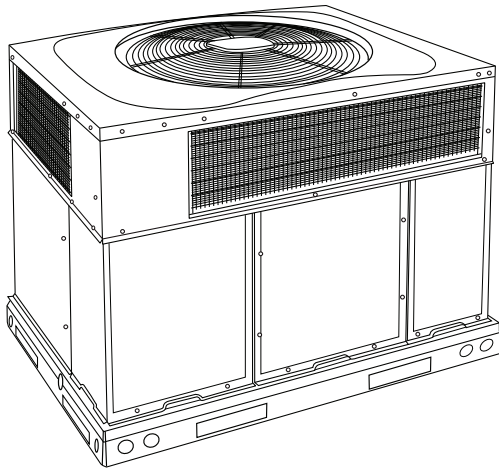


**48VLU-E, 48VLU-F Ultra Low NOx
Comfort™ 14 SEER Single-Packaged Air
Conditioner and Gas Furnace System with Puron®
(R-410A) Refrigerant
Single Phase 2-5 Nominal Tons (Sizes 24-60)
Three Phase 3-5 Nominal Tons (Sizes 36-60)**



Product Data



A170030

Fig. 1 – Unit 48VL

Single-Packaged Products with Energy-Saving Features and Puron® R-410A refrigerant.

- 14.0 SEER
- 11.5 EER
- 81.0% AFUE (Single phase and three phase models)
- ECM Blower Motor-Standard
- Direct Spark Ignition
- Low Sound Levels
- Dehumidification Feature
- Dense Wire Condenser Coil Guard-Standard

Features/Benefits

One-piece heating and cooling units with low sound levels, easy installation, low maintenance, and dependable performance.

Puron is Carrier's unique refrigerant designed to be environmentally balanced. Puron is an HFC refrigerant which does not contain chlorine that can harm the ozone layer. The most important advantage of Puron refrigerant is that it has not been banned in future air conditioning systems as the traditional refrigerant R-22 has been. Puron refrigerant is in service in millions of systems proving highly reliable and is non-ozone depleting.

Easy Installation

Factory-assembled package is a compact, fully self-contained, combination gas heating/electric cooling unit that is prewired, pre-piped, and pre-charged for minimum installation expense. These units are available in a variety of standard and optional heating/ cooling size combinations with voltage options to meet residential and light commercial requirements. Units are lightweight and install easily on a rooftop or at ground level. The high tech composite base eliminates rust problems associated with ground level applications.

Innovative Unit Base Design

On the inside a high-tech composite material will not rust and incorporates a sloped drain pan which improves drainage and helps inhibit mold, algae and bacterial growth. On the outside metal base rails provide added stability as well as easier handling and rigging.

Convertible Duct Configuration

Unit is designed for use in either downflow or horizontal applications. Each unit is converted from horizontal to downflow and includes two horizontal duct covers. Downflow operation is provided in the field to allow vertical ductwork connections. The basepan seals on the bottom openings to ensure a positive seal in the vertical airflow mode.

Efficient operation high-efficiency design offers SEER (Seasonal Energy Efficiency Ratios) of 14.0, 11.5 EER, and AFUE (Annual Fuel Utilization Efficiency) ratings up to 81.0%.

Energy-saving, direct spark ignition saves gas by operating only when the room thermostat calls for heating. Standard units are furnished with natural gas controls.

Ultra Low NOx units meet South Coast Air Quality Management District (SCAQMD) and San Joaquin Air Pollution Control District (SJAPCD) are regulating a reduction of 65%, down to no more than 14ng/J of NOx emissions.

Durable, Dependable Components

Turbo-tubular™ heat exchangers are constructed of stainless steel and aluminized steel for corrosion resistance and optimum heat transfer for improved efficiency. The tubular design permits hot gases to make multiple passes across the path of the supply air.

In addition, dimples located on the heat exchanger walls force the hot gases to stay in close contact with the walls, improving heat transfer.

ECM Blower Motor is standard on all models.

Direct-drive PSC (Permanent Split Capacitor) condenser-fan motors are designed to help reduce energy consumption and provide for cooling operation down to 40°F (4.4°C) outdoor temperature. Motormaster® II low ambient kit is available as a field-installed accessory.

Thermostat Controls

Time Guard® II anti-short cycle protection circuitry. If a non-corporate thermostat without anti-short cycle protection is used the Time Guard II field-installed anti-short cycle kit is recommended.

Refrigerant system is designed to provide dependability. Liquid filter driers are used to promote clean, unrestricted operation. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

High pressure switch provides added reliability for the compressor.

Low pressure switch (24 and 30 size only) provides added reliability for the compressor.

Indoor and outdoor coils are computer-designed for optimum heat transfer and efficiency. The indoor coil is fabricated from copper tube

and aluminum fins and is located inside the unit for protection against damage. The outdoor coil is internally mounted on the top tier of the unit.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 69dBA.

Easy to service cabinets provide easy 3-panel accessibility to serviceable components during maintenance and installation. The basepan with integrated drain pan provides easy ground level installation with mounting pad. A nesting feature ensures a positive basepan to roof curb seal when the unit is roof mounted. A convenient 3/4-in. (19.05 mm) wide perimeter flange makes frame mounting on a rooftop easy.

Standard horizontal metal duct covers with insulation come with the unit and cover the horizontal duct openings. These can be left in place if the units are converted to downflow.

Integrated Gas Control (IGC) board provides safe and efficient control of heating and simplifies trouble-shooting through its built-in diagnostic function.

Cabinets are constructed of heavy duty, phosphated, zinc-coated prepainted steel capable of withstanding 500 hours in salt spray. Interior surfaces of the evaporator/heat exchanger compartment are insulated with cleanable semi-rigid insulation board, which keeps the conditioned air from being affected by the outdoor ambient temperature and provides improved indoor air quality. (Conforms to American Society of Heating, Refrigeration and Air Conditioning Engineers 62.2.) The sloped drain pan minimizes standing water in the drain. An external drain is provided.

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Model Number Nomenclature

48VL	U	E	24	040	3	0	--
Type of Unit 48VL - Single Packaged Air Conditioner and Gas Furnace System						Options GP - Base unit with tin plated indoor coil hairpins and stainless steel HX TP - Base unit with tin plated indoor coil hairpins (Single Phase Only)	
Low NOx Indicator - Standard N - Low NOx U - Ultra Low NOx						See Price Page for full list of factory options. (Only used if ordering an option.)	
Major Series						Minor Series	
Nominal Cooling Capacity 024 - 2.0 Tons 030 - 2.5 Tons 036 - 3.0 Tons 042 - 3.5 Tons 048 - 4.0 Tons 060 - 5.0 Tons						Electrical Supply 3 - 208/230-1-60 5 - 208/230-3-60	
						Nominal Heat Input Size (Btuh) 040 - 45,000 060 - 60,000 090 - 89,000	



Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahridirectory.org.

GAS-FIRED



AHRI* Capacities

Cooling Capacities and Efficiencies

Unit Size	Nominal Tons	Standard CFM	Cooling Capacity†	EER‡	SEER**
24	2	800	23000	11.5	14.0
30	2.5	1000	28600	11.5	14.0
36	3	1150	34800	11.5	14.0
42	3.5	1350	40000	11.5	14.0
48	4	1550	46000	11.5	14.0
60	5	1750	56000	11.5	14.0

*. Air Conditioning, Heating & Refrigeration Institute.

†. Rated in accordance with U.S. Government DOE Department of Energy) test procedures and/or AHRI Standards 210/240.

‡. At "A" conditions-80°F (26.7°C) indoor db/67°F (19.4°C) indoor wb & 95°F (35°C) outdoor db.

** . Rated in accordance with AHRI Standard 270.

Notes:

1. Ratings are net values, reflecting the effects of circulating fan heat.

Ratings are based on:

Cooling Standard: 80°F (26.7°C) db, 67°F wb (19.4°C) indoor entering-air temperature and 95°F db (35°C) outdoor entering-air temperature.

2. Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.

LEGEND

dB-Sound Levels (decibels)

db—Dry Bulb

SEER—Seasonal Energy Efficiency Ratio

wb—Wet Bulb

COP-Coefficient of Performance

Gas Heating Capacities and Efficiencies, Single and Three Phase Models

Unit Size	Heating Input (Btuh)	Output Capacity (Btuh)	Temperature Rise Range °F (°C)	AFUE (%)
24040 30040	45,000	37,000	25-55 (14-31)	81.0
24060 30060 36060 42060	60,000	49,000	25-55 (14-31)	81.0
42090 48090 60090	89,000	73,000	35-65 (19-36)	81.0

LEGEND

AFUE—Annual Fuel Utilization Efficiency

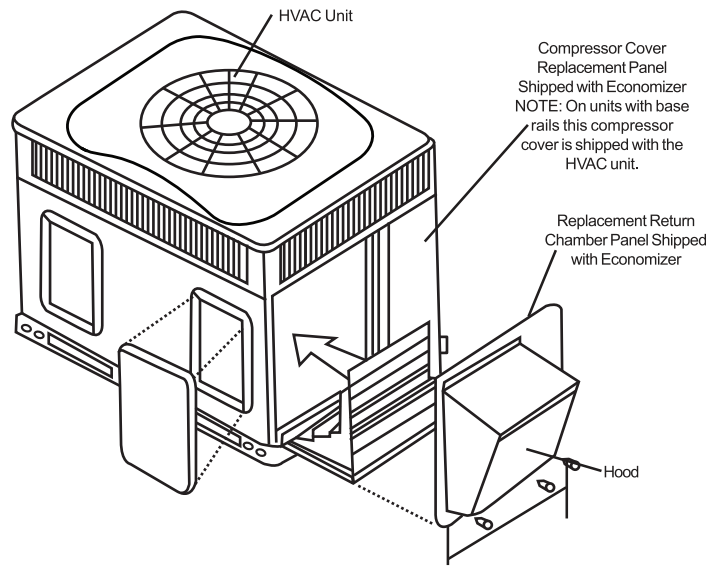
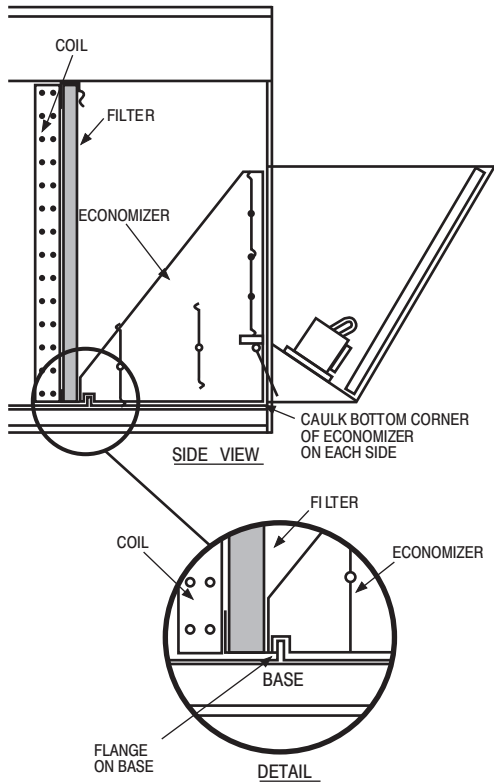
NOTE: Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.

A-Weighted Sound Power Level

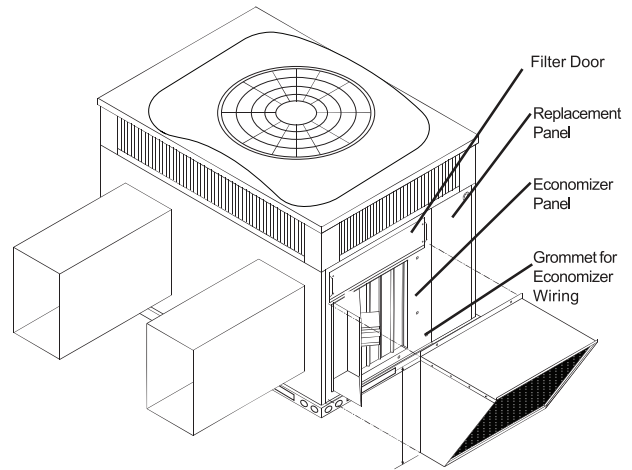
Unit Size	Sound Rating (dBA)	Typical Octave Band Spectrum (dB without tone adjustment)						
		125	250	500	1000	2000	4000	8000
24	69	71.5	71.0	64.0	61.3	60.0	57.6	49.0
30	72	76.3	70.5	67.8	64.4	63.8	61.4	54.3
36	72	74.5	71.7	68.9	68.0	62.6	57.9	52.5
42	72	73.0	71.1	68.9	68.4	62.6	57.6	53.2
48	72	75.4	70.7	68.9	67.4	62.6	59.9	56.7
60	72	81.3	72.6	68.2	65.4	62.9	59.0	54.4

NOTE: Tested in accordance with AHRI Standard 270-2008 (not listed in AHRI).

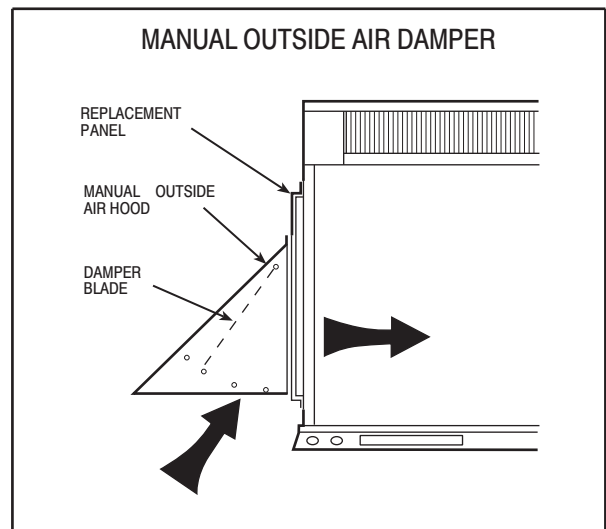
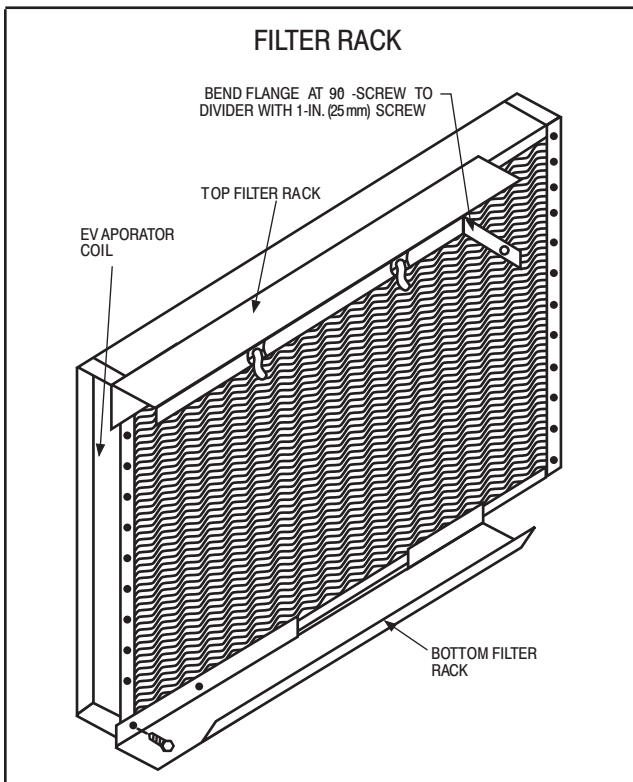
ECONOMIZER



Vertical Economizer



Horizontal Economizer



Physical Data

Unit Size	24040	24060	30040	30060	36060	42060	42090	48090	60090
NOMINAL CAPACITY (ton)	2	2	2-1/2	2-1/2	3	3-1/2	3-1/2	4	5
SHIPPING WEIGHT lb.	329	329	361	361	390	455	455	480	497
SHIPPING WEIGHT (kg)	149	149	164	164	177	206	206	218	225
COMPRESSOR / QUANTITY	Rotary / 1				Scroll / 1				
REFRIGERANT (R-410A)									
Quantity lb.	5.3	5.3	6.0	6.0	8.2	6.2	6.2	9.2	9.8
Quantity (kg)	2.4	2.4	2.7	2.72	3.7	2.8	2.8	4.2	4.4
REFRIGERANT METERING DEVICE	Orifice	Orifice			TXV	Orifice			
ORIFICE ID in. / mm	.059 / 1.5	.059 / 1.5	.063 / 1.60	.061 / 1.55	N/A	.073 / 1.85		.080 / 2.03	.084 / 2.14
OUTDOOR COIL									
Rows...Fins/in.	1...21	1...21	1...21	1...21	1...21	1...21	1...21	1...21	1...21
Face Area (sq ft)	11.9	11.9	13.6	13.6	18.8	13.6	13.6	21.4	23.3
OUTDOOR FAN									
Nominal CFM	2500	2500	2700	2700	3200	3600	3600	3600	4200
Diameter in.	24	24	24	24	24	26	26	26	26
Diameter (mm)	609.6	609.6	609.6	609.6	609.6	660.4	660.4	660.4	660.4
Motor Hp (Rpm)	1/10 (810)	1/10 (810)	1/10 (810)	1/10 (810)	1/5 (810)	1/5 (810)	1/5 (810)	1/5 (810)	1/5 (810)
INDOOR COIL									
Rows...Fins/in.	3...17	3...17	3...17	3...17	3...17	3...17	3...17	3...17	3...17
Face Area (sq ft)	3.7	3.7	3.7	3.7	3.7	4.7	4.7	4.7	5.6
INDOOR BLOWER									
Nominal Cooling Airflow (Cfm)	800	800	1000	1000	1150	1350	1350	1550	1750
Size in.	10x10	10x10	10x10	10x10	11x10	11x10	11x10	11x10	11x10
Size (mm.)	254x254	254x254	254x254	254x254	279.4x254	279.4x254	279.4x254	279.4x254	279.4x254
Motor HP (RPM)	1/2 (1050)	1/2 (1050)	1/2 (1050)	1/2 (1050)	3/4 (1000)	1/2 (1050)	1/2 (1050)	1.0 (1075)	1.0 (1040)
FURNACE SECTION*									
Burner Orifice No. (Qty...Drill Size)									
1 & 3 Phase Ultra Low NOx- Natural Gas (Factory Installed)	1...0.125" size	1...#28	1...0.125" size	1...#28	1...#28	1...#28	1...#18	1...#18	1...#18
HIGH-PRESSURE SWITCH (psig) Cut-out Reset (Auto)	650 +/- 15 420 +/- 25	650 +/- 15 420 +/- 25							
LOSS-OF-CHARGE / LOW-PRESSURE SWITCH (Liquid Line) (psig) cut-out Reset (auto)	50 +/- 7 95 +/- 7	20 +/- 5 45 +/- 10						N/A	
RETURN-AIR FILTERS†									
Throwaway Size in (mm)	2 each 20x12x1 508x305x25		2 each 20x12x1 508x305x25			1 each 24x14x1 610x356x25 24x15x1 610x406x25		1 each 24x16x1 (in.) 610x406x25 (mm) 24x18x1 (in.) 610x457x25 (mm)	

*. Based on altitude of 0 to 2000 ft (0-610m)

†. Required filter sizes shown are based on the larger of the AHRI (Air Conditioning Heating and Refrigeration Institute) rated cooling airflow or the heating airflow velocity of 300 to 350 ft/minute for throwaway type. Air filter pressure drop for non-standard filters must not exceed 0.08 IN. W.C.

If using accessory filter rack refer to the filter rack installation instructions for correct filter sizes and quantity.

N/A= Not Available

Unit Dimensions

42-60

UNIT	ELECTRICAL CHARACTERISTICS		UNIT WT. LB. KG.	UNIT HEIGHT IN/MM	CENTER OF GRAVITY IN/MM		
	VOLTS	AMPS			A	X	Z
48VLC-7N/0/E42/060/090/13/5/10	208/230	11/13/16	413	1137	22-13/16	519.4	18
48VLC-7N/0/E48/090/115/7/30/13/5/10	208/230	11/13/16	488	1340	22-13/16	519.4	18
48VLC-7N/0/E60/090/115/7/30/13/5/10	208/230	11/13/16	455	1391	22-13/16	519.4	18

UNIT	CORNER WEIGHTS, LB/KG		
	11"	22"	33"
42	208/230	62.0	28.1
48	208/230	65.7	29.8
60	208/230	68.3	31.0

REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

TOP OF UNIT.....14 (355.6)
 DUCT SIDE OF UNIT.....2 (50.8)
 SIDE OPPOSITE DUCTS.....14 (355.6)
 SIDE OPPOSITE UNIT.....14 (355.6)
 FUELS PANEL.....36 (914.4)

REQ. REQUIRED CLEARANCES:

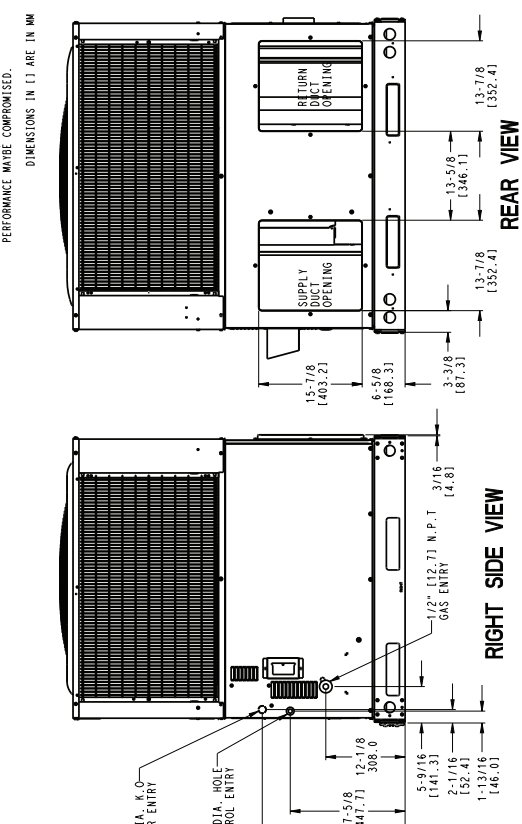
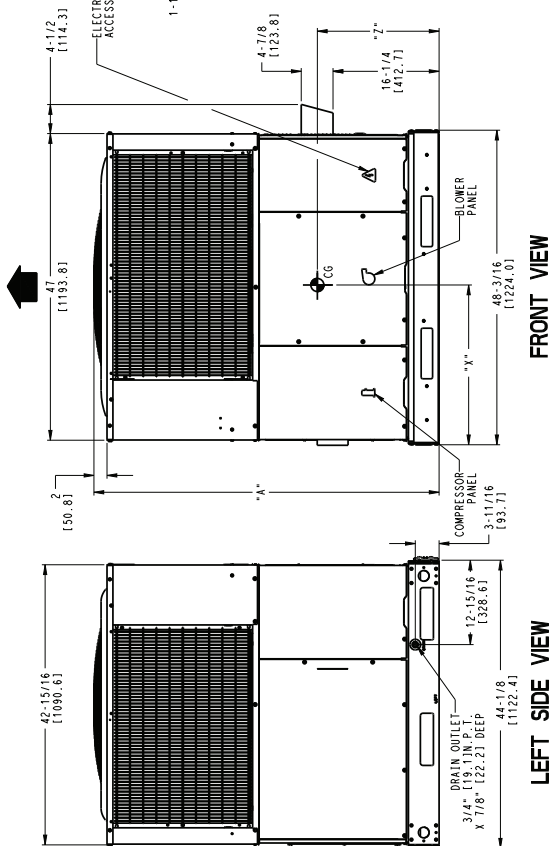
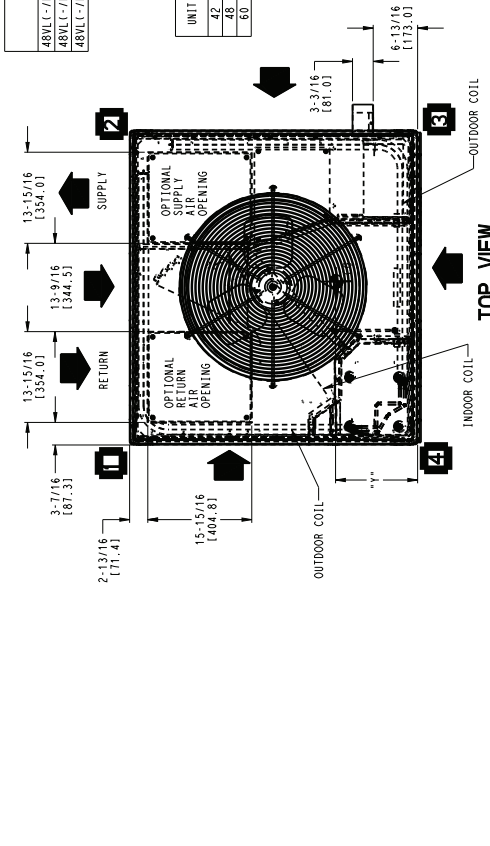
BETWEEN UNITS, POWER ENTRY SIDE.....42 (1066.8)
 UNIT AND UNGROUND SURFACES POWER ENTRY SIDE.....36 (914.0)
 UNIT AND UNGROUND SURFACES POWER ENTRY SIDE AND OTHER GROUND SURFACES, POWER ENTRY SIDE.....42 (1066.8)

REQUIRED CLEARANCE FOR OPERATION AND SERVICE

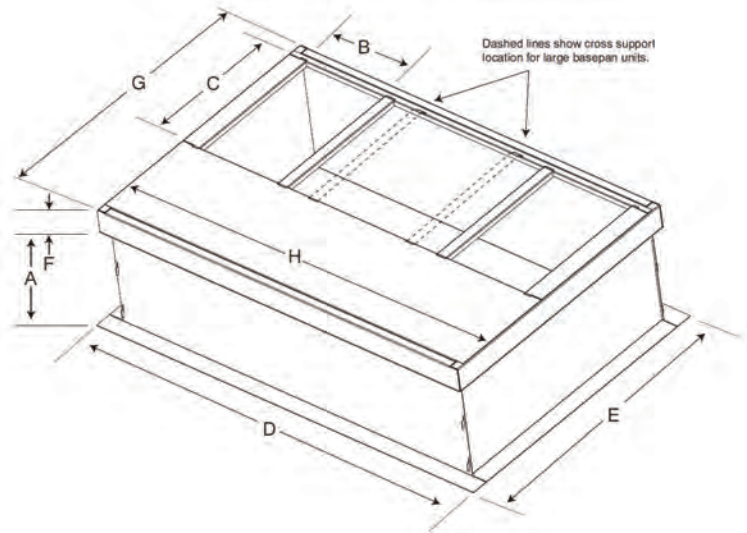
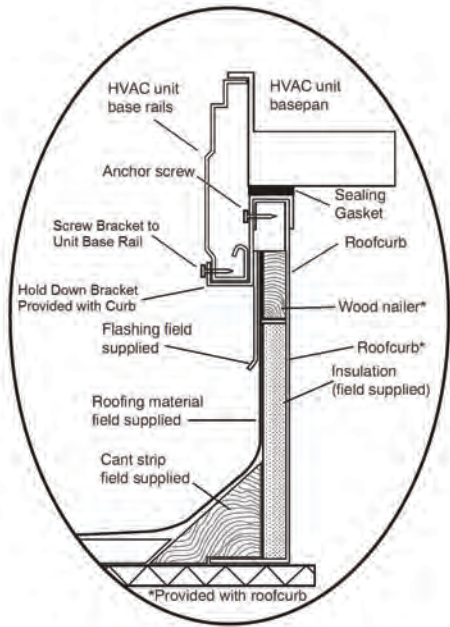
EWAP COIL ACCESS SIDE.....36 (914.0)
 POWER ENTRY SIDE.....42 (1066.8)
 (EXCEPT FOR NEC REQUIREMENTS)
 SIDE OPPOSITE DUCTS.....48 (1219.2)
 SIDE OPPOSITE UNIT.....36 (914.0)
 DUCT PANEL.....12 (304.8)

MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 12 (304.8) FROM WALL SYSTEM THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

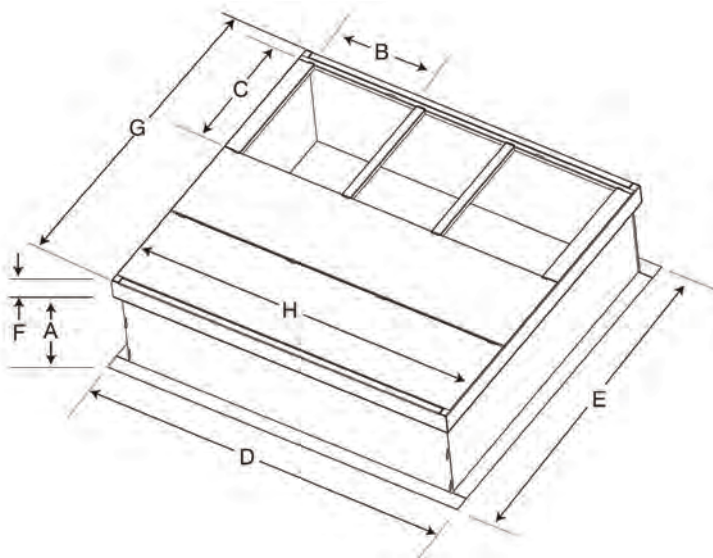
DIMENSIONS IN () ARE IN MM.



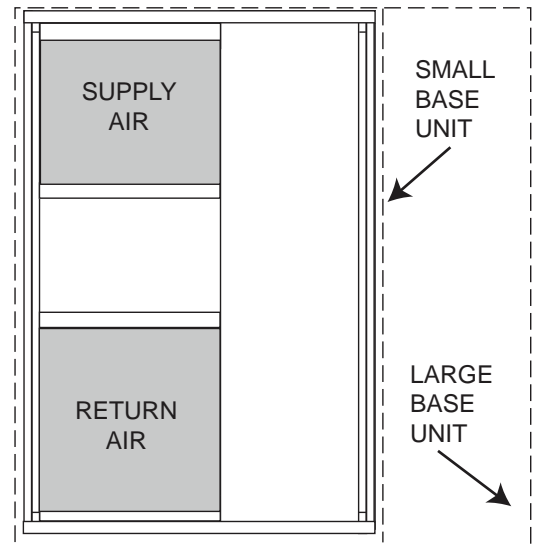
344802-4
A



SMALL/COMMON CURB



LARGE CURB



UNIT PLACEMENT ON COMMON CURB

SMALL OR LARGE BASE UNIT

A180216

Accessory Dimensions

Unit Size	Catalog Number	A IN. (mm)	B (small / common base) IN. (mm)*	B (large base) IN. (mm)*	C IN. (mm)	D IN. (mm)	E IN. (mm)	F IN. (mm)	G IN. (mm)	H IN. (mm)
Small or Large	CPRFCURB011B00	14 (356)	10 (254)	14 (356)	16 (406)	47.8 (1214)	32.4 (822)	2.7 (69)	30.6 (778)	46.1 (1170)
Large	CPRFCURB013B00	14 (356)	14 (356)				43.9 (1116)		42.2 (1072)	

* Part Number CPRFCURB011B00 can be used on both small and large basepan units. The cross supports must be located based on whether the unit is a small basepan or a large basepan.
NOTES:

1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied, as required, to unit being installed.
3. Roof curb is made of 16-gauge steel.
4. Attach ductwork to curb (flanges of duct rest on curb).
5. Insulated panels: 1-in. (25.4 mm) thick fiberglass 1 lb. density.

Selection Procedure (With Example)

DETERMINE COOLING AND HEATING REQUIREMENTS AT DESIGN CONDITIONS:

Given:

Required Cooling Capacity (TC).....	34,000 Btuh
Sensible Heat Capacity (SHC).....	25,000 Btuh
Required Heating Capacity.....	60,000 Btuh
Condenser Entering Air Temperature	95°F (35°C)
Indoor-Air Temperature	80°F (26°C) edb 67°F (19°C) ewb
Evaporator Air Quantity.....	1200 CFM
External Static Pressure	0.100 IN. W.C.
Electrical Characteristics	208-1-60

SELECT UNIT BASED ON REQUIRED COOLING CAPACITY

Enter Net Cooling Capacities table at condenser entering temperature of 95°F (35°C). Unit 036 at 1200 CFM and 67°F (19°C) ewb (entering wet bulb) will provide a total capacity of 34,200 Btuh and a SHC of 27,400 Btuh. Calculate SHC correction, if required, using Note 4 under Cooling Capacities tables.

SELECT HEATING CAPACITY OF UNIT TO PROVIDE DESIGN CONDITION REQUIREMENT.

In the Heating Capacities and Efficiencies table, note that the single phase unit 036090 will provide 73,000 Btuh with an input of 90,000 Btuh.

DETERMINE FAN SPEED AND POWER REQUIREMENTS AT DESIGN CONDITIONS.

Before entering the air delivery tables, calculate the total static pressure required. From the given example, the Wet Coil Pressure Drop Table, and the Filter Pressure Drop Table:

External Static Pressure	0.100 IN. W.C
Filter	0.07 IN. W.C
Wet Coil Pressure Drop	<u>0.180 IN. W.C</u>
Total Static Pressure	0.287 IN. W.C

Enter the table for Dry Coil Air Delivery—Horizontal and Downflow Discharge. At 0.287 IN. W.C. ESP, the closest speed to 1200 CFM is Med-Low (pink wire), which delivers 1213 CFM at .3 in ESP.

SELECT UNIT THAT CORRESPONDS TO POWER SOURCE AVAILABLE.

The Electrical Data Table shows that the unit is designed to operate at 208-1-60.

Performance Data

24 Size

Evaporator Air		Condenser Entering Air Temperatures °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F(°C)	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
700	57 (13.8)	23.62	23.62	1.55	21.90	21.90	1.75	20.07	20.07	1.95	17.88	17.88	2.14	15.87	15.87	2.38	14.01	14.01	2.64
	62 (16.6)	24.47	21.38	1.56	22.45	20.24	1.75	20.32	19.02	1.96	17.92	17.92	2.14	15.90	15.90	2.38	14.03	14.03	2.64
	63* (17.2)	24.99	17.43	1.56	22.88	16.39	1.76	20.71	15.32	1.96	18.05	14.06	2.15	15.56	12.87	2.36	13.28	11.77	2.61
	67 (19.4)	27.02	18.13	1.55	24.79	17.09	1.76	22.51	16.03	1.98	19.92	14.86	2.20	17.28	13.67	2.42	14.91	12.59	2.67
	72 (22.2)	29.59	14.70	1.55	27.20	13.77	1.76	24.84	12.86	1.99	22.48	11.95	2.24	19.68	10.89	2.51	17.14	9.92	2.77
800	57 (13.8)	24.74	24.74	1.57	22.92	22.92	1.77	21.02	21.02	1.99	18.78	18.78	2.19	16.65	16.65	2.42	14.70	14.70	2.69
	62 (16.6)	25.14	23.06	1.57	23.07	21.80	1.78	21.05	21.05	1.99	18.81	18.81	2.19	16.68	16.68	2.42	14.72	14.72	2.69
	63* (17.2)	25.59	18.60	1.57	23.43	17.53	1.77	21.18	16.43	1.99	18.51	15.14	2.18	15.93	13.90	2.39	13.61	12.73	2.64
	67 (19.4)	27.63	19.36	1.56	25.32	18.28	1.77	23.00	17.20	2.00	20.41	16.03	2.24	17.67	14.78	2.45	15.25	13.64	2.71
	72 (22.2)	30.16	15.42	1.56	27.69	14.48	1.77	25.27	13.55	2.01	22.88	12.64	2.26	20.12	11.62	2.53	17.47	10.60	2.80
900	57 (13.8)	25.69	25.69	1.58	23.77	23.77	1.79	21.80	21.80	2.01	19.55	19.55	2.23	17.32	17.32	2.46	15.29	15.29	2.73
	62 (16.6)	25.74	25.74	1.58	23.81	23.81	1.79	21.84	21.84	2.01	19.58	19.58	2.23	17.35	17.35	2.46	15.31	15.31	2.73
	63* (17.2)	26.07	19.72	1.58	23.84	18.62	1.79	21.55	17.49	2.01	18.84	16.17	2.20	16.24	14.87	2.42	13.92	13.92	2.67
	67 (19.4)	28.08	20.52	1.58	25.72	19.42	1.79	23.37	18.31	2.02	20.82	17.17	2.26	17.98	15.84	2.48	15.54	14.63	2.74
	72 (22.2)	30.58	16.10	1.58	28.07	15.15	1.79	25.58	14.21	2.02	23.17	13.29	2.28	20.45	12.30	2.56	17.73	11.25	2.83

Performance Data
30 Size

Evaporator Air		Condenser Entering Air Temperatures °F (°C)														
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)		
CFM	EWB °F(°C)	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
875	57 (13.9)	27.39	27.39	1.98	26.29	26.29	2.20	25.01	25.01	2.44	23.52	23.52	2.69	21.57	21.57	2.94
	62 (16.7)	28.22	26.10	1.99	26.84	25.48	2.20	25.28	24.73	2.45	23.38	23.38	2.68	21.59	21.59	2.94
	63* (17.2)	28.70	21.18	1.99	27.33	20.58	2.20	25.77	19.89	2.45	23.74	19.00	2.69	21.18	17.90	2.93
	67 (19.4)	30.96	21.97	2.00	29.59	21.44	2.22	28.06	20.82	2.46	26.21	20.08	2.74	23.74	19.09	3.02
	71 (21.7)	33.22	18.60	2.02	31.86	18.10	2.24	30.33	17.53	2.48	28.62	16.90	2.76	26.55	16.13	3.08
1000	57 (13.9)	28.61	28.61	2.01	27.47	27.47	2.22	26.20	26.20	2.47	24.68	24.68	2.75	22.66	22.66	3.00
	62 (16.7)	28.93	28.00	2.01	27.59	27.35	2.23	26.34	26.18	2.47	24.72	24.72	2.75	22.70	22.70	3.00
	63* (17.2)	29.30	22.46	2.01	27.91	21.89	2.23	26.32	21.22	2.47	24.35	20.38	2.73	21.72	19.26	2.97
	67 (19.4)	31.55	23.29	2.03	30.16	22.79	2.24	28.60	22.20	2.49	26.76	21.49	2.77	24.30	20.55	3.06
	71 (21.7)	33.80	19.48	2.05	32.41	19.01	2.26	30.84	18.46	2.51	29.10	17.84	2.79	27.04	17.11	3.11
1125	57 (13.9)	29.58	29.58	2.03	28.44	28.44	2.25	27.15	27.15	2.50	25.62	25.62	2.78	23.61	23.61	3.06
	62 (16.7)	29.56	29.56	2.03	28.82	27.88	2.25	27.19	27.19	2.50	25.66	25.66	2.78	23.65	23.65	3.06
	63* (17.2)	29.76	23.65	2.04	28.33	23.11	2.25	26.76	22.46	2.50	24.80	21.66	2.77	22.16	20.54	3.01
	67 (19.4)	31.99	24.51	2.05	30.58	24.06	2.27	29.00	23.49	2.51	27.19	22.82	2.79	24.77	21.94	3.11
	71 (21.7)	34.23	20.29	2.07	32.81	19.85	2.29	31.24	19.31	2.54	29.45	18.71	2.82	27.39	18.01	3.13

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Performance Data
36 Size

Evaporator Air		Condenser Entering Air Temperatures °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F(°C)	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
1000	57 (13.8)	34.58	34.58	2.40	32.46	32.46	2.66	30.31	30.31	2.94	28.08	28.08	3.27	25.78	25.78	3.65	23.44	23.44	4.08
	62 (16.6)	36.10	31.44	2.41	33.65	29.92	2.67	31.16	28.38	2.95	28.62	26.75	3.27	26.05	25.03	3.65	23.48	23.48	4.08
	63* (17.2)	36.53	25.60	2.42	34.01	24.25	2.67	31.48	22.90	2.95	28.86	21.49	3.28	26.20	20.05	3.65	23.49	18.58	4.08
	67 (19.4)	39.44	26.70	2.43	36.74	25.34	2.69	34.00	23.95	2.97	31.20	22.53	3.30	28.34	21.07	3.67	25.45	19.58	4.09
	72 (22.2)	43.05	21.95	2.46	40.11	20.71	2.72	37.12	19.45	3.00	34.07	18.16	3.32	30.95	16.85	3.69	27.81	15.51	4.11
1150	57 (13.8)	36.19	36.19	2.46	33.98	33.98	2.71	31.67	31.67	3.00	29.30	29.30	3.32	26.84	26.84	3.70	24.34	24.34	4.12
	62 (16.6)	37.15	33.84	2.46	34.60	32.19	2.72	32.03	30.46	3.00	29.42	29.41	3.32	26.90	26.90	3.70	24.38	24.38	4.12
	63* (17.2)	37.52	27.28	2.47	34.89	25.86	2.72	32.23	24.43	3.01	29.50	22.95	3.33	26.72	21.43	3.70	23.92	19.88	4.12
	67 (19.4)	40.47	28.51	2.48	37.67	27.07	2.74	34.80	25.60	3.03	31.88	24.11	3.35	28.91	22.56	3.72	25.90	20.99	4.14
	72 (22.2)	44.12	23.06	2.51	41.04	21.76	2.77	37.93	20.44	3.06	34.77	19.10	3.38	31.54	17.73	3.74	28.28	16.32	4.16
1300	57 (13.8)	37.56	37.56	2.51	35.24	35.24	2.77	32.79	32.79	3.05	30.30	30.30	3.38	27.71	27.71	3.75	25.08	25.08	4.17
	62 (16.6)	38.06	35.99	2.51	35.47	34.14	2.77	32.84	32.84	3.05	30.34	30.34	3.38	27.75	27.75	3.75	25.12	25.12	4.17
	63* (17.2)	38.23	28.87	2.51	35.57	27.41	2.77	32.80	25.90	3.05	29.99	24.35	3.38	27.14	22.76	3.75	24.25	21.11	4.17
	67 (19.4)	41.26	30.24	2.53	38.33	28.73	2.79	35.38	27.20	3.08	32.36	25.62	3.40	29.31	24.01	3.76	26.22	22.34	4.18
	72 (22.2)	44.94	24.09	2.56	41.77	22.75	2.82	38.55	21.38	3.11	35.28	19.98	3.43	31.96	18.56	3.79	28.62	17.10	4.21

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Performance Data

42 Size

Evaporator Air		Condenser Entering Air Temperatures °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F(°C)	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
1175	57 (13.8)	38.66	38.66	2.51	36.66	36.66	2.87	34.60	34.60	3.30	32.45	32.45	3.80	30.07	30.07	4.39	27.19	27.19	5.02
	62 (16.6)	40.29	35.16	2.54	37.87	33.90	2.90	35.39	32.59	3.32	32.82	31.18	3.82	30.12	30.12	4.39	27.24	27.24	5.03
	63* (17.2)	41.08	28.70	2.54	38.62	27.55	2.92	36.06	26.34	3.34	33.40	25.10	3.84	30.40	23.73	4.40	26.65	22.06	4.98
	67 (19.4)	44.34	29.79	2.59	41.80	28.66	2.97	39.16	27.52	3.42	36.41	26.33	3.95	33.45	25.06	4.57	29.97	23.59	5.21
	72 (22.2)	48.52	24.17	2.66	45.92	23.18	3.05	43.20	22.16	3.52	40.37	21.10	4.06	37.44	20.00	4.70	34.27	18.84	5.44
1350	57 (13.8)	40.50	40.50	2.58	38.39	38.39	2.95	36.24	36.24	3.40	34.01	34.01	3.92	31.54	31.54	4.51	28.67	28.67	5.17
	62 (16.6)	41.38	37.85	2.59	38.93	36.52	2.96	36.44	36.11	3.41	34.06	34.06	3.92	31.59	31.59	4.52	28.72	28.72	5.17
	63* (17.2)	42.06	30.61	2.60	39.52	29.42	2.97	36.90	28.24	3.41	34.16	26.96	3.92	31.10	25.56	4.49	27.35	23.86	5.08
	67 (19.4)	45.33	31.78	2.64	42.72	30.67	3.03	40.00	29.50	3.48	37.18	28.29	4.01	34.18	27.02	4.64	30.76	25.56	5.32
	72 (22.2)	49.45	25.33	2.72	46.79	24.36	3.12	44.00	23.33	3.58	41.11	22.27	4.13	38.09	21.17	4.78	34.91	20.01	5.52
1525	57 (13.8)	41.99	41.99	2.63	39.82	39.82	3.02	37.59	37.59	3.47	35.28	35.28	4.01	32.78	32.78	4.63	29.92	29.92	5.31
	62 (16.6)	42.32	40.26	2.64	39.90	39.90	3.02	37.64	37.64	3.47	35.33	35.33	4.01	32.82	32.82	4.64	29.97	29.97	5.31
	63* (17.2)	42.81	32.42	2.65	40.22	31.23	3.02	37.53	30.01	3.47	34.76	28.74	3.99	31.66	27.29	4.56	27.97	25.57	5.17
	67 (19.4)	46.08	33.66	2.70	43.40	32.57	3.08	40.64	31.35	3.54	37.75	30.14	4.07	34.73	28.86	4.70	31.38	27.42	5.42
	72 (22.2)	50.14	26.41	2.78	47.44	25.44	3.18	44.60	24.44	3.64	41.64	23.37	4.20	38.57	22.27	4.85	35.35	21.11	5.59

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Performance Data

48 Size

Evaporator Air		Condenser Entering Air Temperatures °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F(°C)	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
1400	57 (13.8)	45.45	45.45	3.10	42.83	42.83	3.46	40.16	40.16	3.89	37.26	37.26	4.36	33.52	33.52	4.82	29.80	29.80	5.37
	62 (16.6)	47.27	42.17	3.13	44.15	40.29	3.49	41.03	38.39	3.91	37.61	36.29	4.36	33.57	33.57	4.83	29.84	29.84	5.37
	63* (17.2)	48.20	34.32	3.13	45.02	32.66	3.50	41.76	30.98	3.92	38.24	29.20	4.38	33.54	26.93	4.82	28.81	24.65	5.33
	67 (19.4)	52.06	35.63	3.15	48.74	34.02	3.52	45.33	32.35	3.95	41.77	30.64	4.44	37.35	28.63	4.96	32.39	26.38	5.46
	72 (22.2)	56.98	28.79	3.18	53.50	27.36	3.56	49.89	25.89	3.99	46.16	24.36	4.48	42.23	22.80	5.04	37.37	21.00	5.64
1550	57 (13.8)	47.02	47.02	3.17	44.27	44.27	3.54	41.50	41.50	3.96	38.53	38.53	4.44	34.79	34.79	4.92	30.91	30.91	5.46
	62 (16.6)	48.16	44.46	3.17	45.01	42.51	3.55	41.85	40.45	3.97	38.60	38.60	4.44	34.83	34.83	4.92	30.95	30.95	5.46
	63* (17.2)	49.02	35.96	3.18	45.75	34.27	3.55	42.41	32.55	3.98	38.87	30.75	4.45	34.15	28.45	4.89	29.32	26.09	5.40
	67 (19.4)	52.88	37.35	3.20	49.49	35.71	3.57	46.00	34.00	4.00	42.38	32.25	4.49	38.03	30.31	5.04	32.93	27.95	5.53
	72 (22.2)	57.73	29.76	3.23	54.20	28.31	3.61	50.51	26.84	4.04	46.68	25.28	4.53	42.70	23.71	5.09	37.92	21.96	5.70
1800	57 (13.8)	49.14	49.14	3.25	46.25	46.25	3.63	43.34	43.34	4.06	40.29	40.29	4.55	36.55	36.55	5.07	32.46	32.46	5.60
	62 (16.6)	49.49	47.88	3.25	46.34	46.34	3.63	43.39	43.39	4.06	40.34	40.34	4.55	36.60	36.60	5.07	32.49	32.49	5.61
	63* (17.2)	50.04	38.56	3.25	46.70	36.84	3.63	43.27	35.06	4.06	39.66	33.20	4.54	34.96	30.85	5.00	30.05	28.30	5.51
	67 (19.4)	53.94	40.13	3.28	50.43	38.42	3.65	46.85	36.63	4.08	43.16	34.80	4.57	38.95	32.92	5.12	33.66	30.41	5.65
	72 (22.2)	58.67	31.28	3.31	55.06	29.83	3.69	51.26	28.32	4.12	47.34	26.73	4.62	43.27	25.12	5.18	38.61	23.50	5.78

Performance Data

60 Size

Evaporator Air		Condenser Entering Air Temperatures °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F(°C)	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**	Capacity MBtuh		Total Sys KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
1750	57 (13.8)	57.04	57.04	3.68	53.71	53.71	4.20	50.37	50.37	4.81	46.94	46.94	5.51	42.94	42.94	6.27	38.22	38.22	7.08
	62 (16.6)	58.59	49.98	3.70	54.72	48.26	4.22	50.83	46.41	4.82	47.02	47.02	5.51	43.00	43.00	6.28	38.29	38.29	7.08
	63* (17.2)	59.69	40.44	3.70	55.67	38.90	4.23	51.62	37.32	4.83	47.50	35.70	5.52	42.48	33.69	6.25	36.58	31.27	7.00
	67 (19.4)	64.43	42.04	3.73	60.26	40.56	4.26	56.00	39.00	4.87	51.67	37.39	5.57	47.05	35.71	6.38	41.05	33.47	7.21
	72 (22.2)	70.39	33.58	3.78	66.06	32.25	4.31	61.55	30.87	4.93	56.94	29.39	5.64	52.21	27.88	6.45	47.19	26.29	7.37
2000	57 (13.8)	59.44	59.44	3.78	55.93	55.93	4.31	52.41	52.41	4.92	48.83	48.83	5.62	44.92	44.92	6.44	39.97	39.97	7.26
	62 (16.6)	60.04	53.50	3.78	56.07	56.07	4.31	52.48	52.48	4.92	48.90	48.90	5.62	44.98	44.98	6.44	40.04	40.04	7.26
	63* (17.2)	60.84	43.04	3.78	56.74	41.49	4.31	52.56	39.87	4.92	48.32	38.18	5.62	43.48	36.25	6.39	37.36	33.66	7.13
	67 (19.4)	65.61	44.79	3.81	61.36	43.29	4.34	56.95	41.68	4.96	52.51	40.02	5.66	47.83	38.30	6.47	41.86	36.09	7.35
	72 (22.2)	71.45	35.11	3.87	67.02	33.78	4.40	62.40	32.37	5.02	57.67	30.89	5.73	52.81	29.36	6.55	47.75	27.77	7.47
2250	57 (13.8)	61.37	61.37	3.86	57.76	57.76	4.39	54.09	54.09	5.01	50.36	50.36	5.72	46.38	46.38	6.54	41.44	41.44	7.43
	62 (16.6)	61.42	61.42	3.86	57.83	57.83	4.40	54.15	54.15	5.01	50.42	50.42	5.72	46.44	46.44	6.54	41.51	41.51	7.43
	63* (17.2)	61.75	45.60	3.86	57.57	43.99	4.39	53.29	42.29	5.00	48.99	40.55	5.71	44.27	38.64	6.52	38.08	35.80	7.26
	67 (19.4)	66.46	47.42	3.89	62.10	45.93	4.43	57.67	44.25	5.04	53.13	42.53	5.75	48.44	40.74	6.56	42.58	38.56	7.48
	72 (22.2)	72.23	36.56	3.95	67.73	35.23	4.48	63.02	33.84	5.11	58.17	32.33	5.82	53.23	30.78	6.65	48.12	29.19	7.57

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Performance Data

* At 75°F (24°C) entering dry bulb-Tennessee Valley Authority (TVA) rating conditions; all others at 80°F dry bulb.

‡ Sensible capacities shown are based on 80°F (27°C) entering air at the indoor coil. For sensible capacities at other than 80°F (27°C), deduct 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air for each degree below 80°F (27°C), or add 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air per degree above 80°F (27°C).

** System KW is total of indoor and outdoor unit kilowatts.

LEGEND

BF— Bypass Factor

edb— Entering Dry--Bulb

Ewb— Entering Wet---Bulb

kW — Total Unit Power Input

SHC— Sensible Heat Capacity (1000 Btuh)

TC — Total Capacity (1000 Btuh) (net)

rh—Relative Humidity

COOLING NOTES:

1. Ratings are net; they account for the effects of the evaporator ---fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. The following formulas may be used:

4. The SHC is based on 80°F (26.6°C) edb temperature of air enteringevaporator coil. Below 80°F (26.6°C) edb, subtract (corr factor x cfm) from SHC.

Above 80°F (26.6°C) edb, add (corr factor x cfm) to SHC.

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

5. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

Gas Adjustment

Natural Gas Orifice Sizes and Manifold Pressure - Single and Three Phase Models

Nameplate Input (Btu/hr)		Altitude of Installation (FT. Above Sea Level)
		U.S.A.* 0 to 2000 (0-610 m)
45,000	Orifice No. (Qty)	0.125-in.
	Manifold Press. (in. W.C.)	3.2~3.8
60,000	Orifice No. (Qty)	28 (1)
	Manifold Press. (in. W.C.)	3.2~3.8
89,000	Orifice No. (Qty)	18 (1)
	Manifold Press. (in. W.C.)	3.2~3.8

* In the U.S.A., the input rating for altitudes above 2000 ft (610m) must be reduced by 4% for each 1000 ft (305 m) above sea level.
 In Canada, the input rating for altitudes from 2001 to 4500 ft (611 to 1372 m) above sea level must be derated by 10% by an authorized gas conversion station or dealer.
 For Canadian Installations from 2000 to 4500 ft (610-1372 m), use U.S.A. column 2001 to 3000 ft (611 to 914 m).

High Altitude Compensation, Natural Gas - Single and Three Phase Models

Nameplate Input (Btu/hr)	Rated Heating Input (Btu/hr), Natural Gas at Installation Altitude Above Sea Level, U.S.A.*
	0 to 2000 ft (0-610 m)
45,000	45,000
60,000	60,000
89,000	89,000

* In the U.S.A., the input rating for altitudes above 2000 ft (610m) must be reduced by 4% for each 1000 ft (305 m) above sea level.
 In Canada, the input rating for altitudes from 2001 to 4500 ft (611 to 1372 m) above sea level must be derated by 10% by an authorized gas conversion station or dealer.
 For Canadian Installations from 2000 to 4500 ft (610-1372 m), use U.S.A. column 2001 to 3000 ft (611 to 914 m).

Dry Coil Air Delivery * - Horizontal and Downflow Discharge Sizes 24-60 208/230VAC - Single & Three Phase

Unit Size	Heating Rise °F (°C)	Motor Speed	Tap	Allowable Functions	ESP (in. W.C.)										
					0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
24040	25 - 55 (14 - 31)	Low†	Blue	Alternate Heating	CFM	654	552	454	338	x	x	x	x	x	x
					BHP	0.09	0.10	0.10	0.11	x	x	x	x	x	x
					Gas Heat Rise (°F)	45	54	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	25	30	NA	NA	NA	NA	NA	NA	NA	NA
					CFM	840	759	677	600	505	411	293	x	x	x
					BHP	0.14	0.15	0.16	0.16	0.17	0.17	0.18	x	x	x
		Med-Low**	Pink	Heating Alternate Cooling	Gas Heat Rise (°F)	35	39	44	50	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	20	22	24	28	NA	NA	NA	NA	NA	
					CFM	888	818	750	679	606	511	425	320	238	x
					BHP	0.18	0.18	0.19	0.19	0.20	0.20	0.21	0.21	0.22	x
					Gas Heat Rise (°F)	34	36	40	44	49	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	19	20	22	24	27	NA	NA	NA	NA	NA
		Med-High	Orange	Alternate Cooling Alternate Heating	CFM	1133	1069	995	930	854	784	701	628	549	464
					BHP	0.26	0.27	0.28	0.29	0.30	0.30	0.31	0.31	0.32	0.33
					Gas Heat Rise (°F)	26	28	30	32	35	38	42	47	54	NA
					Gas Heat Rise (°C)	15	15	17	18	19	21	24	26	30	NA
					CFM	1291	1241	1190	1131	1081	1028	949	854	742	616
					BHP	0.41	0.42	0.43	0.43	0.44	0.45	0.44	0.42	0.40	0.38
High	Black	High Static Cooling Only	CFM	654	552	454	338	x	x	x	x	x			
			BHP	0.09	0.10	0.10	0.11	x	x	x	x	x			
24060	25 - 55 (14 - 31)	Low†	Blue	Alternate Heating	CFM	654	552	454	338	x	x	x	x	x	
					BHP	0.09	0.10	0.10	0.11	x	x	x	x	x	
					Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
					Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
					CFM	840	759	677	600	505	411	293	x	x	x
					BHP	0.14	0.15	0.16	0.16	0.17	0.17	0.18	x	x	x
		Med-Low	Pink	Alternate Cooling Alternate Heating	Gas Heat Rise (°F)	53	NA	NA	NA	NA	NA	NA	NA	NA	
					Gas Heat Rise (°C)	30	NA	NA	NA	NA	NA	NA	NA	NA	
					CFM	888	818	750	679	606	511	425	320	238	x
					BHP	0.18	0.18	0.19	0.19	0.20	0.20	0.21	0.21	0.22	x
					Gas Heat Rise (°F)	50	55	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	28	30	NA	NA	NA	NA	NA	NA	NA	NA
		Med-High**	Orange	Heating Alternate Cooling	CFM	1133	1069	995	930	854	784	701	628	549	464
					BHP	0.26	0.27	0.28	0.29	0.30	0.30	0.31	0.31	0.32	0.33
					Gas Heat Rise (°F)	40	42	45	48	53	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	22	23	25	27	29	NA	NA	NA	NA	NA
					CFM	1291	1241	1190	1131	1081	1028	949	854	742	616
					BHP	0.41	0.42	0.43	0.43	0.44	0.45	0.44	0.42	0.40	0.38
High	Black	High Static Cooling Only	CFM	654	552	454	338	x	x	x	x	x			
			BHP	0.09	0.10	0.10	0.11	x	x	x	x	x			
30040	25 - 55 (14 - 31)	Low†	Blue	Alternate Heating	CFM	654	552	454	338	x	x	x	x	x	
					BHP	0.09	0.10	0.10	0.11	x	x	x	x	x	
					Gas Heat Rise (°F)	45	54	NA	NA	NA	NA	NA	NA	NA	
					Gas Heat Rise (°C)	25	30	NA	NA	NA	NA	NA	NA	NA	
					CFM	840	759	677	600	505	411	293	x	x	x
					BHP	0.14	0.15	0.16	0.16	0.17	0.17	0.18	x	x	x
		Med-Low**	Pink	Heating Alternate Cooling	Gas Heat Rise (°F)	35	39	44	50	NA	NA	NA	NA	NA	
					Gas Heat Rise (°C)	20	22	24	28	NA	NA	NA	NA	NA	
					CFM	1104	1038	979	915	844	782	712	639	532	452
					BHP	0.26	0.27	0.28	0.28	0.29	0.30	0.30	0.31	0.31	0.32
					Gas Heat Rise (°F)	27	29	30	33	35	38	42	47	NA	NA
					Gas Heat Rise (°C)	15	16	17	18	20	21	23	26	NA	NA
		Med-High	Orange	Alternate Cooling Alternate Heating	CFM	1133	1069	995	930	854	784	701	628	549	464
					BHP	0.26	0.27	0.28	0.29	0.30	0.30	0.31	0.31	0.32	0.33
					Gas Heat Rise (°F)	26	28	30	32	35	38	42	47	54	NA
					Gas Heat Rise (°C)	15	15	17	18	19	21	24	26	30	NA
					CFM	1291	1241	1190	1131	1081	1028	949	854	742	616
					BHP	0.41	0.42	0.43	0.43	0.44	0.45	0.44	0.42	0.40	0.38
High	Black	High Static Cooling Only	CFM	654	552	454	338	x	x	x	x	x			
			BHP	0.09	0.10	0.10	0.11	x	x	x	x	x			

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60 208/230VAC - Single & Three Phase (Continued)

Unit Size	Heating Rise °F (°C)	Motor Speed	Tap	Allowable Functions	ESP (in. W.C.)										
					0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
30060	25 - 55 (14 - 31)	Low†	Blue		CFM	654	552	454	338	x	x	x	x	x	x
					BHP	0.09	0.10	0.10	0.11	x	x	x	x	x	x
					Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Med-Low	Pink	Alternate Cooling Alternate Heating	CFM	840	759	677	600	505	411	293	x	x	x
					BHP	0.14	0.15	0.16	0.16	0.17	0.17	0.18	x	x	x
					Gas Heat Rise (°F)	53	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	30	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Medium‡	Red	Cooling Alternate Heating	CFM	1104	1038	979	915	844	782	712	639	532	452
					BHP	0.26	0.27	0.28	0.28	0.29	0.30	0.30	0.31	0.31	0.32
					Gas Heat Rise (°F)	41	43	46	49	53	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	23	24	25	27	30	NA	NA	NA	NA	NA
	Med-High**	Orange	Heating Alternate Cooling	CFM	1133	1069	995	930	854	784	701	628	549	464	
				BHP	0.26	0.27	0.28	0.29	0.30	0.30	0.31	0.31	0.32	0.33	
				Gas Heat Rise (°F)	40	42	45	48	53	NA	NA	NA	NA	NA	
				Gas Heat Rise (°C)	22	23	25	27	29	NA	NA	NA	NA	NA	
High	Black	High Static Cooling Only	CFM	1291	1241	1190	1131	1081	1028	949	854	742	616		
			BHP	0.41	0.42	0.43	0.43	0.44	0.45	0.44	0.42	0.40	0.38		
			CFM	650	587	517	442	381	320	259	x	x	x		
			BHP	0.08	0.08	0.09	0.09	0.10	0.10	0.11	x	x	x		
36060	25 - 55 (14 - 31)	Low†	Blue		CFM	1144	1105	1066	1026	984	941	895	850	806	763
					BHP	0.28	0.28	0.29	0.30	0.31	0.31	0.32	0.33	0.34	0.34
					Gas Heat Rise (°F)	39	41	42	44	46	48	50	53	NA	NA
					Gas Heat Rise (°C)	22	23	23	24	25	26	28	29	NA	NA
		Med-Low**	Pink	Heating Alternate Cooling	CFM	1223	1186	1151	1115	1075	1039	1001	957	914	870
					BHP	0.34	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.40	0.41
					Gas Heat Rise (°F)	37	38	39	40	42	43	45	47	49	52
					Gas Heat Rise (°C)	20	21	22	22	23	24	25	26	27	29
		Med-High	Orange	Alternate Cooling	CFM	1356	1321	1288	1251	1216	1181	1149	1109	1071	1034
					BHP	0.43	0.44	0.45	0.46	0.46	0.47	0.48	0.49	0.50	0.51
					Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	High	Black	High Static Cooling Only	CFM	1520	1487	1459	1429	1394	1364	1331	1295	1261	1225	
				BHP	0.60	0.60	0.61	0.62	0.63	0.64	0.65	0.66	0.66	0.67	
				CFM	1001	902	833	777	717	650	575	527	466	419	
				BHP	0.13	0.13	0.14	0.14	0.15	0.16	0.17	0.18	0.19	0.20	
42060	25 - 55 (14 - 31)	Low†	Blue	Alternate Heating	CFM	1016	950	902	842	783	721	655	590	541	480
					BHP	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22
					Gas Heat Rise (°F)	44	47	50	53	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	25	26	28	30	NA	NA	NA	NA	NA	NA
		Med-Low**	Pink	Heating	CFM	1403	1358	1316	1265	1217	1167	1116	1067	1012	956
					BHP	0.29	0.30	0.31	0.33	0.34	0.35	0.36	0.37	0.38	0.39
					Gas Heat Rise (°F)	32	33	34	35	37	38	40	42	44	47
					Gas Heat Rise (°C)	18	18	19	20	20	21	22	23	25	26
		Med-High	Orange	Alternate Cooling Alternate Heating	CFM	1461	1411	1367	1327	1275	1220	1174	1127	1074	1022
					BHP	0.32	0.33	0.35	0.36	0.37	0.38	0.39	0.40	0.41	0.42
					Gas Heat Rise (°F)	31	32	33	34	35	37	38	40	42	44
					Gas Heat Rise (°C)	17	18	18	19	20	20	21	22	23	24
	High	Black	High Static Cooling Only	CFM	1575	1528	1488	1447	1406	1360	1314	1264	1213	1159	
				BHP	0.40	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.50	

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60 208/230VAC - Single & Three Phase (Continued)

Unit Size	Heating Rise °F (°C)	Motor Speed	Tap	Allowable Functions	ESP (in. W.C.)										
					0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
42090	35 - 65 (19 - 36)	Low†	Blue		CFM	1001	902	833	777	717	650	575	527	466	419
					BHP	0.13	0.13	0.14	0.14	0.15	0.16	0.17	0.18	0.19	0.20
					Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Med-Low	Pink		CFM	1016	950	902	842	783	721	655	590	541	480
					BHP	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22
					Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Medium‡	Red	Cooling Alternate Heating	CFM	1403	1358	1316	1265	1217	1167	1116	1067	1012	956
					BHP	0.29	0.30	0.31	0.33	0.34	0.35	0.36	0.37	0.38	0.39
					Gas Heat Rise (°F)	48	50	51	53	56	58	61	63	NA	NA
					Gas Heat Rise (°C)	27	28	29	30	31	32	34	35	NA	NA
		Med-High**	Orange	Heating Alternate Cooling	CFM	1461	1411	1367	1327	1275	1220	1174	1127	1074	1022
					BHP	0.32	0.33	0.35	0.36	0.37	0.38	0.39	0.40	0.41	0.42
					Gas Heat Rise (°F)	46	48	49	51	53	55	58	60	63	NA
					Gas Heat Rise (°C)	26	27	27	28	29	31	32	33	35	NA
High	Black	High Static Cooling Only	CFM	1575	1528	1488	1447	1406	1360	1314	1264	1213	1159		
			BHP	0.40	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.50		
			CFM	644	552	461	376	301	235	x	x	x	x		
			BHP	0.06	0.07	0.07	0.08	0.08	0.09	x	x	x	x		
48090	35 - 65 (19 - 36)	Low†	Blue		CFM	1430	1386	1347	1302	1258	1208	1160	1114	1065	1014
					BHP	0.26	0.27	0.28	0.29	0.30	0.30	0.32	0.33	0.34	0.35
					Gas Heat Rise (°F)	47	49	50	52	54	56	58	61	64	NA
					Gas Heat Rise (°C)	26	27	28	29	30	31	32	34	35	NA
		Med-Low**	Pink	Heating Alternate Cooling	CFM	1658	1622	1585	1549	1512	1476	1442	1402	1360	1322
					BHP	0.39	0.40	0.41	0.42	0.44	0.45	0.46	0.47	0.48	0.49
					Gas Heat Rise (°F)	41	42	43	44	45	46	47	48	50	51
					Gas Heat Rise (°C)	23	23	24	24	25	25	26	27	28	28
		Medium‡	Red	Cooling Alternate Heating	CFM	1945	1913	1867	1829	1792	1758	1717	1688	1645	1603
					BHP	0.58	0.59	0.61	0.63	0.64	0.65	0.67	0.68	0.69	0.71
					Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Med-High	Orange	Alternate Cooling	CFM	2201	2172	2138	2108	2074	2041	1970	1867	1764	1634
					BHP	0.83	0.84	0.87	0.88	0.89	0.91	0.89	0.83	0.79	0.74
					CFM	1945	1913	1867	1829	1792	1758	1717	1688	1645	1603
					BHP	0.58	0.59	0.61	0.63	0.64	0.65	0.67	0.68	0.69	0.71
High	Black	High Static Cooling Only	CFM	2201	2172	2138	2108	2074	2041	1970	1867	1764	1634		
			BHP	0.83	0.84	0.87	0.88	0.89	0.91	0.89	0.83	0.79	0.74		
			CFM	1945	1913	1867	1829	1792	1758	1717	1688	1645	1603		
			BHP	0.58	0.59	0.61	0.63	0.64	0.65	0.67	0.68	0.69	0.71		

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60 208/230VAC - Single & Three Phase (Continued)

Unit Size	Heating Rise °F (°C)	Motor Speed	Tap	Allowable Functions	ESP (in. W.C.)										
					0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
60090	35 - 65 (19 - 36)	Low†	Blue		CFM	839	768	697	625	551	486	422	360	306	x
					BHP	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.14	0.14	x
					Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Med-Low**	Pink	Heating	CFM	1403	1361	1320	1276	1236	1192	1145	1099	1054	1012
					BHP	0.28	0.29	0.30	0.31	0.31	0.33	0.34	0.35	0.36	0.37
					Gas Heat Rise (°F)	48	50	51	53	55	57	59	62	64	NA
					Gas Heat Rise (°C)	27	28	28	29	30	32	33	34	36	NA
		Medium‡	Red	Cooling Alternate Heating	CFM	1822	1788	1757	1726	1690	1657	1623	1589	1553	1518
					BHP	0.54	0.55	0.56	0.57	0.59	0.60	0.61	0.62	0.63	0.64
					Gas Heat Rise (°F)	37	38	39	39	40	41	42	43	44	45
					Gas Heat Rise (°C)	21	21	21	22	22	23	23	24	24	25
	Med-High	Orange	Alternate Cooling	CFM	1982	1940	1900	1859	1816	1775	1739	1701	1655	1596	
				BHP	0.61	0.62	0.63	0.65	0.66	0.67	0.69	0.70	0.71	0.73	
				Gas Heat Rise (°F)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
				Gas Heat Rise (°C)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	High	Black	High Static Cooling Only	CFM	2271	2241	2206	2171	2134	2080	1973	1857	1746	1596	
				BHP	0.90	0.91	0.93	0.95	0.96	0.95	0.90	0.84	0.78	0.73	

Shaded areas indicate speed/static combinations that are not permitted for dehumidification speed.

- *. Air delivery values are without air filter and are for dry coil (See Wet Coil Pressure Drop table).
- †. Factory-shipped continuous fan speed
- ‡. Factory-shipped cooling speed
- **.

Wet Coil Pressure Drop (IN.W.C)

Unit Size	Standard CFM (SCFM)																
	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
24	0.03	0.04	0.04	0.05	0.06												
30				0.05	0.06	0.07	0.08	0.11									
36				0.06	0.06	0.09	0.10	0.11	0.14								
42					0.05	0.05	0.06	0.07	0.08	0.08	0.09	0.09	0.11				
48							0.04	0.06	0.09	0.10	0.10	0.11	0.12	0.13	0.14		
60										0.06	0.07	0.01	0.08	0.09	0.10	0.12	0.13

22 Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Economizer with 1-in. Filter Pressure Drop (IN. W.C.)

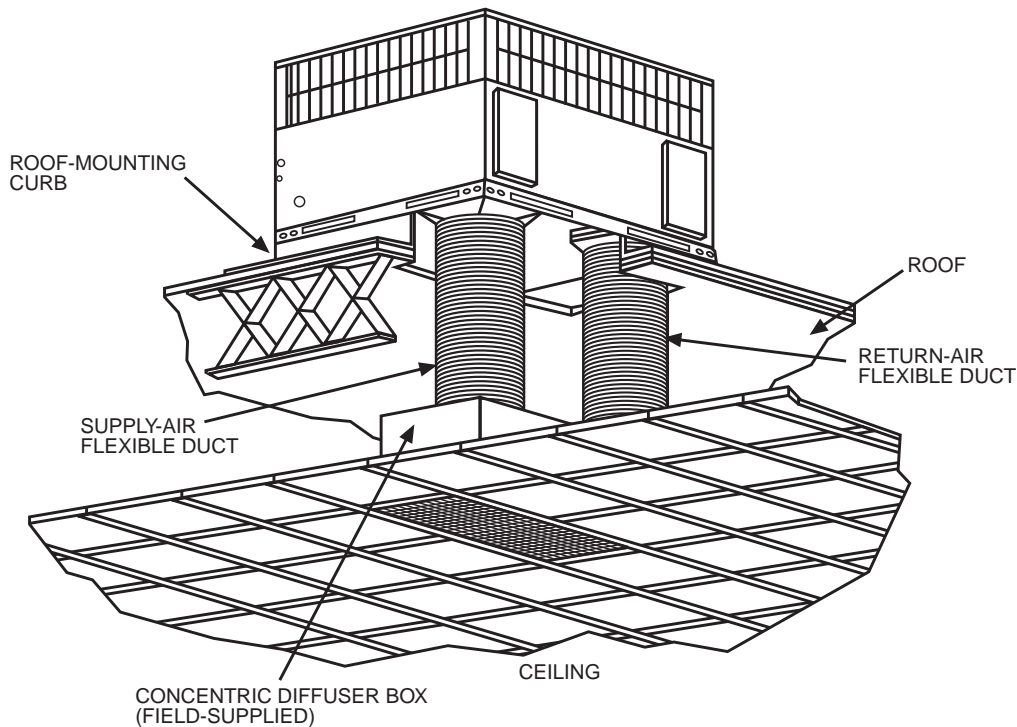
Filter Size in. (mm)	Cooling Tons	Standard CFM (SCFM)																
		600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
600-1400 CFM 12x20x1+12x20x1 (305x508x25+305x508x25)	2.0, 2.5, 3.0	-	-	0.09	0.14	0.16	0.18	0.25	0.28	0.30	-	-	-	-	-	-	-	-
1200-1800 CFM 16x24x1+14x24x1 (406x610x25+356x610x25)	3.5, 4.0	-	-	-	-	-	-	0.10	0.11	0.12	0.13	0.14	0.16	0.16	-	-	-	-
1500-2200 CFM 16x24x1+18x24x1 (406x610x25+457x610x25)	5.0	-	-	-	-	-	-	-	-	-	0.15	0.17	0.18	0.20	0.21	0.22	0.23	0.23

Filter Pressure Drop Table (IN. W.C.)

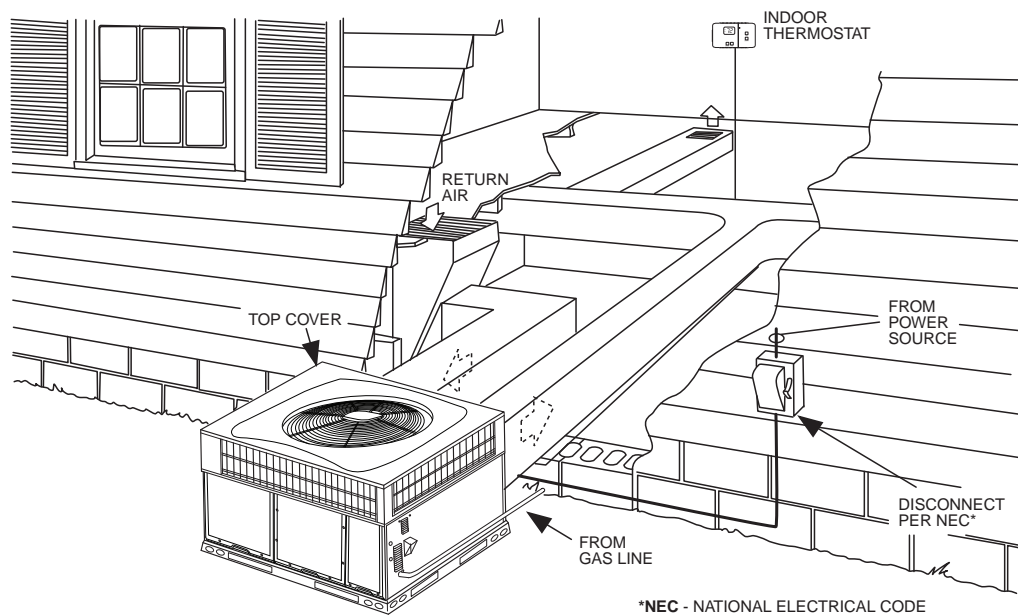
Filter Size in. (mm)	Cooling Tons	Standard CFM (SCFM)																
		600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
600-1400 CFM 12x20x1+12x20x1 (305x508x25+305x508x25)	2.0, 2.5, 3.0	0.03	0.05	0.06	0.08	0.10	0.11	0.13	0.14	0.16	-	-	-	-	-	-	-	-
1200-1800 CFM 16x24x1+14x24x1 (406x610x25+356x610x25)	3.5, 4.0	-	-	-	-	-	-	0.07	0.08	0.09	0.09	0.10	0.11	0.12	-	-	-	-
1500-2200 CFM 16x24x1+18x24x1 (406x610x25+457x610x25)	5.0	-	-	-	-	-	-	-	-	-	0.04	0.06	0.08	0.10	0.11	0.13	0.14	0.15

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

Typical Piping and Wiring



A09230



A09231

Application Data

Condensate trap — A 2-in. (50.8 mm) condensate trap must be field supplied.

Ductwork — Secure downflow discharge ductwork to roof curb. For horizontal discharge applications, attach ductwork to unit with flanges.

To convert a unit to downflow discharge — Units are equipped with factory-installed inserts in the down-flow openings. Removal of the inserts is similar to removing an electrical knock-out. Use the duct cover to seal the horizontal discharge openings in the unit. Units installed in horizontal discharge orientation do not require duct covers.

Airflow — Units are draw-thru in the cooling mode and blow-thru in the heating mode.

Maximum cooling airflow — To minimize the possibility of condensate blow-off from the evaporator, airflow through the units should not exceed 450 CFM per ton.

Minimum cooling airflow — Minimum cooling airflow is 350 cfm per ton.

Minimum ambient cooling operation temperature — All standard units have a minimum ambient operating temperature of 40°F (4°C). With accessory low ambient temperature kit, units can operate at temperatures down to 0°F (-17°C).

Minimum temperature — Air entering the heat exchanger in heating mode must be a minimum of 50°F (10°C) continuous and/or 45°F (7°C) intermittent.

Electrical Data

Model	Nominal V-PH-HZ	Voltage Range		Compressor		OFM	IFM	IDM	Power Supply	
		MIN	MAX	RLA	LRA	FLA	FLA	FLA	MCA	MOCP
2404030	208/230-1-60	197	253	8.7	46	0.6	3.9	0.70	15.4	20
2406030	208/230-1-60	197	253	8.7	46	0.6	3.9	0.70	15.4	20
3004030	208/230-1-60	197	253	13.0	57	0.7	3.9	0.70	21.1	30
3006030	208/230-1-60	197	253	13.0	57	0.7	3.9	0.70	21.1	30
3606030	208/230-1-60	197	253	16.7	79	1.05	5.8	0.70	27.8	40
3606050	208/230-3-60	197	253	10.4	73	1.05	5.8	0.70	19.9	30
4206030	208/230-1-60	197	253	16.7	109	1.07	3.8	0.70	25.8	40
4206050	208/230-3-60	197	253	11.2	88	1.05	3.8	0.70	18.9	30
4209030	208/230-1-60	197	253	16.7	109	1.07	3.8	0.70	25.8	40
4209050	208/230-3-60	197	253	11.2	88	1.05	3.8	0.70	18.9	30
4809030	208/230-1-60	197	253	19.6	130	1.05	6.9	0.70	32.5	50
4809050	208/230-3-60	197	253	13.7	83.1	1.05	6.9	0.70	25.1	35
6009030	208/230-1-60	197	253	23.7	152.5	1.05	6.9	0.70	37.6	60
6009050	208/230-3-60	197	253	15.9	110	1.05	6.9	0.70	27.9	40

LEGEND

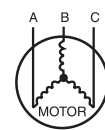
- FLA - Full Load Amps
- IDM - Inducer Motor
- IFM - Indoor Fan Motor
- LRA - Locked Rotor Amps
- MCA - Minimum Circuit Amps
- MOCP - Maximum Over Current Protection
- OFM - Outdoor Fan Motor
- RLA - Rated Load Amps

NOTES:

1. In compliance with NEC (National Electrical Code) requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be Power Supply fuse or circuit breaker.
2. Minimum wire size is based on 60 C copper wire. If other than 60 C wire is used, or if length exceeds wire length in table, determine size from NEC.
3. 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 percentage of voltage imbalance

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

EXAMPLE: Supply voltage is 230-3-60.



- AB = 228 v
- BC = 231 v
- AC = 227 v

$$\begin{aligned} \text{Average Voltage} &= \frac{228 + 231 + 227}{3} \\ &= \frac{686}{3} \\ &= 229 \end{aligned}$$

Determine maximum deviation from average voltage.

- (AB) 229 - 228 = 1 v
- (BC) 231 - 229 = 2 v
- (AC) 229 - 227 = 2 v

Maximum deviation is 2 v.

Determine percent of voltage imbalance

$$\begin{aligned} \% \text{ Voltage Imbalance} &= 100 \times \frac{2}{229} \\ &= 0.8\% \end{aligned}$$

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

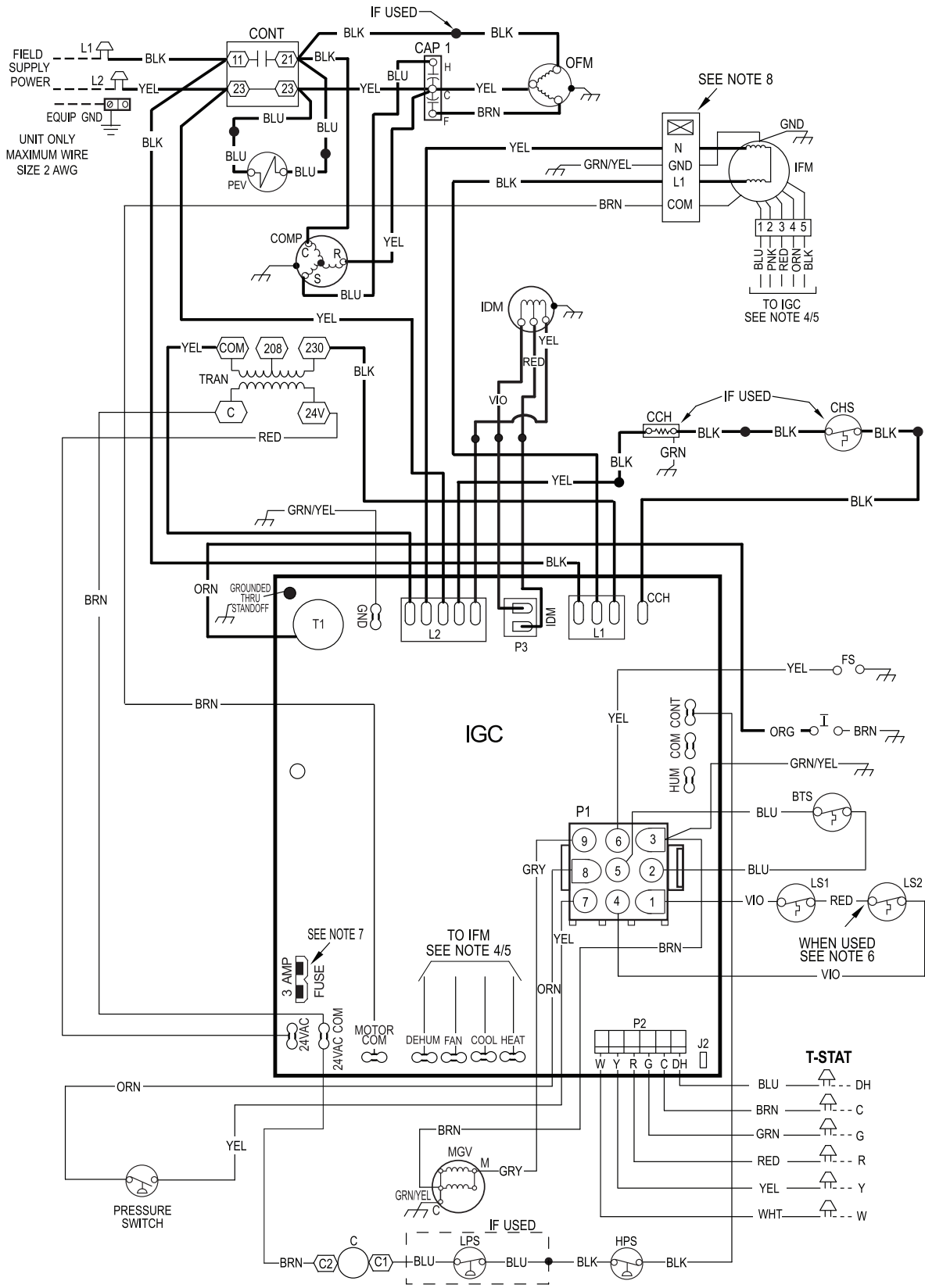
IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

A06564

Connection Wiring Schematic 208/230-1-60

CONNECTION WIRING DIAGRAM

DANGER: ELECTRICAL SHOCK HAZARD DISCONNECT POWER BEFORE SERVICING
SCHEMATIC 208/230-1-60

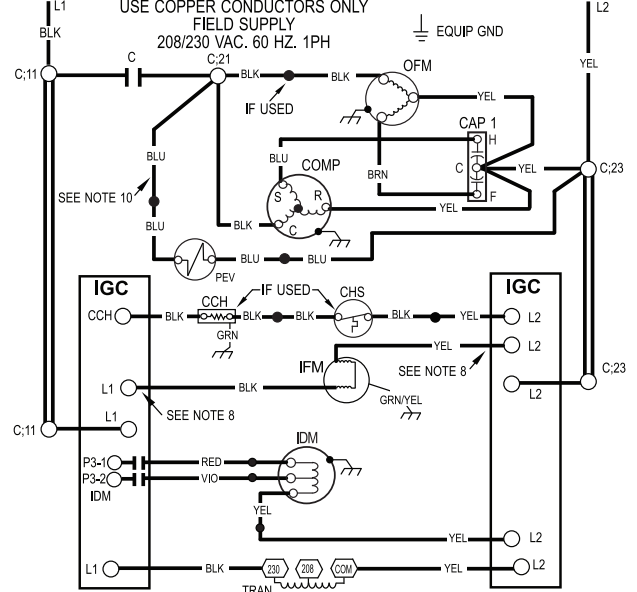
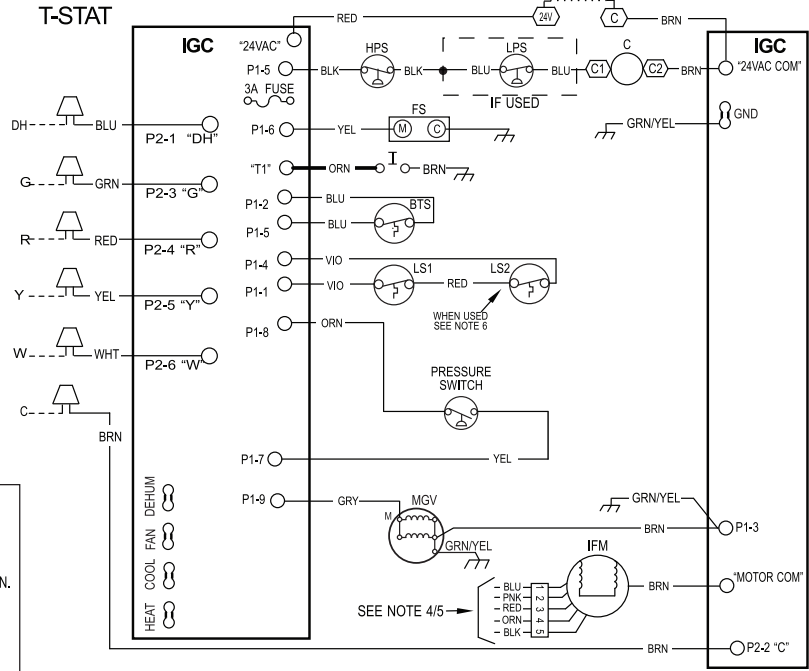
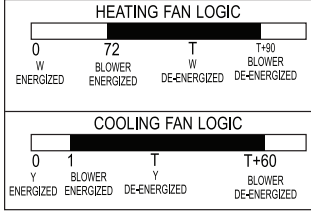
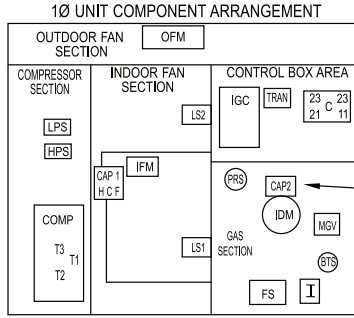


Ladder Wiring Schematic 208/230-1-60

LADDER WIRING DIAGRAM

DANGER: ELECTRICAL SHOCK HAZARD DISCONNECT POWER BEFORE SERVICING

LEGEND		
△	FIELD SPLICE	CONT COMPRESSOR CONTACTOR EQUIPMENT
□	TERMINAL (MARKED)	FS FLAME SENSOR
○	TERMINAL (UNMARKED)	GND GROUND
●	SPLICE	HPS HIGH PRESSURE SWITCH
⊕	SPLICE (MARKED)	IGNITOR
---	FACTORY LO VOLTAGE	IDM INDUCED DRAFT MOTOR
---	FIELD CONTROL WIRING	IFM INDOOR FAN MOTOR
---	FIELD POWER WIRING	IGC INTEGRATED GAS UNIT CONTROLLER
---	ACCESSORY OR OPTIONAL WIRING	LPS LOW PRESSURE SWITCH
---	FACTORY HI VOLTAGE	LS1 PRIMARY LIMIT SWITCH
BTS	BURNER THERMAL SWITCH	LS2 SECONDARY LIMIT SWITCH
C	CONTACTOR	MGV MAIN GAS VALVE
CAP1	CAPACITOR, COMP	OFM OUTDOOR FAN MOTOR
CAP2	CAPACITOR, INDUCER (WHEN USED)	OT QUADRUPLE TERMINAL
CCH	CRANKCASE HEATER	PEV PRESSURE EQUALIZER VALVE (IF USED)
CHS	CRANKCASE HEATER SWITCH	TRAN TRANSFORMER
COMP	COMPRESSOR MOTOR	T-STAT THERMOSTAT



- NOTES:**
- IF ANY OF THE ORIGINAL WIRES FURNISHED ARE REPLACED THEY MUST BE REPLACED WITH THE SAME WIRE OR ITS EQUIVALENT.
 - SEE PRE-SALE LITERATURE FOR THERMOSTATS.
 - USE 75 DEGREES C COPPER CONDUCTORS FOR FIELD INSTALLATION.
 - REFER TO INSTALLATION INSTRUCTIONS FOR CORRECT SPEED SELECTION FOR IFM.
 - SEE INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS FOR YOUR UNIT.
 - ON SOME MODELS LS1 AND LS2 ARE WIRED IN SERIES. ON OTHER MODELS ONLY LS1 IS USED.
 - THIS FUSE IS MANUFACTURED BY LITTLE FUSE, P/N 287003.
 - DO NOT DISCONNECT PLUG UNDER LOAD.
 - N.E.C. CLASS 2, 24V.
 10. PEV FOUND ON SELECT ROTARY COMPRESSORS.



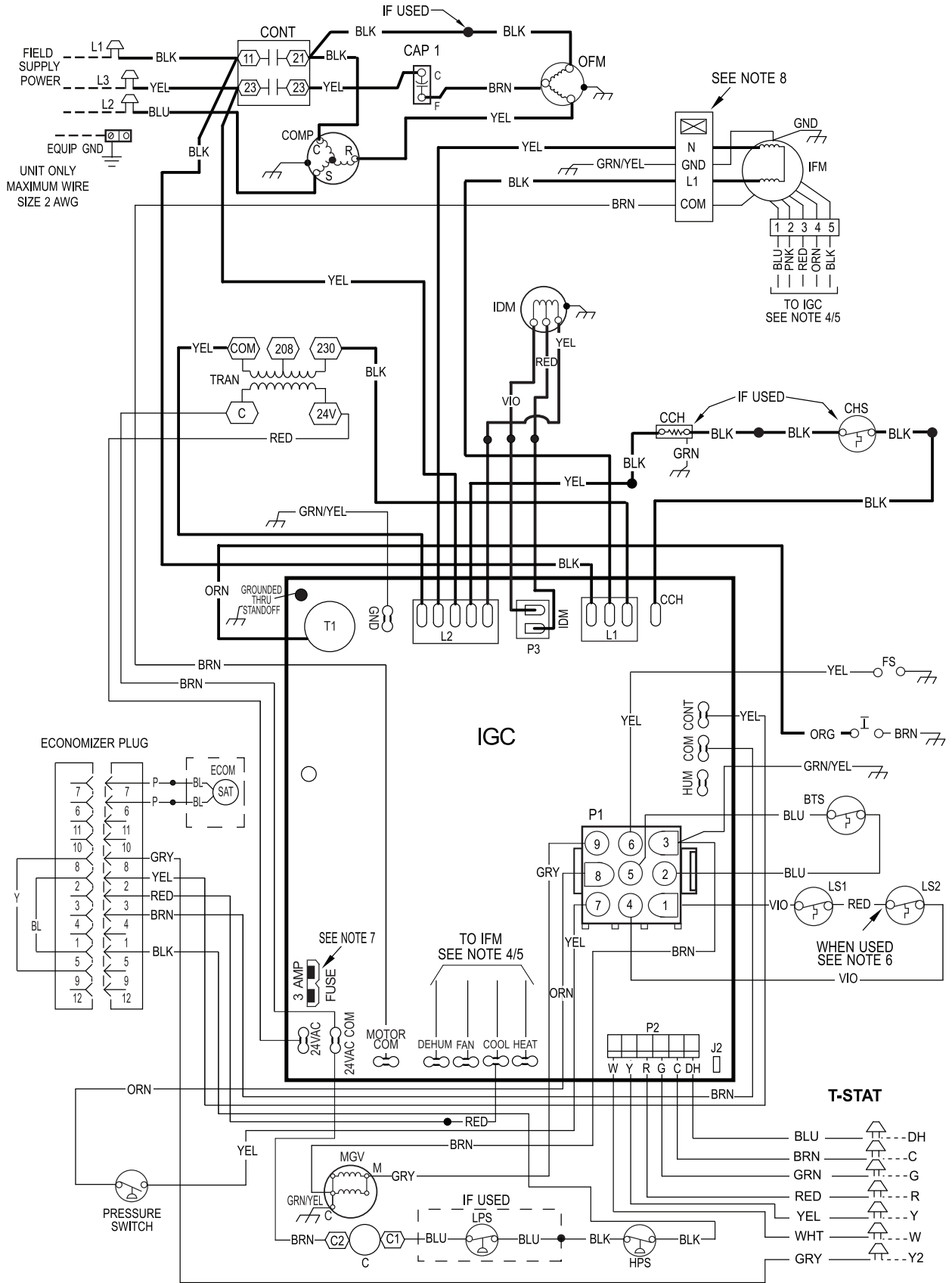
345854-101 REV.A

345854-101 REV.A



Connection Wiring Schematic 208/230-3-60

CONNECTION WIRING DIAGRAM DANGER: ELECTRICAL SHOCK HAZARD DISCONNECT POWER BEFORE SERVICING SCHEMATIC 208/230-3-60



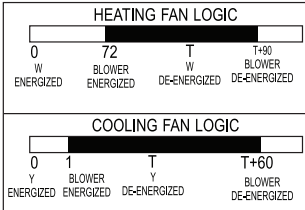
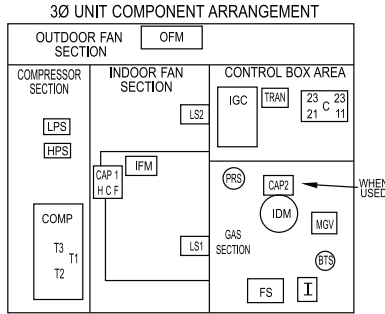
Ladder Wiring Schematic 208/230-3-60

LADDER WIRING DIAGRAM

DANGER: ELECTRICAL SHOCK HAZARD DISCONNECT POWER BEFORE SERVICING

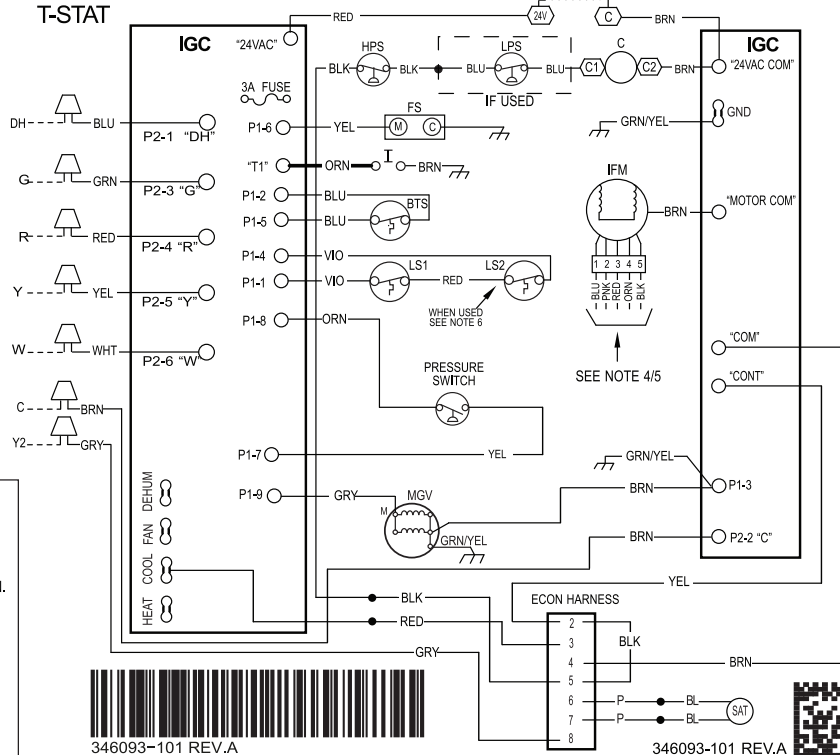
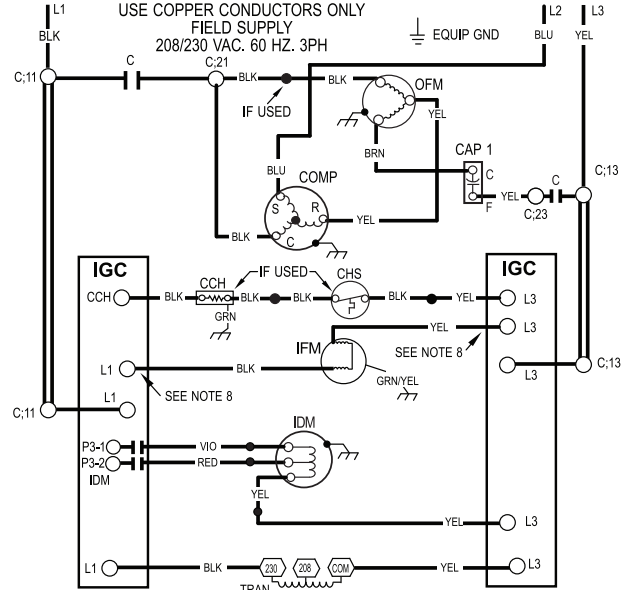
LEGEND

	FIELD SPlice	EQUIP	EQUIPMENT
	TERMINAL (MARKED)	FS	FLAME SENSOR
	TERMINAL (UNMARKED)	GND	GROUND
	SPLICE	HPS	HIGH PRESSURE SWITCH
	SPLICE (MARKED)	I	IGNITOR
	FACTORY LO VOLTAGE	IDM	INDUCED DRAFT MOTOR
	FIELD CONTROL WIRING	IFM	INDOOR FAN MOTOR
	FIELD POWER WIRING	IGC	INTEGRATED GAS UNIT CONTROLLER
	ACCESSORY OR OPTIONAL WIRING	LPS	LOW PRESSURE SWITCH
	FACTORY HI VOLTAGE	LS1	PRIMARY LIMIT SWITCH
		LS2	SECONDARY LIMIT SWITCH
		MGV	MAIN GAS VALVE
		OFM	OUTDOOR FAN MOTOR
		OT	QUADRUPLE TERMINAL
		TRAN	TRANSFORMER
		T-STAT	THERMOSTAT



NOTES:

- IF ANY OF THE ORIGINAL WIRES FURNISHED ARE REPLACED THEY MUST BE REPLACED WITH THE SAME WIRE OR ITS EQUIVALENT.
- SEE PRE-SALE LITERATURE FOR THERMOSTATS.
- USE 75 DEGREES C COPPER CONDUCTORS FOR FIELD INSTALLATION.
- REFER TO INSTALLATION INSTRUCTIONS FOR CORRECT SPEED SELECTION FOR IFM.
- SEE INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS FOR YOUR UNIT.
- ON SOME MODELS LS1 AND LS2 ARE WIRED IN SERIES. ON OTHER MODELS ONLY LS1 IS USED.
- THIS FUSE IS MANUFACTURED BY LITTLE FUSE, P/N 287003.
- DO NOT DISCONNECT PLUG UNDER LOAD.
- N.E.C. CLASS 2, 24V.



346093-101 REV.A



346093-101 REV.A

Controls

Operating sequence

Heating Sequence of Operation (Ultra Low NOx Single and Three Phase Models)

On a call for heating, terminal W of the thermostat is energized, starting the induced-draft motor for a 30 second pre-purge at normal ignition speed. When the pressure switch senses that the induced-draft motor is moving sufficient combustion air, the burner sequence begins. This function is controlled by the integrated gas unit controller (IGC).

After 30 sec of pre purge is complete, the pressure switch checks for sufficient combustion. Then, the gas valve energizes and the system attempts to ignite with igniter being energized. The igniter energizes for 5 sec and integrated gas controller (IGC) allows system to sense flame for 2 sec at the end of 5 sec of ignition trial. On first successful ignition, system stays at the ignition speed for 10 sec and ramps up to an intermediate speed for approximately 10 sec and gradually ramps up to the steady state speed. The system uses the same logic for 2nd and 3rd ignition trials. In case the 4th attempt fails, the system will lock out for 1 hr. After 1 hr. lock out period, the system starts with normal operating sequence. Once flame is established and proven successfully, indoor (evaporator) fan motor is energized after 30 seconds. When the thermostat is satisfied and W is de-energized, the pre-mix burner will stop firing and the indoor (evaporator) fan motor shuts off after a 90 second time-off delay. Please note that the IGC has the capability to automatically decrease the indoor (evaporator) fan motor "ON" delay and increase the indoor (evaporator) fan motor "OFF" delay in the event of high duct static and/or partially-clogged filter.

Cooling Sequence of Operation

With the room thermostat SYSTEM switch in the COOL position and the FAN switch in the AUTO position, the cooling sequence of operation is as follows:

1. When the room temperature rises to a point that is slightly above the cooling control setting of the thermostat, the thermostat completes the circuit between thermostat terminal R to terminals Y and G.
2. The normally open contacts of energized contactor (C) close and complete the circuit through compressor motor (COMP) to condenser (outdoor) fan motor (OFM). Both motors start instantly.
3. The set of normally open contacts on the interface fan board (IFB) are closed which energizes a circuit to the indoor fan motor (IFM).

NOTE: Once the compressor has started and then stopped, it should not be started again until 5 minutes have elapsed. The cooling cycle remains on until the room temperature drops to a point that is slightly below the cooling control setting of the room thermostat. At this point, the thermostat breaks the circuit between thermostat terminal R to terminals Y and G. These open circuits deenergize contactor coil C. The condenser and compressor motors stop. After a 60-sec. delay, the blower motor stops. The unit is in a standby condition, waiting for the next call for cooling from the room thermostat.

Guide Specifications

Packaged Gas Heating/Electric Cooling Units Constant Volume Application HVAC Guide Specifications

Size Range: 2 to 5 Tons, Nominal Cooling

60,000 to 90,000 Btuh,

Nominal Heating Input

General

SYSTEM DESCRIPTION

Outdoor rooftop mounted, gas heating/electric cooling unit utilizing a hermetic scroll compressor for cooling duty. Unit shall discharge supply air vertically or horizontally as shown on contract drawings. Condenser fan/coil section shall have a draw-thru design with vertical discharge for minimum sound levels.

QUALITY ASSURANCE

- Unit shall be rated in accordance with AHRI Standards 210/240 and 270-1995.
- Unit shall be designed in accordance with UL Standard 1995 and ANSI Z 21.47.
- Unit shall be manufactured in a facility registered to ISO 9001 manufacturing quality standard.
- Unit shall be UL listed and c-UL certified as a total package for safety requirements.
- Roof curb shall be designed to conform to NRCA Standards.
- Insulation and adhesives shall meet NFPA 90.1 requirements for flame spread and smoke generation.
- Cabinet insulation shall meet ASHRAE Standard 62.2.

DELIVERY, STORAGE AND HANDLING

- Unit shall be stored and handled per manufacturer's recommendations.

Products

EQUIPMENT

General:

Factory-assembled, single-piece, heating and cooling unit. Contained within the enclosure shall be all factory wiring, piping, controls, refrigerant charge with R-410A refrigerant, and special features required prior to field start-up.

Unit Cabinet:

- Unit cabinet shall be constructed of phosphated, zinc-coated, pre-painted steel capable of with-standing 500 hours in salt spray.
- Normal service shall be through 3 removable cabinet panels.
- The unit shall be constructed on a rust proof unit base that has an externally trapped, integrated sloped drain.
- Evaporator fan compartment top surface shall be insulated with a minimum 1/2-in. (12.7 mm) thick, flexible fiberglass insulation, coated on the air side and retained by adhesive and mechanical means. The evaporator wall sections will be insulated with a minimum semi-rigid foil-faced board capable of being wiped clean. Aluminum foil-faced fiberglass insulation shall be used in the entire indoor air cavity section.
- Unit shall have a field-supplied condensate trap.

Fans:

- The evaporator fan shall be a multi-speed, direct-drive, as shown on equipment drawings.
- Fan wheel shall be made from steel, be double-inlet type with forward curved blades with corrosion resistant finish. Fan wheel shall be dynamically balanced.
- Condenser fan shall be direct drive propeller type with aluminum blades riveted to corrosion resistant steel spiders, be dynamically balanced, and discharge air vertically.

Compressor:

- Fully hermetic compressors with factory-installed vibration isolation.

Coils:

Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed. Tube sheet openings shall be belled to prevent tube wear.

Heating Section:

- Induced-draft combustion type with energy saving direct spark ignition system and redundant main gas valve.
- Induced-draft motors shall provide adequate airflow for combustion.
- The heat exchangers shall be constructed of aluminized steel for corrosion resistance.
- Pre-mixed burners shall be stainless steel and other alloys.
- All gas piping and electric power shall enter the unit cabinet at a single location.

Refrigerant Components:

Refrigerant expansion device shall be of the TXV (thermostatic expansion valve) or fixed orifice type.

Filters:

Filter section shall consist of field-installed, throwaway, 1-in. (25 mm) thick fiberglass filters of commercially available sizes.

Controls and Safeties:

- Unit controls shall be complete with a self-contained low voltage control circuit.
- Compressors shall incorporate a solid-state compressor protector that provides reset capability.

Operating Characteristics:

- Unit shall be capable of starting and running at 125°F (51°C) ambient outdoor temperature per maximum load criteria of AHRI Standard 210.
- Compressor with standard controls shall be capable of operation down to 40°F (4°C) ambient outdoor temperature.
- Units shall be provided with fan time delay to prevent cold air delivery before the heat exchanger warms up.
- Unit shall be provided with 60-second fan time delay (single phase models) after the thermostat is satisfied.

Electrical Requirements:

All unit power wiring shall enter the unit cabinet at a single location.

Motors:

- Compressor motors shall be of the refrigerant-cooled type with line-break thermal and current overload protection.
- All fan motors shall have permanently lubricated bearings, and inherent, automatic reset, thermal overload protection.
- Condenser fan motor shall be totally enclosed.
- Evaporator Fan Motor to be ECM Motor.

Compressor Protection:

Solid-state control shall protect compressor by preventing "short cycling."

Guide Specifications (Continued)

Ultra Low NOx:

Shall provide NOx reduction to meet 14ng/J NOx emissions requirements as shipped from the factory.

Special Features Available:

1. Coil Options
Base unit with tin plated indoor coil hairpins available as a factory installed option.
2. Compressor Start Kit (single phase units only):
Shall provide additional starting torque for single-phase compressors.
3. Thermostat:
To provide for one-stage heating and cooling in addition manual or automatic changeover and indoor fan control.
4. Crankcase Heater:
Shall provide anti-floodback protection for low-load cooling applications.
5. Economizer:
(Horizontal - Field installed accessory)
(Vertical - Field installed accessory)
 - a. Economizer controls capable of providing free cooling using outside air.
 - b. Equipped with low leakage dampers not to exceed 3% leakage, at 1.0 IN. W.C. pressure differential.
 - c. Spring return motor shuts off outdoor damper on power failure.
6. Filter Rack Kit:
Shall provide filter mounting for downflow applications. Offered as a field installed accessory.
7. Flat Roof Curb:
Curbs shall have seal strip and a wood nailer for flashing and shall be installed per manufacturer's instructions.
8. Flue Discharge Deflector
Directs flue gas exhaust; 90 degrees upward from current discharge.
9. Heat Exchanger
Stainless Steel Heat Exchanger available as a factory installed option.
10. Low Ambient Package:
Shall consist of a solid-state control and condenser coil temperature sensor for controlling condenser-fan motor operation, which shall allow unit to operate down to 0°F (-18°C) outdoor ambient temperature when properly installed.
11. Manual Outdoor Air Damper:
Package shall consist of damper, birdscreen, and rainhood which can be preset to admit outdoor air for year-round ventilation.
12. Square-To-Round Duct Transitions (24-48 models):
Shall have the ability to convert the supply and return openings from rectangular to round.
13. Time Guard II
Automatically prevents the compressor from restarting for at least 4 minutes and 45 seconds after shutdown of the compressor. Not required when a corporate programmable thermostat is applied or with a RTU-MP control. Offered as a field installed accessory.
14. Louver Metal Outdoor Coil Grille
Shall provide hail and vandalism protection. Available as a field installed accessory.
15. Low Pressure Switch Kit
Kit is designed for use when a low pressure control is desired. This kit provides added reliability for the compressor.

