

**PGE180-240**

### Commercial Package Gas/Electric Units

#### Meets Ashrae 90.1 - 2001 Standards

##### FEATURES:

- Dual, Electrically and mechanically independent circuits
- Scroll Compressor on each circuit
- TXV refrigerant metering devices
- Pre-painted galvanized steel cabinet for long life and quality appearance
- Commercial strength base rails with built-in rigging capability
- Non-corrosive, sloped condensate drain pan, meets ASHRAE 62-89
- Two-inch return-air filters
- High and low (loss-of-charge) pressure switches
- Direct-spark ignition systems
- Refrigerant filter drier
- Freeze Thermostat
- 25% Manual Outside Air Damper
- Tubular, dimpled heat exchangers
- Thru-the-base utility connections
- Warranty: 10 year Heat Exchanger, 5 year compressor, 1 year parts



RESIDENTIAL AND COMMERCIAL SYSTEMS • SPLIT SYSTEMS • PACKAGED AIR CONDITIONERS • COMBINATION GAS / ELECTRIC UNITS • HEAT PUMPS • AIR HANDLERS • MANUFACTURED HOME AIR CONDITIONERS • GAS, OIL AND ELECTRIC FURNACES)

International Comfort Products  
650 Heil-Quaker Avenue, Lewisburg, TN 37091

**509 71 2201 04**

1/13/03

# Table of Contents

	Page
Features/Benefits .....	1
Model Number Nomenclature .....	2
Unit Specifications .....	3-4
Dimensions .....	5-6
Performance Data .....	7-11
Typical Installation .....	12
Accessories .....	13
Controls and Application Data .....	14
Guide Specifications .....	15

MODEL NUMBER IDENTIFICATION GUIDE							
MODEL NUMBER	P	G	E	180	H	300	A
PRODUCT FAMILY Package Units							Sales Code
TYPE H= Heat Pump      G = Gas/Electric A = Air Conditioner							GAS HEATING OPTIONS (BTUH) 300 = 300,000      360 = 360,000
DESIGN SERIES							VOLTAGE / PHASE / HERTZ H = 208/230-3-60 L = 460-3-60      S = 575-3-60
							COOLING CAPACITY (NOMINAL BTUH) 180 = 15 Ton 240 = 20 Ton

UNIT SPECIFICATIONS - MODELS						
COOLING	PGE180H	PGE180L	PGE180S	PGE240H	PGE240L	PGE240S
ARI Rated Capacity Btuh (Net)	178,000			232,000		
Nominal Tons	15			20		
Standard CFM	5250			6600		
EER	9.5			9.5		
IPLV	11.0			10.9		
Sound Rating (Bels)	8.8			9.5		
Base Unit Operating Weights (lbs)	1700			1850		
ELECTRICAL						
Volts/ 3 Phase/ 60Hertz	208/230	460	575	208/230	460	575
Voltage Range Min/Max	187 / 253	414 / 508	518 / 633	187 / 253	414 / 508	518 / 633
Power Supply MCA	82 / 82	41	31	124 / 124	61	48
Power Supply MOCP*	110 / 110	50	40	150 / 150	80	60
COMPRESSOR						
SCROLL / COPELAND						
Quantity...Model	1...ZR94KC / 1...ZR72KC			1...ZR125KC / 1...ZR108KC		
No. of Circuits	2			2		
RLA / LRA	Circuit #1	32.1 / 195	16.4 / 95	12.0 / 80	42.0 / 239	19.2 / 125
	Circuit #2	20.7 / 156	10.0 / 70	8.2 / 54	33.6 / 225	17.3 / 114
Oil (Oz.) per circuit	85, 60			106, 106		
REFRIGERATION TYPE						
R-22						
Expansion Device	TXV			TXV		
Operating Charge (lb. oz. ) **	CKT 1 = 19-8 CKT 2 = 13-8			CKT 1 = 19-7 CKT 2 = 13-9		
CONDENSER FAN						
Propeller Type						
Nominal CFM	10,500			14,200		
Quantity..Diameter (in.)	3...22			2...30		
Motor Hp...RPM (each)	1/2...1050			1...1075		
Watts Input (Total)	1100			3400		
FLA	1.7	0.8	0.75	6.6	3.3	3.4
CONDENSER COIL						
Cross Hatched 3/8 in. Copper Tubes, Aluminum Lanced						
Rows...Fin/In.	4...15			4...15		
Total Face Area (Sq. Ft.)	21.7			21.7		
EVAPORATOR COIL						
Cross Hatch 3/8 in. Copper Tubes, Aluminum Lanced, Face Split						
Rows...Fins/Inche	4...15			4...15		
Total Face Area (sq. ft.)	17.5			17.5		
EVAPORATOR FAN						
Centrifugal Type						
Quantity...Size (in.)	2...12 x 12			2...12 x 12		
Type Drive	Belt			Belt		
Nominal CFM	6000			8000		
Motor Hp, RPM, Max. Continuous Bhp	5.0, 1745, 6.3	5.0, 1745, 6.3	5.0, 1745, 6.3	7.5, 1745, 8.7	7.5, 1745, 9.5	7.5, 1745, 8.7
FLA (Each)	15.8 / 15.8	7.9	6.0	25.0 / 25.0	13.0	10.0
Motor Frame Size	184T			213T		
Fan RPM Range	873 - 1021			1002- 1151		
Motor Bearing	Ball			Ball		
Maximum Allowable RPM	1550			1550		
Motor Pulley Pitch / Diameter Min/Max. (in.)	4.9-5.9			5.4-6.6		
Motor Shaft Diameter (in.)	1-1/8			1-3/8		
Fan Pulley Pitch Diam (in)	9.4			9.4		
Belt, Quantity...Type... Length (in.)	1.BX.50			1.BX.53		
Pulley Center Line Distance (in)	13.5-14.8			14.6-15.4		
Speed Change per Full Turn of Movable Pulley Flange (RPM)	37			37		
Pulley Max. full Turns From Closed Postion	4			6		
Factory Setting	3.5			3.5		
Factory Speed Setting RPM	965			1120		
Fan Shaft Diam. at Pulley	1-7/16			1-7/16		
SEE LEGENDS AND NOTES ON FOLLOWING PAGES						

UNIT SPECIFICATIONS (CONT)		MODELS	
FURNACE SECTION		PGE180	PGE240
Rollout Switch Cutout Temp (F) +		190	190
Burner Orifice Diameter (in. .drill size)			
Natural Gas		136...29	136...29
Thermostat Heat Anticipator Setting (amps)			
208/230 v and 575v	Stage 1	0.98	0.98
208/230 v and 575v	Stage 2	0.44	0.44
460 v	Stage 1	0.80	0.80
460 v	Stage 2	0.44	0.44
Gas Input (Btuh)			
Stage 2 / Stage 1		360,000 / 275,000	360,000 / 270,000
Output Capacity (Btuh)		291,600	291,600
Efficiency (Steady State) (%) AFUE		81	81
Temperature Rise Range		20-50	20-50
Manifold Pressure (in. wg)			
Natural Gas		3.3	3.3
Liquid Propane		3.3	3.3
Gas Valve Quantity		1	1
Gas Valve Pressure Range	Psig	0.235-0.487	0.235-0.487
	in. wg	5.5-13.5	5.5-13.5
Field Gas Connection Size (in.)		3/4	3/4
HIGH-PRESSURE SWITCH (psig)			
Internal Relief (Differential) Cutout		426	426
Reset (Auto.)		320	320
LOSS-OF-CHARGE SWITCH (psig) (LOW-PRESS.)			
Cutout		27	27
Reset (Auto.)		44	44
FREEZE PROTECTION THERMOSTAT (F)			
Opens		30 +/- 5	30 +/- 5
Closes		45 +/- 5	45 +/- 5
RETURN-AIR FILTERS (THROWAWAY)			
Quantity...Size (in.)		4...20 x 20 x 2	4...20 x 20 x 2
		4...16 x 20 x 2	4...16 x 20 x 2

#### LEGEND

Bhp = Brake Horsepower

TXV = Thermostatic Expansion Valve

\* Fuse or HACR Circuit breaker

\*\*Circuit 1 uses the lower portion of the condenser coil and lower portion of the evaporator coils; and Circuit 2 uses the upper portion of both coils.

Bels - Sound Levels

EER - Energy Efficiency Ratio

IPLV - Integrated Part Load Values

MCA - Minimum Circuit Amps

MOCP - Maximum Over-current Protection

FLA - Full Load Amps

LRA - Locked Rotor Amps

RLA - Rated Load Amps

+Rollout switch is manual reset.

NOTE: The PGE180-240 units have a low-pressure switch (standard) located on the suction side.

NOTE: Minimum allowable temperature of mixed-air entering the heat exchanger during first-stage heating is 45F. There is no minimum mixed-air temperature limitation during second-stage heating. For entering-air temperatures below 45 F both stages of heat must be energized together to minimize condensation issues and ensure proper unit operation.

#### NOTES:

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

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

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

% Voltage Imbalance

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

#### LEGENDS AND NOTES

NOTES: 1. Rated in accordance with ARI Standards 210/240, latest revision (for sizes 090 & 120) or 360, latest revision (for size 150).

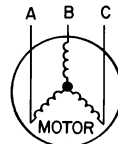
2. ARI ratings are net values, reflecting the effects of circulating fan heat.

3. Ratings are based on:

Cooling Standard: 80F db, 67F wb indoor entering air temperature and 95F db air entering outdoor unit.

IPLV Standard: 80F db, 67F wb indoor entering air temperature and 80F db entering air temperature.

EXAMPLE: Supply voltage is 460-3-60.



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

Determine maximum deviation from average voltage.

$$(\text{AB}) 457 - 452 = 5 \text{ V}$$

$$(\text{BC}) 464 - 457 = 7 \text{ V}$$

$$(\text{AC}) 457 - 455 = 2 \text{ V}$$

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.

## PGE180 BASE UNIT DIMENSIONS

	Unit Weight		Corner A		Corner B		Corner C		Corner D		Dim. A		Dim. B		Dim. C	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	ft-in	mm	ft-in	mm	ft-in	mm
PGE180	1700	771	411	186	381	173	438	199	471	213	3-3	991	3-5	1041	1-10	559

1. Dimensions in ( ) are in millimeters.

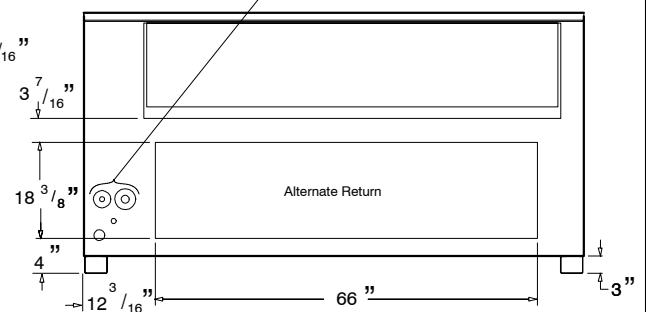
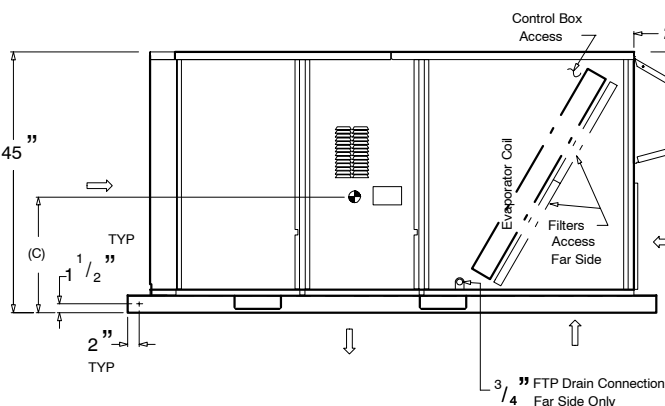
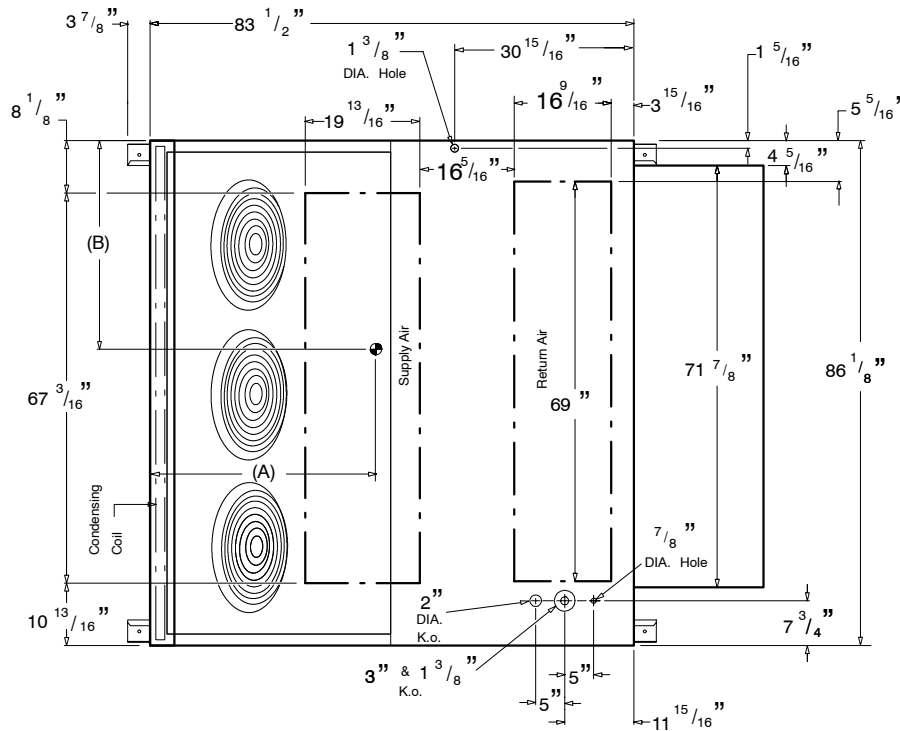
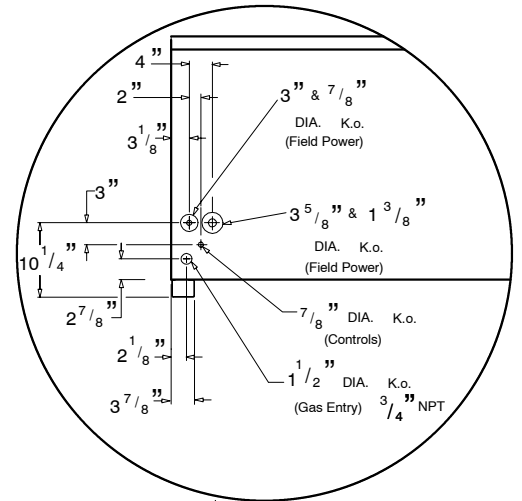
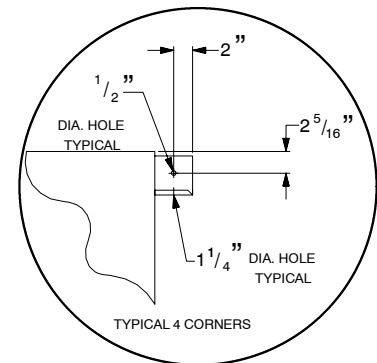
2.  Center of Gravity.

3.  Direction of Airflow

4. Ductwork to be attached to accessory roof curb only.

5. Minimum clearance:

- Rear: 7'-0" (2134) for coil removal. This dimension can be reduced to 4'0" (1219) if conditions permit coil removal from the top.
  - 4'0" (1219) to combustible surfaces, all four sides (includes between units).
  - Left Side: 4'-0" (1219) for proper condenser coil airflow.
  - Front : 4'-0" (1219) for control box access.
  - Right side: 4'-0" (1219) for proper operations of damper and power exhaust if so equipped.
  - Top: 6'-0" (1829) to assure proper condenser fan operation.
  - Bottom: 14" (356) to combustible surfaces (when not using curb).
  - Control Box side: 3'-0" (914) to ungrounded surfaces, non-combustible
  - Control Box Side: 3'-6" (1067) to block or concrete walls, or other grounded surfaces.
  - Local codes or jurisdiction may prevail.
6. With the exception of clearance for the condenser coil as stated in Note 5, a removable fence or barricade requires no clearance.
7. Dimensions are from outside of corner post. Allow 0'-5/16" on each side for top cover drip edge.




38-11-38a

## PGE240 BASE UNIT DIMENSIONS

PGE240	Unit Weight		Corner A		Corner B		Corner C		Corner D		Dim. A		Dim. B		Dim. C	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	ft-in	mm	ft-in	mm	ft-in	mm
PGE240	1850	839	441	200	408	185	474	215	526	239	3-2	965	3-5	1041	1-8	508

1. Dimensions in ( ) are in millimeters.

2.  Center of Gravity.

3.  Direction of Airflow

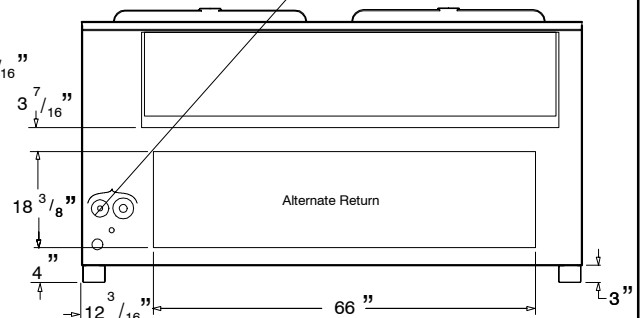
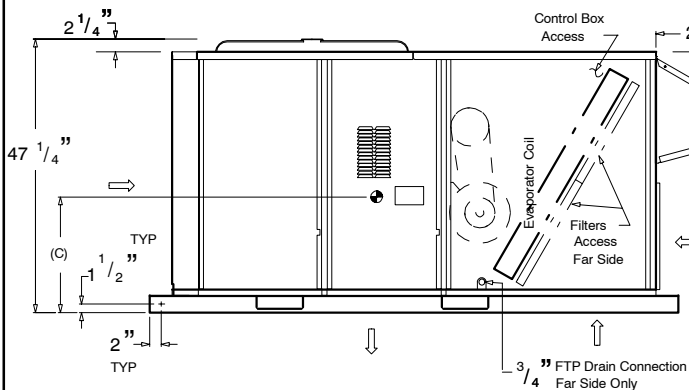
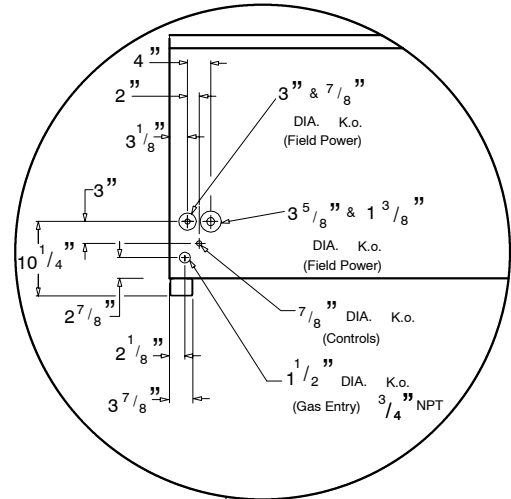
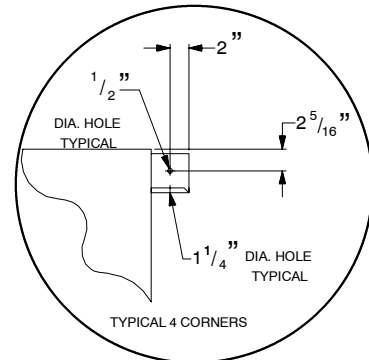
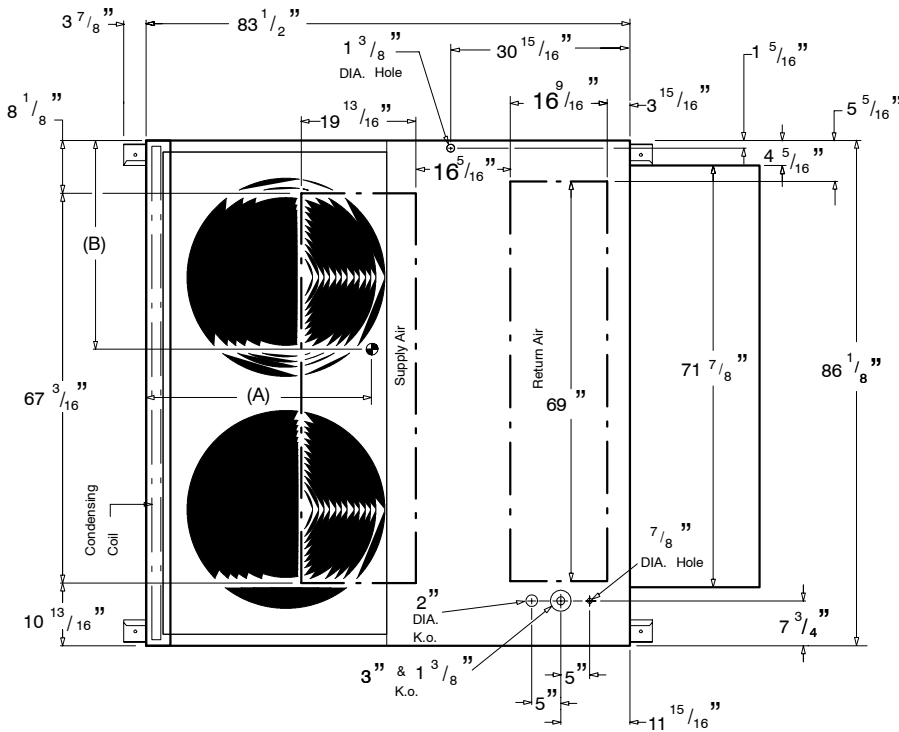
4. Ductwork to be attached to accessory roof curb only.

5. Minimum clearance:

- Rear: 7'-0" (2134) for coil removal. This dimension can be reduced to 4'-0" (1219) if conditions permit coil removal from the top.
- 4'-0" (1219) to combustible surfaces, all four sides (includes between units).
- Left Side: 4'-0" (1219) for proper condenser coil airflow.
- Front: 4'-0" (1219) for control box access.
- Right side: 4'-0" (1219) for proper operations of damper and power exhaust if so equipped.
- Top: 6'-0" (1829) to assure proper condenser fan operation.
- Bottom: 14" (356) to combustible surfaces (when not using curb).
- Control Box side: 3'-0" (914) to ungrounded surfaces, non-combustible
- Control Box Side: 3'-6" (1067) to block or concrete walls, or other grounded surfaces.
- Local codes or jurisdiction may prevail.

6. With the exception of clearance for the condenser coil as stated in Note 5, a removable fence or barricade requires no clearance.

7. Dimensions are from outside of corner post. Allow 0'-5/16" on each side for top cover drip edge.



38-11-38

**EXPANDED PERFORMANCE DATA (COOLING) 15 Ton (GROSS Capacity)**

Airflow CFM IDB (BF)			Outdoor Ambient Temperature - Degrees F, Dry Bulb														
			75			85			95			105			115		
			Entering Indoor Air Temperature - Degrees F, Wet Bulb														
			62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
80	6750 (0.15)	MBH	191.1	202.9	216.7	185.2	197.0	209.8	178.3	189.1	201.9	170.4	179.3	191.1	163.5	169.4	180.3
		S/T	0.93	0.74	0.55	0.93	0.74	0.54	0.94	0.75	0.53	0.94	0.77	0.53	0.93	0.79	0.54
		KW	12.59	12.91	13.24	13.78	14.11	14.43	15.08	15.41	15.84	16.49	16.82	17.14	18.01	18.23	18.55
	6000 (0.14)	MBH	186.2	200.9	215.7	180.3	195.0	208.8	173.4	187.2	200.0	166.5	178.3	190.1	158.6	168.4	178.3
		S/T	0.92	0.70	0.52	0.92	0.70	0.50	0.93	0.72	0.50	0.93	0.73	0.51	0.94	0.75	0.52
		KW	12.37	12.80	13.13	13.67	14.00	14.43	14.97	15.30	15.73	16.38	16.71	17.03	17.79	18.12	18.45
	5250 (0.12)	MBH	183.2	198.0	213.7	177.3	191.1	205.9	169.4	184.2	198.0	162.5	175.3	188.1	154.6	165.5	177.3
		S/T	0.86	0.66	0.48	0.87	0.67	0.49	0.90	0.68	0.49	0.91	0.70	0.50	0.92	0.71	0.51
		KW	12.26	12.69	13.13	13.56	13.89	14.32	14.76	15.19	15.62	16.17	16.60	17.03	17.58	18.01	18.45

**FORMULAS AND NOTES FOR USING EXPANDED PERFORMANCE DATA**

To find leaving wet bulb and dry bulb from the expanded performance charts, use the following formulas.

1. Direct interpolation is permissible. Do not extrapolate.

2. The following formulas may be used:

$$t/db = t\ edb - \text{sensible capacity Btuh} / (1.10 \times \text{cfm})$$

$$t/wb = \text{Wet bulb temp. corresponding to enthalpy of air leaving evaporator coil (h/wb)}$$

$$h/wb = h\ ewb - \text{total capacity Btuh} / (4.5 \times \text{cfm})$$

where h ewb = Enthalpy of air entering evap. coil

3. The SHC is based on 80F edb of air entering evap coil.  
Below 80F edb, subtract (corr factor x cfm) from SHC.  
Above 80F edb, add (corr factor x cfm) to SHC.

**LEGEND**

MBH = Total Capacity (Gross)  
S/T = Sensible to Total Ratio  
KW = Compressor Motor Power Input.  
IDB = Indoor Dry Bulb  
edb = Entering Dry Bulb  
ewb = Entering Wet Bulb  
t/db = Leaving Dry Bulb  
t/wb = Leaving Wet Bulb  
h/wb = Enthalpy of Leaving Wet Bulb  
SHC = Sensible Heat Capacity

BYPASS FACTOR (BF)	ENTERING AIR DRY BULB					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
Correction Factor						
.05	1.04	2.07	3.11	4.14	5.18	Use formulas shown below
.10	0.98	1.96	2.94	3.92	4.90	
.20	0.87	1.74	2.62	3.49	4.36	
.30	0.76	1.53	2.29	3.05	3.82	

$$\text{Correction Factor} = 1.10 \times (1 - \text{BF}) \times (\text{edb} - 80).$$

**EXPANDED PERFORMANCE DATA (COOLING) 20 Ton (GROSS Capacity)**

Airflow CFM IDB (BF)			Outdoor Ambient Temperature - Degrees F, Dry Bulb														
			75			85			95			105			115		
			Entering Indoor Air Temperature - Degrees F, Wet Bulb														
			62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
80	9000 (0.110)	MBH	248.2	266.9	290.6	241.3	258.1	281.7	231.5	247.2	270.9	221.7	236.4	258.1	212.5	223.6	244.3
		S/T	0.98	0.77	0.55	0.98	0.78	0.55	0.99	0.79	0.55	1.00	0.81	0.56	1.00	0.83	0.58
		KW	17.07	17.60	18.33	18.42	19.00	19.76	19.83	20.33	21.08	21.28	21.77	22.56	22.85	23.25	24.03
	8000 (0.100)	MBH	243.3	264.0	286.6	235.4	256.1	278.8	226.6	245.3	266.9	216.9	233.4	255.1	207.3	221.8	240.3
		S/T	0.96	0.74	0.54	0.96	0.74	0.53	0.97	0.75	0.54	0.98	0.77	0.54	0.99	0.79	0.56
		KW	16.88	17.48	18.18	18.20	18.82	19.58	19.64	20.26	20.98	21.08	21.67	22.36	22.56	23.05	23.84
	7000 (0.085)	MBH	238.4	260.0	283.7	230.5	250.2	273.8	221.8	241.3	263.0	212.3	230.5	250.2	201.6	218.2	237.4
		S/T	0.91	0.70	0.51	0.92	0.71	0.51	0.94	0.72	0.52	0.95	0.73	0.53	0.97	0.75	0.53
		KW	16.69	17.33	18.04	18.01	18.63	19.37	19.37	20.07	20.83	20.83	21.47	22.16	22.36	22.95	23.64

**FORMULAS AND NOTES FOR USING EXPANDED PERFORMANCE DATA**

To find leaving wet bulb and dry bulb from the expanded performance charts, use the following formulas.

1. Direct interpolation is permissible. Do not extrapolate.

2. The following formulas may be used:

$$t/db = t\ edb - \text{sensible capacity Btuh} / (1.10 \times \text{cfm})$$

$$t/wb = \text{Wet bulb temp. corresponding to enthalpy of air leaving evaporator coil (h/wb)}$$

$$h/wb = h\ ewb - \text{total capacity Btuh} / (4.5 \times \text{cfm})$$

where h ewb = Enthalpy of air entering evap. coil

3. The SHC is based on 80F edb of air entering evap coil.  
Below 80F edb, subtract (corr factor x cfm) from SHC.  
Above 80F edb, add (corr factor x cfm) to SHC.

**LEGEND**

MBH = Total Capacity (Gross)  
S/T = Sensible to Total Ratio  
KW = Compressor Motor Power Input.  
IDB = Indoor Dry Bulb  
edb = Entering Dry Bulb  
ewb = Entering Wet Bulb  
t/db = Leaving Dry Bulb  
t/wb = Leaving Wet Bulb  
h/wb = Enthalpy of Leaving Wet Bulb  
SHC = Sensible Heat Capacity

BYPASS FACTOR (BF)	ENTERING AIR DRY BULB					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	Use formulas shown below
.10	0.98	1.96	2.94	3.92	4.90	
.20	0.87	1.74	2.62	3.49	4.36	
.30	0.76	1.53	2.29	3.05	3.82	

$$\text{Correction Factor} = 1.10 \times (1 - \text{BF}) \times (\text{edb} - 80).$$



## PERFORMANCE DATA

### CIRCULATING BLOWER PERFORMANCE - 15 TON UNITS (5 HP Std Motor w/873-1021 rpm drive pkg)

CFM	EXTERNAL STATIC PRESSURE IN INCHES WATER COLUMN - DRY COIL WITH FILTER													
	0.3		0.5		0.7		0.9		1.1		1.3		1.5	
	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W
5250	<b>794</b>	<b>1692</b>	<b>867</b>	<b>1947</b>	936	2209	1001	2478	1062	2754	1119	3035	1175	3323
5500	<b>823</b>	<b>1916</b>	893	2178	958	2446	1020	2720	1079	3001	1134	3288	1188	3580
5750	<b>853</b>	<b>2154</b>	919	2423	981	2698	1041	2978	1097	3263	1150	3555	1204	3846
6000	886	2329	952	2607	1015	2891	1074	3180	1130	3474	1184	3774		
6250	920	2519	985	2806	1048	3099	1107	3396	1164	3700	1220	4003		
6500	950	2811	1013	3104	1072	3403	1132	3702						
6750	981	3125	1041	3425	1101	3725								

- NOTES:
- 1) Maximum motor Watts is 5180 for standard 5 HP motor.
  - 2) Maximum blower wheel speed is 1550 rpm.
  - 3) Motor drive range is 873 to 1021 rpm.
  - 4) Air flow data based on dry coil with filters. Deduct 0.08 inches for wet coil performance.
  - 5) Operation in shaded areas requires accessory high static drive kit sold separately.
  - 6) Boldface indicates field-supplied drive is required.

### CIRCULATING BLOWER PERFORMANCE - 20 TON UNITS (7.5 HP Standard Motor w/1002-1151 rpm drive pkg)

CFM	EXTERNAL STATIC PRESSURE IN INCHES WATER COLUMN - DRY COIL WITH FILTER													
	0.3		0.5		0.7		0.9		1.1		1.3		1.5	
	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W
6750	<b>960</b>	<b>3444</b>	1020	3680	1078	3918	1134	4160	1187	4405	1239	4652	1289	4901
7000	<b>991</b>	<b>3687</b>	1049	3923	1105	4161	1159	4403	1211	4647	1262	4894	1311	5142
7250	1023	3949	1079	4185	1133	4424	1186	4665	1237	4909	1286	5155	1334	5403
7500	1054	4211	1109	4447	1161	4686	1213	4926	1262	5170	1310	5415	1357	5663
7750	1086	4492	1139	4728	1190	4967	1240	5207	1288	5451	1335	5696	1381	5943
8000	1117	4773	1168	5009	1218	5247	1267	5488	1314	5731	1360	5976	1405	6222
8250	1149	5073	1199	5309	1248	5547	1295	5788	1341	6031	1386	6276	1430	6522

- NOTES:
- 1) Maximum motor Watts is 7915 for standard 7.5 HP motor.
  - 2) Maximum blower wheel speed is 1550 rpm.
  - 3) Motor drive range is 1002-1151 rpm
  - 4) Air flow data based on dry coil with filters. Deduct 0.08 inches for wet coil performance.
  - 5) Operation in shaded areas requires accessory high static drive kit sold separately.
  - 6) Boldface indicates field-supplied drive is required.

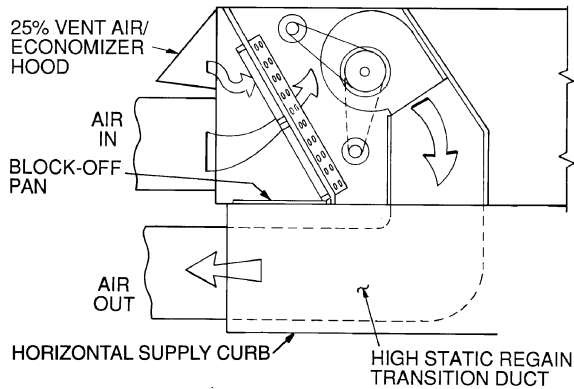
## PERFORMANCE DATA (cont.)

### GAS HEAT FAN PERFORMANCE LOSS

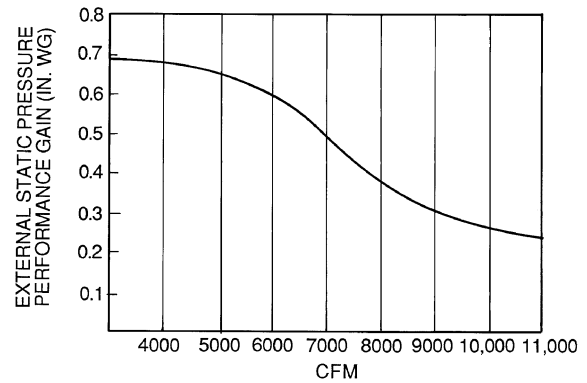
PGE180		
Airflow	Low Heat	High Heat
cfm	in. wg	in. wg
4500	0.16	0.17
4800	0.17	0.19
5100	0.19	0.20
5400	0.20	0.22
5700	0.21	0.24
6000	0.23	0.26
6300	0.24	0.28
6600	0.26	0.30
6900	0.28	0.33
7200	0.29	0.35
7500	0.31	0.37

PGE240		
Airflow	Low Heat	High Heat
Cfm	in. wg	in. wg
5,500	0.23	0.31
6,000	0.26	0.37
6,500	0.30	0.43
7,000	0.33	0.49
7,500	0.37	0.56
8,000	0.41	0.63
8,500	0.46	0.70
9,000	0.50	0.78
9,500	0.55	0.87
10,000	0.60	0.96

### HORIZONTAL SUPPLY/RETURN FAN PERFORMANCE WITH HIGH STATIC REGAIN ADAPTER CURB



NOTE: The high static regain adapter accessory may be used to provide horizontal supply//return.



NOTE: The high static supply/return adapter accessory improves fan performance by increasing external static pressure by amount shown above.

### Altitude Compensation\* - PGE180-240

ELEVATION (ft)	NATURAL GAS ORIFICE Size **	
	Low Heat	High Heat
0-3,000	30	29
3,000- 7,000	31	30
7,000- 9,000	32	31
9,000-10,000	33	31
above 10,000	35	32

\*Includes a 4% input reduction per each 1,000 feet.

\*\* Orifices available through your local distributor .

### Altitude Derating Factor\* - All Units

ELEVATION (ft)	MAXIMUM HEATING VALUE (Btu/ft <sup>3</sup> )
0-2,000	1,100
2,001-3,000	1,050
3,001-4,000	1,000
4,001-5,000	950
5,001-6,000	900

\*Derating of the unit is not required unless the heating value of the gas exceeds the values listed in the table above, or if the elevation exceeds 6000 ft. Derating conditions must be 4% per thousand ft above sea level. For example, at 4000 ft, if the heating value of the gas exceeds 1000 Btu/ft<sup>3</sup>, the unit will require a 16% derating. For elevations above 6000 ft, the same formula applies. For example, at 7000 ft, the unit will require a 28% derating of the maximum heating value per the National Fuel Gas Code.

# PERFORMANCE DATA (cont.)

AIR QUANTITY LIMITS		
UNIT	MINIMUM CFM	MAXIMUM CFM
PGE180	4,500	7,500
PGE240	6,000	10,000

Evaporator Fan Motor Efficiency		
UNIT	MOTOR EFFICIENCY (%)	
PGE180 (5.0 Hp)	87.5	
PGE240 (7.5 Hp)	88.5	

**NOTE:** All indoor-fan motors 5 hp and larger meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.

OUTDOOR SOUND POWER										
UNIT PGE	SOUND RATING (60 Hz)	A-WEIGHTED (db)	OCTAVE BANDS							
			63	125	250	500	1000	2000	4000	8000
180	8.8 Bels	87.8	90.8	88.7	86.4	84.3	83.5	78.4	75.6	66.8
240	9.5 Bels	94.1	98.7	92.3	93.8	90.9	89.6	85.9	80.3	74.3

**Bels** - Sound Levels (1 bel = 10 decibels)

FAN RPM AT MOTOR PULLEY SETTINGS*													
UNIT PGE	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1-1/2	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6
180**	****	****	****	****	1021	1002	984	965	947	928	910	891	873
180***	****	****	****	****	1200	1178	1156	1134	1112	1091	1069	1047	1025
240**	****	****	1225	1209	1187	1165	1143	1120	1098	1076	1053	1031	1002
240***	****	****	1458	1434	1407	1381	1354	1328	1301	1275	1248	1222	1193

\* Approximate fan rpm shown.

\*\* Indicates standard drive package

\*\*\* Indicates alternate drive package.

\*\*\*\* Due to belt and pulley size, pulley cannot be set to this number of turns open.

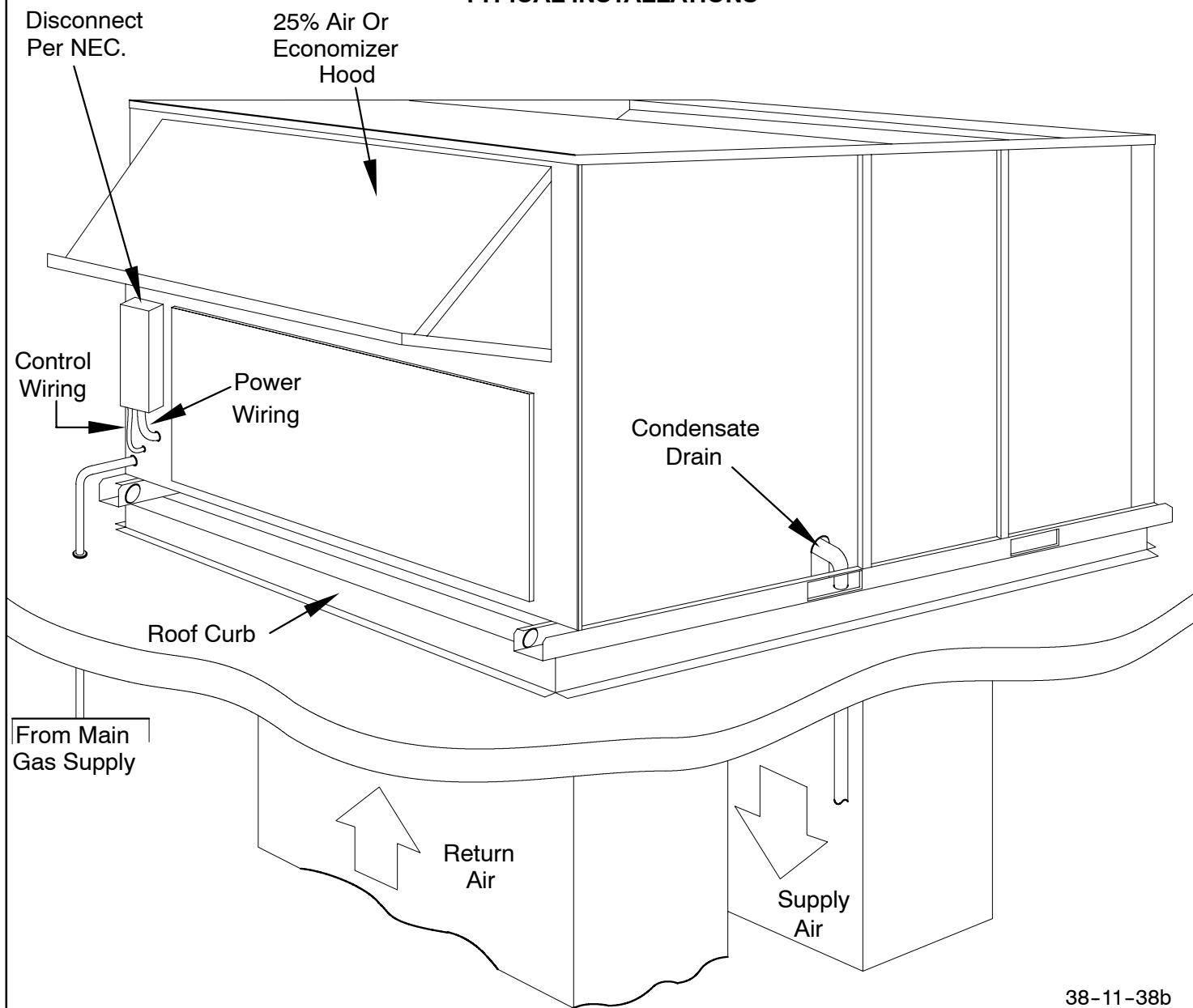
Evaporator-Fan Motor Performance				
UNIT PGE	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE CONTINUOUS WATTS	MAXIMUM AMP DRAW
180	208/230	6.13	5,180	15.8
	460			7.9
	575	6.13	5,180	6.0
240	208/230	8.70	7,915	22.0
	460	9.50	8,640	13.0
	575	8.70	7,915	10.0

**Bhp** - Brake Horsepower

\*Extensive motor and electrical testing on these units ensures that the full horsepower range of the motors can be utilized with confidence Using your fan motors up to the horsepower ratings shown in this table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

**NOTE:** All indoor-fan motors 5 hp and larger meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.

**TYPICAL INSTALLATIONS**

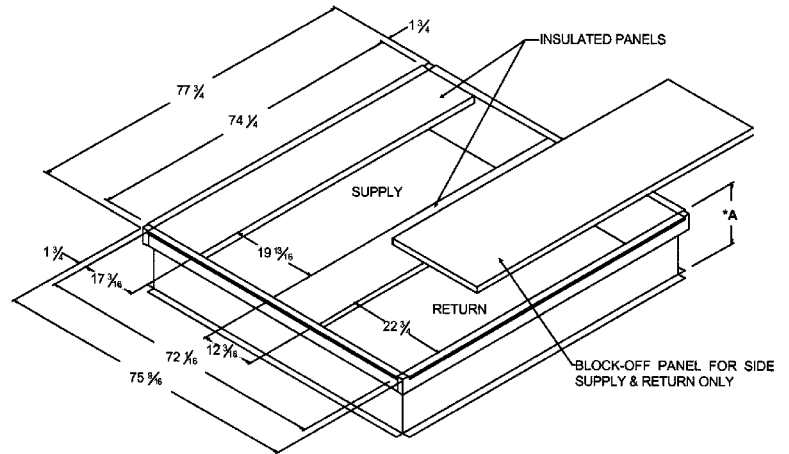


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## ACCESSORIES

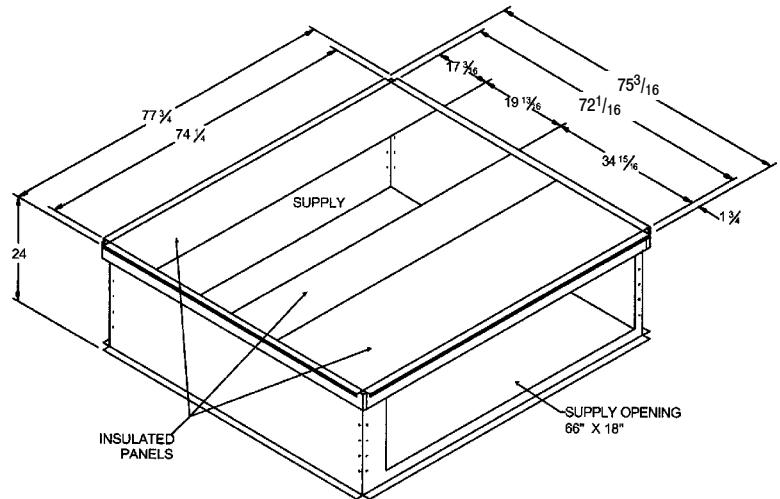
### VERTICAL DISCHARGE ROOF CURBS

Description	Model Number	Where Used
14" High	AXB060CMA	180, 240
24" High	AXB060CHA	180, 240



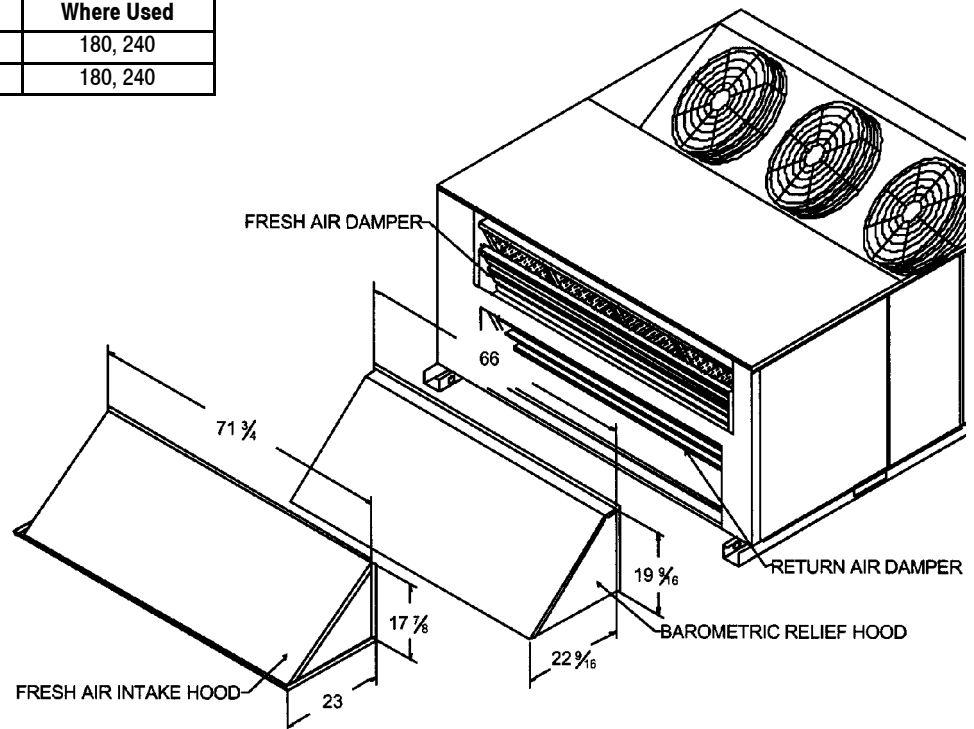
### HORIZONTAL DISCHARGE ROOF CURBS

Description	Model Number	Where Used
24" High	AXB065CHA	180, 240
24" High w/ Duct	AXB165CHA	180, 240



### ECONOMIZER - HORIZONTAL / DOWNFLOW

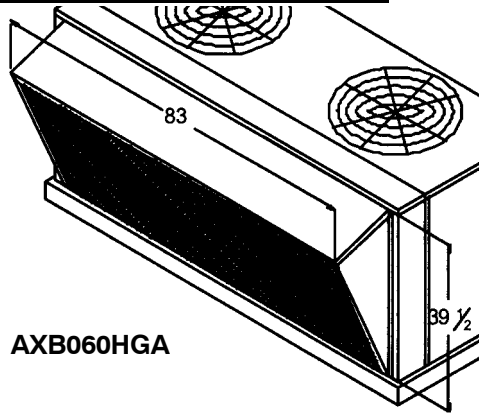
Description	Model Number	Where Used
Fully Modulating	AXB060EMA	180, 240
Three Position	AXB060EPA	180, 240



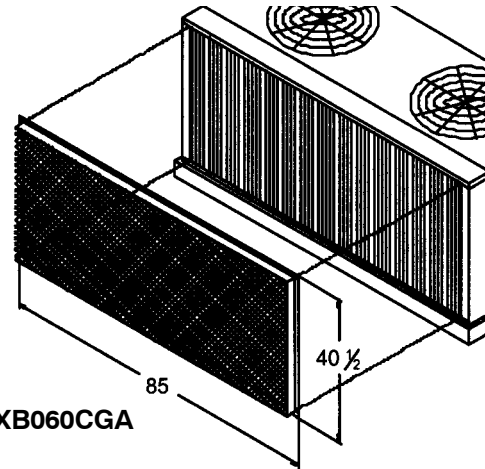
## ACCESSORIES (CONT.)

### COIL PROTECTION

Description	Model Number	Where Used
Coil Guard	AXB060CGA	180, 240
Hail Guard	AXB060HGA	180, 240



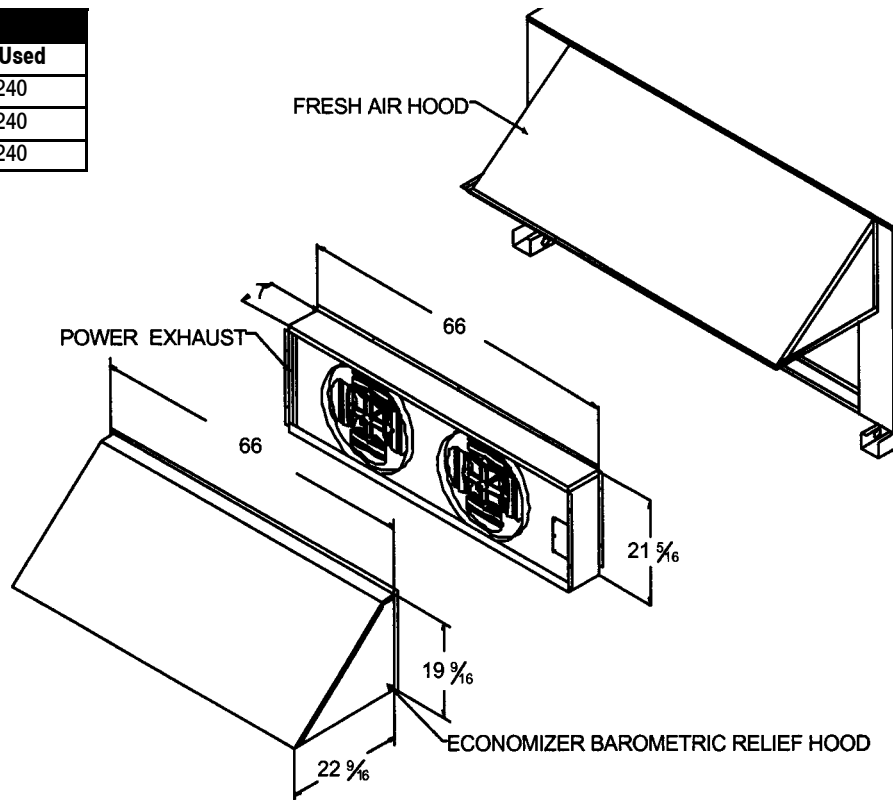
AXB060HGA



AXB060CGA

### POWER EXHAUST

Description	Model Number	Where Used
208/230 Volt	AXB060PEH	180, 240
460 Volt	AXB060PEL	180, 240
575 Volt	AXB060PES	180, 240



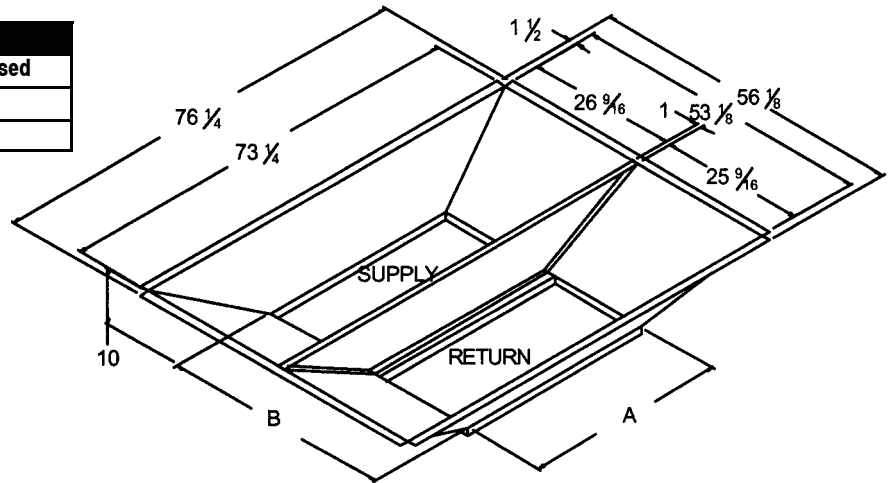
### POWER EXHAUST PERFORMANCE DATA

Model	Volt/Phase/ Hertz	Motor			Unit					
		Qty	HP	RPM	Cir. Qty	LRA	FLA	MCA	Fuse Size	@0.1 CFM
AXB060PEH	208-230/3/60	2	3/4	1075	1	24.9	10.0	12.6	15	9,600
AXB060PEL	460/3/60	2	3/4	1075	1	N/A	4.4	5.6	8	9,600
AXB060PES	575/3/60	2	3/4	1050	1	N/A	3.0	3.8	5	9,600

## ACCESSORIES (CONT.)

### CONCENTRIC DUCT KIT

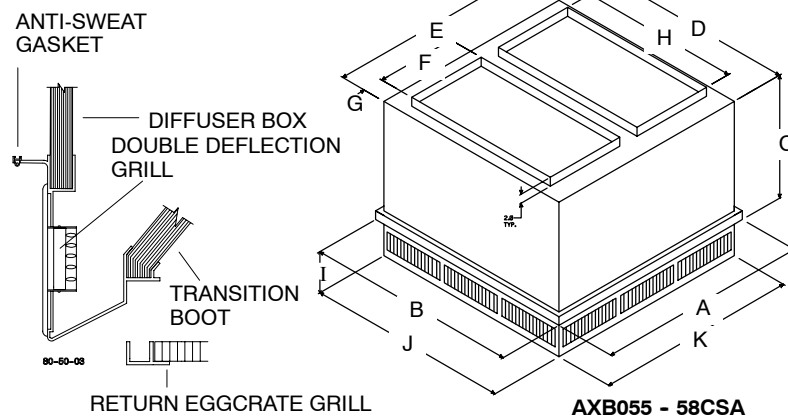
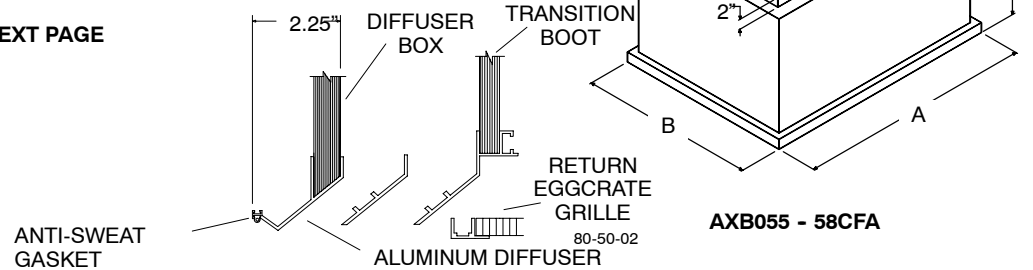
Description	Model Number	Where Used
18" x 36"	AXB160CTA	180
24" x 48"	AXB260CTA	240



### CONCENTRIC DIFFUSER

Description	Model Number	Used With
Flush Mount	AXB055CFA	180
Flush Mount	AXB058CFA	240
Step Down	AXB055CSA	180
Step Down	AXB058CSA	240

SEE PERFORMANCE DATA ON NEXT PAGE



### DIMENSIONS

Model Number	A	B	C	D	E	F	G	H	I	J	K	Duct Size
AXB055CFA	47-5/8	47-5/8	29-1/4	45	45	18	2-1/4	38	N/A	N/A	N/A	18 x 36
AXB058CFA	59-5/8	59-5/8	35-1/4	57	57	24	2-1/4	48	N/A	N/A	N/A	24 x 48
AXB055CSA	47-5/8	47-5/8	24-5/8	45	45	18	2-1/2	36	10-1/8	45-1/2	45-1/2	18 x 36
AXB058CSA	59-5/8	59-5/8	30-5/8	57-1/2	57-1/2	24	2-1/2	48	11-1/8	57-1/2	57-1/2	24 x 48

## ACCESSORIES (CONT.)

### CFA SERIES PERFORMANCE DATA

Part No. AXB	CFM	Static Pressure In. WC	Throw Feet	Neck Velocity FPM	Jet Velocity FPM	db Sound Level
055CFA	5600	.36	28-37	1000	2082	45
	5800	.39	29-38	1036	2156	45
	6000	.42	40-50	1071	2230	45
	6200	.46	42-51	1107	2308	50
	6400	.50	43-52	1143	2379	50
	6600	.54	45-56	1179	2454	50
058CFA	7200	.39	26-35	996	2093	45
	7400	.41	28-37	1024	2151	45
	7600	.43	29-38	1051	2209	45
	7800	.47	40-50	1079	2276	45
	8000	.50	42-51	1107	2326	50
	8200	.53	43-52	1134	2384	50

### CSA SERIES PERFORMANCE DATA

Part No. AXB	CFM	Static Pressure In. WC	Throw Feet	Neck / Jet Velocity FPM	db Sound Levels
055CSA	5600	.36	39-49	920	30
	5800	.39	42-51	954	30
	6000	.42	44-54	1022	30
	6200	.46	45-55	1056	30
	6400	.50	46-55	1090	30
	6600	.54	47-56	1124	30
058CSA	7200	.39	33-38	827	25
	7400	.41	35-40	850	25
	7600	.43	36-41	873	25
	7800	.47	38-43	896	30
	8000	.50	39-44	918	30
	8200	.53	41-46	941	30

#### CSA/CFA NOTES:

1. All data is based on the Air Diffusion Council guidelines.
2. Throw data is based on Terminal Velocities of 75 FPM using isothermal air.
3. Throw is based on diffuser blades being directed in a straight pattern.
4. Actual sound levels are less than those shown.
5. Minimum height 9' above floor.

### FRESH AIR DAMPERS

Description	Model Number	Used With
35% Motorized	AXB060FMA	180, 240

### NATURAL TO LP CONVERSION KIT

Model Number	Used With
AXB265LPA	180, 240

### LOW AMBIENT KIT

Model Number	Used With
AXB160LAA	180
AXB260LAA	240

### PART NUMBERS FOR APPROVED HIGH STATIC CONVERSIONS\*

Unit Size	Voltage	Motor	Motor Pulley	Blower Pulley	Belt	Circuit Breaker	Circuit Breaker Bracket
15 Ton	208/230 & 460	No Change	1170552	1171427	No Change	N/A	N/A
15 Ton	575	N/A	N/A	N/A	N/A	N/A	N/A
20 Ton	All Voltages	No Change	1171414	1170569	1171528	N/A	N/A

\* Available thru service parts only.



## CONTROLS

### OPERATING SEQUENCE

Cooling, Units Without Economizer – When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC) and compressor contactor no. 1 (C1) are energized, and evaporator-fan motor (IFM), compressor no. 1, and condenser fan(s) start. The condenser-fan motor(s) runs continuously while unit is cooling. When 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

NOTE: The PGE180–240 units have 2 stages of heat. When the thermostat calls for heating, power is sent to W on the IGC (integrated gas unit controller) board. An LED (light-emitting diode) on the IGC board will be on during normal operation. A check is made to ensure that the rollout switch and limit switch are closed. The induced-draft motor is then energized, and when speed is proven with the hall effect sensor on the motor, the ignition activation period begins. The burners will ignite within 5 seconds.

If the burners do not light, there is a 22-second delay before another 5-second attempt. If the burners still do not light, this sequence is repeated for 15 minutes. After the 15 minutes have elapsed, if the burners still have not lighted, heating is locked out. To reset the control, break 24-v power to the thermostat.

When ignition occurs the IGC board will continue to monitor the condition of the rollout and limit switches, the hall effect sensor, as well as the flame sensor. If the unit is controlled through a room thermostat set for fan auto., 45 seconds after ignition occurs, the indoor-fan motor will be energized. If for some reason the overtemperature limit opens prior to the start of the indoor fan blower, on the next attempt, the 45-second delay will be shortened to 5 seconds less than the time from initiation of heat to when the limit tripped. Gas will not be interrupted to the burners and heating will continue. Once modified, the fan on delay will not change back to 45 seconds unless power is reset to the control.

When additional heat is required, W2 closes and initiates power to the second stage of the main gas valve. When the thermostat is satisfied, W1 and W2 open and the gas valve closes, interrupting the flow of gas to the main burners. If the call for W1 lasted less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit is controlled through a room thermostat set for fan auto., the indoor-fan motor will continue to operate for an additional 45 seconds then stop. If the overtemperature limit opens after the indoor motor is stopped within 10 minutes of W1 becoming inactive, on the next cycle the time will be extended by 15 seconds. The maximum delay is 3 minutes. Once modified, the fan off delay will not change back to 45 seconds unless power is reset to the control.

A LED indicator is provided on the IGC to monitor operation. The IGC is located by removing the side panel and viewing the IGC through the view port located in the control box access panel. During normal operation, the LED is continuously on.

## APPLICATION DATA

1. DUCTWORK – Ductwork should be attached to the curb on all units. Interior installation may proceed before unit is set in place on roof. If ductwork will be attached to the unit, do not drill in condensate drain pan area – leaks may result.
2. THRU-THE-CURB SERVICE CONNECTIONS – Roof curb connections allow field power wires, control wires, and gas supply to enter through the roof curb opening.
3. THERMOSTAT – Use of 2-stage cooling thermostat is recommended for all units. A 2-stage cooling thermostat is required on units with accessory economizer to provide integrated cooling.
4. HEATING-TO-COOLING CHANGEOVER – All units are automatic changeover from heating to cooling when automatic changeover thermostat and subbase are used.
5. AIRFLOW – Units are draw-thru on cooling and blow-thru on heating.
6. MAXIMUM AIRFLOW – To minimize the possibility of condensate blow-off from evaporator, airflow through units should not exceed 500 cfm/nominal ton on size 180–240 units.
7. MINIMUM AIRFLOW – The minimum airflow for cooling is 300 cfm/nominal ton on size 180–240 units.
8. MINIMUM AMBIENT COOLING OPERATION TEMPERATURE – Units are designed to operate at outdoor temperatures down to 40 F.
9. MAXIMUM OPERATING OUTDOOR-AIR TEMPERATURE – For cooling, this temperature is 120 F for 180 unit and 125 F for 240 unit. Refer to Cooling Capacities tables.
10. HIGH ALTITUDE – A change to the gas orifice may be required at high altitudes. Refer to Altitude Compensation charts.
11. MINIMUM TEMPERATURE – Air entering the heat exchanger in heating must be a minimum of 50 F continuous and 45 F intermittent. For entering-air temperatures below 45 F both stages of heat must be energized together to minimize condensation issues and ensure proper unit operation.
12. INTERNAL UNIT DESIGN – Due to the internal unit design (draw-thru over the motor), air path, and specially designed motors, the full horsepower (maximum continuous bhp) listed in the Physical Data table and the notes following each Fan Performance table can be utilized with extreme confidence. Using motors with the values listed in the Physical and Fan Performance Data tables will not result in nuisance tripping or premature motor failure. The unit warranty will not be affected.

**CABINET:**

The cabinet shall be made of sturdy baked enamel coated galvanized steel. Base rails shall be 16 gauge steel and have fork lift slots and holes provided for lifting shackles. Unit shall be designed with convertible airflow and shipped ready for downflow applications with conversion to horizontal air flow accomplished by relocating two panels.

Return air compartments shall be insulated with not less than 1/2" of water resistant coated glass fiber and not less than 1/2" of aluminum foil faced glass fiber in the furnace/supply compartments.

**COOLING SECTION:**

Units shall be factory charged and operationally ready. Each refrigeration circuit shall have a compressor, with internal overload protection, high and low pressure switches, filter drier and copper tube/aluminum fin evaporator and condenser coils.

Units shall be capable of cooling operation down to 25°F as shipped from the factory.

**COILS:**

The evaporator and condenser coils shall be fabricated with aluminum fins mechanically bonded to copper tubing. Both coils shall be pressure tested prior to assembly into the unit and electronically leak tested after assembly onto the unit. The evaporator coil shall be protected from dust and debris on the return air side by factory installed 2" air filters.

**CONDENSER FAN:**

The unit shall have a single direct drive propeller fan/motor assembly mounted directly to a vertical-discharge grille panel that is easily removable. Motors shall have permanently lubricated sleeve bearings and inherent overload protection.

**EVAPORATOR BLOWER:**

The units shall have a single belt driven evaporator blower. The motor shall have permanently lubricated ball bearings and internal overload protection. An adjustable motor drive sheave for matching air flow requirements shall be standard. Additionally high static accessory kits shall be available for air flows above the standard requirement.

**HEATING SECTION:**

The units shall have aluminized steel tubular heat exchangers located on the discharge side of the evaporator blower and equipped with a two-stage gas valve. The units shall have in-shot burners that are ignited by an electronic spark with flame proving feature and protected by both a limit switch and flame roll-out switch.