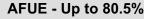






# **Up-Flow/Horizontal**

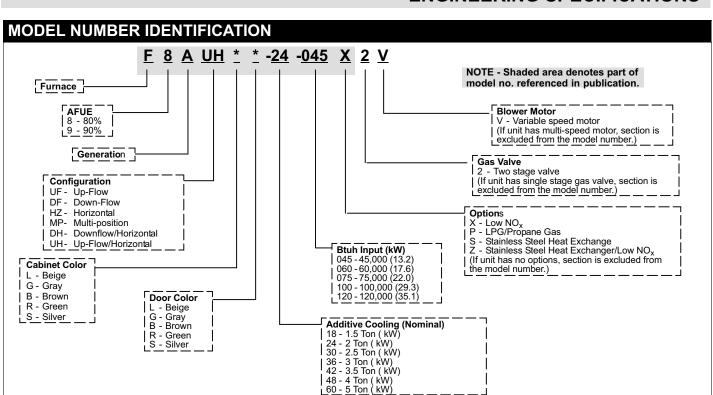


Heating Input - 45,000 to 120,000 Btuh (13.2 to 35.2 kW) Add-On Cooling - 1 thru 5 Tons (3.5 to 17.6 kW)

May 1999

No. 210258

## ENGINEERING SPECIFICATIONS



### **FEATURES**

#### Applications

- Gas fired furnaces include ten models (natural gas or LPG/propane) with input capacities of 45,000, 60,000, 75,000, 100,000 and 120,000 Btuh (13.2, 17.6, 22.0, 29.3 and 32.2 kW)
- AFUE up to 80.5%
- Up-flow or horizontal applications.
- Add-on evaporator coils, electronic air cleaners and power humidifiers can be easily added to the furnace.
- Units are shipped factory assembled with all controls installed and wired.
- Each unit is factory test operated to insure proper operation.

### **Tubular Aluminized Steel Heat Exchanger**

- Constructed of aluminized steel for superior resistance to corrosion and oxidation.
- Curving design allows complete exposure of heating surfaces to supply air stream.
- Round surfaces create minimum air resistance and allow air to surround all surfaces for excellent heat transfer.
- Compact design reduces space requirements in unit cabinet.
- Heat exchanger has been laboratory life cycle tested.

### Approvals

- Units are certified by AGA/CGA Laboratories
- Ratings are certified by GAMA.
- Units have been rated and tested according to US DOE test procedures and FTC labeling regulations.
- "X" models meet California Nitrogen Oxides ( $NO_x$ ) Standards and California Seasonal Efficiency requirements.
- Units are approved for conventional or horizontal (sidewall) venting.

  NOTE Horizontal venting requires sidewall power venting kit, see Optional Accessories.

### **Equipment Warranty**

- Heat exchanger limited warranty for ten years.
- All other covered components limited warranty for one year.
- Refer to the Limited Warranty certificate included with the equipment for details.

#### **Induced Draft Blower**

- Induced draft blower prepurges heat exchanger and safely vents flue products.
- Blower is controlled by the furnace control center board for a prepurge cycle (15 seconds) and a post purge cycle (5 seconds).
- Pressure switch proves blower operation before allowing gas valve to open.
- Induced draft blower operates only during heating cycle.

#### **Inshot Burners**

- Aluminized steel inshot burners provide efficient trouble free operation.
- Burner venturi mixes air and gas in correct proportion for proper combustion.
- Burner assembly is removeable from the unit as a single component for ease of service and each burner may be removed individually.

#### **Gas Control Valve**

- 24 volt redundant combination gas control valve combines a manual main shutoff valve, pressure regulation and automatic electric valve (dual) into one compact combination control.

### **Hot Surface Ignition**

- Solid-state electronic hot surface ignition control provides positive, safe main burner ignition and guiet operation.

#### Cabinet

- Constructed of pre-painted steel.
- Foil faced fiberglass insulation on side and back panels of heat section reduce cabinet temperatures.
- Complete service access is accomplished by removing panels
- Blower assembly may be removed from unit for service.
- Safety interlock switch located on blower access door automatically shuts off power to the unit when door is removed.
- Gas piping inlets are provided in both sides and top of cabinet.
- Electrical knockouts are provided in both sides, top and bottom of cabinet.
- Units have flanges on top and bottom of cabinet that may be bent out for duct connection to unit. See dimension drawing.
- Painted panel is furnished to block off bottom return air. Return air entry is possible on either side or bottom of cabinet for up-flow applications. End return air entry is available for horizontal applications.

#### Flame Rollout Switches

- Dual manual reset switches are furnished as standard and are factory installed on either side of the burner box.
- Switches prevent unit operation in the event combustion products passage through the flueway is reduced or blocked.

#### **Limit Controls**

- Factory installed and accurately located limit controls provide protection from abnormal operating conditions. Primary limit is located on heating compartment vestibule panel.
- Two secondary limits are located on either side of the blower housing.

#### **Furnace Control Center Board**

- Furnished and factory installed.
- Solid-state board contains all necessary controls and relays to operate blower, gas valve, combustion air blower and ignition.
- Board also monitors flame, limit and gas valve operation.
- Electronic flame sensor control assures safe and reliable operation.
- Should loss of flame occur, flame sensor controls will initiate up to 4 re-ignition trials before locking out unit operation for 60 minutes.
- Watchguard circuit automatically resets ignition controls after one hour of continuous thermostat demand after unit lockout, eliminating nuisance calls for service.
- Fan control consists of blower timed-off delay (adjustable from 60 to 180 seconds. Factory setting is 90 seconds.) and non-adjustable blower timed-on delay (45 seconds).
- For air-conditioning applications, blower is automatically energized on thermostat demand for cooling.
- Continuous heating speed blower operation is furnished on board.
- Also included is a low voltage terminal strip for thermostat connections.
- Diagnostic LED is furnished on board as an aid in servicing the system.
- Three 120 volt accessory terminals are provided on control board for operation of accessories during unit operation.

#### **Transformer**

- 24 volt control transformer is furnished as standard equipment and is factory installed on control panel.

### **Direct Drive Blower**

- Units are equipped with quiet multi-speed direct drive blower.
- Each blower assembly is statically and dynamically balanced.
- Blower motor is resiliently mounted.
- Choice of blower speeds is available.
- See blower performance tables.

### Filter (Not Furnished)

- Filters are not furnished and must be ordered extra.
- External filter kits are available for up-flow or horizontal applications.
- See Optional Accessories and Specifications table.

### **OPTIONAL ACCESSORIES**

### Hanging Bracket Kit (46J66)

- Available for easy suspension of unit in horizontal applications.
- Includes four vertical supports for mounting to joists and two horizontal channels.

### LPG/Propane Conversion Kit

- For LPG/propane models a conversion kit is required for field changeover from natural gas.
- Kit is not furnished and must be ordered extra. See specifications table for order number.

#### Sidewall Power Venting Kit (79J15)

- Required for horizontal venting. Kit includes ETL listed power venter and control kit.
- Control kit includes junction box with pressure switch, aluminum tubing, tubing, conduit connectors and barometric draft control. See venting table for requirements.
- Flue piping must be field provided.

#### **Thermostat**

- Heating thermostat is not furnished and must be ordered extra.
- For all-season applications, heating and cooling thermostat is available with the condensing unit.

### Twinning Kit (15L38)

- Field installed kit is available to operate two furnaces simultaneously.
- Kit consists of twinning control and two fan sensors.

### Up-flow/Horizontal Filter Kit

- Filter kits are furnished with units for field installation in up-flow or horizontal applications.
- Includes adjustable filter rack with access door, filter removal tool for bottom return air applications and filter. Available in single and ten packs. See Specifications table for filter sizes and catalog numbers.

SPECIFICATIONS						
Model No.		F8AUH**-24-045 F8AUH**-24-045X	F8AUH**-24-060	F8AUH**-36-060 F8AUH**-36-060X	F8AUH**-24-075	F8AUH**-36-075 F8AUH**-36-075X
Input Btuh (kW)		45,000 (13.2)	60,000 (17.6)	60,000 (17.6)	75,000 (22.0)	75,000 (22.0)
Output Btuh (kW)		39,600 (10.8)	49,200 (14.4)	49,200 (14.4)	61,700 (18.1)	61,700 (18.1)
<b>TAFUE</b>		80.1%	80.5%	80.5%	80.1%	80.0%
California Seasonal Efficiency		75.4%	76.4%	75.9%	76.8%	76.8%
Flue size connection dia in. (mm)	round	3 (76)	3 (76)	3 (76)	4 (102)	4 (102)
Temperature rise range - °F (°C)	30 - 60 (17 - 33)	45 - 75 (25 - 42)	45 - 75 (25 - 42)	45 - 75 (25 - 42)	45 - 75 (25 - 42)	
High static AGA/CGA cert in wg.	(Pa)	.50 (125)	.50 (125)	.50 (125)	.50 (125)	.50 (125)
Gas Piping Size IPS Nat. or LPG/pro	pane	1/2 (13)	1/2 (13)	1/2 (13)	1/2 (13) 1/2 (13)	
Blower wheel nominal	in.	9 x 7	9 x 7	10 x 7	9 x 7	10 x 7
diameter x width	mm	229 x 178	229 x 178	254 x 178	229 x 178	254 x 178
Blower motor output - hp (W)		1/4 (187)	1/4 (187)	1/3 (224)	1/4 (187)	1/3 (224)
Nominal cooling	Tons	1, 1.5 or 2	1, 1.5 or 2	2, 2.5 or 3	1, 1.5 or 2	2, 2.5 or 3
that can be added	kW	3.5, 5.3 or 7.0	3.5, 5.3 or 7.0	7.0, 8.8 or 10.6	3.5, 5.3 or 7.0	7.0, 8.8 or 10.6
Shipping weight - lbs. (kg) 1 packag	ge	130 (59)	130 (59)	135 (61)	135 (61)	135 (61)

Electrical characteristics

120 volts - 60 hertz - 1 phase (less than 12 amps) All models

OPTIONAL ACCESSORIES - Must Be Ordered Extra										
Hanging Bracket Kit	46J66	46J66	46J66	46J66	46J66					
②High Altitude Pressure Switch Kits	No Change	No Change	No Change	88J80	88J80					
LPG/propane kit	38K84	38K84	38K84	38K84	38K84					
③Sidewall Power Venting Kit	79J15	79J15	79J15	79J15	79J15					
Twinning Kit	15L38	15L38	15L38	15L38	15L38					
Up-Flow/Horizontal Filter and Filter Rack Kits  4 No. & size of filters - in. (mm)	32J02 (single) 66K64 (ten) (1) 16 x 20 x 1 (406 x 508 x 25)	32J02 (single) 66K64 (ten) (1) 16 x 20 x 1 (406 x 508 x 25)	32J02 (single) 66K64 (ten) (1) 16 x 20 x 1 (406 x 508 x 25)	32J02 (single) 66K64 (ten) (1) 16 x 20 x 1 (406 x 508 x 25)	32J02 (single) 66K64 (ten) (1) 16 x 20 x 1 (406 x 508 x 25)					

<sup>\*</sup>Variable Field.

Talking Fred Utilization Efficiency based on US DOE test procedures and according to FTC labeling regulations. Isolated combustion system rating for non-weatherized furnaces.

For proper operation at altitudes over 4500 ft. (1370 m).

Required for horizontal venting applications.

Polyurethane frame type filter is furnished with kit.

SPECIFICATIONS						4
Model No.		F8AUH**-48-075 F8AUH**-48-075X	F8AUH**-48-100 F8AUH**-48-100X	F8AUH**-60-100 F8AUH**-60-100X	F8AUH**-48-120	F8AUH**-60-120 F8AUH**-60-120X
Input Btuh (kW)		75,000 (22.0)	100,000 (29.3)	100,000 (29.3)	120,000 (35.2)	120,000 (35.2)
Output Btuh (kW)		61,700 (18.1)	82,000 (24.0)	82,000 (24.0)	98,400 (28.8)	98,400 (28.8)
1AFUE		80.0%	80.1%	80.0%	80.0%	80.1%
California Seasonal Efficiency		76.3%	76.5%	77.0%	Not available	75.5%
Flue size connection dia in. (mm	4 (102)	4 (102)	4 (102)	4 (102)	4 (102)	
Temperature rise range - °F (°C)	45 - 75 (25 - 42)	45 - 75 (25 - 42)	35 - 65 (19 - 36)	45 - 75 (25 - 42)	45 - 75 (25 - 42)	
High static AGA/CGA cert in wg.	(Pa)	.50 (125)	.50 (125)	.65 (162)	.50 (125)	.50 (125)
Gas Piping Size IPS Nat. or LPG/pro	pane	1/2 (13)	1/2 (13)	1/2 (13)	1/2 (13)	1/2 (13)
Blower wheel nominal	in.	11 x 8	12 x 8	12 x 9	10 x 10	12 x 9
diameter x width	mm	279 x 203	305 x 203	305 x 229	254 x 254	305 x 229
Blower motor output - hp (W)		1/2 (373)	1/2 (373)	3/4 (560)	1/2 (373)	3/4 (560)
Nominal cooling Tor		2 thru 4	2 thru 4	3.5 thru 6	2 thru 4	3.5 thru 6
that can be added	kW	7.0 thru 14.1	7.0 thru 14.1	12.3 thru 21.1	7.0 thru 14.1	12.3 thru 21.1
Shipping weight - lbs. (kg) 1 package		140 (64)	175 (79)	175 (79)	175 (79)	175 (79)

Electrical characteristics

120 volts - 60 hertz - 1 phase (less than 12 amps) All models

OPTIONAL ACCESSORIES - Must Be Ordered Extra										
Hanging Bracket Kit	46J66	46J66	46J66	46J66	46J66					
②High Altitude Pressure Switch Kits	88J80	18L24	18L24	18L24	18L24					
LPG/propane kit	38K84	81J14	81J14	81J14	81J14					
③Sidewall Power Venting Kit	79J15	79J15	79J15	79J15	79J15					
Twinning Kit	15L38	15L38	15L38	15L38	15L38					
Up-Flow/Horizontal Filter and Filter Rack Kits 4 No. & size of filters - in. (mm)	32J02 (single) 66K64 (ten) (1) 16 x 20 x 1 (406 x 508 x 25)	46J14 (single) 66K65 (ten) (1) 20 x 20 x 1 (508 x 508 x 25)	46J14 (single) 66K65 (ten) (1) 20 x 20 x 1 (508 x 508 x 25)	46J14 (single) 66K65 (ten) (1) 20 x 20 x 1 (508 x 508 x 25)	46J14 (single) 66K65 (ten) (1) 20 x 20 x 1 (508 x 508 x 25)					

\*Variable Field.

☐Annual Fuel Utilization Efficiency based on US DOE test procedures and according to FTC labeling regulations. Isolated combustion system rating for non-weatherized furnaces

②For proper operation at altitudes over 4500 ft. (1370 m). ③Required for horizontal venting applications. ④Polyurethane frame type filter is furnished with kit.

### **INSTALLATION CLEARANCES**

# **UP-FLOW POSITION**

Vent Type	Type "B"	Type "C"		
Sides	0 inches (0 mm)	0 inches (0 mm)		
Rear	0 inches (0 mm)	0 inches (0 mm)		
Тор	1 inch (25 mm)	1 inch (25 mm)		
Front	2 inches (51 mm)	2 inches (25 mm)		
Front (service)	24 inches (610 mm)	24 inches (610 mm)		
Floor	Combustible	Combustible		
Flue	1 inch (25 mm)	6 inch (152 mm)		

NOTE-Air for combustion and supply air ventilation must conform to the methods outlined in American National Standard (ANSI-Z223.1) National Fuel Gas Code or National Standard of Canada CAN /CGA-149.1, & CAN/CGA-149.2 "Installation Code for Gas Burning Appliances".

NOTE-In the U.S. flue sizing must conform to the methods outlined in current GAMA/A.G.A. venting tables, American National Standard (ANSI-Z223.1) National Fuel Gas Code or applicable provisions of local building codes. In Canada flue sizing must conform to the methods outlined in National Standard of Canada CAN/CGA-149.1 and .2.

### HORIZONTAL POSITION

Vent Type	Type "B"	Type "C"			
1]Sides	12 inches (51 mm)	12 inches (51 mm)			
Rear	0 inches (0 mm)	0 inches (0 mm)			
<b>1</b> Тор	10 inches (0 mm)	10 inches (0 mm)			
Front	2 inches (25 mm)	2 inches (25 mm)			
Front (service)	24 inches (610 mm)	24 inches (610 mm)			
Floor	0 inches (0 mm)	0 inches (0 mm)			
Flue	1 inch (25 mm)	6 inch (152 mm)			

NOTE-Air for combustion and supply air ventilation must conform to the methods outlined in American National Standard (ANSI-Z223.1) National Fuel Gas Code or National Standard of Canada CAN/

& CAN/CGA-149.2 "Installation Code for Gas Burning Appliances". NOTE-In the U.S. flue sizing must conform to the methods outlined in current GAMA/A.G.A. venting tables, American National Standard (ANSI-Z223.1) National Fuel Gas Code or applicable provisions of local building codes. In Canada flue sizing must conform to the methods outlined in National Standard of Canada CAN/CGA-149.1 and .2.

Line contact installation permissible between jacket top or sides and building joists.

F8AUH\*\*-24-045, F8AUH\*\*-24-060 AND F8AUH\*\*-24-75 BLOWER PERFORMANCE

External Static Pressure			Air Volume at Various Blower Speeds										
		High		Mediur	n-High	Medium-Low		Low					
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s				
0	0	1270	600	980	460	770	365	570	270				
.05	12	1245	590	975	460	770	365	565	265				
.10	25	1220	575	975	460	770	365	565	265				
.15	37	1195	565	965	455	765	360	560	265				
.20	50	1170	550	960	455	760	360	560	265				
.25	62	1140	540	950	450	760	360	555	260				
.30	75	1110	525	940	445	760	360	550	260				
.40	100	1060	500	910	430	750	355	545	255				
.50	125	990	465	880	415	740	350	540	255				
.60	150	900	425	810	380	690	325	530	250				
.70	175	800	380	740	350	630	295	520	245				

NOTE - All air data is measured external to unit with 1 in. (25 mm) cleanable filter (not furnished) in place. Also see Filter Air Resistance table

### F8AUH\*\*-36-060 AND F8AUH\*\*-36-075 BLOWER PERFORMANCE

Externa	External Static Pressure			Air Vol	ume at Vari	ous Blower S	Speeds		
Pres			High		m-High	Mediu	m-Low	ow .	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1425	670	1240	585	1000	470	800	380
.05	12	1415	670	1230	580	995	470	800	380
.10	25	1400	660	1220	575	990	465	795	375
.15	37	1385	655	1200	565	985	465	795	375
.20	50	1370	645	1180	555	980	460	790	375
.25	62	1350	635	1160	545	970	460	780	370
.30	75	1330	630	1140	540	955	450	770	365
.40	100	1280	605	1095	515	925	435	750	355
.50	125	1210	570	1040	490	900	425	720	340
.60	150	1135	535	985	465	860	405	680	320
.70	175	1070	505	920	435	800	380	630	300

NOTE - All air data is measured external to unit with 1 in. (25 mm) cleanable filter (not furnished) in place. Also see Filter Air Resistance table

### F8AUH\*\*-48-075, F8AUH\*\*-48-100 AND F8AUH\*\*-48-120 BLOWER PERFORMANCE

External Static					Air Volun	ne at Vario	us Blowe	r Speeds			
Pres	Pressure		High M		m-High	Med	lium	ım Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1830	865	1600	755	1325	625	1070	505	880	415
.05	12	1815	855	1585	750	1320	625	1070	505	880	415
.10	25	1800	850	1570	740	1315	620	1070	505	880	415
.15	37	1875	885	1550	730	1310	620	1065	505	875	415
.20	50	1750	825	1530	720	1300	615	1060	500	875	415
.25	62	1725	815	1515	715	1290	610	1050	495	870	410
.30	75	1700	800	1500	710	1275	600	1040	490	870	410
.40	100	1650	780	1460	690	1245	590	1020	480	860	405
.50	125	1600	755	1420	670	1210	570	1000	470	840	395
.60	150	1550	730	1380	650	1170	550	980	460	820	385
.70	175	1480	700	1330	630	1130	535	960	455	790	375

NOTE - All air data is measured external to unit with 1 in. (25 mm) cleanable filter (not furnished) in place. Also see Filter Air Resistance table

**BLOWER DATA** 

### F8AUH\*\*-60-100 AND F8AUH\*\*-60-120 BLOWER PERFORMANCE

External Static					Air Volun	ne at Vario	us Blowe	r Speeds			
Pres	Pressure		High		m-High	Med	lium	Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2450	1155	2160	1020	1970	930	1700	800	1500	710
.05	12	2440	1150	2155	1015	1965	925	1695	800	1500	710
.10	25	2430	1145	2150	1015	1960	925	1690	800	1495	705
.15	37	2415	1140	2135	1010	1950	920	1685	795	1495	705
.20	50	2400	1135	2120	1000	1940	915	1680	795	1490	705
.25	62	2380	1125	2105	995	1930	910	1675	790	1480	700
.30	75	2360	1115	2090	985	1915	905	1670	790	1470	695
.40	100	2310	1090	2050	965	1870	880	1650	780	1440	680
.50	125	2260	1065	2000	945	1810	855	1610	760	1410	665
.60	150	2180	1030	1950	920	1750	825	1560	735	1370	645
.70	175	2100	990	1890	890	1700	800	1520	715	1330	630

NOTE - All air data is measured external to unit with 1 in. (25 mm) cleanable filter (not furnished) in place. Also see Filter Air Resistance table

Air V	olume	Total Static				
cfm	L/s	in. w.g.	Pa			
0	0	0	0			
200	95	0.01	2			
400	185	0.03	7			
600	280	0.04	10			
800	375	0.06	15			
1000	470	0.09	22			
1200	560	0.12	30			
1400	655	0.15	37			
1600	750	0.19	47			
1800	845	0.23	57			
2000	935	0.27	67			
2200	1030	0.33	82			
2400	1125	0.38	95			
2600	1220	0.44	110			

### HORIZONTAL VENTING REQUIREMENTS (Requires Optional Side Wall Power Venting Kit)

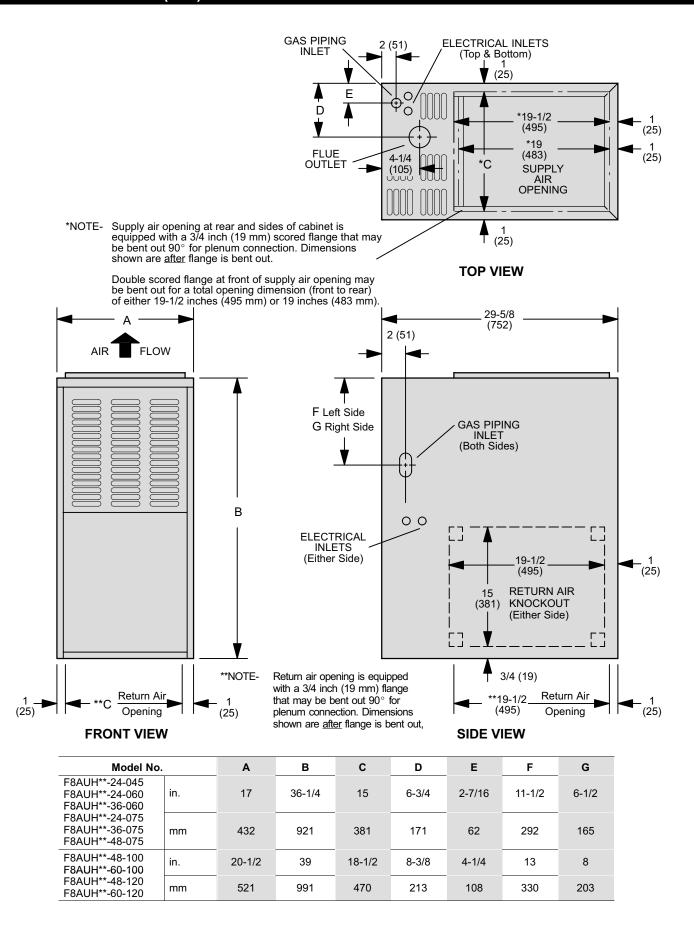
Furnace Model No.	Vent Pipe Diameter Furnace Connection		Vent Pipe Minimum Equivalent Length		Vent pipe Maximum Equivalent Length		Horizontal Venting Transition Required	
	in.	mm	feet	meters	feet	meters	in.	mm
F8AUH**-24-045 F8AUH**-24-060 F8AUH**-36-060	3	76	10	3.0	60	18.0	13 to 4	1176 to 102
F8AUH**-24-075 F8AUH**-36-075 F8AUH**-48-075 F8AUH**-48-100 F8AUH**-60-100 F8AUH**-48-120 F8AUH**-60-120	4	102	10	3.0	60	18.0		

VENTING NOTES - Elbows 
One 3 inch (76 mm) diameter 45° elbow is equivalent to 3 feet (1.0 m) of straight vent pipe.
One 4 inch (102 mm) 90° elbow is equivalent to 5 feet (1.5 m) of straight vent pipe.
One 4 inch (102 mm) 90° elbow is equivalent to 7 feet (2.1 m) of straight vent pipe.
One 4 inch (102 mm) 90° elbow is equivalent to 7 feet (2.1 m) of straight vent pipe.
Tees One 3 inch (76 mm) diameter tee is equivalent to 19 feet (5.8 m).of straight vent pipe.
One 4 inch (102 mm) diameter tee is equivalent to 25 feet (7.6 m).of straight vent pipe.

Transition 
3 inch to 4 inch (76 mm to 102 mm) transition is equivalent to 2 feet (0.61 m) of straight vent pipe.

Transition furnished with power venter should be installed on top of flue adaptor at induced draft blower.

NOTE - All horizontal venting applications require optional Sidewall Power Venting Kit.



### HIGH ALTITUDE DERATE

Unit does not require gas pressure adjustment when operating at elevations of 0 to 4500 feet (0 to 1372 m). See table for correct manifold pressures for natural and LPG/Propane gases at altitudes greater than 4,500 ft. (1372 m)

In Canada, certification for installation at altitudes over 4500 feet (1372 m) above sea level is the jurisdiction of local authorities.

NOTE - Combustion air pressure switches are factory set. No adjustment is necessary. All models operate satisfactorily in the high fire mode at altitudes up to 4500 ft. (1370 m). At altitudes over 4500 ft. (1370 m), High Altitude Pressure Switch Kits are required for proper operation. See Specifications table for correct kit usage.

### **MANIFOLD GAS PRESSURE**

Altitude ft. (m)	Fuel	Manifold Pressure (Outlet) in. w.g. (kPa)			
0-4500	Natural Gas	3.5 (0.87)			
(0-2285)	LPG/Propane	9.5 (2.37)			
4501 - 5500	Natural Gas	3.4 (0.85)			
(2286 -1676)	LPG/Propane	9.2 (2.29)			
5501-6500	Natural Gas	3.3 (0.82)			
(1677 - 1981)	LPG/Propane	8.9 (2.21)			
6501-7500	Natural Gas	3.2 (0.80)			
(1982 - 2286)	LPG/Propane	8.6 (2.14)			