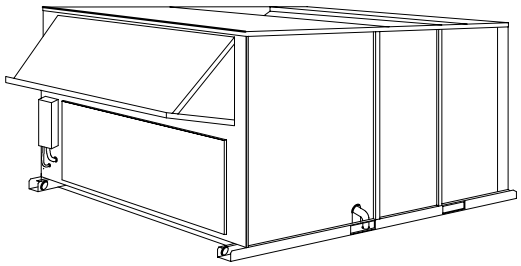
PGS SERIES
15 to 20 Ton

TEMPSTAR®
Heating and Cooling Products



PGS180-240

Commercial Package Gas/Electric Units

Standard-Efficiency Rooftop Units with:

- 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
- Unit shipped ready for downflow applications with conversion to horizontal airflow accomplished with accessory horizontal discharge roof curb.
- Warranty: 10 year Heat Exchanger, 5 year compressor, 1 year parts

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

509 21 2002 00

9/23/04

Table of Contents

MODEL NUMBER IDENTIFICATION GUIDE

MODEL NUMBER	P	G	S	180	H	300	A

PRODUCT FAMILY
Package Units

TYPE
H= Heat Pump G = Gas/Electric
A = Air Conditioner

DESIGN SERIES

Sales Code

GAS HEATING OPTIONS (BTUH)
300 = 300,000 360 = 360,000

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	**PGS180H**	**PGS180L**	**PGS180S**	**PGS240H**	**PGS240L**	**PGS240S**
ARI Rated Capacity Btuh (Net)	172,000			214,000		
Nominal Tons	15			20		
Standard CFM	5250			6600		
EER	8.5			8.4		
IPLV	9.2			8.4		
Sound Rating (Bels)	8.8			9.5		
Base Unit Operating Weights (lbs)	1650			1850		
ELECTRICAL						
Volts/ 3 Phase/ 60Hertz	208/230	460	575	208/230	460	575
Voltage Range Min/Max	187 / 253	414 / 508	518 / 632	187 / 253	414 / 508	518 / 632
Power Supply MCA	73.8 / 74.3	37.9	29.7	109 / 109	54	44
Power Supply MOCP*	90 / 90	50	35	125 / 125	70	50
COMPRESSOR	SCROLL					
(Quantity)...Model	(2)...SR*942AE			(1)...SM120 / (1)...SM110		
No. of Circuits	2			2		
RLA / LRA Circuit #1	25.6 / 190	13.5 / 95	10.2 / 75	33.0 / 237	16.2 / 130	12.7 / 85
Circuit #2	25.6 / 190	13.5 / 95	10.2 / 75	29.5 / 237	14.1 / 130	11.3 / 85
Oil (Oz.) per circuit	90, 90			110, 110		
REFRIGERATION TYPE	R-22					
Expansion Device	TXV			TXV		
Operating Charge (lb. oz.) **	CKT 1 = 10-13 CKT 2 = 10-5			CKT 1 = 16-3 CKT 2 = 14.8		
CONDENSER FAN	Propeller Type					
Nominal CFM	10,350			13,650		
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.	2...17			3...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	2...17			3...15		
Total Face Area (sq. ft.)	17.5			17.5		
EVAPORATOR FAN	Centrfugal Type					
Quantity...Size (in.)	2...10 x 10		2...10 x 10	2...12 x 12		
Type Drive	Belt		Belt	Belt		
Nominal CFM	6000		6000	8000		
Motor Hp, RPM, Max. Continuous Bhp	3.7, 1725, 4.25	3.7, 1725, 4.25	3.0, 1725, 3.45	7.5, 1745, 8.7	7.5, 1745, 9.5	7.5, 1745, 8.7
FLA (Each)	10.5 / 11.0	4.8	3.9	25.0 / 25.0	13.0	10.0
Motor Frame Size	56H		56H	213T		
Fan RPM Range	891 - 1179		1159 - 1429	1002-1225		
Motor Bearing	Ball		Ball	Ball		
Maximum Allowable RPM	1550		1550	1550		
Motor Pulley Pitch / Diameter Min/Max. (in.)	3.1-4.1	3.1-4.1	4.3-5.3	5.4-6.6		
Motor Shaft Diameter (in.)	7/8		7/8	1-3/8		
Fan Pulley Pitch Diam (in)	6.0		6.4	9.4		
Belt, Quantity...Type... Length (in.)	1.BX.42		1.BX.45	1.BX.54		
Pulley Center Line Distance (in)	13.5-15.5		13.5-15.5	14.6-15.4		
Speed Change per Full Turn of Movable Pulley Flange (RPM)	48		44	37		
Pulley Max. full Turns From Closed Postion	5		5	5		
Factory Setting	3.5		3.5	3.5		
Factory Speed Setting RPM	1035		1296	1120		
Fan Shaft Diam. at Pulley	1-3/16		1-3/16	1-7/16		

SEE LEGENDS AND NOTES ON FOLLOWING PAGES

UNIT SPECIFICATIONS (CONT)		MODELS	
FURNACE SECTION		**PGS180**	**PGS240**
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		300,000 / 225,000	360,000 / 270,000
Output Capacity (Btuh)		243,000	292,000
Efficiency (Steady State) (%) AFUE		81	81
Temperature Rise Range		15–45 / 30–60	15–45 / 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

LEGENDS AND NOTES

LEGEND
Bhp = Brake Horsepower
TXV = Thermostatic Expansion Valve

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

* 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.
+Rollout switch is manual reset.
NOTE: The PGS180-240 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 muxt be energized together to minimize condensation issues and ensure proper unit operation.

NOTES:

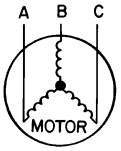
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker . Canadian units may be fuse or circuit breaker .
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate 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

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

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

EXAMPLE: Supply voltage is 460-3-60.



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

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

Determine maximum deviation from average voltage.
(AB) 457 - 452 = 5 V
(BC) 464 - 457 = 7 V
(AB) 457 - 455 = 2 V
Maximum deviation is 7 v.
Determine percent voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457} = 1.53\%$$

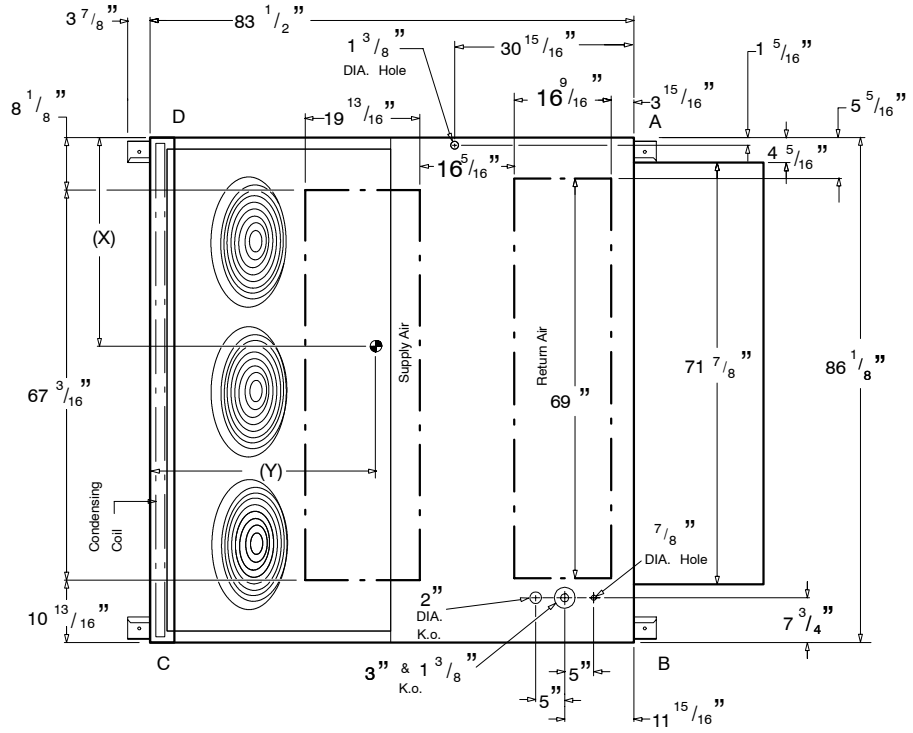
This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

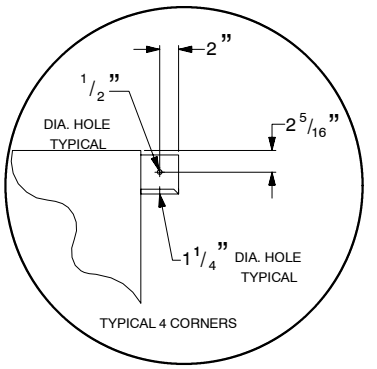
IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately .

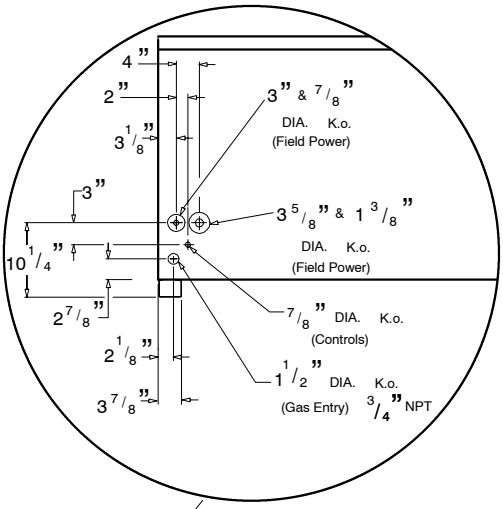
PGS180 BASE UNIT DIMENSIONS

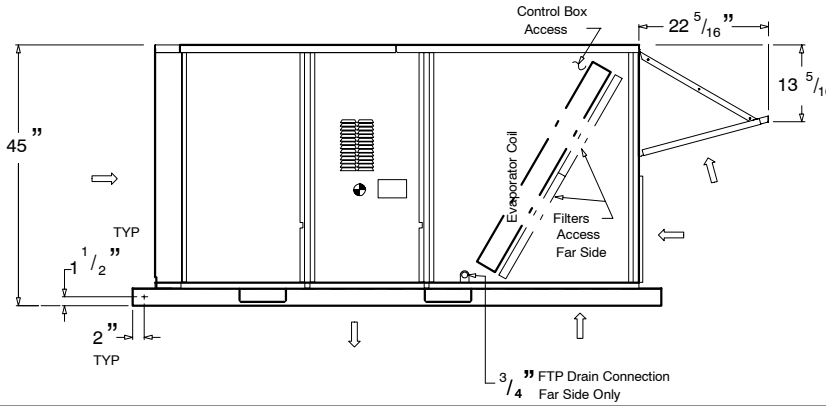
	Unit Weight		Corner A		Corner B		Corner C		Corner D		Dim. X		Dim. Y	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	ft-in	mm	ft-in	mm
PGS180	1650	748	423	192	386	175	403	183	438	199	3-5	1046	3-5	1040

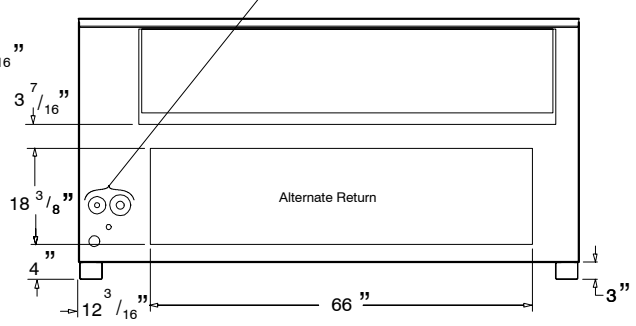
1. Dimensions in ( ) are in millimeters.
2. Center of Gravity.
3. Direction of Airflow
4. Ductwork to be attached to accessory roof curb only.
5. Minimum clearance:
   - Rear: 7'-0" (2134) for coil removal. This dimension can be reduced to 4'0" (1219) if conditions permit coil removal from the top.
   - 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.











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PGS240 BASE UNIT DIMENSIONS

	Unit Weight		Corner A		Corner B		Corner C		Corner D		Dim. X		Dim. Y	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	ft-in	mm	ft-in	mm
PGS240	1850	839	443	201	406	184	476	216	525	238	3-5	1043	3-2	973

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).
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   - Right side: 4'-0" (1219) for proper operations of damper and power exhaust if so equipped.
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   - Local codes or jurisdiction may prevail.
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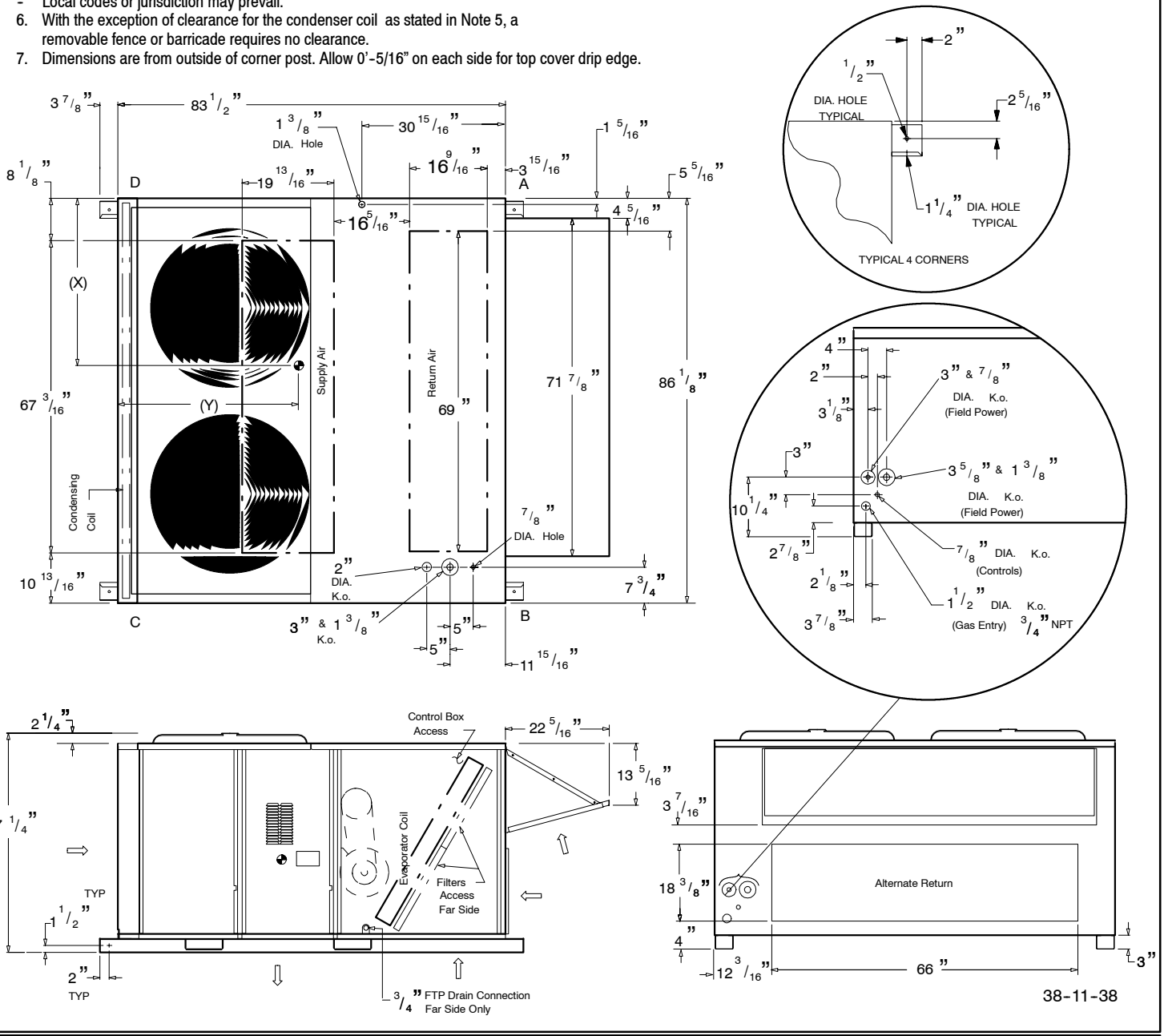

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EXPANDED PERFORMANCE DATA (COOLING) 15 Ton (Gross Capacity)

Airflow			Outdoor Ambient Temperature - Degrees F, Dry Bulb														
			75			85			95			105			115		
			Entering Indoor Air Temperature - Degrees F, Wet Bulb														
IDB	CFM (BF)		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
80	6750 (0.28)	MBU	183	203	221	183	196	213	177	189	205	171	181	197	165	173	188
		S/T	0.88	0.70	0.52	0.88	0.71	0.53	0.89	0.72	0.54	0.89	0.73	0.55	0.88	0.75	0.55
		kW	12.8	13.2	13.5	14.3	14.7	15.1	15.9	16.2	16.6	17.5	17.9	18.3	19.3	19.6	20.1
	6000 (0.25)	MBU	185	200	218	179	193	210	173	186	203	167	179	194	160	171	186
		S/T	0.86	0.68	0.51	0.87	0.69	0.52	0.88	0.70	0.52	0.88	0.71	0.54	0.89	0.73	0.54
		kW	12.8	13.1	13.5	14.2	14.6	15.0	15.8	16.1	16.6	17.4	17.8	18.2	19.1	19.6	20.0
	5250 (0.23)	MBU	182	197	214	175	190	207	169	183	199	162	176	191	156	168	183
		S/T	0.83	0.66	0.55	0.85	0.67	0.51	0.86	0.68	0.51	0.88	0.69	0.52	0.88	0.70	0.52
		kW	12.7	13.1	13.4	14.1	14.5	14.9	15.7	16.0	16.5	17.2	17.7	18.1	19.0	19.5	19.9

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 - sensible capacity Btuh / (1.10 x cfm)

   t /wb = Wet bulb temp. corresponding to enthalpy of air leaving evaporator coil (h /wb)

   h /wb = h ewb - total capacity Btuh / (4.5 x 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 (F)				
	79	78	77	76	75
	81	82	83	84	85
	Correction Factor				
0.05	1.04	2.07	3.11	4.14	5.18
0.10	0.98	1.96	2.94	3.92	4.91
0.20	0.87	1.74	2.62	3.49	4.36
0.30	0.76	1.53	2.29	3.05	3.82
0.40	0.65	1.31	1.96	2.62	3.27
0.50	0.55	1.09	1.64	2.18	2.73
0.60	0.44	0.87	1.31	1.74	2.18
0.70	0.33	0.65	0.98	1.31	1.64

Correction Factor = 1.10 x (1-BF) x (edb-80)

EXPANDED PERFORMANCE DATA (COOLING) 20 Ton (Gross Capacity)

Airflow			Outdoor Ambient Temperature - Degrees F, Dry Bulb													
			75			85			95			105			115		
			Entering Indoor Air Temperature - Degrees F, Wet Bulb													
IDB	CFM (BF)		62	67	72	62	67	72	62	67	72	62	67	72	62	67	72
80	9000 (0.24)	MBU	250	267	290	243	258	281	235	249	270	228	239	260	220	229	249
		S/T	0.89	0.72	0.53	0.89	0.73	0.54	0.89	0.74	0.55	0.89	0.76	0.56	0.88	0.77	0.57
		kW	15.8	16.1	16.6	17.6	18	18.4	19.5	19.8	20.3	21.6	21.9	22.4	23.9	24.2	24.7
	8000 (0.23)	MBU	241	259	286	237	254	276	229	245	267	221	236	256	213	226	246
		S/T	0.88	0.70	0.52	0.88	0.70	0.53	0.89	0.72	0.53	0.89	0.73	0.54	0.89	0.74	0.55
		kW	15.6	15.9	16.5	17.4	17.8	18.3	19.3	19.8	20.2	21.4	21.8	22.3	23.7	24	24.6
	7000 (0.21)	MBU	238	254	281	231	250	272	223	241	262	215	232	252	207	222	242
		S/T	0.85	0.68	0.51	0.86	0.68	0.51	0.87	0.69	0.52	0.88	0.70	0.52	0.88	0.72	0.53
		kW	15.5	15.9	16.4	17.3	17.7	18.2	19.2	19.6	20.1	21.2	21.7	22.2	23.5	23.9	24.5

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 - sensible capacity Btuh / (1.10 x cfm)

   t /wb = Wet bulb temp. corresponding to enthalpy of air leaving evaporator coil (h /wb)

   h /wb = h ewb - total capacity Btuh / (4.5 x 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 (F)				
	79	78	77	76	75
	81	82	83	84	85
	Correction Factor				
0.05	1.04	2.07	3.11	4.14	5.18
0.10	0.98	1.96	2.94	3.92	4.91
0.20	0.87	1.74	2.62	3.49	4.36
0.30	0.76	1.53	2.29	3.05	3.82
0.40	0.65	1.31	1.96	2.62	3.27
0.50	0.55	1.09	1.64	2.18	2.73
0.60	0.44	0.87	1.31	1.74	2.18
0.70	0.33	0.65	0.98	1.31	1.64

Correction Factor = 1.10 x (1-BF) x (edb-80)

PERFORMANCE DATA

CIRCULATING BLOWER PERFORMANCE - 15 TON UNITS (3.7 HP Standard Motor w/891-1179 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		1.7	
	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W
5250	926	1879	1009	2075	1087	2272	1162	2472	1233	2674	1301	2879	1367	3087	1430	3299
5500	960	2110	1039	2308	1113	2508	1185	2710	1253	2914	1318	3121	1381	3331	1442	3543
5750	995	2358	1070	2558	1141	2761	1209	2965	1274	3172	1337	3380	1400	3589		
6000	1034	2539	1109	2745	1180	2953	1248	3163	1313	3375	1376	3589				
6250	1073	2733	1148	2945	1218	3158	1287	3373	1352	3591	1418	3808				
6500	1109	3024	1180	3238	1248	3454	1315	3669								
6750	1145	3333	1213	3550	1281	3767										

NOTES: 1) Maximum motor Watts is 3775 for standard 3.7 HP motor.
2) Maximum blower wheel speed is 1468 rpm.
3) Motor drive range is 891 to 1179 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.

CIRCULATING BLOWER PERFORMANCE - 20 TON UNITS (7.5 HP Standard Motor w/1002-1225 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		1.7	
	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W
6750	**945**	**3162**	1006	3440	1063	3723	1119	4012	1172	4307	1224	4607	1274	4911	1323	5221
7000	**975**	**3414**	1034	3695	1090	3981	1144	4272	1196	4569	1246	4870	1295	5176	1343	5487
7250	1006	3692	1063	3975	1118	4264	1170	4557	1226	4856	1270	5159	1318	5466	1365	5779
7500	1037	3969	1092	4255	1145	4546	1196	4842	1256	5142	1294	5447	1340	5756	1386	6070
7750	1068	4272	1121	4561	1173	4854	1223	5152	1277	5454	1319	5761	1364	6072	1409	6387
8000	1099	4575	1150	4866	1201	5162	1249	5462	1297	5766	1343	6075	1388	6388	1431	6704
8250	1130	4904	1180	5198	1230	5496	1277	5798	1323	6105	1368	6415	1412	6730	1455	7047

NOTES: 1) Maximum motor Watts is 7915 for standard 7.5 HP motor.
2) Maximum blower wheel speed is 1540 rpm.
3) Motor drive range is 1002-1225 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.

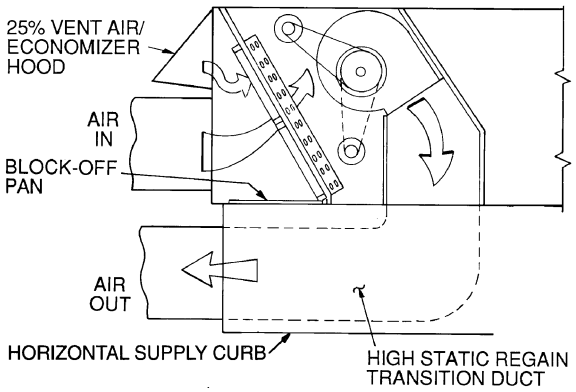
PERFORMANCE DATA (cont.)

GAS HEAT FAN PERFORMANCE LOSS

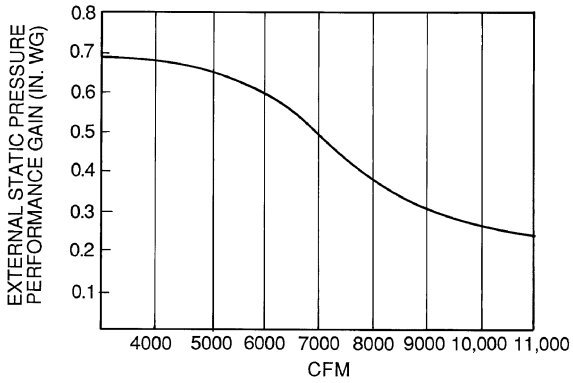
PGS180		
Airflow	Low Heat	High Heat
cfm	in. wg	in. wg
4500	0.16	0.17
4800	0.17	0.19
5100	0.19	0.20
5400	0.20	0.22
5700	0.21	0.24
6000	0.23	0.26
6300	0.24	0.28
6600	0.26	0.30
6900	0.28	0.33
7200	0.29	0.35
7500	0.31	0.37

PGS240		
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 anount shown above.

Evaporator Fan Motor Efficiency

UNIT	MOTOR EFFICIENCY (%)
PGS180 (3.7 Hp)	85.8
PGS240 (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 (EP ACT) effective October 24, 1997.

Altitude Compensation* - PGS180-240

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 ^{3})
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 ^{3}, 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**
PGS180	**4,500**	**7,500**
PGS240	**6,000**	**10,000**

OUTDOOR SOUND POWER

UNIT PGS	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 PGS	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**	****	****	1179	1150	1121	1093	1064	1035	1006	978	949	920	891
180-575v Only**	****	****	1429	1403	1376	**1349**	**1323**	**1296**	**1269**	**1242**	**1215**	**1188**	**1159**
180***	****	****	1559	1522	1488	1455	1422	1389	1356	1323	1289	1256	1227
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, pully cannot be set to this number of turns open.**

Evaporator-Fan Motor Performance

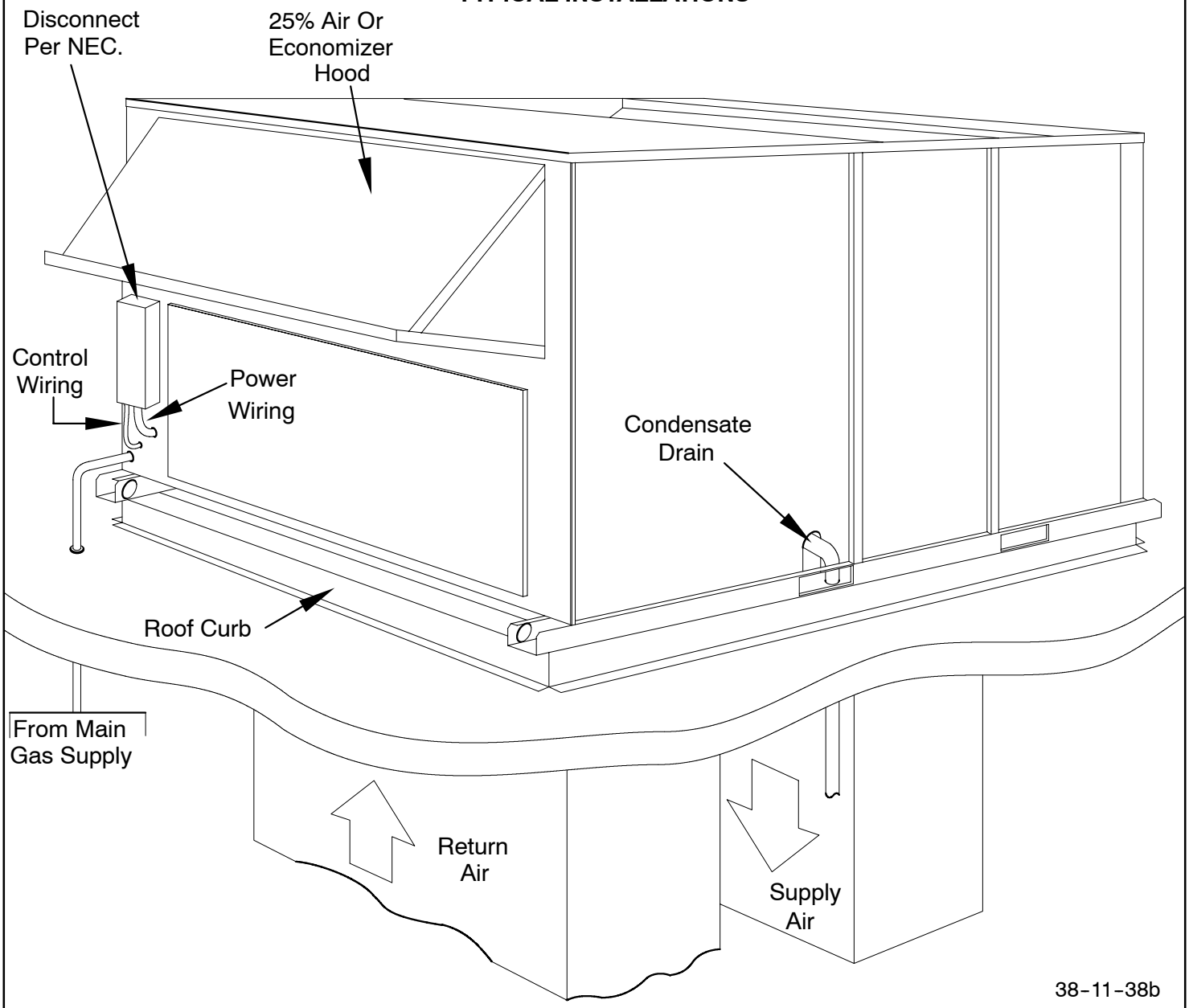
UNIT PGS	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE CONTINUOUS WATTS	MAXIMUM AMP DRAW
180	208/230	4.25	3,775	10.5
	460			4.8
	575	3.45	3,065	3.9
240	208/230	8.70	7,915	22.0
	460	9.50	8,640	13.0
	575	8.70	7,915	10.0

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.

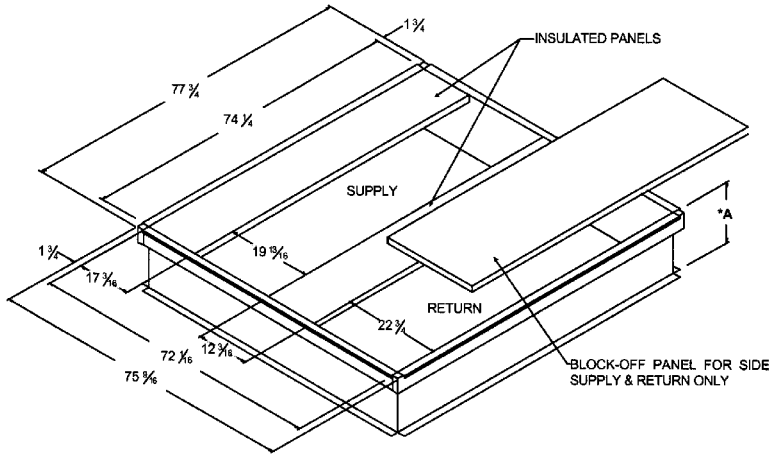
TYPICAL INSTALLATIONS



ACCESSORIES

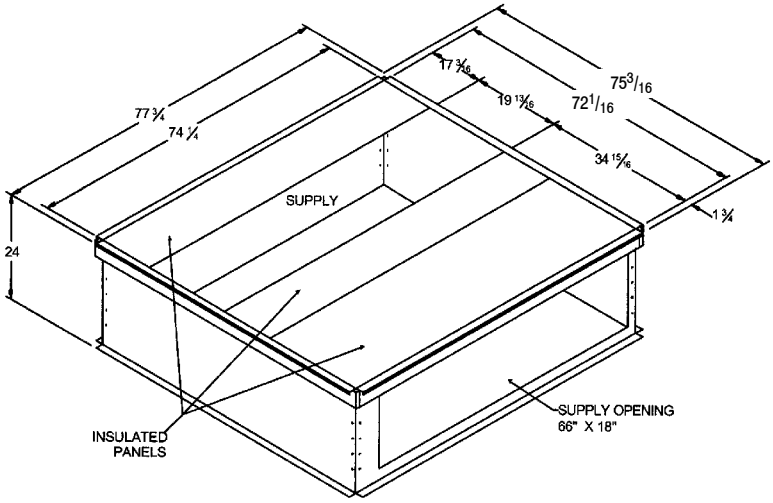
VERTICAL DISCHARGE ROOF CURBS

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



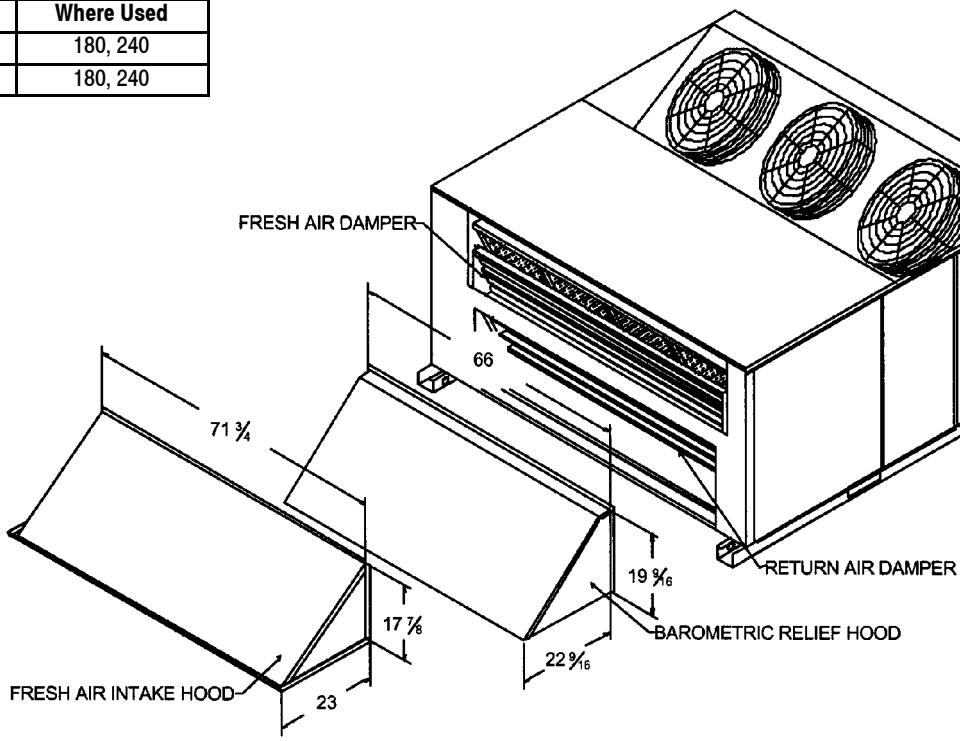
HORIZONTAL DISCHARGE ROOF CURBS

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



ECONOMIZER - HORIZONTAL / DOWNFLOW

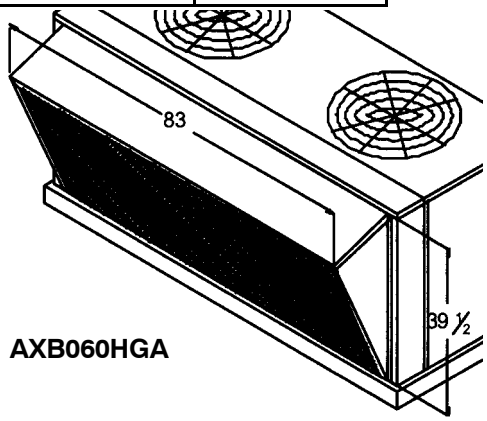
Description	Model Number	Where Used
Fully Modulating	AXB060EMA	180, 240
Three Position	AXB060EPA	180, 240



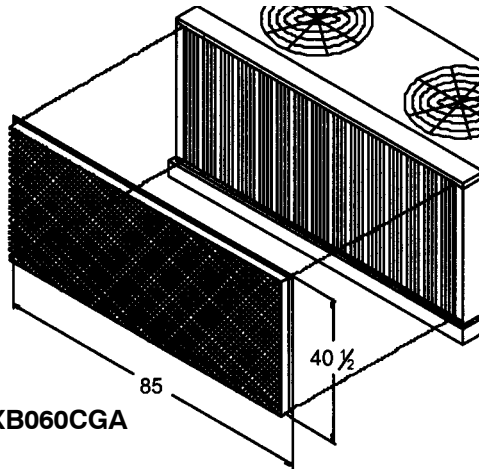
ACCESSORIES (CONT.)

COIL PROTECTION

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



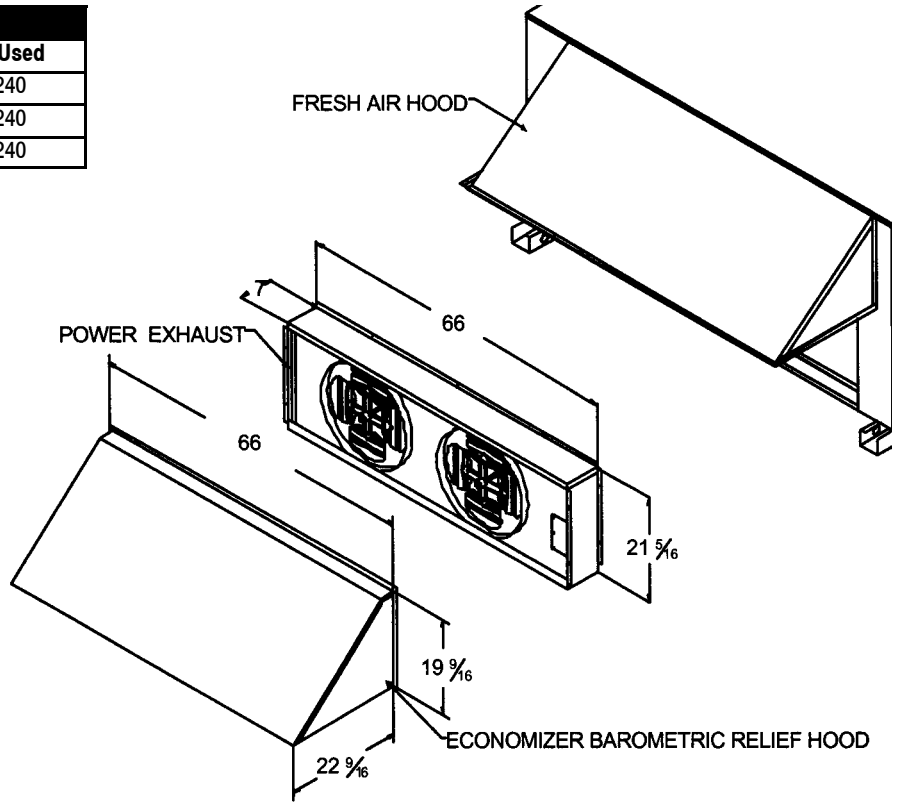
AXB060HGA



AXB060CGA

POWER EXHAUST

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



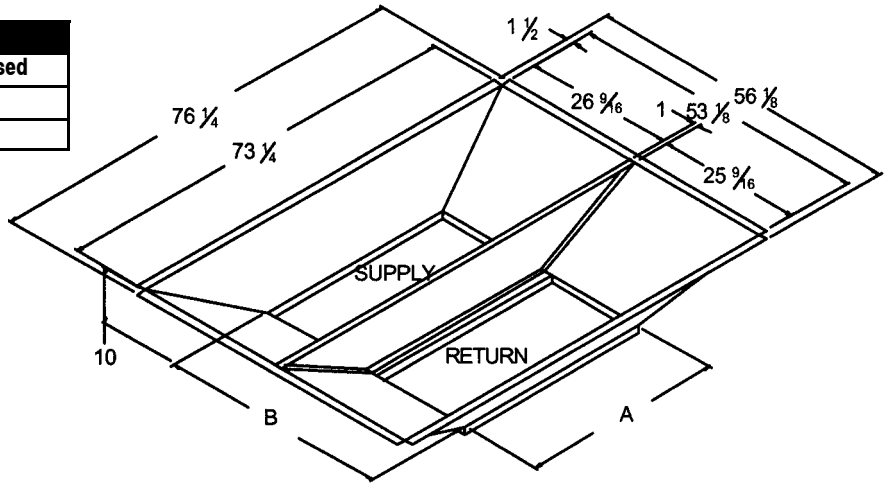
POWER EXHAUST PERFORMANCE DATA

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

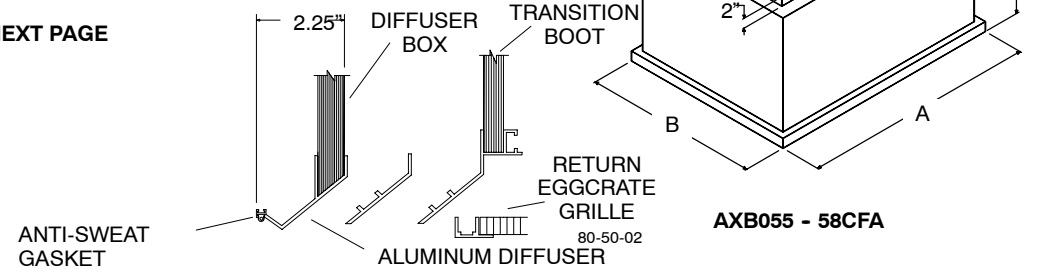
Description	Model Number	Where Used
18" x 36"	AXB160CTA	180
24" x 48"	AXB260CTA	240



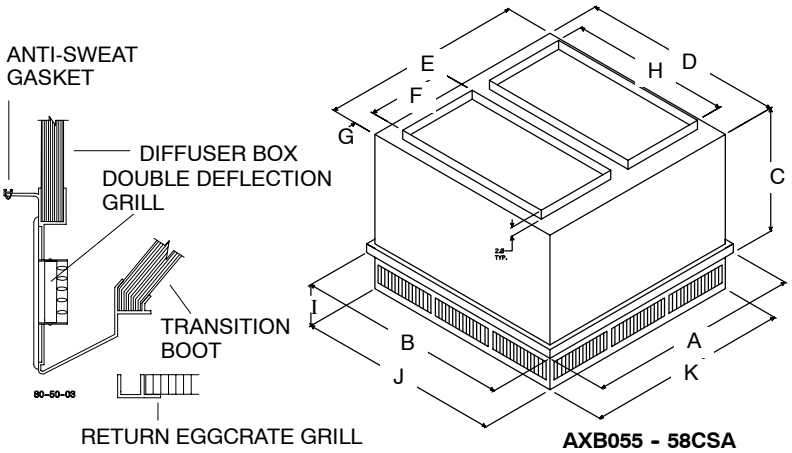
CONCENTRIC DIFFUSER

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



AXB055 - 58CFA



AXB055 - 58CSA

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

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

LOW AMBIENT KIT

Model Number	Used With
AXB160LAA (10°)	180
AXB260LAA (25°)	240

NATURAL TO LP CONVERSION KIT

Model Number	Used With
AXB265LPA	180, 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 PGS180–240 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.

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 buy an electronic spark with flame proving feature and protected by both a limit switch and flame roll-out switch.

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:

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