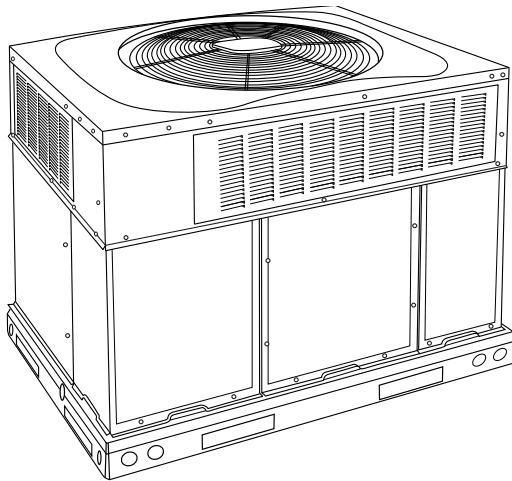


**48VLUK Ultra Low NOx
Comfort™ 13.4 SEER2 Single-Packaged Air
Conditioner and Gas Furnace System with Puron®
(R-410A) Refrigerant
Single Phase 2-5 Nominal Tons (Sizes 24-60)
Three Phase 3-5 Nominal Tons (Sizes 36-60)**



Turn to the experts

Product Data



A09033

Fig. 1 – Unit 48VL

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

- 13.4 SEER2
- 10.6 EER2
- 81.0% AFUE (Single phase and three phase models)
- ECM Blower Motor-Standard
- Direct Spark Ignition
- Low Sound Levels
- Dehumidification Feature
- Louvered 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 SEER2 (Seasonal Energy Efficiency Ratios) of 13.4, 10.6 EER2, and AFUE (Annual Fuel Utilization Efficiency) ratings of 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 California air quality district standards requiring NOx emissions no more than 14ng/J.

Durable, Dependable Components

Turbo-tubular™ heat exchangers are constructed of stainless 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.

Indoor and outdoor coils are computer-designed for optimum heat transfer and efficiency. The indoor coil is fabricated from aluminum 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 70.7 dBA.

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.

Table of Contents

Features/Benefits 1

Model Number Nomenclature 3

AHRI Capacities 4

Unit Dimensions 7

Unit Dimensions 8

Performance Data 11

Application Data 25

Electrical Data 26

Connection Wiring Schematic 208/230-1-60 27

Controls 31

Guide Specifications 32



Model Number Nomenclature

48VL	U	K	24	040	3	0	--
Type of Unit 48VL - Single Packaged Air Conditioner and Gas Furnace System							Options LW - Low cabinet air leakage
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†	EER2‡	SEER2**
24	2	750	22800	10.6	13.4
30	2.5	950	28000	10.6	13.4
36	3	1150	33800	10.6	13.4
42	3.5	1350	39000	10.6	13.4
48	4	1600	47000	10.6	13.4
60	5	1750		10.6	13.4

*. 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

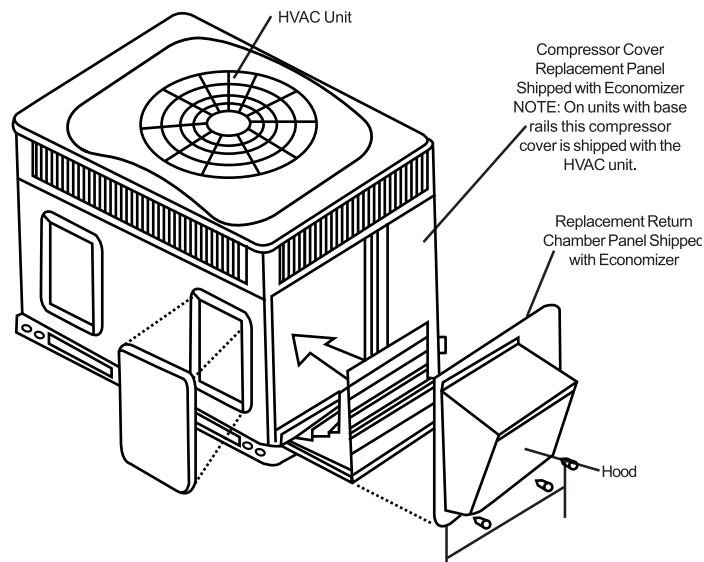
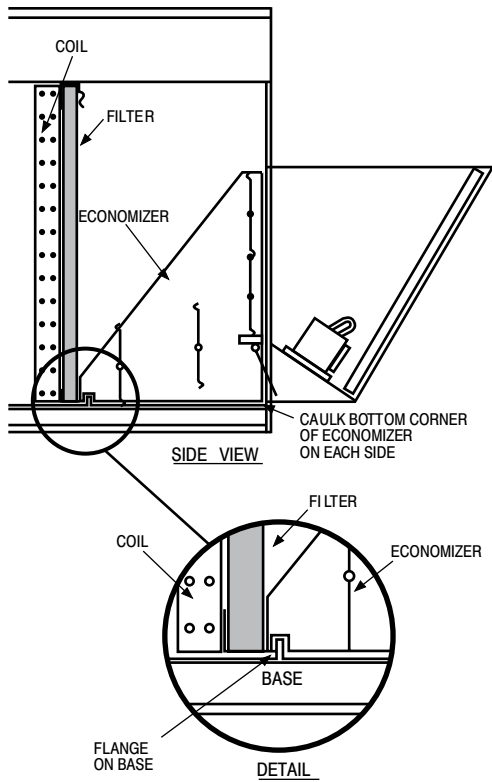
NOTE: Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.

A-Weighted Sound Power Level

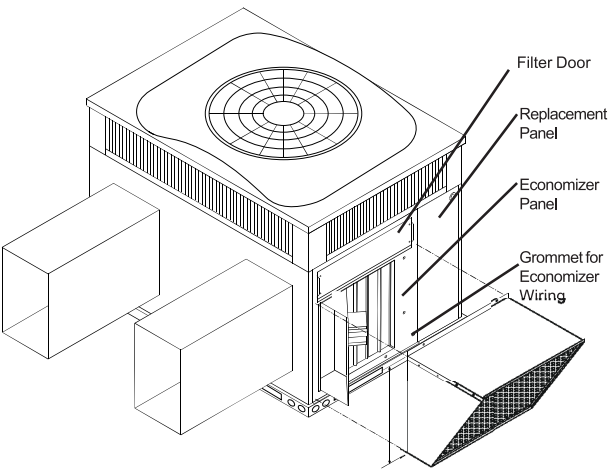
UNIT SIZE	STANDARD RATING (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
24	70.7	59.4	58.5	58.3	60.4	56.7	52.6	46.9
30	73.4	53.8	59.9	62.3	64.0	61.4	53.8	45.6
36	74.8	67.1	60.3	64.3	63.8	61.9	57.1	50.8
42	74.9	62.5	63.1	63.7	65.5	61.5	57.5	53.5
48	75.4	64.1	61.0	65.5	63.7	61.8	60.1	56.1
60								

NOTE: Tested in compliance with AHRI 270 but not listed with AHRI.

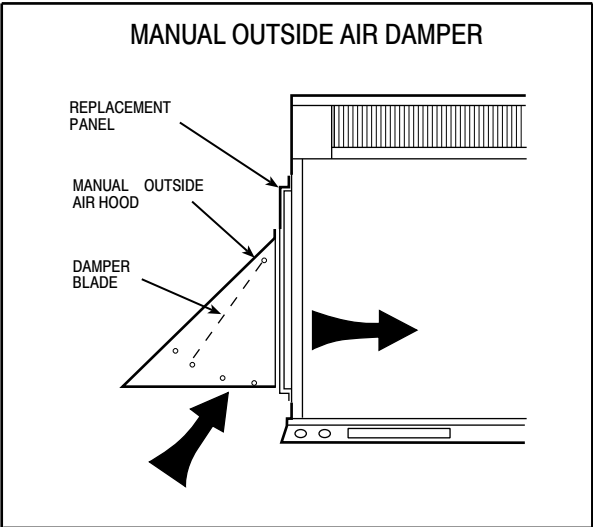
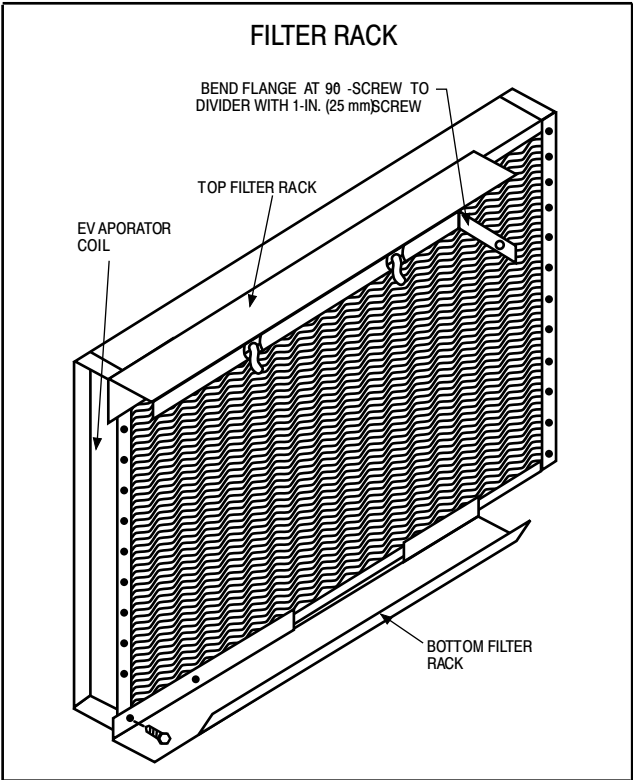
ECONOMIZER



Vertical Economizer



Horizontal Economizer



Physical Data

UNIT SIZE	24040	24060	30040	30060	36060	42060	42090	48090
NOMINAL CAPACITY (ton)	2	2	2-1/2	2-1/2	3	3-1/2	3-1/2	4
SHIPPING WEIGHT lb.	339	339	348	348	394	428	428	481
SHIPPING WEIGHT (kg)	154	154	158	158	179	194	194	218
COMPRESSOR / QUANTITY	Scroll / 1							
REFRIGERANT (R-410A)								
Quantity lb.	6.4	6.4	6.0	6.0	5.75	6.0	6.0	9.0
Quantity (kg)	2.9	2.9	2.7	2.7	2.6	2.7	2.7	4.1
REFRIGERANT METERING DEVICE	Orifice							
ORIFICE ID in. / mm	.059 / 1.5	.059 / 1.5	.063 / 1.60	.063 / 1.60	.070 / 1.78	.073 / 1.85	.073 / 1.85	.080 / 2.03
OUTDOOR COIL								
Rows...Fins/in.	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	13.6	13.6	13.6	23.3
OUTDOOR FAN								
Nominal CFM	2500	2500	3200	3200	3500	3500	3500	3500
Diameter in.	24	24	24	24	26	26	26	26
Diameter (mm)	609.6	609.6	609.6	609.6	660.4	660.4	660.4	660.4
Motor Hp (Rpm)	1/12 (810)	1/12 (810)	1/5 (810)	1/5 (810)	1/2 (810)	3/4 (810)	3/4 (810)	1/5 (810)
INDOOR COIL								
Rows...Fins/in.	3...17	3...17	3...17	3...17	2...17	3...17	3...17	3...17
Face Area (sq ft)	3.7	3.7	3.7	3.7	5.6	4.7	4.7	5.6
INDOOR BLOWER								
Nominal Cooling Airflow (CFM)	750	750	950	950	1150	1350	1350	1600
Size in.	10x10	10x10	10x10	10x10	11x10	11x10	11x10	11x10
Size (mm.)	254x254	254x254	254x254	254x254	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)
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
HIGH-PRESSURE SWITCH (psig) Cut-out Reset (Auto)	650 +/- 15 420 +/- 25							
LOSS-OF-CHARGE / LOW-PRESSURE SWITCH (Liquid Line) (psig) cut-out Reset (auto)	NA							
RETURN-AIR FILTERS ^{† ‡}								
Throwaway Size in. (mm)	2 each 20x12x1 508x305x25				1 each 24x16x1 610x406x25 24x18x1 610x457x25	1 each 24x14x1 610x356x25 24x16x1 610x406x25	1 each 24x16x1 610x406x25 24x18x1 610x457x25	

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

†. 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

NA - Not Available



Unit Dimensions
24-30

COOLING CAPACITY	UNIT WT.		UNIT HEIGHT	CENTER OF GRAVITY (IN/MM)			
	LB	KG		"A"		X	
24	328	148.8	43-3/4	1111	22-13/16	579.4	15-5/16
30	337	152.9	45-3/4	1162	22-13/16	579.4	15-5/16

UNIT	CORNER WEIGHT (LB/KG)		"A"	"X"
	"1"	"2"		
24	49.0	22.3	66.0	29.8
30	51.0	22.9	67.0	30.6

REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

INCHES (MM)

TOP OF UNIT..... 12 (304.8)
DUCT SIDE OF UNIT..... 2 (50.8)
SIDE OPPOSITE DUCTS..... 14 (355.6)
BOTTOM OF UNIT..... 6 (152.4)
ELECTRICAL PANEL..... 36 (914.4)

NEC REQUIRED CLEARANCES.

INCHES (MM)

BETWEEN UNITS, POWER ENTRY SIDE..... 42 (1066.8)
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE..... 36 (914.0)
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE..... 42 (1066.8)

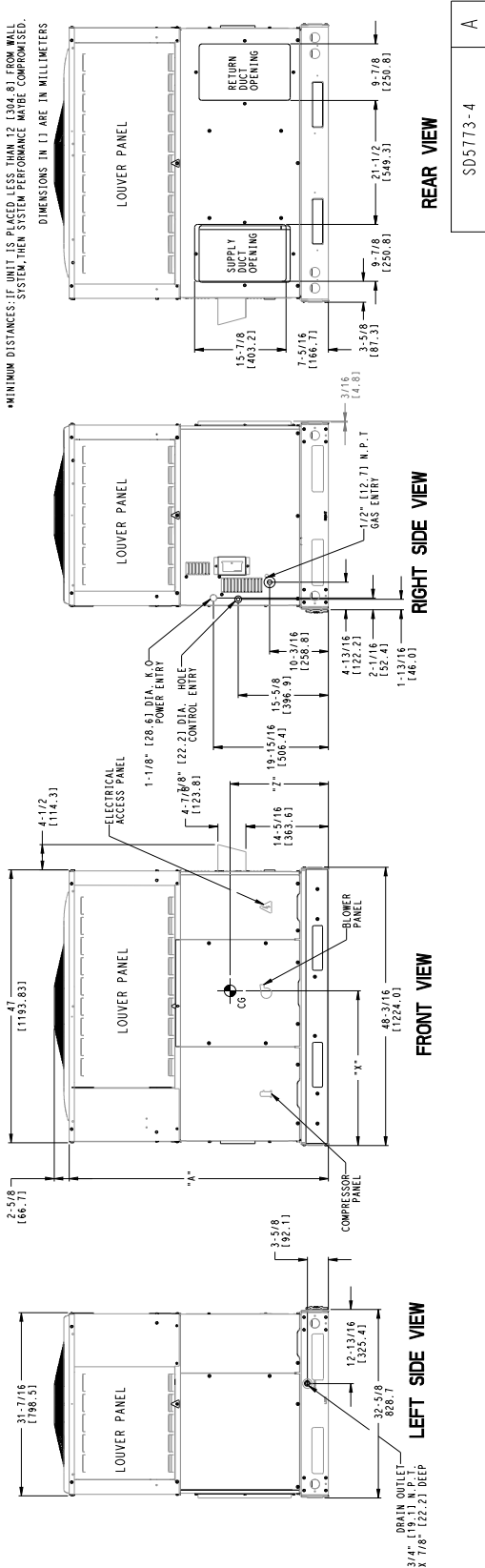
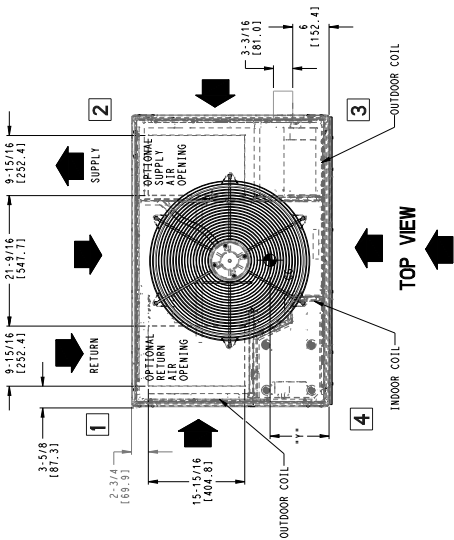
REQUIRED CLEARANCE FOR OPERATION AND SERVICING

INCHES (MM)

EVAP. COIL ACCESS SIDE..... 36 (914.0)
POWER ENTRY SIDE..... 42 (1066.8)
DUCT TOP (FOR NEC REQUIREMENTS)..... 48 (1219.2)
UNIT TOP (FOR NEC REQUIREMENTS)..... 36 (914.0)
SIDE OPPOSITE DUCTS..... 12 (304.8)
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 MILLIMETERS



SD5773-4 A

Unit Dimensions
36-60

COOLING CAPACITY	UNIT WT. LB / KG	UNIT HEIGHT "A"	CENTER OF GRAVITY IN/MM		
			X	Y	Z
36	380	172.4	44-3/4	1137	22-13/16 579.4
42	414	181.8	44-3/4	1137	22-13/16 579.4
48	467	211.3	54-3/4	1391	22-13/16 579.4

UNIT	CORNER WEIGHT LB/KG		
	"1"	"2"	"3"
36	57.0	25.9	16.0
42	62.0	28.2	18.0
48	70.0	31.8	21.0

REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

TOP OF UNIT..... 14 [355.6]
SIDE OF UNIT..... 14 [355.6]
SIDE OPPOSITE DUCTS..... 14 [355.6]
BOTTOM OF UNIT..... 0 [0.0]
ELECTRICAL PANEL..... 36 [914.4]

NEC REQUIRED CLEARANCES

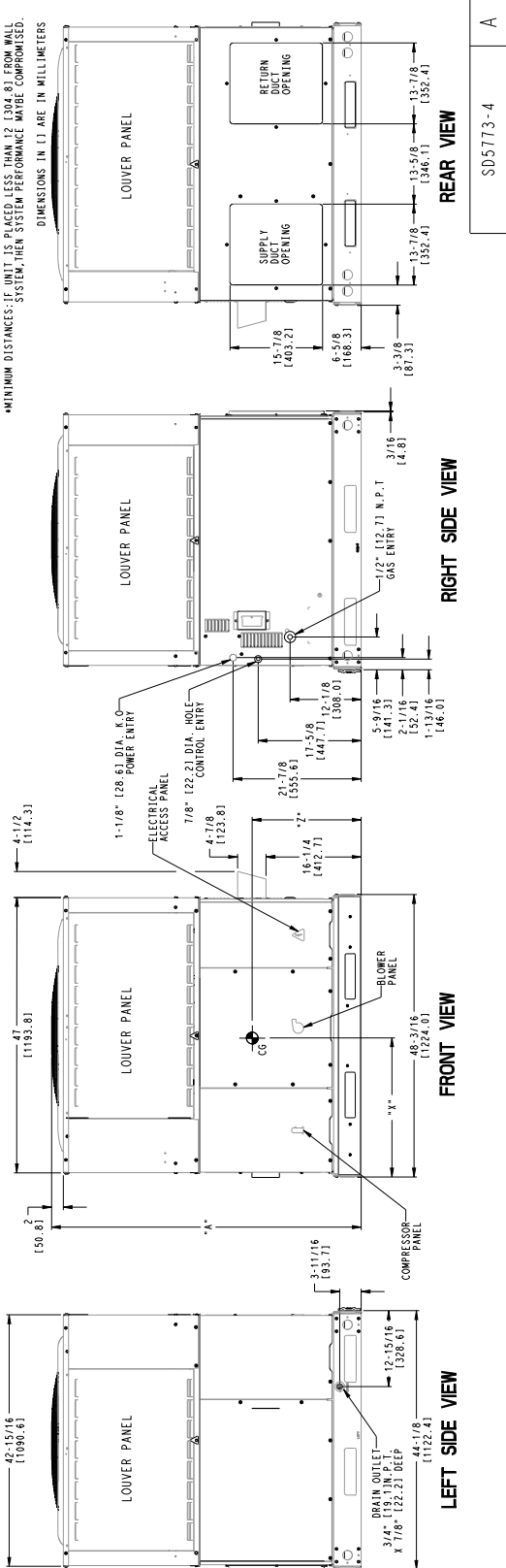
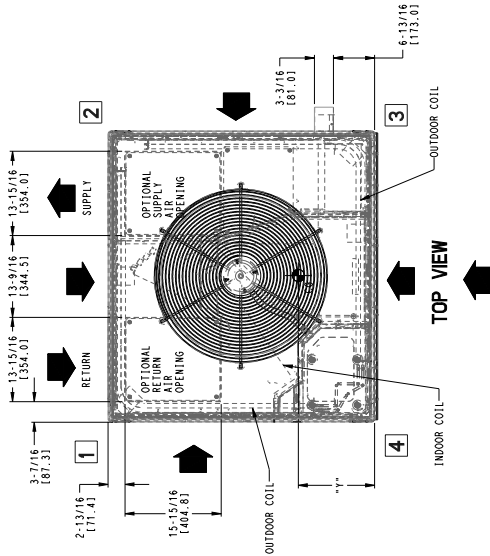
BETWEEN UNITS, POWER ENTRY SIDE..... 36 [914.4]
UNIT AND UNGROUND SURFACES, POWER ENTRY SIDE..... 36 [914.4]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUND SURFACES, POWER ENTRY SIDE..... 42 [1066.8]

REQUIRED CLEARANCE FOR OPERATION AND SERVICING

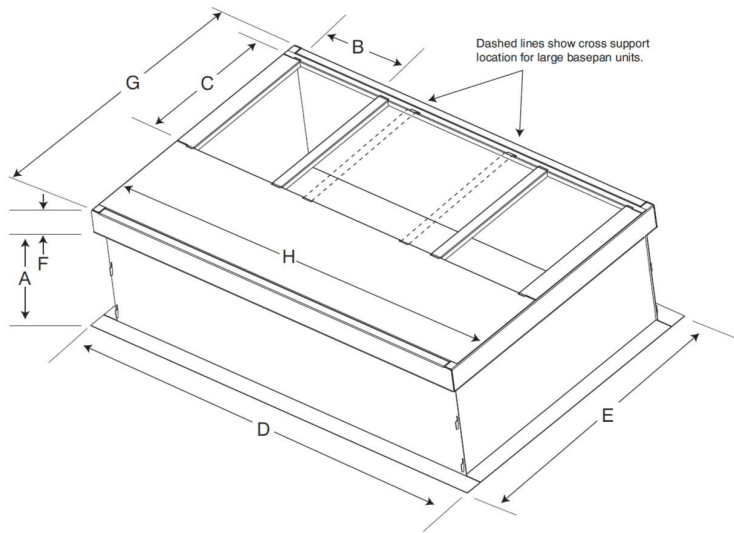
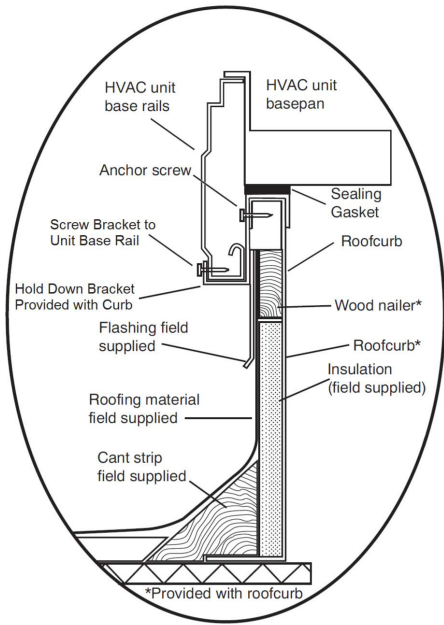
PUMP, COIL ACCESS SIDE..... 42 [1066.8]
POWER ENTRY SIDE..... 42 [1066.8]
(EXCEPT FOR NEC REQUIREMENTS)
UNIT TOP SURFACE..... 48 [1219.2]
SIDE OPPOSITE DUCTS..... 48 [1219.2]
DUCT PANEL..... 12 [304.8]

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

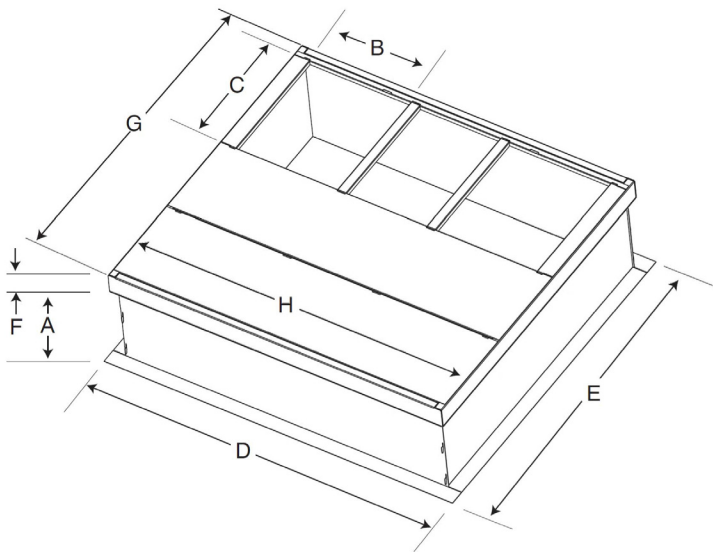
DIMENSIONS IN () ARE IN MILLIMETERS



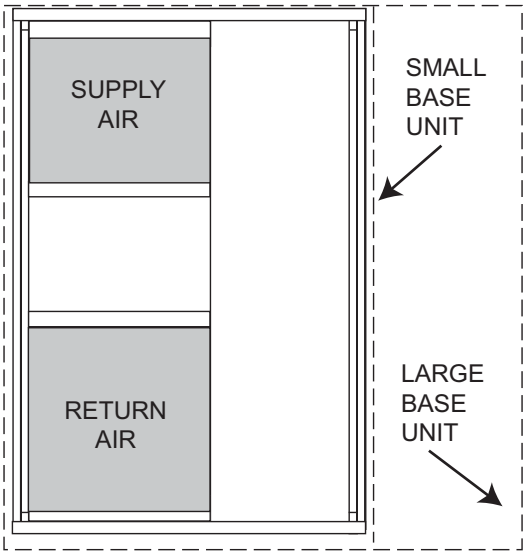
SD5773-4 A



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).....46,000 Btuh
Sensible Heat Capacity (SHC).....34,000 Btuh
Required Heating Capacity72,000 Btuh
Condenser Entering Air Temperature95°F (35°C)
Indoor-Air Temperature80°F (27°C) edb 67°F (19°C) ewb
Evaporator Air Quantity..... 1600 CFM
External Static Pressure 0.440 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 48 at 1600 CFM and 67°F (19°C) ewb (entering wet bulb) will provide a total capacity of 47,000 Btuh and a SHC of 35,000 Btuh. Calculate SHC correction, if required, using Note 4 under Cooling Capacities tables.

SELECT ELECTRIC HEAT

In the Gas Heating Capacities and Efficiencies table, note that the 48090 unit will provide 73,000 Btuh with an input of 89,000 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	0.30 IN. W.C
Filter	0.06 IN. W.C
Wet Coil Pressure Drop	<u>0.07 IN. W.C</u>
Total Static Pressure	0.43 IN. W.C

At 0.43 IN. W.C. ESP (external static pressure) and MED speed the motor delivers between 1664 CFM and 1627 cfm. Interpolation estimates 1653 CFM at .43 IN. W.C. Thus, MED delivers CFM needed.

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)		
		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**
CFM	EWB °F(°C)	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

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



Performance Data
30 Size

Evaporator Air		Condenser Entering Air Tempeatures °F (°C)														
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)		
		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**
CFM	EWB °F(°C)	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)		
		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**
CFM	EWB °F(°C)	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)		
		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**
CFM	EWB °F(°C)	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)		
		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**
CFM	EWB °F(°C)	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 x (1 + BF) x (edb --- 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

*. Altitude of 2001ft and above is not allowed.



Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60

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	640	553	454	310	---	---	---	---	---	---
					BHP	0.07	0.08	0.08	0.09	---	---	---	---	---	---
					Gas Heat Rise (°F)	52	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	29	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Med-Low‡	Pink	Heating Alternate Cooling	CFM	830	758	688	607	514	393	254	---	---	---
					BHP	0.12	0.13	0.13	0.13	0.14	0.14	0.15	---	---	---
					Gas Heat Rise (°F)	40	44	49	55	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	22	25	27	31	NA	NA	NA	NA	NA	NA
		Medium**	Red	Cooling Alternate Heating	CFM	1080	1025	969	910	852	787	718	638	541	457
					BHP	0.21	0.22	0.23	0.23	0.24	0.24	0.25	0.25	0.26	0.27
					Gas Heat Rise (°F)	31	33	35	37	39	43	47	52	NA	NA
					Gas Heat Rise (°C)	17	18	19	20	22	24	26	29	NA	NA
		Med-High	Orange	Alternate Cooling Alternate Heating	CFM	1101	1046	993	936	878	816	749	676	599	498
					BHP	0.22	0.23	0.24	0.24	0.25	0.26	0.26	0.27	0.27	0.28
					Gas Heat Rise (°F)	30	32	34	36	38	41	45	50	NA	NA
					Gas Heat Rise (°C)	17	18	19	20	21	23	25	28	NA	NA
		High	Black	High Static Cooling Only	CFM	1222	1173	1123	1072	1021	967	912	853	787	712
					BHP	0.29	0.29	0.30	0.31	0.31	0.32	0.33	0.34	0.34	0.34
24060	25 - 55 (14 - 31)	Low†	Blue		CFM	640	553	454	310	---	---	---	---	---	---
					BHP	0.07	0.08	0.08	0.09	---	---	---	---	---	---
					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	830	758	688	607	514	393	254	---	---	---
					BHP	0.12	0.13	0.13	0.13	0.14	0.14	0.15	---	---	---
					Gas Heat Rise (°F)	54	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	1080	1025	969	910	852	787	718	638	541	457
					BHP	0.21	0.22	0.23	0.23	0.24	0.24	0.25	0.25	0.26	0.27
					Gas Heat Rise (°F)	41	44	46	49	52	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	23	24	26	27	29	NA	NA	NA	NA	NA
		Med-High‡	Orange	Heating Alternate Cooling	CFM	1101	1046	993	936	878	816	749	676	599	498
					BHP	0.22	0.23	0.24	0.24	0.25	0.26	0.26	0.27	0.27	0.28
					Gas Heat Rise (°F)	41	43	45	48	51	55	NA	NA	NA	NA
					Gas Heat Rise (°C)	23	24	25	26	28	30	NA	NA	NA	NA
		High	Black	High Static Cooling Only	CFM	1222	1173	1123	1072	1021	967	912	853	787	712
					BHP	0.29	0.29	0.30	0.31	0.31	0.32	0.33	0.34	0.34	0.34



Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60

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
30040	25 - 55 (14 - 31)	Low†	Blue	Alternate Heating	CFM	643	552	455	348	225	---	---	---	---	---
					BHP	0.09	0.10	0.11	0.11	0.11	---	---	---	---	---
					Gas Heat Rise (°F)	52	NA	NA	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	29	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Med-Low‡	Pink	Heating Alternate Cooling	CFM	817	744	673	597	516	431	325	190	---	---
					BHP	0.14	0.15	0.15	0.16	0.17	0.17	0.18	0.18	---	---
					Gas Heat Rise (°F)	41	45	50	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	23	25	28	NA	NA	NA	NA	NA	NA	NA
		Medium	Red	Alternate Cooling Alternate Heating	CFM	1159	1104	1045	990	937	878	821	759	693	618
					BHP	0.31	0.32	0.33	0.33	0.34	0.35	0.36	0.37	0.37	0.38
					Gas Heat Rise (°F)	29	30	32	34	36	38	41	44	48	54
					Gas Heat Rise (°C)	16	17	18	19	20	21	23	25	27	30
		Med-High**	Orange	Cooling Alternate Heating	CFM	1201	1147	1095	1037	987	934	877	818	755	671
					BHP	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.40	0.41	0.40
					Gas Heat Rise (°F)	28	29	31	32	34	36	38	41	44	50
					Gas Heat Rise (°C)	15	16	17	18	19	20	21	23	25	28
		High	Black	High Static Cooling Only	CFM	1291	1236	1181	1131	1080	1033	978	909	792	661
					BHP	0.41	0.42	0.43	0.43	0.44	0.45	0.46	0.45	0.43	0.40
30060	25 - 55 (14 - 31)	Low†	Blue		CFM	643	552	455	348	225	---	---	---	---	---
					BHP	0.09	0.10	0.11	0.11	0.11	---	---	---	---	---
					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	817	744	673	597	516	431	325	190	---	---
					BHP	0.14	0.15	0.15	0.16	0.17	0.17	0.18	0.18	---	---
					Gas Heat Rise (°F)	55	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	Heating Alternate Cooling	CFM	1159	1104	1045	990	937	878	821	759	693	618
					BHP	0.31	0.32	0.33	0.33	0.34	0.35	0.36	0.37	0.37	0.38
					Gas Heat Rise (°F)	39	40	43	45	48	51	54	NA	NA	NA
					Gas Heat Rise (°C)	21	22	24	25	26	28	30	NA	NA	NA
		Medium-High**	Orange	Cooling Alternate Heating	CFM	1201	1147	1095	1037	987	934	877	818	755	671
					BHP	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.40	0.41	0.40
					Gas Heat Rise (°F)	37	39	41	43	45	48	51	55	NA	NA
					Gas Heat Rise (°C)	21	22	23	24	25	27	28	30	NA	NA
		High	Black	High Static Cooling Only	CFM	1291	1236	1181	1131	1080	1033	978	909	792	661
					BHP	0.41	0.42	0.43	0.43	0.44	0.45	0.46	0.45	0.43	0.40



Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60

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
36060	25 - 55 (14 - 31)	Low†	Blue	Alternate Cooling, Alternate Gas Heating	CFM	1096	1044	994	945	892	837	780	717	664	612
					BHP	0.14	0.15	0.16	0.18	0.19	0.19	0.20	0.21	0.22	0.23
					Gas Heat Rise (°F)	41	43	45	47	50	53	NA	NA	NA	NA
					Gas Heat Rise (°C)	23	24	25	26	28	30	NA	NA	NA	NA
		Med-Low‡	Pink	Gas Heating, Alternate Cooling	CFM	1151	1103	1056	1002	953	897	845	788	729	678
					BHP	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25
					Gas Heat Rise (°F)	39	40	42	45	47	50	53	NA	NA	NA
					Gas Heat Rise (°C)	22	22	23	25	26	28	29	NA	NA	NA
		Medium	Red	Alternate Cooling, Alternate Gas Heating	CFM	1299	1252	1204	1155	1106	1059	1007	959	905	844
					BHP	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31
					Gas Heat Rise (°F)	34	36	37	39	40	42	44	47	49	53
					Gas Heat Rise (°C)	19	20	21	21	22	23	25	26	27	29
		Med-High**	Orange	Cooling, Alternate Gas Heating	CFM	1382	1335	1292	1246	1202	1152	1106	1058	1007	957
					BHP	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35
					Gas Heat Rise (°F)	32	33	35	36	37	39	40	42	44	47
					Gas Heat Rise (°C)	18	19	19	20	21	22	22	23	25	26
		High	Black	High Static Cooling Only	CFM	1530	1485	1442	1398	1354	1309	1263	1217	1169	1120
					BHP	0.33	0.35	0.36	0.37	0.38	0.39	0.40	0.41	0.42	0.43
42060	25 - 55 (14 - 31)	Low†	Blue	Alternate Heating	CFM	956	899	843	786	729	676	621	558	504	435
					BHP	0.13	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18	0.19
					Gas Heat Rise (°F)	47	50	53	NA	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	26	28	29	NA	NA	NA	NA	NA	NA	NA
		Med-Low‡	Pink	Heating Alternate Cooling	CFM	1201	1153	1107	1060	1012	965	917	871	828	782
					BHP	0.21	0.22	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29
					Gas Heat Rise (°F)	37	39	40	42	44	46	49	51	54	NA
					Gas Heat Rise (°C)	21	22	22	23	25	26	27	28	30	NA
		Medium	Red	Alternate Cooling Alternate Heating	CFM	1443	1402	1361	1322	1284	1243	1204	1164	1124	1084
					BHP	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.40	0.42
					Gas Heat Rise (°F)	31	32	33	34	35	36	37	38	40	41
					Gas Heat Rise (°C)	17	18	18	19	19	20	21	21	22	23
		Med-High**	Orange	Cooling Alternate Heating	CFM	1529	1491	1451	1411	1376	1338	1300	1261	1223	1185
					BHP	0.37	0.39	0.40	0.41	0.42	0.43	0.44	0.45	0.46	0.47
					Gas Heat Rise (°F)	29	30	31	32	32	33	34	35	36	38
					Gas Heat Rise (°C)	16	17	17	18	18	19	19	20	20	21
		High	Black	High Static Cooling Only	CFM	1604	1565	1529	1490	1455	1421	1385	1348	1310	1274
					BHP	0.42	0.44	0.45	0.46	0.47	0.48	0.49	0.50	0.51	0.52



Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60

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	956	899	843	786	729	676	621	558	504	435
					BHP	0.13	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.18	0.19
					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	1201	1153	1107	1060	1012	965	917	871	828	782
					BHP	0.21	0.22	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29
					Gas Heat Rise (°F)	56	58	60	63	NA	NA	NA	NA	NA	NA
					Gas Heat Rise (°C)	31	32	34	35	NA	NA	NA	NA	NA	NA
		Medium‡	Red	Heating Alternate Cooling	CFM	1443	1402	1361	1322	1284	1243	1204	1164	1124	1084
					BHP	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.40	0.42
					Gas Heat Rise (°F)	46	48	49	51	52	54	56	58	60	62
					Gas Heat Rise (°C)	26	27	27	28	29	30	31	32	33	34
		Med-High**	Orange	Cooling Alternate Heating	CFM	1529	1491	1451	1411	1376	1338	1300	1261	1223	1185
					BHP	0.37	0.39	0.40	0.41	0.42	0.43	0.44	0.45	0.46	0.47
					Gas Heat Rise (°F)	44	45	46	47	49	50	52	53	55	57
					Gas Heat Rise (°C)	24	25	26	26	27	28	29	29	30	31
		High	Black	High Static Cooling Only	CFM	1604	1565	1529	1490	1455	1421	1385	1348	1310	1274
					BHP	0.42	0.44	0.45	0.46	0.47	0.48	0.49	0.50	0.51	0.52
48090	35 - 65 (19 - 36)	Low†	Blue		CFM	641	551	462	385	289	216	163	115	---	---
					BHP	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	---	---
					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 Alternate Cooling	CFM	1437	1395	1351	1307	1265	1221	1176	1132	1084	1039
					BHP	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38
					Gas Heat Rise (°F)	47	48	50	51	53	55	57	59	62	64
					Gas Heat Rise (°C)	26	27	28	28	29	30	32	33	34	36
		Medium**	Red	Cooling Alternate Heating	CFM	1771	1735	1699	1664	1627	1592	1557	1522	1486	1450
					BHP	0.51	0.52	0.53	0.55	0.56	0.57	0.58	0.59	0.61	0.62
					Gas Heat Rise (°F)	38	39	39	40	41	42	43	44	45	46
					Gas Heat Rise (°C)	21	21	22	22	23	23	24	24	25	26
		Med-High	Orange	Alternate Cooling Alternate Heating	CFM	1928	1897	1862	1830	1796	1764	1732	1698	1620	1512
					BHP	0.64	0.65	0.67	0.68	0.69	0.71	0.72	0.73	0.71	0.66
					Gas Heat Rise (°F)	35	35	36	37	37	38	39	39	41	44
					Gas Heat Rise (°C)	19	20	20	20	21	21	21	22	23	25
		High	Black	High Static Cooling Only	CFM	2212	2167	2124	2061	1976	1892	1794	1699	1567	1438
					BHP	0.97	0.99	1.00	0.97	0.95	0.91	0.86	0.82	0.77	0.71



Dry Coil Air Delivery* - Horizontal and Downflow Discharge Sizes 24-60

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	Alternate Heating	CFM	641	551	462	385	289	216	163	115	---	---
					BHP	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	---	---
					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 Alternate Cooling	CFM	1437	1395	1351	1307	1265	1221	1176	1132	1084	1039
					BHP	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38
					Gas Heat Rise (°F)	47	48	50	51	53	55	57	59	62	64
					Gas Heat Rise (°C)	26	27	28	28	29	30	32	33	34	36
		Medium**	Red	Cooling Alternate Heating	CFM	1914	1881	1848	1814	1780	1748	1716	1681	1619	1512
					BHP	0.62	0.64	0.65	0.67	0.68	0.69	0.71	0.72	0.71	0.66
					Gas Heat Rise (°F)	35	36	36	37	38	38	39	40	41	44
					Gas Heat Rise (°C)	19	20	20	21	21	21	22	22	23	25
		Med-High	Orange	Alternate Cooling Alternate Heating	CFM	1928	1897	1862	1830	1796	1764	1732	1698	1620	1512
					BHP	0.64	0.65	0.67	0.68	0.69	0.71	0.72	0.73	0.71	0.66
					Gas Heat Rise (°F)	35	35	36	37	37	38	39	39	41	44
					Gas Heat Rise (°C)	19	20	20	20	21	21	21	22	23	25
		High	Black	High Static Cooling Only	CFM	2212	2167	2124	2061	1976	1892	1794	1699	1567	1438
					BHP	0.97	0.99	1.00	0.97	0.95	0.91	0.86	0.82	0.77	0.71
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 heating speed
** Factory-shipped cooling speed
"High Static Cooling" = Only to be used for cooling function (not allowed for heating function)
NOTE: Deduct field-supplied air filter pressure drop and wet coil pressure drop to obtain static pressure available for ducting.

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				0.02	0.03	0.03	0.04	0.05	0.05								
42					0.05	0.05	0.06	0.07	0.08	0.08	0.09	0.09	0.11				
48							0.04	0.05	0.05	0.06	0.07	0.07	0.08	0.09	0.14		
60										0.06	0.07	0.01	0.08	0.09	0.10	0.12	0.13

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	-	-	0.08	0.09	0.10	0.11	0.11	0.13	0.14	-	-	-	-	-	-	-	-
1200-1800CFM 16x24x1+14x24x1 (406x610x25+356x610x25)	3.5	-	-	-	-	-	0.09	0.09	0.10	0.12	0.13	0.15	0.17	0.17	0.19	0.21	-	-
1500-2200CFM 16x24x1+18x24x1 (406x610x25+457x610x25)	3.0, 4.0, 5.0	-	-	-	-	-	-	-	-	-	0.15	0.17	0.18	0.20	0.21	0.22	0.23	0.23



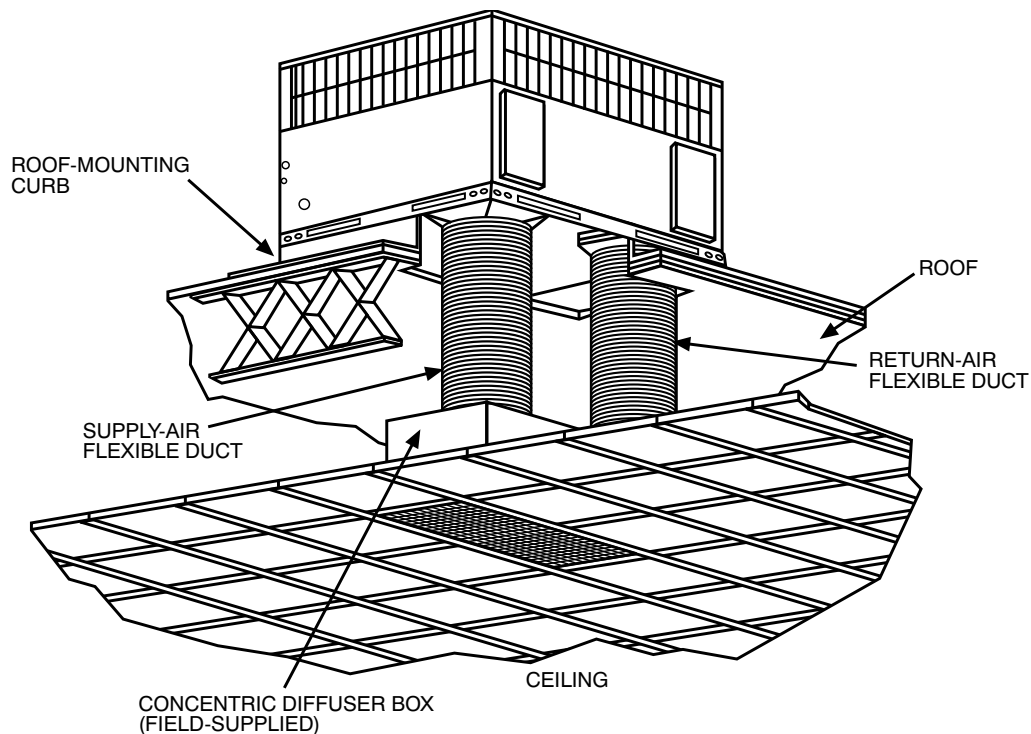
Filter Pressure Drop Table (IN. W.C.)

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
600-1400CFM 12x20x1+12x20x1 (305x508x25+305x508x25)	2.0, 2.5	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	-	-	-	-	-	-	0.07	0.08	0.09	0.09	0.10	0.11	0.12	-	-	-	-
1100-2200 CFM 16x24x1+18x24x1 (406x610x25+457x610x25)	3.0 4.0 5.0	-	-	-	-	-	0.02	0.02	0.03	0.03	0.04	0.06	0.08	0.10	0.11	0.13	0.14	0.15

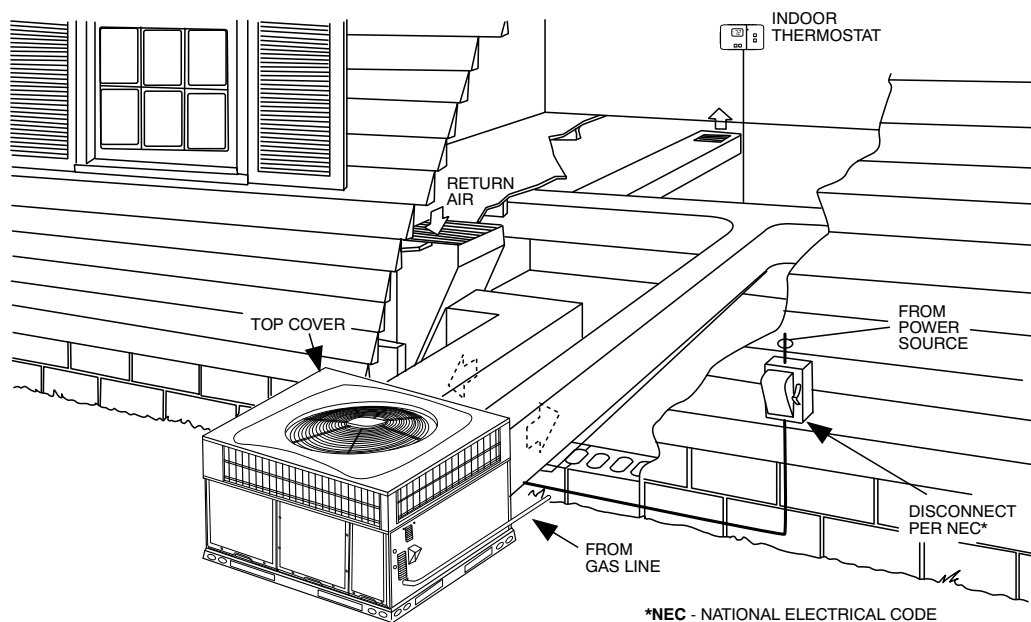
Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.



Typical Piping and Wiring



A09230



*NEC - NATIONAL ELECTRICAL CODE

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
24040, 24060	208/230-1-60	197	253	11.1	59.5	0.6	3.9	0.7	18.4	25
30040, 30060	208/230-1-60	197	253	14.1	67.9	1.05	3.9	0.7	22.6	30
36060	208/230-1-60	197	253	14.7	75	1.05	3.8	0.7	23.3	35
36060	208/230-3-60	197	253	8.5	70	1.05	3.8	0.7	15.5	25
42060, 42090	208/230-1-60	197	253	16.7	109	1.05	5.8	0.7	27.8	40
42060, 42090	208/230-3-60	197	253	11.2	84	1.05	5.8	0.7	20.9	30
48090	208/230-1-60	197	253	19.6	130	1.05	6.9	0.7	32.5	50
48090	208/230-3-60	197	253	13.7	83.1	1.05	6.9	0.7	25.1	35

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

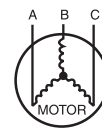
NOTES:

- 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.
- 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.
- 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

% 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

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

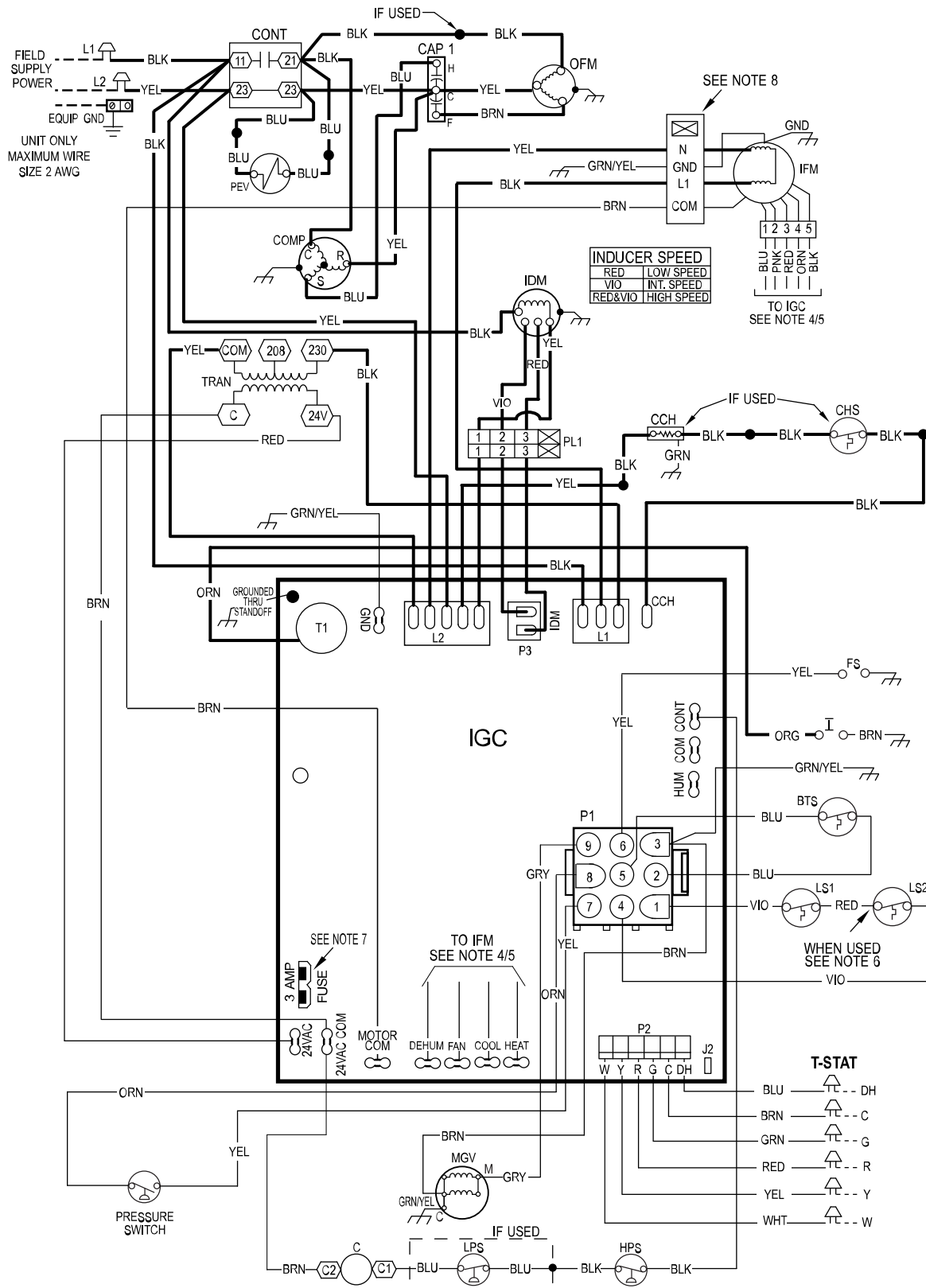
This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

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

A06564

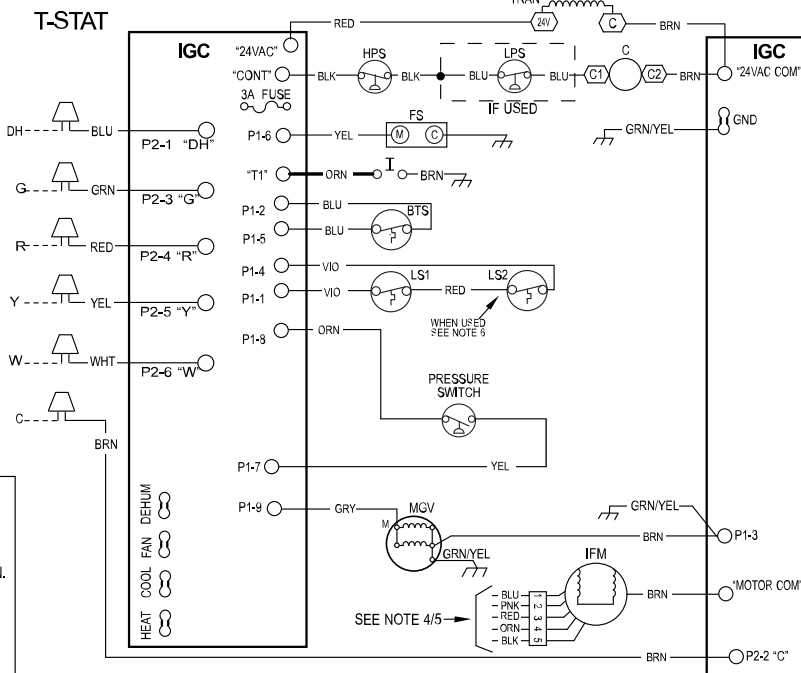
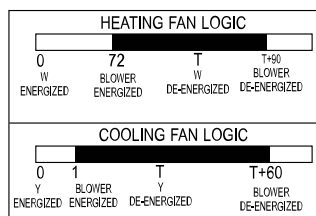
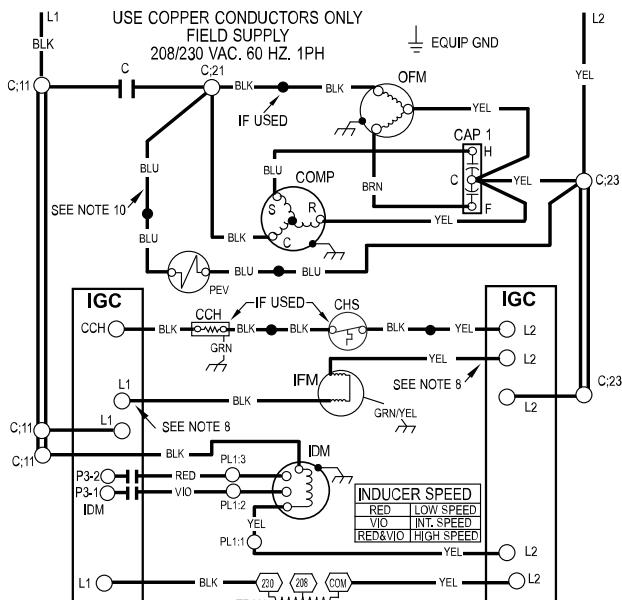
Connection Wiring Schematic 208/230-1-60

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



A221593

DANGER: ELECTRICAL SHOCK HAZARD DISCONNECT POWER BEFORE SERVICING



1. IF ANY OF THE ORIGINAL WIRES FURNISHED ARE REPLACED THEY MUST BE REPLACED WITH THE SAME WIRE OR ITS EQUIVALENT.
2. SEE PRE-SALE LITERATURE FOR THERMOSTATS.
3. USE 75 DEGREES C COPPER CONDUCTORS FOR FIELD INSTALLATION.
4. REFER TO INSTALLATION INSTRUCTIONS FOR CORRECT SPEED SELECTION FOR IFM.
5. SEE INSTALLATION INSTRUCTIONS FOR PROPER HEATING AND COOLING CONNECTIONS FOR YOUR UNIT.
6. ON SOME MODELS L51 AND L52 ARE WIRED IN SERIES, ON OTHER MODELS ONLY L51 IS USED.
7. THIS FUSE IS MANUFACTURED BY LITTLE FUSE, P/N 287003.
8. DO NOT DISCONNECT PLUG UNDER LOAD.
9. N.E.C. CLASS 2, 24V.
10. PEV FOUND ON SELECT ROTARY COMPRESSORS.
11. INDUCER MOTOR USES A 230V CONTROL SIGNAL.



345854-101 REV. D



345854-101 REV. D

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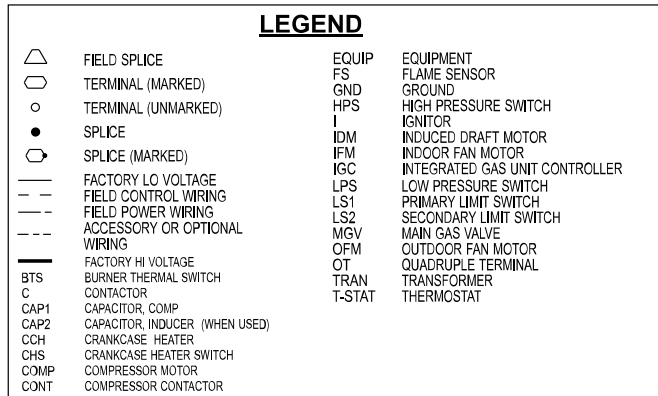
DANGER: ELECTRICAL SHOCK HAZARD DISCONNECT POWER BEFORE SERVICING



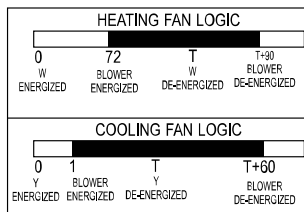
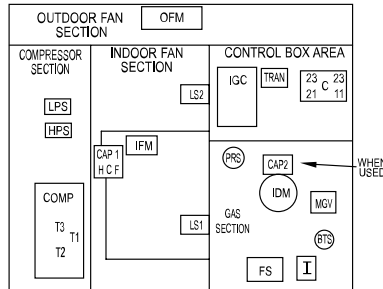
Ladder Wiring Schematic 208/230-3-60

LADDER WIRING DIAGRAM

DANGER: ELECTRICAL SHOCK HAZARD DISCONNECT POWER BEFORE SERVICING

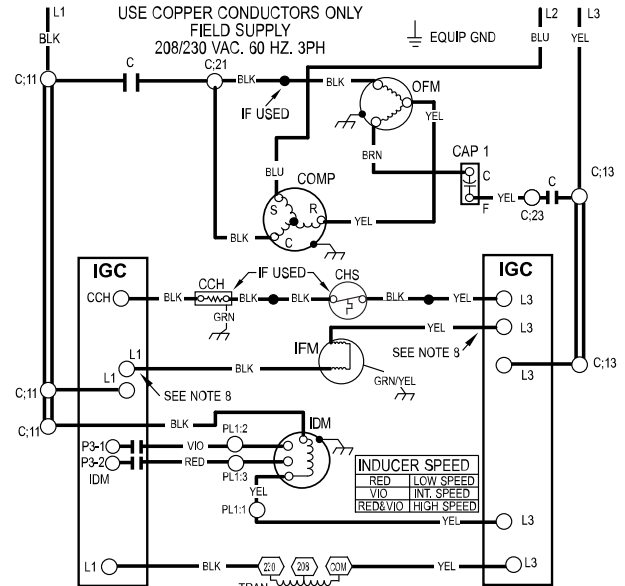


3Ø UNIT COMPONENT ARRANGEMENT

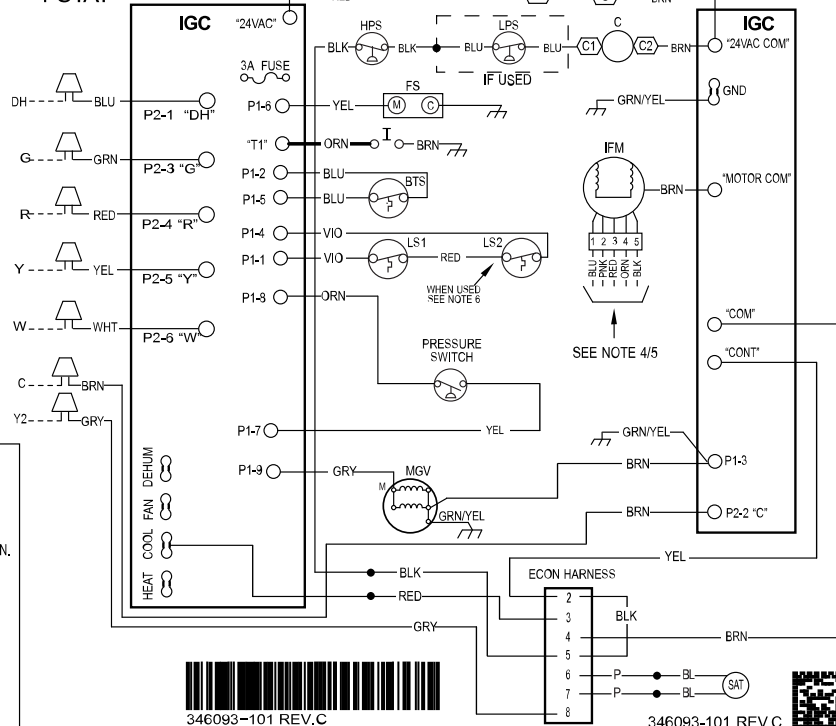


NOTES:

- 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.
- INDUCER MOTOR USES A 230V CONTROL SIGNAL.



T-STAT



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 intermediate 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 intermediate inducer speed for 10 sec and gradually ramps up to the high speed for steady-state operation. The system uses the same logic for 2nd ignition trial. If a 3rd or 4th ignition attempt is needed, the inducer speed is decreased to the low speed. On a successful light on the 3rd or 4th attempt, the inducer speed is increased to the intermediate speed for about 10 seconds and then gradually ramps up to the high speed for steady-state operation. 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 stainless 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. 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.
10. Manual Outdoor Air Damper:
Package shall consist of damper, birdscreen, and rainhood which can be preset to admit outdoor air for year-round ventilation.
11. Square-To-Round Duct Transitions (24-48 models):
Shall have the ability to convert the supply and return openings from rectangular to round.
12. 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.
13. Low Pressure Switch Kit
Kit is designed for use when a low pressure control is desired. This kit provides added reliability for the compressor.



