



Turn to the Experts.™

# Installation Instructions

**IMPORTANT:** This installation instruction contains basic unit installation information including installation of field control devices. For information on unit start-up, service, and operation, refer to the unit Controls, Start-Up, Operation, Service, and Troubleshooting Instructions also enclosed in the unit literature packet.

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## SAFETY CONSIDERATIONS


Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or

other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the furnace and in instructions or manuals, be alert to the potential for personal injury.


Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies a hazard which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

 **WARNING**

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch.

 **CAUTION**

**UNIT OPERATION AND SAFETY HAZARD**

Failure to follow this caution may result in personal injury or equipment damage.

Puron® (R-410A) refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron® refrigerant equipment.

## **⚠ WARNING**

### **FIRE, EXPLOSION HAZARD**

Failure to follow this warning could result in personal injury, death and/or property damage.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. What to do if you smell gas:

DO NOT try to light any appliance.

DO NOT touch any electrical switch, or use any phone in your building.

IMMEDIATELY call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.

If you cannot reach your gas supplier, call the fire department.

## **⚠ WARNING**

### **FIRE, EXPLOSION HAZARD**

Failure to follow this warning could result in personal injury or death.

Disconnect gas piping from unit when pressure testing at pressure greater than 0.5 psig. Pressures greater than 0.5 psig will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than 0.5 psig, it *must* be replaced before use. When pressure testing field-supplied gas piping at pressures of 0.5 psig or less, a unit connected to such piping must be isolated by closing the manual gas valve(s).

**IMPORTANT:** Units have high ambient operating limits. If limits are exceeded, the units will automatically lock the compressor out of operation. Manual reset will be required to restart the compressor.

## **INSTALLATION**

### **Step 1 — Provide Unit Support**

#### **Roof Curb**

Assemble or install accessory roof curb in accordance with instructions shipped with this accessory. See Fig. 1. Install insulation, cant strips, roofing, and counter flashing as shown. Ductwork can be installed to roof curb before unit is set in place. Ductwork must be attached to curb and not to the unit. Curb must be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is  $\pm 1/16$  in. per linear ft in any direction. Refer to Accessory Roof Curb Installation Instructions for additional information as required. When accessory roof curb is used, unit may be installed on class A, B, or C roof covering material. Carrier roof curb accessories are for flat roofs or slab mounting.

**IMPORTANT:** The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket with the roof curb as shown in Fig. 1. Improperly applied gasket can also result in air leaks and poor unit performance. Do not slide unit to position on roof curb.

#### **Alternate Unit Support**

When a curb cannot be used, install unit on a noncombustible surface. Support unit with sleepers, using unit curb support area. If sleepers cannot be used, support long sides of unit with a minimum of 3 equally spaced 4-in. x 4-in. pads on each side.

### **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.

### **Step 2 — Remove Shipping Rails**

Remove shipping rails prior to lowering unit onto roof curb. See Fig. 2. The rails are attached to the unit at both the return end and condenser end. Remove the screws from both ends of each rail. Be careful not to drop the rails onto any surface that could be damaged. Discard the rails. It is important to replace the screws into the unit to avoid any air or water leakage.

## **⚠ CAUTION**

### **UNIT OR PROPERTY DAMAGE HAZARD**

Failure to follow this caution may result in equipment or property damage.

Do not allow the shipping rail to drop on the roof surface. Damage to the roof surface may result.

### **Step 3 — Rig and Place Unit**

Inspect unit for transportation damage. See Tables 1-3 for physical data. File any claim with transportation agency.

## **⚠ CAUTION**

### **UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage.

All panels must be in place when rigging. Unit is not designed for handling by fork truck.

Do not drop unit; keep upright. Use spreader bars over unit to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit frame as a reference; leveling tolerance is  $\pm 1/16$  in. per linear ft in any direction. See Fig. 3 for additional information. Unit rigging weight is shown in Fig. 3.

Four lifting holes are provided in the unit base rails as shown in Fig. 3. Refer to rigging instructions on unit.

#### **Positioning**

Maintain clearance, per Fig. 4, around and above unit to provide minimum distance from combustible materials, proper airflow, and service access.

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air. For proper unit operation, adequate combustion and ventilation air must be provided in accordance with Section 5.3 (Air for Combustion and Ventilation) of the National Fuel Gas Code, ANSI Z223.1 (American National Standards Institute).

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

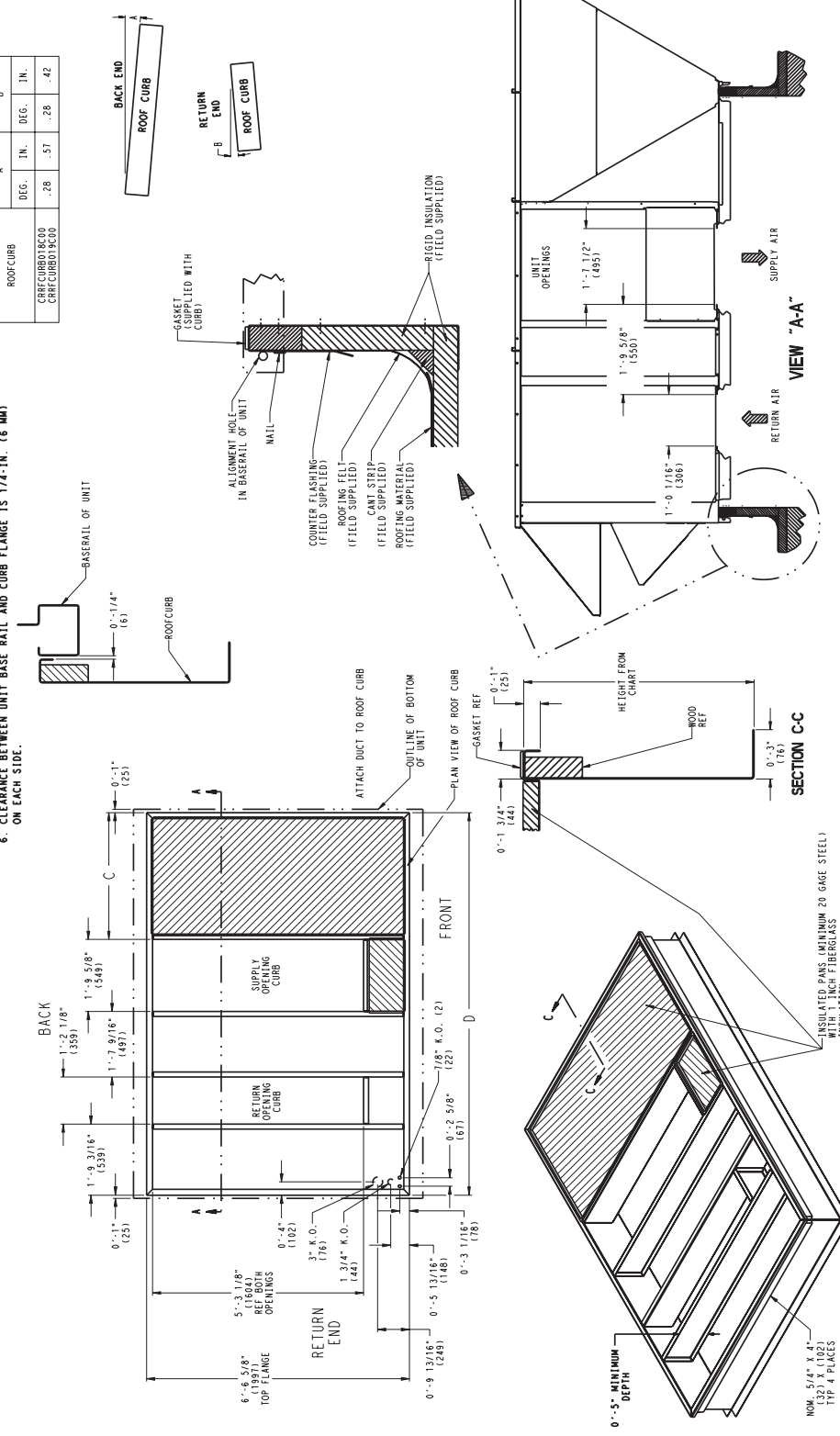
Locate mechanical draft system flue assembly at least 4 ft from any opening through which combustion products could enter the building, and at least 4 ft from any adjacent building (or per local codes). When unit is located adjacent to public walkways, flue assembly must be at least 7 ft above grade. Locate unit at least 10 ft away from adjacent units.

ROOF CURB ACCESSORY	CURB HEIGHT	DESCRIPTION	C		D	
			IN.	MM	IN.	MM
CRRFCURB018000	1'-2"	ROOF CURB	3'-1 15/16"	946	9'-6 7/16"	2260
CRRFCURB019000	2'-5 1/2"	WOOD CURB	3'-7 5/16"	943	9'-7 1/16"	2266

- NOTES:
1. ROOF CURB ACCESSORY IS SHIPPED DISASSEMBLED.
  2. DIMENSIONS ARE IN MILLIMETERS.
  3. DIRECTION OF AIRFLOW.
  4. ROOF CURB: 18 GA. (1403-56) STEEL
  5. TO PREVENT THE HAZARD OF STAGNANT WATER BUILD-UP IN THE UNIT
  6. CLEARANCE BETWEEN UNIT BASE RAIL AND CURB FLANGE IS 1/4-IN. (6 MM) ON EACH SIDE.

MAX CURB LEVELING TOLERANCES:

ROOF CURB	A		B	
	IN.	MM	IN.	MM
CRRFCURB018000	.28	7.1	.28	7.1
CRRFCURB019000	.28	7.1	.28	7.1



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Fig. 1 - Roof Curb Details

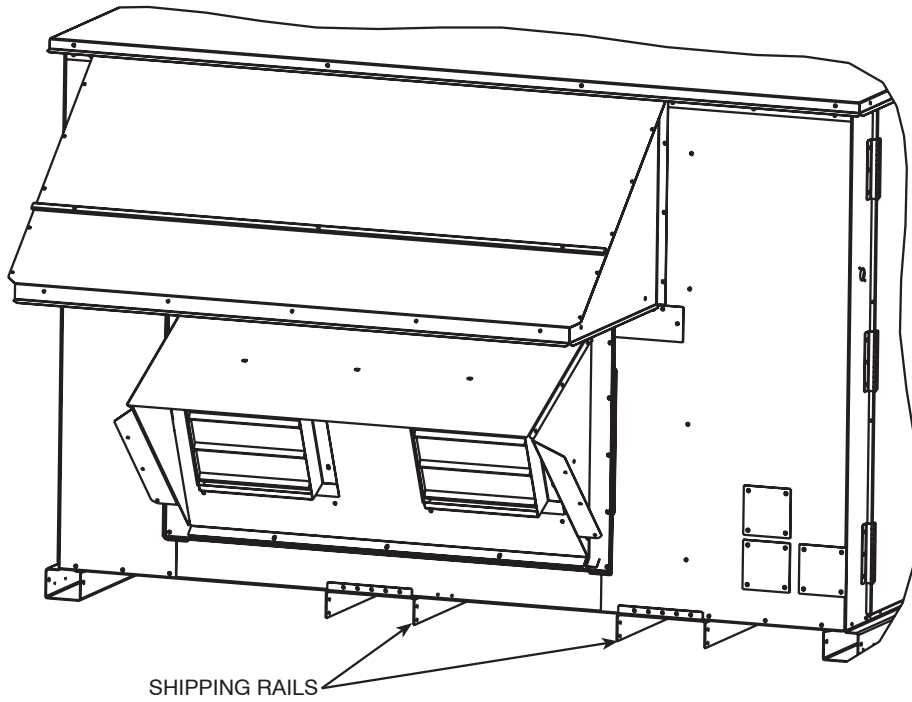


Fig. 2 - Shipping Rail Removal

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### CAUTION - NOTICE TO RIGGERS:

ALL PANELS MUST BE IN PLACE WHEN RIGGING.

**NOTICE TO RIGGERS:** Rig by inserting hooks into unit base rails as shown. Maintain a distance of 120 inches (3048 MM) from top of unit to eyehook. Leave coil cover attached to unit while rigging to protect coil of unit from damage.

UNIT SIZE	MAX WEIGHT (LB) *	CENTER OF GRAVITY (IN.)		
		X	Y	Z
PG20	3825	66.5	36.7	31.4
PG24	4075	66.5	37.0	31.8
PG28	4300	70.5	37.0	35.2

\* DOES NOT INCLUDE ERV (ENERGY RECOVERY VENTILATOR) OPTION.

**NOTES:**  
 1. Add 150 lb (68 Kg) for domestic crating.  
 2. See label for unit location on roof curb.

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Fig. 3 - Rigging Details

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UNIT SIZE	OPERATING WEIGHT (LB. / KG.)		UNIT LENGTH (IN. / MM.)		UNIT HEIGHT (IN. / MM.)		CENTER OF GRAVITY LOCATION							CORNER WEIGHT (LB. / KG.)		
	LB.	KG.	N.	MM.	N.	MM.	X	Y	Z	A	B	C	D	E	F	
48PG20	2480	1125	51-3/4	1300	186-7/16	4700	69.6	35.4	28.6	682.4	783.5	122.1	142.0	170.0	155.0	
48PG24	2720	1235	57-1/2	1450	198-1/2	4950	72.0	37.0	30.0	720.0	840.0	130.0	150.0	180.0	165.0	
48PG28	2720	1235	69-3/4	1750	210-1/4	5200	78.0	39.0	32.0	780.0	900.0	140.0	160.0	190.0	175.0	

- NOTES: FOR OUTDOOR USE ONLY.  
 1. WEIGHTS SHOWN ARE FOR 48PG (LOW HEAT) UNIT WITH MANUAL 254 OUTDOOR AIR OPTION, ALUMINUM COILS, EQUIPMENT CONSULT PRODUCT DATA BOOK.  
 2. DO NOT LOCATE ADJACENT UNITS WITH FLUE MIN. CLEARANCES TO BE: SEE TABLE.  
 3. FRONT SIDE: 8'-0" (1829) CONDENSER AIR  
 4. REAR SIDE: 8'-0" (1829) CONDENSER AIR  
 5. TOP: 8'-6" (1881) ECONOMIZER REMOVAL  
 6. BOTTOM: 4'-0" (1193) COMBUSTIBLE SURFACES (W/O CURB)  
 7. FLUE OUTLET: 4'-0" (1193) COMBUSTIBLE SURFACES (W/O CURB)  
 8. CONTACT CARRIER APPLICATION ENGINEERING DEPARTMENT FOR CURB CLEARANCES AND SUPPLEMENTS  
 9. REAR CURB ONLY. IF UNIT IS MOUNTED SIDE SUPPLY, IT IS RECOMMENDED THE DUCTS MUST BE SUPPORTED BY MILLIMETERS OR KILOGRAMS.  
 10. DIMENSIONS ARE IN INCHES, WEIGHTS AND DIMENSIONS IN ( ) ARE IN MILLIMETERS OR KILOGRAMS.  
 11. WITH THE EXCEPTION OF CLEARANCE FOR THE CONDENSER COIL RELIEF HOOD/ POWER EXHAUST.  
 12. REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.  
 13. DIMENSIONS ARE FROM OUTSIDE OF BASE RAIL.  
 14. ALLOW 9'-3/16 (15) ON EACH SIDE FOR TOP COVER DRIP EDGE.

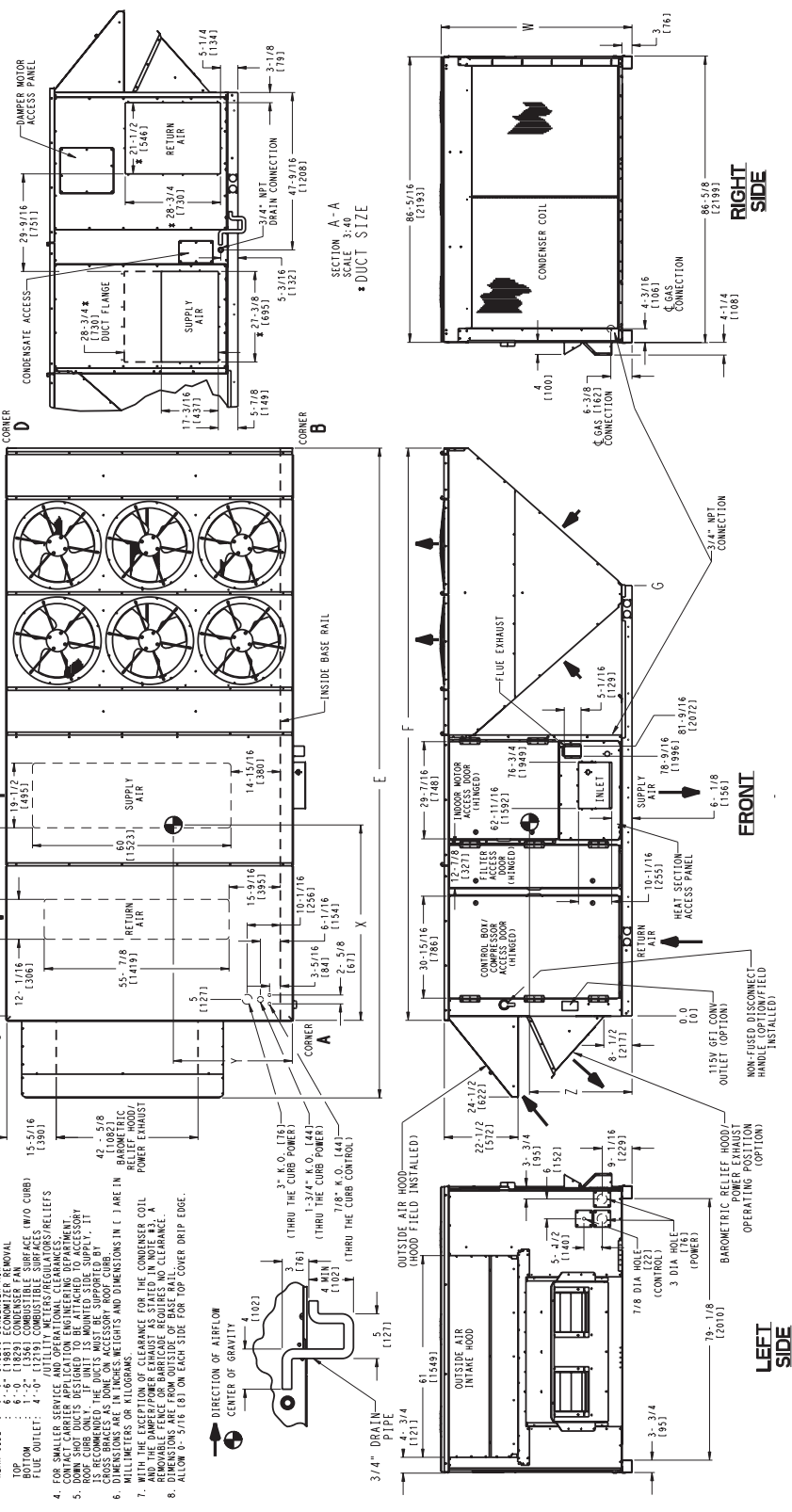


Fig. 4 - Base Unit Dimensions

Table 1 – Physical Data

UNIT 48PG		20		24		28	
VOLTAGE		208/230 and 460	575	208/230 and 460	575	208/230 and 460	575
NOMINAL CAPACITY (Tons)		18	18	20	20	25	25
OPERATING WEIGHT (lb)							
48 Series (Low Heat) Al/Al		2480	2480	2588	2588	2773	2773
COMPRESSOR		Fully Hermetic Scroll					
Quantity		2	2	2	2	3	3
Number of Refrigerant Circuits		2	2	2	2	2	2
Oil (ounces) Comp A1, A2, B1		85, NA, 85	85, NA, 85	85, NA, 85	85, NA, 85	85, 85, 85	85, 85, 85
REFRIGERANT TYPE		Puron® Refrigerant (R-410A)					
Expansion Device		TXV	TXV	TXV	TXV	TXV	TXV
Change Type							
Operating Charge (lb) — Standard Unit							
Circuit A		25.3	25.3	29.2	29.2	49.3	49.3
Circuit B		25.3	25.3	30.1	30.1	24.3	24.3
Total Charge		50.6	50.6	59.3	59.3	73.6	73.6
OPERATING CHARGE (lb)							
Unit with Humidi-Mizer™ System							
Circuit A		42.9	42.9	46.5	46.5	66.1	66.1
Circuit B		39.8	39.8	44.5	44.5	35.7	35.7
Total Charge		82.7	82.7	91.0	91.0	101.8	101.8
REFRIGERANT ECONOMIZER							
Heat Exchanger Size		B15Hx26x26	B15Hx26x26	B15Hx26x26	B15Hx26x26	B15Hx26x36	B15Hx26x36
Expansion Device		TXV	TXV	TXV	TXV	TXV	TXV
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins					
Rows...Fins/inch		2...17	2...17	3...17	3...17	3...17	3...17
Quantity		2	2	3	3	3	3
Length of Tube Sheets (in.)		80.3	80.3	80.3	80.3	80.3	80.3
Width (in.)		60	60	60	60	60	60
Total Face area (sq ft)		33.46	33.46	33.46	33.46	33.46	33.46
CONDENSER FAN		Propeller					
Nominal Cfm (Total, all fans)		14,000	14,000	21,000	21,000	21,000	21,000
Quantity...Diameter (in.)		4...22	4...22	6...22	6...22	6...22	6...22
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts input (Total)		1400	1400	2100	2100	2100	2100
EVAPORATOR COIL		Enhanced Copper Tubes, Face Split, Aluminum Lanced Fins					
Rows...Fins/inch		4...15	4...15	4...15	4...15	4...15	4...15
Length of Tube Sheets (in.)		69.4	69.4	69.4	69.4	69.4	69.4
Width (in.)		48	48	48	48	60	60
Total Face area (sq ft)		23.13	23.13	23.13	23.13	28.92	28.92
EVAPORATOR FAN		Centrifugal, Belt Type					
Quantity...Size (in.)		2...15 x 11	2...15 x 11	2...15 x 11	2...15 x 11	2...15 x 11	2...15 x 11
Type Drive		Belt	Belt	Belt	Belt	Belt	Belt
Nominal Cfm		7000	7000	8000	8000	10,000	10,000
Motor Bearing Type		Ball	Ball	Ball	Ball	Ball	Ball
Maximum Allowable Fan Rpm		1400	1400	1400	1400	1400	1400
HUMIDI-MIZER COIL							
Weight (lb)		80	80	80	80	100	100
Rows...Fins/Inch		2...15	2...15	2...15	2...15	2...15	2...15
Length of Tube Sheets (in.)		56	56	56	56	56	56
Width (in.)		32	32	32	32	44	44
Total Face Area (sq ft)		12.4	12.4	12.4	12.4	17.1	17.1
FURNACE SECTION							
Rollout Switch Cutout Temp (°F)	Vertical	225	225	225	225	225	225
Burner Orifice Diameter (in. ...drill size)		0.136...29	0.136...29	0.136...29	0.136...29	0.136...29	0.136...29
Gas		Natural	Natural	Natural	Natural	Natural	Natural
Thermostat Heat Anticipator Setting							
Stage 1 (amps)		0.98	0.98	0.98	0.98	0.98	0.98
Stage 2 (amps)		0.44	0.44	0.44	0.44	0.44	0.44
Gas Input (Btuh) HIGH HEAT	Stage 1	317,000	317,000	317,000	317,000	317,000	317,000
	Stage 2	400,000	400,000	400,000	400,000	400,000	400,000
Efficiency (Steady State) %	Vertical	82	82	82	82	82	82
Temperature Rise Range		25-55	25-55	25-55	25-55	25-55	25-55
Gas Input (Btuh) MEDIUM HEAT	Stage 1	281,000	281,000	281,000	281,000	281,000	281,000
	Stage 2	365,000	365,000	365,000	365,000	365,000	365,000
Efficiency (Steady State) %	Vertical	81	81	81	81	81	81
Temperature Rise Range		25-55	25-55	25-55	25-55	25-55	25-55
Gas Input (Btuh) LOW HEAT	Stage 1	199,000	199,000	199,000	199,000	199,000	199,000
	Stage 2	250,000	250,000	250,000	250,000	250,000	250,000
Efficiency (Steady State) %	Vertical	82	82	82	82	82	82
Temperature Rise Range		15-45	15-45	15-45	15-45	15-45	15-45
Manifold Pressure							
Natural Gas (in. wg)	Vertical	3.00	3.00	3.00	3.00	3.00	3.00
Natural Gas (in. wg)	Horizontal	2.95	2.95	2.95	2.95	2.95	2.95
Gas Valve Quantity		1	1	1	1	1	1
Gas Valve Pressure Range	(in. wg)	5.5-13.0	5.5-13.0	5.5-13.0	5.5-13.0	5.5-13.0	5.5-13.0
Min-Max Allowable	(psig)	.235-.469	.235-.469	.235-.469	.235-.469	.235-.469	.235-.469
Field Gas Connection Size (in...FPT)		3/4	3/4	3/4	3/4	3/4	3/4
HIGH-PRESSURE SWITCHES (psig)							
Cutout		630 ± 10	630 ± 10	630 ± 10	630 ± 10	630 ± 10	630 ± 10
Reset (Auto)		505 ± 20	505 ± 20	505 ± 20	505 ± 20	505 ± 20	505 ± 20
OUTDOOR AIR INLET SCREENS							
Quantity...Size (in.)		3...20 x 25	3...20 x 25	3...20 x 25	3...20 x 25	3...20 x 25	3...20 x 25
RETURN-AIR FILTERS							
Quantity...Size (in.)		9...16 x 25 x 2	9...16 x 25 x 2	9...16 x 25 x 2	9...16 x 25 x 2	9...18 x 24 x 2	9...20 x 25 x 2

LEGEND

TXV — Thermostatic Expansion Valve

Table 2 – Fan Motor and Drive Data — Vertical Supply/Return

48PG	20		24		28	
	208/230 and 460	575	208/230 and 460	575	208/230 and 460	575
<b>LOW RANGE</b>						
Motor Hp	3.7	5	3.7	5	5	5
Motor Nominal Rpm	1750	1750	1750	1750	1750	1750
Maximum Continuous Bhp	4.26	5.88	4.26	5.88	5.37/6.00	5.88
Maximum Continuous Watts	3700	5015	3700	5015	4578/5115	5015
Motor Frame Size	56HZ	S184T	56HZ	S184T	S184T	S184T
Motor Shaft Diameter (in.)	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8
Fan Rpm Range	685–939	751–954	685–939	751–954	687–873	687–873
Motor Pulley Min. Pitch Diameter (in.)	2.7	3.7	2.7	3.7	3.7	3.7
Motor Pulley Max. Pitch Diameter (in.)	3.7	4.7	3.7	4.7	4.7	4.7
Blower Pulley Pitch Diameter (in.)	6.8	8.6	6.8	8.6	9.4	9.4
Blower Pulley Shaft Diameter (in.)	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	11.293–13.544	9.81–13.055	11.293–13.544	9.81–13.055	9.81–13.055	9.81–13.055
Belt, Quantity...Type...Length (in.)	1...BX38...39.8	1...BX40...41.8	1...BX38...39.8	1...BX40...41.8	1...BX41...42.8	1...BX41...42.8
Speed Change Per Turn — Moveable Pulley (rpm)	42	34	42	34	31	31
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	812	853	812	853	780	780
<b>MID–LOW RANGE</b>						
Motor Hp	5	5	5	5	5	5
Motor Nominal Rpm	1750	1750	1750	1750	1750	1750
Maximum Continuous Bhp	5.37/6.00	5.88	5.37/6.00	5.88	5.37/6.00	5.88
Maximum Continuous Watts	4578/5115	5015	4578/5115	5015	4578/5115	5015
Motor Frame Size	S184T	S184T	S184T	S184T	S184T	S184T
Motor Shaft Diameter (in.)	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Fan Rpm Range	949–1206	949–1206	949–1206	949–1206	805–1007	805–1007
Motor Pulley Min. Pitch Diameter (in.)	3.7	3.7	3.7	3.7	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	4.7	4.7	4.7	4.7	6	6
Blower Pulley Pitch Diameter (in.)	6.8	6.8	6.8	6.8	10.4	10.4
Blower Pulley Shaft Diameter (in.)	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.81–13.055	9.81–13.055	9.81–13.055	9.81–13.055	9.81–13.055	9.81–13.055
Belt, Quantity...Type...Length (in.)	1...BX38...39.8	1...BX38...39.8	1...BX38...39.8	1...BX38...39.8	1...BX45...46.8	1...BX45...46.8
Speed Change Per Turn — Moveable Pulley (rpm)	43	43	43	43	34	34
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1078	1078	1178	1078	906	906
<b>MID–HIGH RANGE</b>						
Motor Hp	7.5	7.5	7.5	7.5	7.5	7.5
Motor Nominal Rpm	1750	1750	1750	1750	1750	1750
Maximum Continuous Bhp	7.66/9.00	9.00	7.66/9.00	9.00	7.66/9.00	9.00
Maximum Continuous Watts	6458/7586	7586	6458/7586	7586	6458/7586	7586
Motor Frame Size	S213T	S213T	S213T	S213T	S213T	S213T
Motor Shaft Diameter (in.)	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Fan Rpm Range	941–1176	941–1176	941–1176	941–1176	941–1176	941–1176
Motor Pulley Min. Pitch Diameter (in.)	4.8	4.8	4.8	4.8	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	6.0	6.0	6.0	6.0	6.0	6.0
Blower Pulley Pitch Diameter (in.)	8.9	8.9	8.9	8.9	8.9	8.9
Blower Pulley Shaft Diameter (in.)	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179
Belt, Quantity...Type...Length (in.)	1...BX42...43.8	1...BX42...43.8	1...BX42...43.8	1...BX42...43.8	1...BX42...43.8	1...BX42...43.8
Speed Change Per Turn — Moveable Pulley (rpm)	39	39	39	39	39	39
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1059	1059	1059	1059	1059	1059
<b>HIGH RANGE</b>						
Motor Hp	10	10	10	10	10	10
Motor Nominal Rpm	1750	1750	1750	1750	1750	1750
Maximum Continuous Bhp	9.94/11.19	11.65	9.94/11.19	11.65	9.94/11.19	11.65
Maximum Continuous Watts	8284/9330	9711	8284/9330	9711	8284/9330	9711
Motor Frame Size	S215T	S215T	S215T	S215T	S215T	S215T
Motor Shaft Diameter (in.)	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Fan Rpm Range	1014–1297	1014–1297	1014–1297	1014–1297	1014–1297	1014–1297
Motor Pulley Min. Pitch Diameter (in.)	4.3	4.3	4.3	4.3	4.3	4.3
Motor Pulley Max. Pitch Diameter (in.)	5.5	5.5	5.5	5.5	5.5	5.5
Blower Pulley Pitch Diameter (in.)	7.4	7.4	7.4	7.4	7.4	7.4
Blower Pulley Shaft Diameter (in.)	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179
Belt, Quantity...Type...Length (in.)	2...BX38...39.8	2...BX38...39.8	2...BX38...39.8	2...BX38...39.8	2...BX38...39.8	2...BX38...39.8
Speed Change Per Turn — Moveable Pulley (rpm)	47	47	47	47	47	47
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1156	1156	1156	1156	1156	1156

48PG20–28

Table 3 – Fan Motor and Drive Data — Horizontal Supply/Return

48PG	20		24		28	
	208/230 and 460	575	208/230 and 460	575	208/230 and 460	575
<b>LOW RANGE</b>						
Motor Hp	—	—	—	—	5	5
Motor Nominal Rpm	—	—	—	—	1750	1750
Maximum Continuous Bhp	—	—	—	—	5.37/6.00	5.88
Maximum Continuous Watts	—	—	—	—	4578/5115	5015
Motor Frame Size	—	—	—	—	S184T	S184T
Motor Shaft Diameter (in.)	—	—	—	—	1 1/8	1 1/8
Fan Rpm Range	—	—	—	—	687–873	687–873
Motor Pulley Min. Pitch Diameter (in.)	—	—	—	—	3.7	3.7
Motor Pulley Max. Pitch Diameter (in.)	—	—	—	—	4.7	4.7
Blower Pulley Pitch Diameter (in.)	—	—	—	—	9.4	9.4
Blower Pulley Shaft Diameter (in.)	—	—	—	—	1 3/16	1 3/16
Blower Pulley Type	—	—	—	—	Fixed	Fixed
Pulley Center Line Distance (in.)	—	—	—	—	9.81–13.055	9.81–13.055
Belt, Quantity...Type...Length (in.)	—	—	—	—	1...BX41...42.8	1...BX41...42.8
Speed Change Per Turn — Moveable Pulley (rpm)	—	—	—	—	31	31
Moveable Pulley Maximum Full Turns	—	—	—	—	6	6
Factory Speed Setting (rpm)	—	—	—	—	780	780
<b>MID–LOW RANGE</b>						
Motor Hp	3.7	5	3.7	5	5	5
Motor Nominal Rpm	1750	1750	1750	1750	1750	1750
Maximum Continuous Bhp	4.26	5.88	4.26	5.88	5.37/6.00	5.88
Maximum Continuous Watts	3700	5015	3700	5015	4578/5115	5015
Motor Frame Size	56HZ	S184T	56HZ	S184T	S184T	S184T
Motor Shaft Diameter (in.)	7/8	1 1/8	7/8	1 1/8	1 1/8	1 1/8
Fan Rpm Range	896–1227	873–1108	896–1227	873–1108	805–1007	805–1007
Motor Pulley Min. Pitch Diameter (in.)	2.7	3.7	2.7	3.7	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	3.7	4.7	3.7	4.7	6.0	6.0
Blower Pulley Pitch Diameter (in.)	5.2	7.4	5.2	7.4	10.4	10.4
Blower Pulley Shaft Diameter (in.)	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	11.293–13.544	9.81–13.055	11.293–13.544	9.81–13.055	9.81–13.055	9.81–13.055
Belt, Quantity...Type...Length (in.)	1...BX35...36.8	1...BX38...39.8	1...BX35...36.8	1...BX38...39.8	1...BX45...46.8	1...BX45...46.8
Speed Change Per Turn — Moveable Pulley (rpm)	55	39	55	39	34	34
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1062	991	1062	991	906	906
<b>MID–HIGH RANGE</b>						
Motor Hp	5	5	5	5	7.5	7.5
Motor Nominal Rpm	1750	1750	1750	1750	1750	1750
Maximum Continuous Bhp	5.37/6.00	5.88	5.37/6.00	5.88	7.66/9.00	9.00
Maximum Continuous Watts	4578/5115	5015	4578/5115	5015	6458/7586	7586
Motor Frame Size	S184T	S184T	S184T	S184T	S213T	S213T
Motor Shaft Diameter (in.)	1 1/8	1 1/8	1 1/8	1 1/8	1 3/8	1 3/8
Fan Rpm Range	1113–1414	1113–1414	1113–1414	1113–1414	941–1176	941–1176
Motor Pulley Min. Pitch Diameter (in.)	3.7	3.7	3.7	3.7	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	4.7	4.7	4.7	4.7	6.0	6.0
Blower Pulley Pitch Diameter (in.)	5.8	5.8	5.8	5.8	8.9	8.9
Blower Pulley Shaft Diameter (in.)	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.81–13.055	9.81–13.055	9.81–13.055	9.81–13.055	9.025–12.179	9.025–12.179
Belt, Quantity...Type...Length (in.)	1...BX35...36.8	1...BX35...36.8	1...BX35...36.8	1...BX35...36.8	1...BX42...43.8	1...BX42...43.8
Speed Change Per Turn — Moveable Pulley (rpm)	50	50	50	50	39	39
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1264	1264	1264	1264	1059	1059
<b>HIGH RANGE</b>						
Motor Hp	7.5	7.5	7.5	7.5	10	10
Motor Nominal Rpm	1750	1750	1750	1750	1750	1750
Maximum Continuous Bhp	7.66/9.00	9.00	7.66/9.00	9.00	9.94/11.19	11.65
Maximum Continuous Watts	6458/7586	7586	6458/7586	7586	8284/9330	9711
Motor Frame Size	S213T	S213T	S213T	S213T	S215T	S215T
Motor Shaft Diameter (in.)	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Fan Rpm Range	1096–1339	1096–1339	1096–1339	1096–1339	1014–1297	1014–1297
Motor Pulley Min. Pitch Diameter (in.)	5.4	5.4	5.4	5.4	4.3	4.3
Motor Pulley Max. Pitch Diameter (in.)	6.6	6.6	6.6	6.6	5.5	5.5
Blower Pulley Pitch Diameter (in.)	8.6	8.6	8.6	8.6	7.4	7.4
Blower Pulley Shaft Diameter (in.)	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16	1 3/16
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179	9.025–12.179
Belt, Quantity...Type...Length (in.)	1...BX42...43.8	1...BX42...43.8	1...BX42...43.8	1...BX42...43.8	1...BX38...39.8	1...BX38...39.8
Speed Change Per Turn — Moveable Pulley (rpm)	41	41	41	41	47	47
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1218	1218	1218	1218	1156	1156

48PG20 – 28

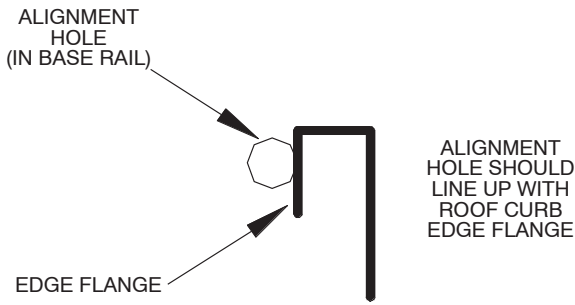


**Roof Mount**

Check building codes for weight distribution requirements. Unit operating weight is shown in Table 1.

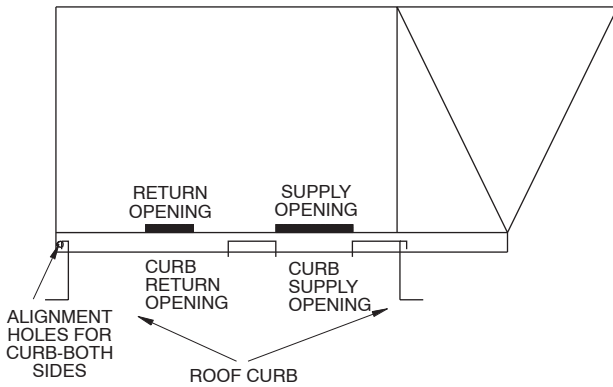
**Installation Onto Curb**

The 48PG units are designed to fit on the accessory full perimeter curb. Correct placement of the unit onto the curb is critical to operating performance. To aid in correct positioning, 3/8-in. diameter locating holes have been added to the unit base rails. When placing the unit, these holes should line up with the roof curb edge as shown in Fig. 5 and 6, to assure proper duct opening alignment. For placement on the roof PG curb, use the alignment holes located approximately 2-in. from the end of the base rail on the return end of the unit. See labels on the side of the unit for more details.



**Fig. 5 - Alignment Hole Details**

C06276



**Fig. 6 - Alignment Hole Location**

C06277

**Step 4 — 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 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 pressure (a negative condition) shall not exceed 0.35 in. wg with economizer or 0.45 in. wg without economizer.

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

To operate at lower return-air temperatures, a field-supplied outdoor-air temperature control must be used to initiate both stages of heat when the temperature is below 45°F. Indoor comfort may be compromised when these lower air temperatures are used with insufficient heating temperature rise.

**Step 5 — Make Unit Duct Connections**

**Vertical Configuration**

Unit is shipped for vertical supply and return duct connections. Ductwork openings are shown in Fig. 1 and 4. Duct connections for vertical configuration are shown in Fig. 7. Field-fabricated concentric ductwork may be connected as shown in Fig. 8 and 9. The unit is designed to attach the ductwork to the roof curb. Do not attach duct directly to the unit.

**⚠ CAUTION**

**PERSONAL INJURY HAZARD**

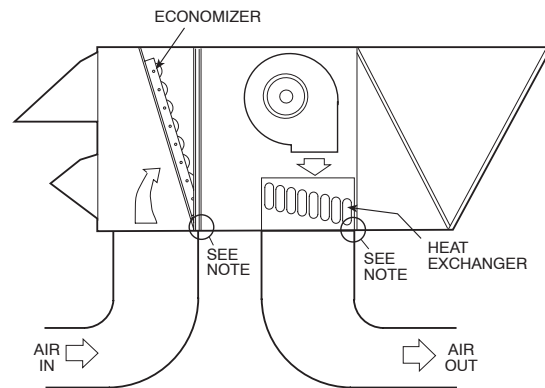
Failure to follow this caution may result in personal injury.

For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90° turn in the return ductwork between the unit and the conditioned space. If a 90° elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space.

**Horizontal Applications**

Horizontal units are shipped with outer panels that allow for side by side horizontal duct connections. If specified during ordering, the unit will be shipped with the vertical duct openings blocked off from the factory, ready for side supply installation. If the horizontal supply/return option was not specified at time of ordering the unit, a field-installed accessory kit is required to convert the vertical unit into a horizontal supply configuration.

Installation of the duct block-off covers should be completed prior to placing the unit unless sufficient side clearance is available. A minimum of 66 in. is required between the unit and any obstruction to install the duct block-off covers. Side supply duct dimensions and locations are shown in Fig. 4. Install ductwork to horizontal duct flange connections on side of unit.

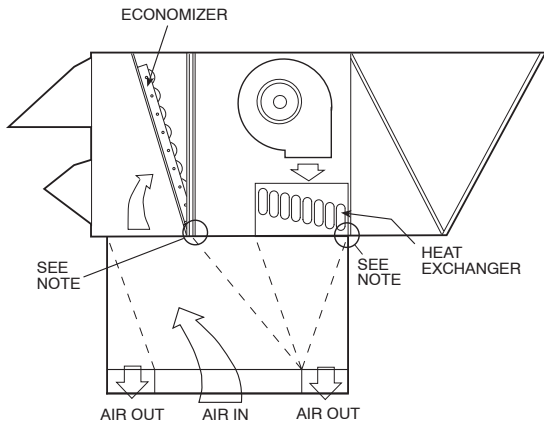


NOTE: Do not drill in this area. Damage to basepan may result in water leak.

**Fig. 7 - Air Distribution - Vertical Supply/Return**

C06278

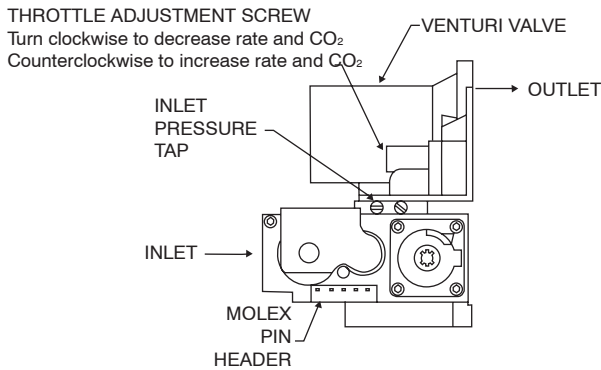
48PG20-28



NOTE: Do not drill in this area. Damage to basepan may result in water leak.

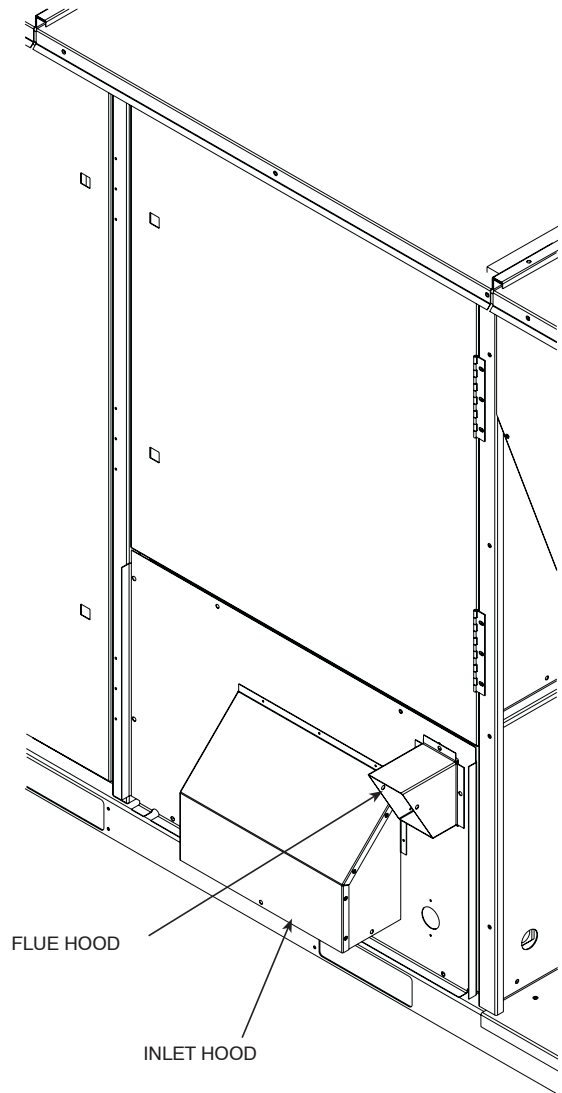
C06279

**Fig. 8 - Air Distribution - Concentric Duct**



C06100

**Fig. 9 - Concentric Duct Details**



C06280

**Fig. 10 - Flue and Inlet Hood Locations**

**Step 6 — Install Flue Hood and Inlet Hood**

Flue hood (smaller hood), inlet hood (larger hood), and screens are shipped inside the unit in the fan section. To install, remove the heat panel. The flue hood is attached to the heat section panel from the outside using the screws provided. See Fig. 10.

The inlet hood is installed by inserting the hood through the back of the heat panel. Attach the hood by inserting the screws provided through the clearance holes in the heat panel and into the intake hood.

Install the screens into both hoods using the screws and retaining nuts provided with the unit.

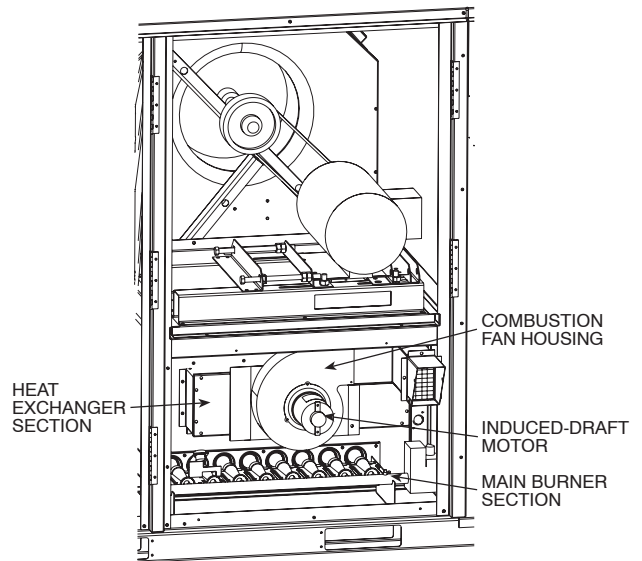
Attach the cover of the observation hole on the intake hood and then replace the heat panel onto the unit to complete the installation.

**NOTE:** When properly installed, the flue hood will line up with the combustion fan housing. See Fig. 11.

**Step 7 — Trap Condensate Drain**

See Fig. 12 for drain location. One 3/4-in. half coupling is provided outside unit evaporator section for condensate drain connection. A trap at least 4-in. deep must be used. See Fig. 13.

All units must have an external trap for condensate drainage. Install a trap at least 4 in. deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10 ft. of run. Do not use a pipe size smaller than the unit connection.



C06281

**Fig. 11 - Combustion Fan Housing Location**

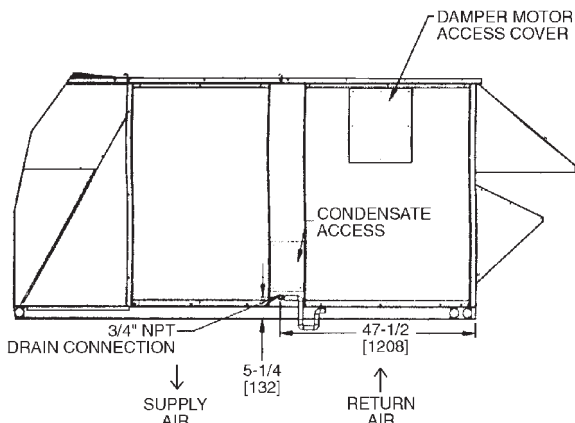
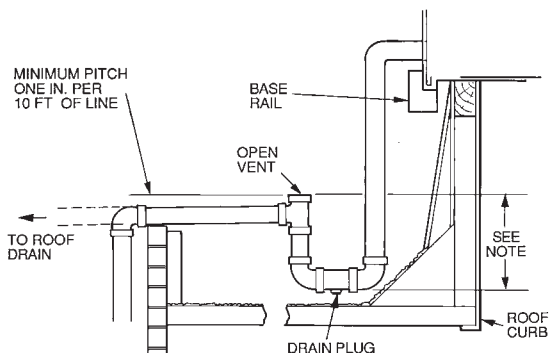


Fig. 12 - Condensate Drain Details

C06282



NOTE: Trap should be deep enough to offset maximum unit static difference. A 4-in. trap is recommended.

Fig. 13 - Condensate Drain Piping Details

C06291

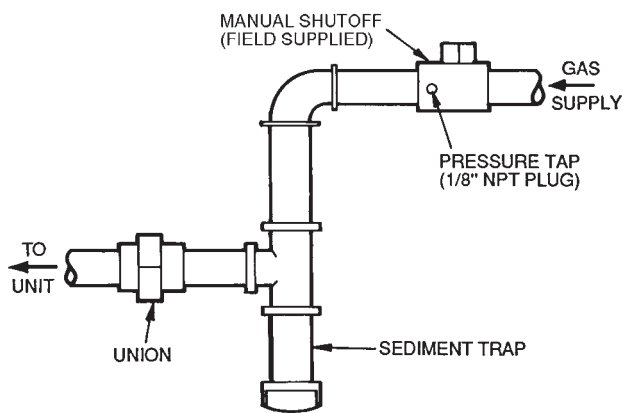


Fig. 14 - Field Gas Piping

C06236

**Step 8 — Install Gas Piping**

Unit is equipped for use with natural gas. Refer to local building codes, or in the absence of local codes, to ANSI Z223.1-latest year and addendum Z223.1A-latest year entitled NFGC. In Canada, installation must be in accordance with the CAN1.B149.1 and CAN1.B149.2 installation codes for gas burning appliances.

Support gas piping. 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 3 support beams.

Install field-supplied manual gas shutoff valve with a 1/8-in. NPT pressure tap for test gauge connection at unit. The pressure tap is

located on the gas manifold, adjacent to the gas valve. Field gas piping must include sediment trap and union. See Fig. 14.

**⚠ WARNING**

**FIRE, EXPLOSION HAZARD**

Failure to follow this warning could result in personal injury or death.

Do not pressure test gas supply while connected to unit. Always disconnect union before servicing. High pressures can cause gas valve damage resulting in a hazardous condition.

**IMPORTANT:** Natural gas pressure at unit gas connection must not be less than 5.5 in. wg or greater than 13.0 in. wg.

Size gas-supply piping for 0.5-in. wg maximum pressure drop. Do not use supply pipe smaller than unit gas connection.

**Step 9 — Orifice Change**

This unit is factory assembled for heating operation using natural gas at an elevation from sea level to 2000 ft. This unit uses orifice type LH32RFnnn, where “nnn” indicates the orifice size based on drill size diameter in thousands of an inch.

**High Elevation (Above 2000 ft)**

Use accessory high altitude kit when installing this unit at an elevation of 2000 to 7000 ft. For elevations above 7000 ft, refer to Table 4 to identify the correct orifice size for the elevation. See Table 5 for the number of orifices required for each unit size. Purchase these orifices from your local Carrier dealer. Follow instructions in accessory Installation Instructions to install the correct orifices.

Table 4 – Altitude Compensation\*

ELEVATION (ft)	NATURAL GAS ORIFICE†			
	Low Heat	Med. Heat	High Heat (6 Cell)	High Heat (8 Cell)
0-1,999	29	30	29	29
2,000	29	30	29	29
3,000	30	31	30	30
4,000	30	31	30	30
5,000	30	31	30	30
6,000	30	31	30	30
7,000	31	32	31	31
8,000	31	32	31	31
9,000	31	32	31	31
10,000	32	33	32	32

\*. As the height above sea level increases, there is less oxygen per cubic ft. of air. Therefore, heat input rate should be reduced at higher altitudes. Includes a 4% input reduction per each 1000 ft.

† Orifices available through your Carrier dealer.

Table 5 – Orifice Quantity

UNIT	ORIFICE QUANTITY
Low Heat (48PGD/L)	5
Medium Heat (48PGE/M)	8
High Heat (48PGF/N)	8

**Conversion to LP (Liquid Propane) Gas**

Use accessory LP gas conversion kit when converting this unit for use with LP fuel usage for elevations up to 7000 ft. For elevations above 7000 ft, refer to Table 6 to identify the correct orifice size for the elevation. See Table 5 for the number of orifices required for each unit size. Purchase these orifices from your local Carrier dealer. Follow instructions in accessory Installation Instructions to install the correct orifices.

48PG20-28

Table 6 – LP Gas Conversion\*

ELEVATION (ft)	LP GAS ORIFICE†			
	Low Heat	Med. Heat	High Heat (6 Cell)	High Heat (8 Cell)
0-1,999	35	38	35	35
2,000	36	39	36	36
3,000	36	39	36	36
4,000	37	40	37	37
5,000	37	40	37	37
6,000	38	41	38	38
7,000	39	42	39	39
8,000	40	43	40	40
9,000	41	44	41	41
10,000	42	45	42	42

\* As the height above sea level increases, there is less oxygen per cubic ft. of air. Therefore, heat input rate should be reduced at higher altitudes. Includes a 4% input reduction per each 1000 ft.

## Step 10 — Make Electrical Connections

### Field Power Supply

Unit is factory wired for voltage shown on unit nameplate. Be sure to check for correct voltage.

All 208/230-v units are factory wired for 230-v power supply. If the 208/230-v unit is to be connected to a 208-v power supply, transformers (TRAN1 and TRAN2) must be rewired by moving the black wire with the 1/4-in. female quick connect from the 230-volt connection and moving to the 200-volt 1/4-in. male terminal on the primary side of the transformer.

When installing units, provide disconnect per NEC (National Electrical Code) of adequate size (MOCP [Maximum Overcurrent protection] of unit is on the informative plate). See Tables 7 and 8. All field wiring must comply with NEC and local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 15 for power wiring connection to the unit power terminal block and equipment ground.

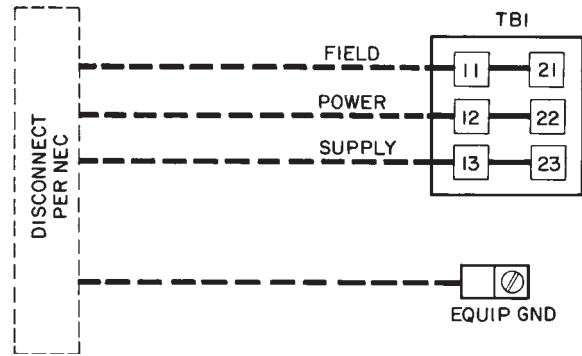
Route power and ground lines through control box end panel or unit basepan (see Fig. 4) to connections as shown on unit wiring diagram and Fig. 15.

## CAUTION

### UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

The correct power phasing is critical to the operation of the scroll compressors. An incorrect phasing will result in compressor shutdown on thermal overload and possible damage to compressor. Should this occur, power phase correction must be made to the incoming power.



### LEGEND

**EQUIP** - Equipment  
**GND** - Ground  
**NEC** - National Electrical Code  
**TB** - Terminal Board

NOTE: The maximum wire size for TB1 is 2/0

C06293

Fig. 15 - Field Power Wiring Connections

## WARNING

### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

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; ANSI (American National Standards Institute)/NFPA (National Fire Protection Association), latest edition, and local electrical codes. *Do not use gas piping as an electrical ground.*

Field wiring must conform to temperature limitations for type "T" wire. All field wiring must comply with NEC and local requirements.

Operating voltage to compressor must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2%.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components.

### Field Control Wiring (Units Without Optional Humidi-MiZer™ Adaptive Dehumidification System)

Unit can be controlled with either a Carrier-approved accessory thermostat or a Carrier-approved space temperature sensor. Install thermostat according to the installation instructions included with accessory. Locate thermostat assembly or space temperature sensor on a solid interior wall in the conditioned space to sense average temperature.

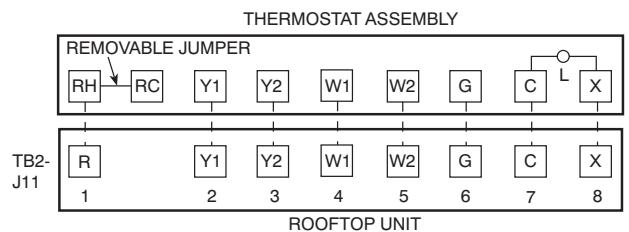
Route thermostat or space temperature sensor cable or equivalent single leads of colored wire from subbase terminals through conduit into unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 16 or 17.

**NOTE:** For wire runs up to 50 ft, use no. 18 AWG (American Wire Gauge) insulated wire (35°C minimum). For 50 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). All wire larger than no. 18 AWG cannot be directly connected at the thermostat and will require a junction box and splice at the thermostat.

Set heat anticipator settings as follows:

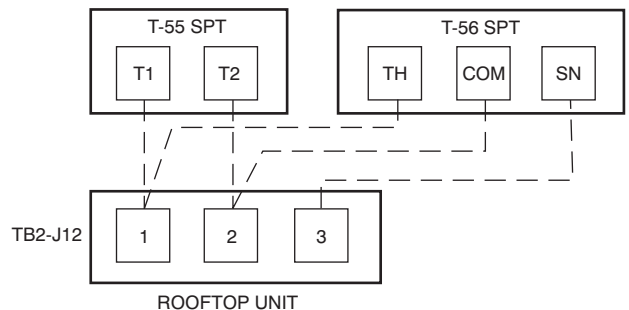
VOLTAGE	STAGE 1 (W1) ON	STAGE 1 AND 2 (W1 AND W2) ON
All	0.15	0.30

Settings may be changed slightly to provide a greater degree of comfort for a particular installation.



C06298

**Fig. 16 - Field Control Thermostat Wiring**



C06294

**Fig. 17 - Field Control Space Temperature Sensor Wiring**

**Field Control Wiring (Units With Optional Humidi-MiZer™ Adaptive Dehumidification System)**

Units require temperature control inputs for cooling and heating operation and humidity control inputs for Humidi-MiZer operation.

**Temperature Control**

The unit can be controlled with either a Carrier-approved space temperature sensor, a Carrier accessory Thermidistat™ device, or a Carrier-approved accessory thermostat. Install the temperature control device according to the installation instructions included with the accessory. Locate the device on a solid interior wall in the conditioned space to sense average temperature. Carrier space temperature sensor wiring connections are shown in Fig. 17. General thermostat field control wiring connections are shown in Fig. 16. Carrier Thermidistat device wiring connections are shown in Fig. 18. Configuration of the unit control is required to specify the control input type before unit operation.

Route thermostat or space temperature sensor cable or equivalent single leads of colored wire from subbase terminals through conduit into unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 16-18.

**NOTE:** For wire runs up to 50 ft, use no. 18 AWG (American Wire Gauge) insulated wire (35°C minimum). For 50 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). All wire larger than no. 18 AWG cannot be directly connected at the thermostat and will require a junction box and splice at the thermostat.

Set heat anticipator settings as follows:

VOLTAGE	STAGE 1 (W1) ON	STAGE 1 AND 2 (W1 AND W2) ON
All	0.15	0.30

Settings may be changed slightly to provide a greater degree of comfort for a particular installation.

**Humidity Control**

Unit can be controlled with either a Carrier accessory Thermidistat device or a Carrier-approved accessory humidistat (switch output). The input for an accessory humidity sensor with 4 to 20 mA output is not available. Install the humidity control device according to the installation instructions included with the accessory. Locate the device on a solid interior wall in the conditioned space to sense average humidity. Carrier Thermidistat device wiring connections are shown in Fig. 18. General humidistat wiring connections are shown in Fig. 19. Configuration of the unit control is required to specify the control input type before unit operation.

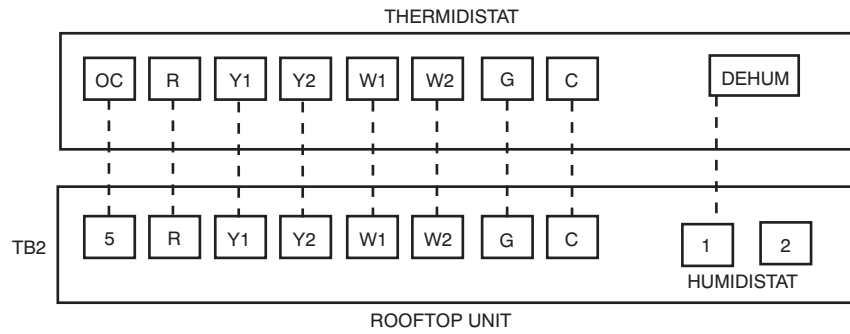
Units with the Humidi-MiZer option receive a discrete input from a field-installed device (such as from the Carrier humidistat or Thermidistat device). The discrete input is connected to the TB2 terminal strip points labeled Humidistat 1 and 2. As this is a discrete input, one of the connection points is for power to the switch and the other is the return path. See Fig. 19.

A space relative humidity sensor input (SPRH) is also available. The sensor can be connected to the OAQ point TB2-4. See Fig. 20. This input is for a different purpose than the Humidistat input and the space relative humidity sensor in no way interacts with the Humidi-MiZer system. The relative humidity value (measured by the relative humidity sensor) can be displayed on the Scrolling Marquee, in the space, through a System Pilot™ device, or can be read by other CCN devices where it can be used to perform more advanced functions. It does not affect the Humidi-MiZer system or its operation.

If the customer also wishes to install a smoke detector into a Humidi-MiZer equipped 48PG unit, the fire shutdown connection points are on Plug PL-19, located in the economizer section. See the unit wiring schematic for wiring.

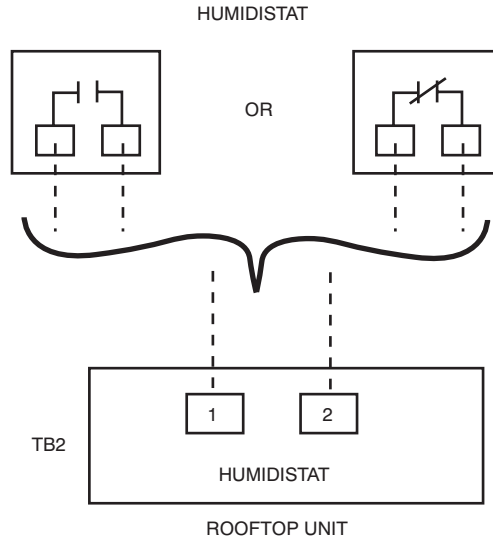
Point 19-3 is the 24 vac power source for the detector. Point 19-4 is 24 vac power for the indoor fan contactor control. Point 19-5 is the 24 vac signal input for the shutdown. If an immediate fan shutdown is desired, install a normally closed contactor between 19-3 and 19-4.

More information is available in the third party control section of the Controls, Start-up, Operation, and Troubleshooting Manual.



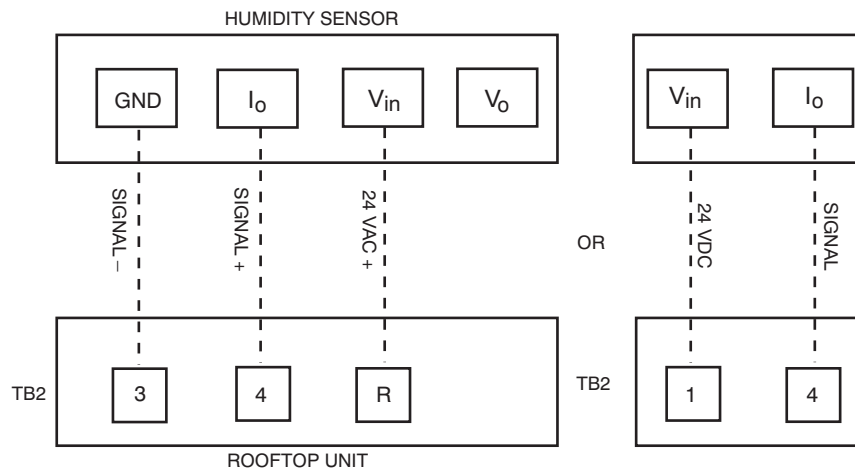
**Fig. 18 - Field Control Thermidistat Wiring**

C06295



**Fig. 19 - Field Control Humidistat Wiring**

C06296



**Fig. 20 - Field Control Humidity Sensor Wiring**

C06297

**Table 7 – Electrical Data (Units Without Optional Powered Convenience Outlet)**

UNIT SIZE 48HG	NOMINAL VOLTAGE 3 PH, 60 Hz	VOLT-AGE RANGE		COMPRESSOR						OFM			IFM		POWER EXHAUST			COMBUS-TION FAN MOTOR	POWER SUPPLY*		POWER SUPPLY UNITS WITH OPTIONAL HACR BREAKER		DISCON-NECT SIZE
				No. 1		No. 2		No. 3															
		MIN	MAX	RLA	LRA	RLA	LRA	RLA	LRA	QTY	HP	FLA (EA)	HP	FLA	QTY	HP	FLA (EA)	FLA	MCA	MOCP	MCA	MOCP	FLA
20	208/230	187	253	28.2	208	28.2	208	—	—	4	0.25	1.5	3.7	10.6/ 9.6	—	—	—	0.5	80/ 79	100/100	80/ 80	100/100	84/ 83
													5	16.7/15.2	2	1	5.9		92/ 91	100/100	92/ 92	100/100	98/ 96
													7.5	24.2/22	2	1	5.9		86/ 85	100/100	86/ 86	100/100	91/ 89
													10	30.8/28	2	1	5.9		98/ 96	100/100	98/ 98	100/100	105/103
	460	414	506	15.4	104	15.4	104	—	—	4	0.25	0.7	3.7	4.8	2	1	3.1	0.3	42	50	42	50	44
													5	7.6	2	1	3.1		48	60	48	60	51
													7.5	11	2	1	3.1		45	60	45	60	47
													10	14	2	1	3.1		51	60	51	60	55
	575	518	633	12.8	83	12.8	83	—	—	4	0.25	0.7	5	6.1	2	1	2.4	0.24	48	60	48	60	51
													7.5	9	2	1	2.4		55	60	55	60	58
													10	11	2	1	2.4		51	60	51	60	55
													—	—	—	—	—		58	60	58	60	62
24	208/230	187	253	32.1	240	32.1	240	—	—	6	0.25	1.5	3.7	10.6/ 9.6	2	1	5.9	0.5	38	50	38	50	40
													5	16.7/15.2	2	1	5.9		43	50	43	50	45
													7.5	24.2/22	2	1	5.9		41	50	41	50	43
													10	30.8/28	2	1	5.9		45	50	45	50	49
	460	414	506	15.4	110	15.4	110	—	—	6	0.25	0.7	3.7	4.8	2	1	3.1	0.3	43	50	43	50	45
													5	7.6	2	1	3.1		47	60	47	60	51
													7.5	11	2	1	3.1		50	60	50	60	53
													10	14	2	1	3.1		56	60	56	60	60
	575	518	633	12.8	88	12.8	88	—	—	6	0.25	0.7	5	6.1	2	1	2.4	0.24	53	60	53	60	56
													7.5	9	2	1	2.4		50	60	50	60	53
													10	11	2	1	2.4		53	60	53	60	56
													—	—	—	—	—		59	60	59	60	63
28	208/230	187	253	28.2	208	28.2	208	28.2	208	6	0.25	1.5	5	16.7/15.2	2	1	5.9	0.5	39	50	39	50	41
													7.5	24.2/22	2	1	5.9		44	50	44	50	47
													10	30.8/28	2	1	5.9		42	50	42	50	45
													—	—	—	—	—		47	50	47	50	50
	460	414	506	15.4	104	15.4	104	15.4	104	6	0.25	0.7	5	7.6	2	1	3.1	0.3	44	50	44	50	47
													7.5	11	2	1	3.1		62	70	62	70	67
													10	14	2	1	3.1		68	80	68	80	74
													—	—	—	—	—		65	80	65	80	71
	575	518	633	12.8	83	12.8	83	12.8	83	6	0.25	0.7	5	6.1	2	1	2.4	0.24	71	80	71	80	78
													7.5	9	2	1	2.4		68	80	68	80	74
													10	11	2	1	2.4		74	80	74	80	81
													—	—	—	—	—		52	60	52	60	56
208/230	187	253	28.2	208	28.2	208	28.2	208	6	0.25	1.5	5	16.7/15.2	2	1	5.9	0.5	55	60	55	60	59	
												7.5	24.2/22	2	1	5.9		60	60	60	60	65	
												10	30.8/28	2	1	5.9		57	60	57	60	62	
												—	—	—	—	—		62	70	62	70	67	

See Legend and Notes after Table 8.

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**Table 8 – Electrical Data (Units With Optional Powered Convenience Outlet)**

UNIT SIZE 48HG	NOMINAL VOLTAGE 3 Ph, 60 Hz	VOLT-AGE RANGE		COMPRESSOR						OFM			IFM		POWER EXHAUST			COMBUS-TION FAN MOTOR	POWER SUPPLY*		POWER SUPPLY UNITS WITH OPTIONAL HACR BREAKER		DISCON-NECT SIZE
				No. 1		No. 2		No. 3													MCA	MOCP	
		MIN	MAX	RLA	LRA	RLA	LRA	RLA	LRA	QTY	HP	FLA (EA)	HP	FLA	QTY	HP	FLA (EA)	FLA	MCA	MOCP	MCA	MOCP	FLA
20	208/230	187	253	28.2	208	28.2	208	—	—	4	0.25	1.5	3.7	10.6/ 9.6	—	—	—	0.5	85/ 84	100/100	85/ 85	100/100	90/ 89
													5	16.7/15.2	2	1	5.9		97/ 96	100/100	97/ 97	100/100	103/102
													7.5	24.2/22	2	1	5.9		91/ 90	100/100	91/ 91	100/100	97/ 95
													10	30.8/28	2	1	5.9		103/101	125/125	103/103	125/125	110/109
	460	414	506	15.4	104	15.4	104	—	—	4	0.25	0.7	3.7	4.8	—	—	—	0.3	45	60	45	60	48
													5	7.6	2	1	3.1		51	60	51	60	55
													7.5	11	2	1	3.1		48	60	48	60	51
													10	14	2	1	3.1		54	60	54	60	58
	575	518	633	12.8	83	12.8	83	—	—	4	0.25	0.7	5	6.1	—	—	—	0.24	41	50	41	50	43
													7.5	9	2	1	2.4		46	50	46	50	49
													10	11	2	1	2.4		44	50	44	50	46
																			48	60	48	60	52
24	208/230	187	253	32.1	240	32.1	240	—	—	6	0.25	1.5	3.7	10.6/ 9.6	—	—	—	0.5	97/ 96	100/100	97/ 97	100/100	102/101
													5	16.7/15.2	2	1	5.9		109/108	125/125	109/109	125/125	116/115
													7.5	24.2/22	2	1	5.9		103/101	125/125	103/103	125/125	109/107
													10	30.8/28	2	1	5.9		115/113	125/125	115/115	125/125	123/121
	460	414	506	15.4	110	15.4	110	—	—	6	0.25	0.7	3.7	4.8	2	1	3.1	0.3	110/108	125/125	110/110	125/125	118/115
													5	7.6	2	1	3.1		122/120	150/150	122/122	150/150	131/129
													7.5	11	2	1	3.1		117/114	125/125	117/117	125/125	125/122
													10	14	2	1	3.1		129/126	150/150	129/129	150/150	139/136
	575	518	633	12.8	88	12.8	88	—	—	6	0.25	0.7	5	6.1	2	1	2.4	0.24	47	60	47	60	49
													7.5	9	2	1	2.4		53	60	53	60	56
													10	11	2	1	2.4		49	60	49	60	52
																			56	60	56	60	60
28	208/230	187	253	28.2	208	28.2	208	28.2	208	6	0.25	1.5	5	16.7/15.2	—	—	—	0.5	45	60	45	60	48
													7.5	24.2/22	2	1	5.9		50	60	50	60	54
													10	30.8/28	2	1	5.9		47	50	47	50	50
																			52	60	52	60	56
	460	414	506	15.4	104	15.4	104	15.4	104	6	0.25	0.7	5	7.6	2	1	3.1	0.3	122/121	150/125	122/122	150/150	133/131
													7.5	11	2	1	3.1		134/133	150/150	134/134	150/150	146/144
													10	14	2	1	3.1		130/128	150/150	130/130	150/150	141/139
																			142/139	150/150	142/142	150/150	155/152
	575	518	633	12.8	83	12.8	83	12.8	83	6	0.25	0.7	5	6.1	2	1	2.4	0.24	137/134	150/150	137/137	150/150	149/146
													7.5	9	2	1	2.4		149/145	175/150	149/149	175/175	162/159
													10	11	2	1	2.4		65	80	65	80	70
																			71	80	71	80	77

**LEGEND**

- 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-Fan Motor
- RLA** – Rated Load Amps



Example: Supply voltage is 460–3–60



AB = 452 v  
 BC = 464 v  
 AC = 455 v  
 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 of voltage imbalance.

% 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.

- 3. The convenience outlet full load amps (FLA) are 5., 3, and 3 for 208/230, 460, 575–V units, respectively.

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

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## Step 11 — Install Outdoor Air Hood

Perform the following procedure to install the outdoor-air hood on units equipped with an economizer, two-position damper, or manual outdoor air damper:

1. Remove blank panel from return end of unit (hood section). Save the screws. See Fig. 21 for shipping location of components.
2. Hood sides are fastened to sides of outdoor air opening. Remove the hood sides and save the screws (3 each side).
3. Remove the bracket holding the bottom half of the hood in the shipping position. Remove the hood bottom half and filters (or manual dampers on units so equipped) from outdoor section.

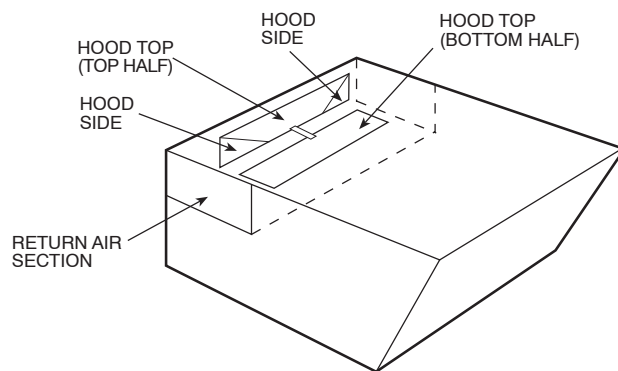
**NOTE:** On units without economizers, the components are attached to the unit basepan. To access the components, remove the panel below the outdoor air intake section.

4. Remove inner filter track from shipping position in outdoor section. Position inner filter track so the track is facing outward from the unit. Install the filter track with 4 screws provided.
5. Apply seal strip (provided) to back flange of both hood sides where hood side connects to the unit back panel. See Fig. 22.
6. Apply seal strip (provided) to top flange of both hood sides where hood sides connect to the hood top panels. See Fig. 22.
7. Install hood sides to the back panels using the screws from item 2. The sloped flanges point outward. The drip edges of the side panels should face outward as well. The filter guides to the hood sides. The flanges of the filter guides should face inward to hold the filters in place. See Fig. 22.
8. Apply seal strip along the entire length of the bottom flange of the hood top. See Fig. 22.
9. Install the bottom part of the hood top using 4 screws provided. See Fig. 22.
10. Remove the packaging from filters (3) and install into the filter tracks. Slide the filters to the sides then place the last filter into the center of the filter track.

**NOTE:** For units with manual dampers, replace the end filters with the manual dampers. Install the filter in the center between the manual dampers.

11. Install the filter retainer track along the bottom edge of the outdoor air hood using 4 screws provided. See Fig. 22.
12. Install top section of the outdoor air hood using 9 screws provided. See Fig. 22. See Fig. 23 for a picture of the assembled outdoor air hood.

**NOTE:** For filter removal, remove the four screws holding the filter retainer. The filters can then be removed, cleaned, or replaced. Install the filters by reversing the procedure.



C06283

**Fig. 21 - Power Exhaust or Barometric Relief Damper Mounting Details**

### Manual Damper Assembly

For units equipped with manual dampers, the assembly process is similar to the outdoor air hood for units with economizers. There are two slide dampers shipped with the unit to allow for manual setting of the outside air volume. When assembling the hood, place one of the manual slide dampers in each of the end positions and the remaining filter in the center position. The manual dampers can then be moved to the appropriate position and then locked into place using the screws mounted in the adjustment slots. See Fig. 24.

### **Step 12 — Position Optional Power Exhaust or Barometric Relief Damper Hood**

The optional power exhaust or barometric relief dampers are shipped assembled and tilted back into the unit for shipping. Brackets and extra screws are shipped in shrink wrap around the dampers.

1. Remove 9 screws holding each damper assembly in place. See Fig. 25. Each damper assembly is secured with 3 screws on each side and 3 screws along the bottom. Save screws.

## **CAUTION**

### **PERSONAL INJURY HAZARD**

Failure to follow this caution may result in personal injury. Be careful when tilting blower assembly. Hoods and blowers are heavy and can cause injury if dropped.

2. Pivot the damper assembly outward until top edge of the damper assembly rests against the inside wall of unit.
3. Secure each damper assembly to unit with 6 screws across top (3 screws provided) and bottom (3 screws from item 1) of damper.
4. With screws saved from item 1, install brackets on each side of damper assembly. See Fig. 26.
5. Remove tape from damper blades.

### **Step 13 — Non-Fused Disconnect**

The handle for the factory-installed non-fused disconnect is shipped inside the unit to prevent the handle from damage during shipping. Follow these steps to complete installation of the handle.

# ⚠ WARNING

## ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Be sure power is shut-off to the unit from the building power supply.

1. Open the control box access door.
2. Remove the small cover plate located on the unit corner post near the control section.
3. Remove the inner control box cover. The handle and shaft are located in a plastic bag at the bottom of the control box.
4. Insert the square shaft into the disconnect with the pins vertical. On the 100-amp disconnect, the shaft is keyed into the disconnect and can only be installed one way (with the pins vertical).

5. Insert the handle through the corner post and onto the shaft with the handle positioned so that "OFF" is on top.
6. Rotate the handle to the "ON" position to lock the pins into the handle.
7. From the inside of the corner post, attach the handle mounting screws to the handle. Slide the shaft fully into the handle and tighten the set screw(s) on the disconnect to lock the shaft. Tighten the screws that attach the handle to the corner post.
8. Rotate the handle back to the "OFF" position.
9. Replace all panels and doors. Power can now be turned back on to the unit.

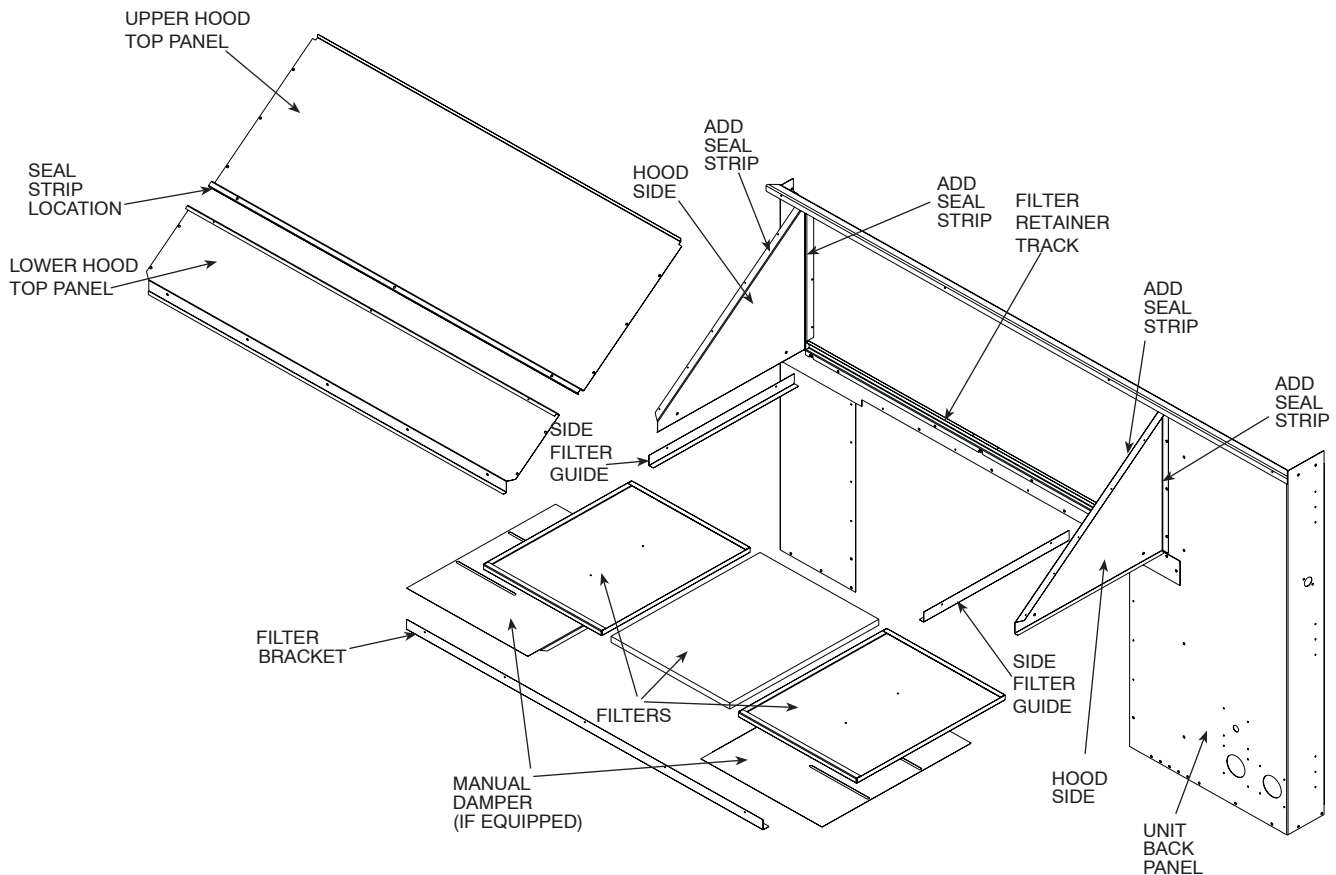
### Step 14 — Install All Accessories

After all of the factory-installed options have been adjusted, install all field-installed accessories. Refer to the accessory installation instructions included with each accessory.

### Step 15 — Configure Controls

Refer to unit Controls and Troubleshooting book for information on configuring controls.

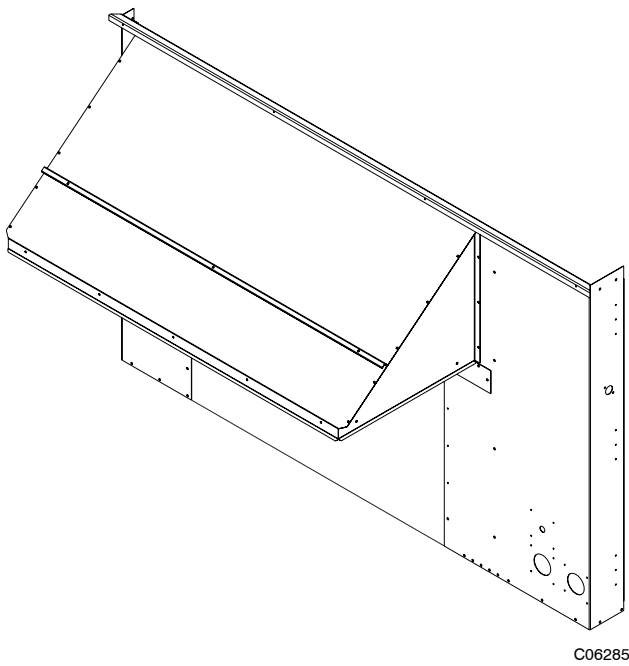
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NOTE: Units with manual damper only use one filter.

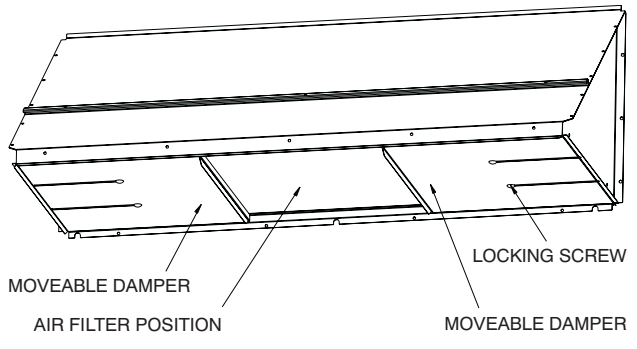
Fig. 22 - Bracket and Hood Positioning

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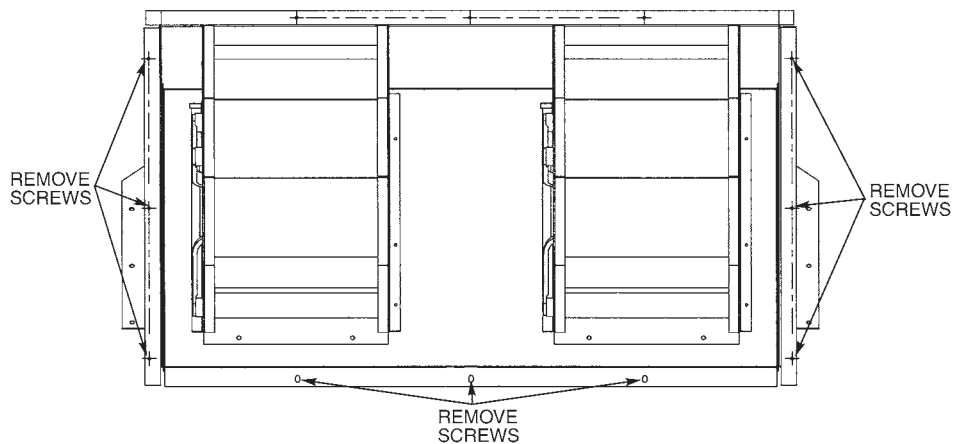
**Fig. 23 - Outdoor-Air Hood Assembled**



C06286

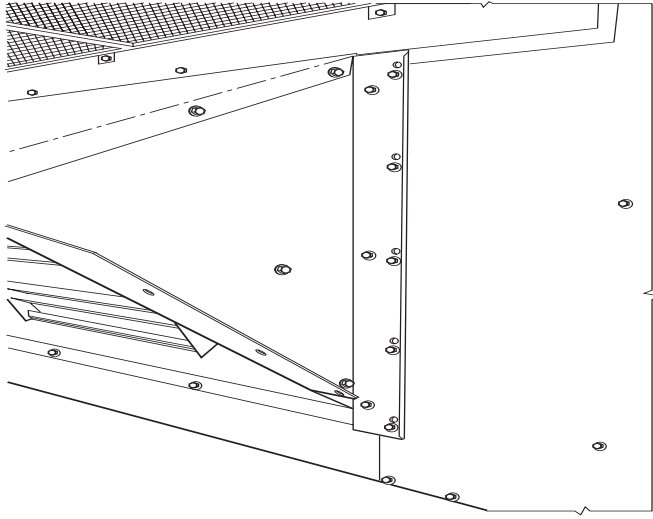
**Fig. 24 - Manual Damper Details**

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**Fig. 25 - Power Exhaust or Barometric Relief Damper Mounting Details**



C06288

**Fig. 26 - Bracket and Hood Positioning**

