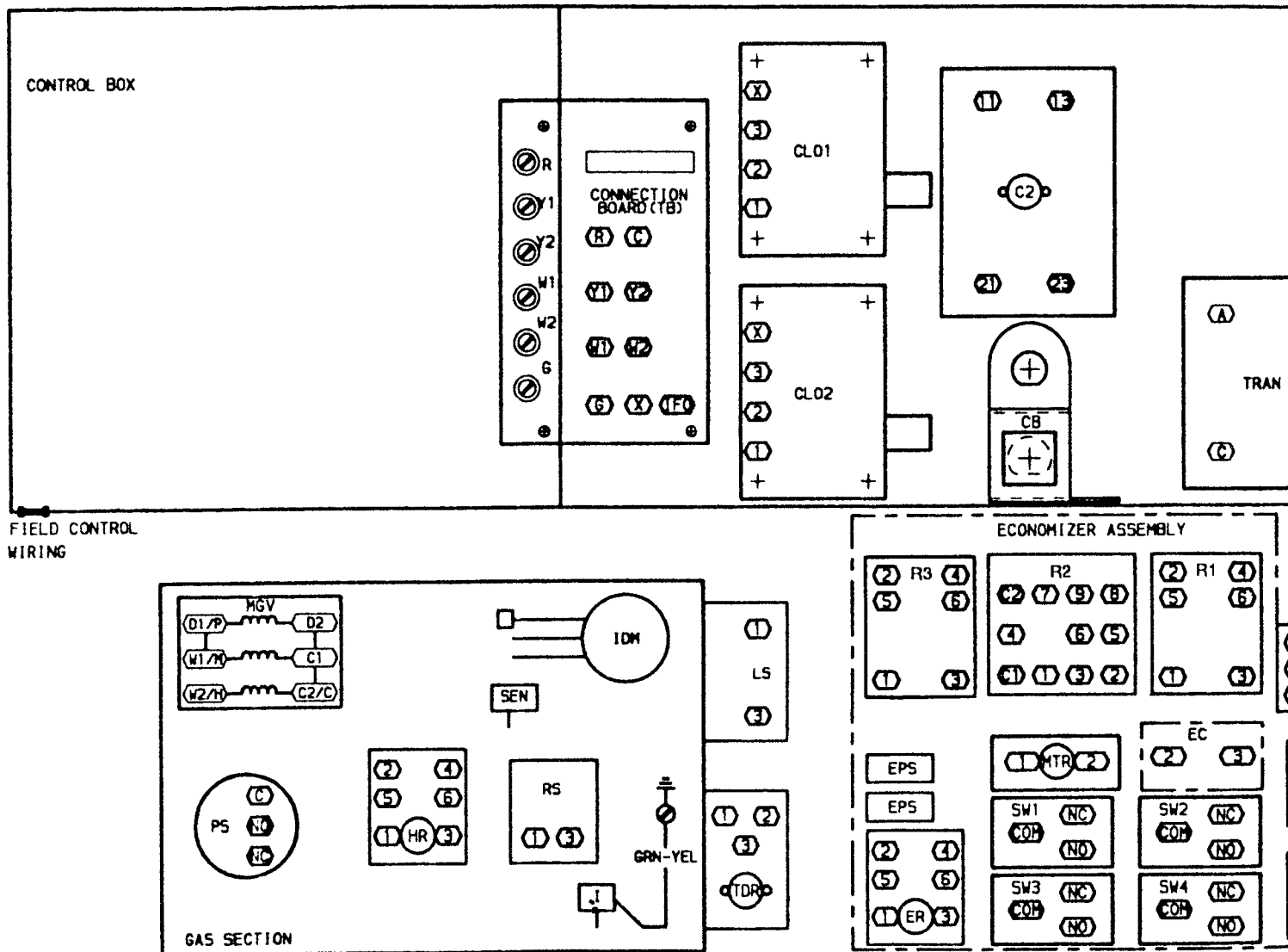
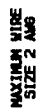


Fig. 35 — Componder





UNIT IS WIRED TO 230V TAP FOR 208-230V UNITS
AND WIRED TO 450V TAP FOR 450V UNITS.



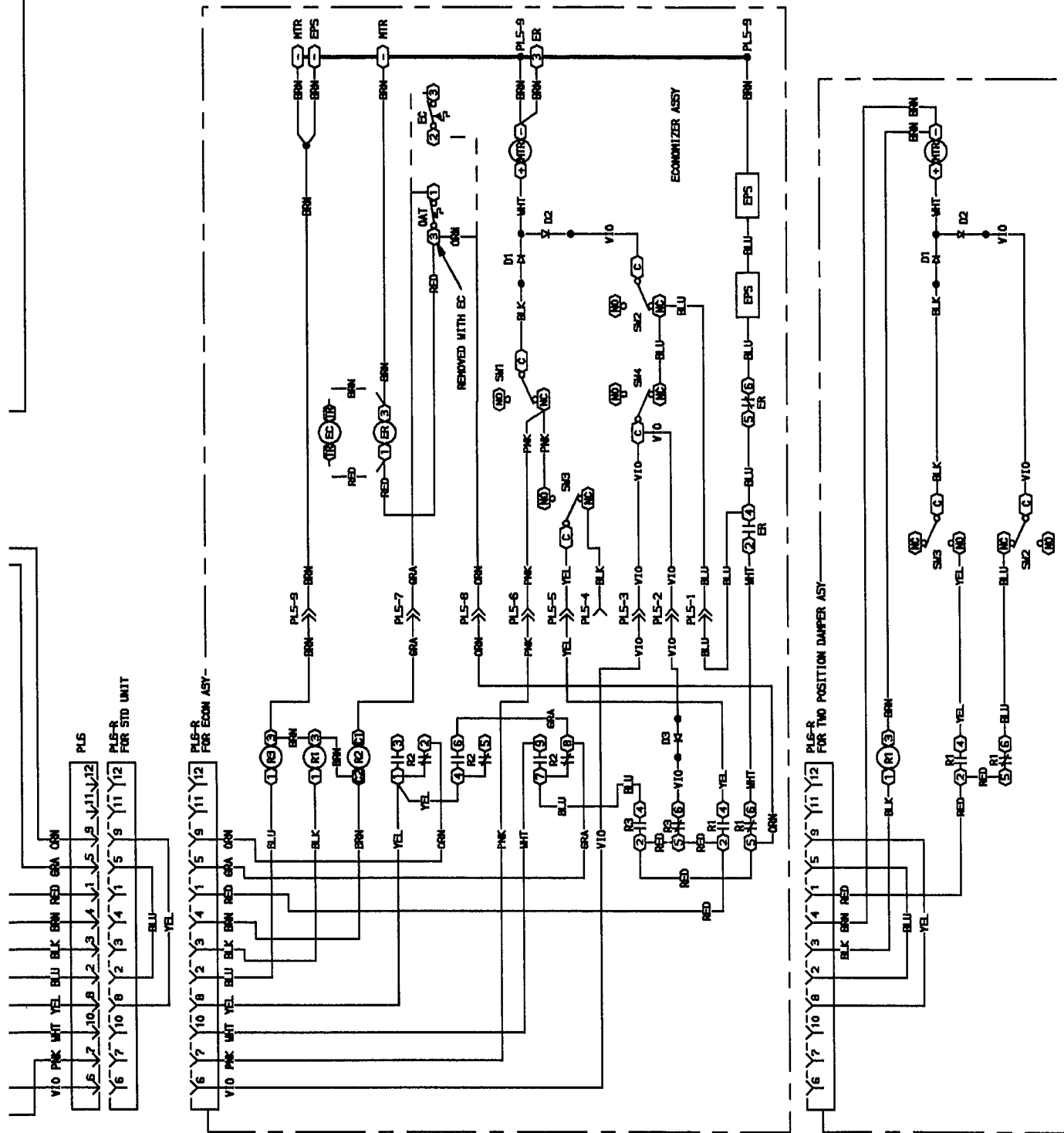


Fig. 36 – Typical Wiring Schematic

