

## COMMERCIAL HIGH EFFICIENCY PACKAGE HEAT PUMP UNITS R-22, SINGLE PACKAGE ROOFTOP, 3 – 15 TONS (3-Phase)

### BUILT TO LAST, EASY TO INSTALL AND SERVICE

- One-piece, high efficiency heat pump with a low profile, prewired, tested, and charged at the factory.
- Field convertible supply and return openings (036-120) are intended for installation on a roof top or ground level.
- Hermetic-type scroll compressor, single compressor on 036-072 models, dual compressors on 090-120 models. Semi-hermetic single compressor on size 156, dual semi-hermetic compressors on size 180.
- Two speed belt motors on sizes 036-060. Belt-drive with variable pitch pulley on sizes 072-120
- Liquid line filter drier
- Non-corrosive condensate pan on 036-120 models with choice of bottom or side drain connections. All models have self draining sloping design.
- Refrigeration system: Loss-of-charge, freeze protection, and high pressure safety switches
- Single-point electrical connections on field installed electric heat units
- Adjustable belt drive indoor fan standard, with permanently lubricated motors
- Direct-drive propeller outdoor fan totally enclosed with permanently lubricated bearings
- Prepainted, galvanized steel cabinet with primer inner panels, certified at 500-hr salt spray test and noncorrosive screws
- Easily removable panels provide ready access to components for removal or maintenance
- Two inch disposable type return air filters in dedicated rack with filter access door requiring no tools
- Four-way valve operation
- Outdoor temperature cooling operation down to 25°F and up to 125°F
- Fixed orifice metering devices to precisely control refrigerant flow
- State of the art defrost control board, easily configured for defrost cycles at 30, 50, or 90 minutes
- Indoor and outdoor coils constructed of aluminum fins mechanically bonded to seamless copper tubes
- 24-Volt control circuit with circuit breaker
- Thru-the-bottom power entry capability
- 25% manual outside air damper on sizes 156-180 models



PHH 036-072



PHH 090-120



PHH 156, 180

### WARRANTY

- 5 Year compressor limited warranty
- 1 Year parts limited warranty



This product has been designed and manufactured to meet ENERGY STAR criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow the manufacturer's refrigerant charging and air flow instructions. Failure to confirm proper charge and airflow may reduce energy efficiency and shorten equipment life.

### UNIT PERFORMANCE DATA

UNIT PHH 1 & 3-Phase	NOMINAL TONS	COOLING		HEATING (High Temp)		Unit Dimensions H x W x L	Unit Weight
		Net Cap. (Btuh)	SEER	Cap. (Btuh)	HSPF		
PHH036*0A00AA	3	35,600	13.1	34,800	7.7	33-5/16" x 73-11/16" x 45"	550
PHH048*0A00AA	4	45,000	13.0	45,000	7.8	33-5/16" x 73-11/16" x 45"	560
PHH060*0A00AA	5	58,000	13.0	55,000	7.7	41-5/16" x 73-11/16" x 45"	630

UNIT PHH 3-Phase	NOMINAL TONS	COOLING		HEATING (High/Low)		Unit Dimensions H x W x L	Unit Weight
		Net Cap. (Btuh)	EER	Cap. (Btuh)	COP		
PHH072*0A00AA	6	71,000	10.5	69,000/37,000	3.4/2.2	41-5/16" x 73-11/16" x 45"	630
PHH090*0A00AA	7 1/2	88,000	10.3	85,000/48,000	3.3/2.2	41-5/16" x 87-3/8" x 57-3/4"	870
PHH102*0A00AA	8 1/2	98,000	10.3	96,000/52,000	3.3/2.2	49-5/16" x 87-3/8" x 57-3/4"	1000
PHH120*0A00AA	10	116,000	10.3	114,000/64,000	3.3/2.2	49-5/16" x 87-3/8" x 57-3/4"	1000
PHH156*0A00AA	12 1/2	140,000	9.8	136,000/72,000	3.2/2.1	45" x 91-1/4" x 86-1/8"	1615
PHH180*0A00AA	15	172,000	9.3	172,000/90,000	3.3/2.2	45" x 91-1/4" x 86-1/8"	1925

\* Indicates Unit voltage: K = 208/230v (1 Phase), H = 208/230v, L = 460v

**NOTE: BASE MODEL NUMBERS LISTED. SEE MODEL NOMENCLATURE LISTING FOR ADDITIONAL OPTIONS**

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## MODEL NOMENCLATURE

<b>MODEL SERIES</b>	<b>P</b>	<b>H</b>	<b>H</b>	<b>090</b>	<b>H</b>	<b>0</b>	<b>A</b>	<b>00</b>	<b>A</b>	<b>A</b>	<b>A</b>
P = Package											
H = Heat Pump											
H = High Efficiency											
036 = 36,000											
048 = 48,000											
060 = 60,000											
072 = 72,000											
090 = 90,000											
102 = 102,000											
120 = 120,000											
156 = 156,000											
180 = 180,000											
<b>NOMINAL COOLING BTU/h</b>											
K= 208/230-1-60											
H = 208/230-3-60											
L =460-3-60											
<b>VOLTAGE</b>											
0 = No Heat				<b>HEATING CAPACITY</b> (see spec sheet for actual capacity)							
A = Standard Motor				<b>MOTOR OPTION</b> (see spec sheet for details)							
B = High Static Motor											
00 = No Factory Installed Options				<b>FACTORY INSTALLED OPTIONS</b> (see spec sheet for details)							
XX = See FIOP Selection Guide for Details											
A = Aluminum/Copper Outdoor Coil				<b>OUTDOOR COIL OPTION</b>							
A = Initial Offering				<b>SALES DIGIT</b>							
A = Original Design				<b>ENGINEERING DIGIT</b>							

## FEATURES/BENEFITS

Every compact one-piece unit arrives fully assembled, charged, tested, and ready to run.

**QUIET, EFFICIENT OPERATION AND DEPENDABLE PERFORMANCE** — Compressors have vibration isolators for quiet operation. Efficient fan and motor design permits operation at low sound levels.

Quiet and efficient operation is provided by belt-driven indoor fans (standard on all units over 5 tons). The belt-driven indoor fan is equipped with variable-pitch pulleys which allow adjustment within the rpm ranges of the factory-supplied pulleys. Increased operating efficiency is achieved through computer-designed coils featuring staggered internally enhanced copper tubes. Fins are ripple-edged for strength, lanced, and double waved for higher heat transfer.

**DURABLE, DEPENDABLE CONSTRUCTION** — Designed for durability in any climate, the weather-resistant cabinets are constructed of galvanized steel and bonderized, and all exterior panels are coated with a prepainted baked enamel finish. The paint finish is non-chalking, and is capable of withstanding ASTM (American Society for Testing and Materials) B117 500-hour Salt Spray Test. All internal cabinet panels are primed, permitting longer life and a more attractive appearance for the entire unit.

**All size 036–120 units are designed with a single, continuous top piece** to eliminate any possible leaks. Totally enclosed outdoor-fan motors and permanently lubricated bearings provide additional unit dependability.

**Patented State-of-the-Art Defrost System** uses time and temperature to keep the outdoor coil frost-free for economical, dependable operation. The defrost board can be easily configured for defrost cycles every 30, 50, or 90 minutes.

**Dependable 4-Way Valve Operation** safely and efficiently accomplishes cycle reversals, defrost, and normal operation.

### EASY INSTALLATION AND CONVERSION

**All Units are Shipped in the Vertical Duct Configuration** for fit-up to standard roof curbs. (3 different curb sizes fit unit sizes 036–072, 090–120, and 156,180 respectively.) The contractor can order and install the roof curb early in the construction stage, before decisions on size requirements are made.

All units feature a base rail design with forklift slots and rigging holes for easier maneuvering. Durable packaging protects all units during shipment and storage.

The units can be easily converted from a vertical to a horizontal duct configuration by relocating the panels supplied with the unit.

**To Convert 036–120 Units** from vertical to horizontal discharge, simply relocate 2 panels. The same basic unit can be used for a variety of applications and can be quickly modified at the jobsite.

**To Convert Size 156 and 180 Units** from vertical to horizontal discharge, use the optional horizontal supply/return adapter roof curb.

**Convenient Duct Openings** in the unit basepans permit side-by-side or concentric duct connections without requiring internal unit modification (size 156,180 only).

**NOTE:** On units using horizontal supply and return, the accessory barometric relief or power exhaust **MUST** be installed on the return ductwork. Thru-the-bottom service connection capability comes standard with the rooftop unit to allow power and control wiring to be routed through the unit's basepan, thereby minimizing roof penetrations (to prevent water leaks). Power and control connections are made on the same side of the unit to simplify installation.

**The Non-Corrosive Sloped Condensate Drain Pan** permits either an external horizontal side condensate drain (outside the roof curb) or an internal vertical bottom drain (inside the roof curb). Both options require an external, field-supplied P-trap.

**Standard 2-in. Throwaway Filters** are easily accessed through a removable panel located above the air intake hood. No tools are required to change unit filters.

**Belt-Driven Indoor-Fan Motors** allow maximum on-site flexibility without changing motors or drives (sizes 072–120).

**Field-Installed Accessory Electric heaters** are available in a wide range of capacities. An available single-point wiring kit makes installation simple.

**Low Voltage Wiring Connections** are easily made due to the large terminal board which is located for quick, convenient access. In addition, color-coded wires permit easy tracing and diagnostics.

### PROVEN COMPRESSOR RELIABILITY

Design techniques feature computer-programmed balance between compressor, condenser, and evaporator. Hermetic compressors are equipped with compressor overcurrent and overtemperature protection to ensure dependability.

All units have a fixed orifice metering device which precisely controls refrigerant flow, preventing slugging and flood-back, while maintaining optimum unit performance. Refrigerant filter driers are standard.

**Standard Low Ambient Cooling Operation to 25°F;** optional head pressure control kit available for outdoor ambient conditions to –20°F.

### INTEGRATED ECONOMIZERS AND OUTDOOR-AIR DAMPERS

Available as options or accessories, economizers and manual outdoor-air dampers introduce outdoor air which mixes with the conditioned air, improving indoor-air quality and often reducing energy consumption.

During a first stage call for cooling, if the outdoor-air temperature is below the economizer control changeover set point, the mixed-air sensor modulates the economizer outdoor-air damper open to take advantage of free cooling provided by the outside air. When second-stage cooling is called for, the compressor is energized in addition to the economizer. If the outdoor-air temperature is above the changeover set point, the first stage of compression is activated and the economizer damper stays at minimum position.

All economizers incorporate a parallel blade, gear driven damper system for efficient air mixing and reliable control.

In addition, the standard damper actuator includes a spring return to provide reliable closure on power loss. The economizers for sizes 036–120 are equipped with up to 100% barometric relief capability for high outdoor airflow operations. Economizers for unit sizes 156 and 180 are compatible for vertical or horizontal return. An optional field-installed barometric relief package is available for 156 and 180 size units.

In addition, single-stage power exhaust is available as a field-installed accessory for economizer to help maintain proper building pressure.

For units without economizer, year-round ventilation is enhanced by a manual outdoor-air damper. On size 036–120 units, a manual damper is available as a field-installed accessory. Unit sizes 156 and 180 are equipped with a manual 25% damper.

### INDOOR-AIR QUALITY

Sloped condensate pans minimize biological growth in rooftop units in accordance with ASHRAE Standard 62. Two-inch filters provide for greater particle reduction in the return air. The face-split evaporator coils improve the dehumidification capability of standard units and maximize building humidity control.

## ARI\* CAPACITY RATINGS – PHH 036–180

UNIT PHH	NOMINAL TONS	COOLING		HEATING (High Temp)		SOUND RATING (decibels)
		Net Cap. (Btuh)	SEER†	Cap. (Btuh)	HSPF†	
036	3	35,600	13.1	34,800	7.7	76
048	4	45,000	13	45,000	7.8	76
060	5	58,000	13	55,000	7.7	80

UNIT PHH	NOMINAL TONS	COOLING		HEATING (High Temp)		HEATING (Low Temp)		SOUND RATING (decibels)	IPLV
		Net Cap. (Btuh)	EER	Cap. (Btuh)	COP	Cap. (Btuh)	COP		
072	6	71,000	10.5	69,000	3.4	37,000	2.2	80	–
090	7½	88,000	10.3	85,000	3.3	48,000	2.2	82	10.5
102	8½	98,000	10.3	96,000	3.3	52,000	2.2	110	11.0
120	10	116,000	10.3	114,000	3.3	64,000	2.2	84	10.4

UNIT PHH	COOLING					HEATING (High Temp)			HEATING (Low Temp)			SOUND RATING (decibels)
	Total kW	Net Cap. (Btuh)	CFM	IPLV	EER	Cap. (Btuh)	Total kW	COP	Cap. (Btuh)	Total kW	COP	
156	14.3	140,000	4500	12.4	9.8	136,000	12.4	3.2	72,000	10	2.1	87
180	18.5	172,000	5200	9.7	9.3	172,000	15.3	3.3	90,000	12.5	2.2	88

**LEGEND:**

- Cap – Net Capacity (Btuh)
- HSPF — Heating Seasonal Performance Factor
- SEER — Seasonal Energy Efficiency Ratio
- COP — Coefficient of Performance
- db — Dry Bulb
- EER — Energy Efficiency Ratio
- ESP — External Static Pressure
- IPLV — Integrated Part-Load Value
- wb — Wet Bulb
- \* Air Conditioning and Refrigeration Institute
- † — Applies only to units with capacity of 60,000 Btuh or less



**NOTES:**

1. PHH036–120 units rated in accordance with ARI Standards 210/240–95 and 270–95. PHH156–180 units rated in accordance with ARI Standards 340–93.
2. Ratings are net values, reflecting the effects of circulating fan heat. Supplementary electric heat is not included. Ratings based on ESP:–.35 in.wg.
3. ALL the PHH units are in compliance with ASHRAE 90.1 2001 Energy Standard for minimum SEER and EER requirements. Refer to state and local codes or visit the following website: <http://solstice.crest.org/efficiency/bcap> to determine if compliance with this standard pertains to a given geographical area of the United States.
4. Ratings are based on:  
**Cooling Standard:** 80°F db, 67°F wb indoor entering–air temperature and 95°F db air entering outdoor unit.  
**IPLV Standard:** 80°F db, 67°F wb indoor entering–air temperature and 80°F db outdoor entering–air temperature.  
**High-Temp Heating Standard:** 70°F db indoor entering–air temperature and 47°F db, 43°F wb outdoor entering–air temperature.  
**Low-Temp Heating Standard:** 70°F db indoor entering–air temperature and 17°F db, 15°F wb outdoor entering–air temperature.

## OPTIONS AND ACCESSORIES – PHH 036–120

ITEM	OPTION*	ACCESSORY†
High Static Motors and Drives	X	
Compressor Cycle Delay		X
Convenience Outlet	X	
Copper Fins Outdoor Coil	X	
Economizer with Controller	X	X
Electric Heat		X
Electronic Programmable Thermostat**		X
Indoor Air Quality (CO <sub>2</sub> ) Sensor (For Return Air)		X
Manual Outdoor–Air Damper	X	X
Low Ambient Kits		X
Outdoor Air Enthalpy Sensor		X
Outdoor Coil Grille		X
Outdoor Coil Hail Guard Assembly		X
Outdoor Air/Return Air Temperature Sensor		X
Power Exhaust with Barometric Relief		X
Return Air Enthalpy Sensor		X
Return Air Temperature Sensor		X
Roof Curbs (Vertical and Horizontal Discharge)		X
Thermostats and Subbases**		X
Thru–the–Bottom Utility Connections		X
Unit–Mounted Non–Fused Disconnect	X	

## OPTIONS AND ACCESSORIES – PHH 156, 180

ITEM	OPTION*	ACCESSORY†
High Static Motors and Drives	X	
Convenience Outlet	X	
Compressor Cycle Delay		X
Barometric Relief Damper (Not for use with horizontal roof curb) sizes 156, 180 only		X
Copper Fins Outdoor Coil	X	
Economizer with Controller	X	X
Electric Heat		X
Electronic Programmable Thermostat**		X
Horizontal Adapter Curb		X
Indoor Air Quality (CO <sub>2</sub> ) Sensor		X
Manual Outdoor–Air Damper (Standard feature)		
Low Ambient Kit		X
Outdoor Air Enthalpy Sensor		X
Power Exhaust without Barometric Relief		X
Return Air Enthalpy Sensor		X
Return Air Temperature Sensor		X
Roof Curbs (Vertical and Horizontal Discharge)		X
Thermostats and Subbases**		X
Winter Start Time Delay		X

\*Factory–installed.

†Field–installed.

\*\*Available through FAST Parts.

### NOTES:

1. Refer to unit specifications or contact your local representative for accessory and option package information.
2. Some options may increase product lead times.

## OPTIONS AND ACCESSORIES (cont.)

**Roof Curbs (Horizontal and Vertical)** permit installation and securing of ductwork to curb prior to mounting unit on the curb. 8 in, 14-in. and 24-in. roof curbs are available as field-installed accessories.

**Economizer** is available as a factory-installed option in vertical supply/return configuration only for unit sizes 036–120. Vertical or horizontal configuration is available for unit sizes 156 and 180. (Economizer is available as a field-installed accessory for horizontal and/or vertical supply return configurations.) The Economizer is provided with an industry standard, standalone, solid-state controller that is easy to configure and troubleshoot. The Economizer is compatible with non-DDC applications. Economizer is equipped with a barometric relief damper capable of relieving up to 100% return air. Dry bulb outdoor-air temperature sensor is provided as standard. The return air sensor, indoor enthalpy sensor, and outdoor enthalpy sensor are provided as field-installed accessories to provide enthalpy control, differential enthalpy control, and differential dry bulb temperature control.

**Manual Outdoor-Air Damper** accessory can be preset to admit up to 50% outdoor air for year round ventilation.

**Low Ambient Control** accessory package maintains condensing temperature between 90°F and 110°F at outdoor ambient temperatures down to –20°F by condenser-fan speed modulation or condenser-fan cycling and wind baffles.

**Electric Resistance Heaters** are UL listed and available to match heating requirements. Single point kits available for each heater when required. Heaters are field-installed accessories.

**Unit-Mounted, Non-Fused Disconnect Switch** provides unit power shutoff. The switch is accessible from outside the unit and provides power off lockout capability and is available as factory-installed option.

**Convenience Outlet** can be installed and internally mounted with easily accessible 115v female receptacle. Requires separate field supplied power source.

**Compressor Cycle Delay** prevents unit from restarting for minimum of 5 minutes after shutdown.

**Thru-the-Bottom Utility Connectors** permit electrical connections to be brought to the unit through the basepan. Connectors are a field-installed accessory.

**Power Exhaust** accessory will provide system exhaust of up to 100% of return air (vertical only). The power exhaust is a field-installed accessory (separate vertical and horizontal design).

## ACCESSORIES – PHH 036–180

<b>FLAT ROOF CURBS</b>		
<b>Model Number</b>	<b>Height</b>	<b>Use With Model Size</b>
AXB035CLA	8" High Roof Curb	036–072
AXB035CMA	14" High Roof Curb	036–072
AXB035CHA	24" High Roof Curb	036–072
AXB045CLA	8" High Roof Curb	090 – 120
AXB045CMA	14" High Roof Curb	090 – 120
AXB045CHA	24" High Roof Curb	090 – 120
AXB060CMA	14" Vertical Discharge Roof Curb	156, 180
AXB060CHA	24" Vertical Discharge Roof Curb	156, 180
AXB065CHA	24" Horizontal Discharge Roof Curb	156, 180
AXB165CHA	24" Horizontal Discharge Roof Curb	156, 180

<b>ECONOMIZERS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNECOMZR020A02	Vertical 3-Position -- with W7212 controller	036–072
DNECOMZR021A02	Vertical 3-Position -- with W7212 controller	090 – 120
DNECOMZR024A02	Horizontal 3-Position -- with W7212 controller	036–072
DNECOMZR025A02	Horizontal 3-Position -- with W7212 controller	090 – 120
DNECOMZR008C00	Vertical or Horizontal 3-Position -- with W7212 controller	156 , 180

\* Economizer model numbers for factory installed economizers. Must use the 'DN' model power exhaust with 'DN' economizers

<b>ALTERNATE ECONOMIZERS</b>		
AXB035EMA	Fully Modulating Economizer – Downflow	036–072
AXB035EPA	Three Position Economizer – Downflow	036–072
AXB035HEA	Fully Modulating Economizer – Horizontal	036–072
AXB035HPA	Three Position Economizer – Horizontal	036–072
AXB145EMA	Fully Modulating Economizer – Downflow	90
AXB245EMA	Fully Modulating Economizer – Downflow	102, 120
AXB145EPA	Three Position Economizer – Downflow	90
AXB245EPA	Three Position Economizer – Downflow	102, 120
AXB145HEA	Fully Modulating Economizer – Horizontal	90
AXB245HEA	Fully Modulating Economizer – Horizontal	102, 120
AXB145HPA	Three Position Economizer – Horizontal	90
AXB245HPA	Three Position Economizer – Horizontal	102, 120
AXB060EMA	Fully Modulating Economizer – Horizontal/Downflow	156, 180
AXB060EPA	Three Position Economizer – Horizontal/Downflow	156, 180

<b>AIR DAMPERS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNMANDPR001A03	Manual Fresh Air Damper	036–072
DNMANDPR002A03	Manual Fresh Air Damper	090–120
DNBARREL001A00	Barometric Relief Damper	156, 180

<b>ALTERNATE DAMPERS</b>		
AXB035FAA	Manual Fresh Air Damper	036–072
AXB035FMA	Motorized Fresh Air Damper	036–072
AXB145FAA	Fresh Air Damper – 35% Manual	90
AXB245FAA	Fresh Air Damper – 35% Manual	102, 120
AXB145FMA	Fresh Air Damper – 35% Motorized	90
AXB245FMA	Fresh Air Damper – 35% Motorized	102, 120



<b>POWER EXHAUST</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNPWREXH030A01	Vertical Power Exhaust 208/230 volt	036-072
DNPWREXH021A01	Vertical Power Exhaust 460 volt	036-072
DNPWREXH022A01	Vertical Power Exhaust 208/230 volt	090 - 120
DNPWREXH023A01	Vertical Power Exhaust 460 volt	090 - 120
DNPWREXH028A01	Horizontal Power Exhaust 208/230 volt	036- 120
DNPWREXH029A01	Horizontal Power Exhaust 460 volt	036- 120
DNPWREXH008A00	Power Exhaust 460 volt (field convertible to 208/230 volt)	156, 180
DNPWREXH010A00	Power Exhaust 575 volt	156, 180

<b>ALTERNATE POWER EXHAUST</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
AXB035PEH	Power Exhaust 208/230 volt	036-072
AXB035PEL	Power Exhaust 460 volt	036-072
AXB035PES	Power Exhaust 575 volt	036-072
AXB145PEH	Power Exhaust 208/230 volt	90
AXB145PEL	Power Exhaust 460 volt	90
AXB145PES	Power Exhaust 575 volt	90
AXB245PEH	Power Exhaust 208/230 volt	102, 120
AXB245PEL	Power Exhaust 460 volt	102, 120
AXB245PES	Power Exhaust 575 volt	102, 120
AXB060PEH	Power Exhaust 208/230 volt	156, 180
AXB060PEL	Power Exhaust 460 volt	156, 180
AXB060PES	Power Exhaust 575 volt	156, 180

<b>LOW AMBIENT CONTROLS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
AXB035LAA	0 Deg. Low Ambient	036-120
AXB045LAA	Low Ambient Kit/OFM Sequencing Kit (-20°F) 208/230v	090 - 120
AXB160LAA	OFM Sequencing Kit (3 fans)	156, 180

<b>WINTER START KIT</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNWINSTR001A00	Low pressure switch bypass (time delay)	ALL

<b>PHASE MONITOR CONTROL</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNPHASE3001A01	Electronic phase monitor breaks "R" control signal if trouble is detected	ALL

<b>THROUGH-THE-BOTTOM/CURB POWER CONNECTION</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNBTMPWR001A01	Thru-the bottom electrical + thru-the curb Gas	036-072
DNBTMPWR002A01	Thru-the bottom electrical + thru-the curb Gas	090 - 120
DNBTMPWR003A01	Thru-the bottom electrical and Gas	036-072
AXB045PKA	Thru-the bottom electrical and Gas	090 - 120
DNGASSER006A00	Thru-the curb power kit	036-120

<b>ECONOMIZER SENSORS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNTEMPSN002A00	Single or Differential Temp' (dry bulb) Control	ALL Economizers With W7212 Controller
DNCBDIOX005A00	CO <sub>2</sub> Sensor	ALL Economizers With W7212 Controller
DNENTDIF004A00	Return Air Enthalpy Sensor	ALL Economizers With W7212 Controller

<b>ANTI-CYCLE TIMER</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
DNTIMEGD001A00	Five minute compressor delay	ALL

## ACCESSORIES – PHH 036–180 (cont.)

<b>COIL PROTECTION</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
AXB145CGA	Coil Guard	090
AXB245CGA	Coil Guard	102, 120
AXB145HGA	Hail Guard	090
AXB245HGA	Hail Guard	102, 120
AXB060CGA	Coil Guard	156, 180
AXB060HGA	Hail Guard	156, 180

<b>CONCENTRIC DIFFUSERS AND DUCT KITS</b>		
<b>Model Number</b>	<b>Description</b>	<b>Use With Model Size</b>
AXB035CTA	20" Round Concentric Duct Kit	036–072
AXB445CTA	20" Round Concentric Duct Kit	90
AXB545CTA	Concentric Duct Kit 18" x 28" Rect.	102
AXB645CTA	Concentric Duct Kit 18" x 32" Rect.	120
AXB160CTA	Concentric Duct Kit 18" x 36"	156, 180
AXB030CFA	Concentric Diffuser – Flush Mount	036–072
AXB030CSA	Concentric Diffuser – Step Down	036–072
AXB040CFA	Concentric Diffuser – Flush Mount	036–072
	Concentric Diffuser – Flush Mount (use with AXB445CTA)	90
AXB040CSA	Concentric Diffuser – Step Down	036–072
	Concentric Diffuser – Step Down (use with AXB445CTA)	90
AXB045CFA	Concentric Diffuser – Flush Mount (use with AXB545CTA)	102
AXB045CSA	Concentric Diffuser – Step Down (use with AXB545CTA)	102
AXB050CFA	Concentric Diffuser – Flush Mount (use with AXB645CTA)	120
AXB050CSA	Concentric Diffuser – Step Down (use with AXB645CTA)	120
AXB055CFA	Concentric Diffuser – Flush Mount (use with AXB160CTA)	156, 180
AXB055CSA	Concentric Diffuser – Step Down (use with AXB160CTA)	156, 180

## ACCESSORIES – PHH 036–180

### ELECTRIC HEATERS for 036 –060 SIZE MODELS

Model Size	Voltage	kW	Electric Heater Model Number(s)	Single Point Wiring Kit Required
036	208/230/240 (Single phase)	3.3/ 4.0/ 4.4	AES001EHA	-
		4.9/ 6.0/ 6.5	AES007EHA	-
		6.5/ 8.0/ 8.7	AES003EHA	AXB004SPA
		7.9/ 9.6/ 10.5	AES009EHA	AXB004SPA
		9.8/ 12.0/ 13.0	AES007EHA	AXB005SPA
	208/230/240 (3 phase)	3.3/ 4.0/ 4.4	AES001EHA	-
		4.9/ 6.0/ 6.5	AES007EHA	-
		6.5/ 8.0/ 8.7	AES003EHA	-
		7.9/ 9.6/ 10.5	AES009EHA	-
		12.0/ 14.7/ 16.0	AES015EHA	AXB002SPA
	460/480 (3 phase)	5.5/ 6.0	AES006ELA	-
		8.1/ 8.8	AES008ELA	-
		10.6/ 11.5	AES011ELA	-
		12.9/ 14.0	AES013ELA	-
048	208/230/240 (Single phase)	3.3/ 4.0/ 4.4	AES001EHA	-
		6.5/ 8.0/ 8.7	AES003EHA	AXB004SPA
		9.8/ 12.0/ 13.0*	AES007EHA+AES007EHA	AXB005SPA
		13.1/ 16.0/ 17.4*	AES003EHA+AES003EHA	AXB005SPA
		15.8/ 19.3/ 21.0*	AES009EHA+AES009EHA	AXB003SPA
	208/230/240 (3 phase)	4.9/ 6.0/ 6.5	AES007EHA	-
		6.5/ 8.0/ 8.7	AES003EHA	-
		12.0/ 14.7/ 16.0	AES015EHA	AXB002SPA
		15.8/ 19.3/ 21.0*	AES009EHA+AES009EHA	AXB003SPA
	460/480 (3 phase)	5.5/ 6.0	AES006ELA	-
		10.6/ 11.5	AES011ELA	-
		12.9/ 14.0	AES013ELA	-
		21.1/23.0*	AES011ELA+AES011ELA	-
		060	208/230/240 (Single phase)	4.9/ 6.0/ 6.5
6.5/ 8.0/ 8.7	AES003EHA			AXB004SPA
9.8/ 12.0/ 13.0*	AES007EHA+AES007EHA			AXB005SPA
13.1/ 16.0/ 17.4*	AES003EHA+AES003EHA			AXB005SPA
15.8/ 19.3/ 21.0*	AES009EHA+AES009EHA			AXB005SPA
208/230/240 (3 phase)	4.9/ 6.0/ 6.5		AES007EHA	-
	7.9/ 9.6/ 10.5		AES009EHA	AXB002SPA
	12.0/ 14.7/ 16.0		AES015EHA	AXB002SPA
	15.8/ 19.3/ 21.0*		AES009EHA+AES009EHA	AXB003SPA
	19.9/ 24.3/ 26.5*		AES009EHA+AES015EHA	AXB002SPA
460/480 (3 phase)	5.5/ 6.0		AES006ELA	-
	10.6/ 11.5		AES011ELA	-
	12.9/ 14.0		AES013ELA	-
	21.1/ 23.0*		AES011ELA+AES011ELA	-
	23.4/ 25.5*	AES011ELA+AES013ELA	-	

\* Requires both heater packages to provide kW indicated

## ACCESSORIES – PHH 036–180 (cont.)

ELECTRIC HEATERS for 072–180 SIZE MODELS				
Model Size	Voltage	kW	Electric Heater Model Number(s)	Single Point Wiring Kit Required
072	208/230/240 (3 phase)	4.9/ 6.0/ 6.5	AES007EHA	-
		7.9/ 9.6/ 10.5	AES009EHA	AXB002SPA
		12.0/ 14.7/ 16.0	AES015EHA	AXB002SPA
		15.8/ 19.3/ 21.0*	AES009EHA+AES009EHA	AXB003SPA
		19.9/ 24.3/ 26.5*	AES009EHA+AES015EHA	AXB003SPA
	460/480 (3 phase)	5.5/ 6.0	AES006ELA	-
		10.6/ 11.5	AES011ELA	-
		12.9/ 14.0	AES013ELA	-
		21.1/ 23.0*	AES011ELA+AES011ELA	-
		23.4/ 25.5*	AES011ELA+AES013ELA	-
090	208/230/240 (3 phase)	7.8/ 9.6/ 10.4	AES010EHA	AXB007SPA
		12.0/ 14.7/ 16.0	AES016EHA	AXB007SPA
		18.6/ 22.8/ 24.8	AES024EHA	AXB009SPA
		24.0/ 29.4/ 32.0	AES032EHA	AXB009SPA
		31.8/ 39.0/ 42.4*	AES032EHA+AES010EHA	AXB013SPA
	460/480 (3 phase)	12.8/ 13.9	AES014ELA	AXB006SPA
		15.2/ 16.5	AES016ELA	AXB006SPA
		25.6/ 27.8	AES027ELA	AXB008SPA
		30.4/ 33.0	AES033ELA	AXB008SPA
		38.4/ 41.7*	AES027ELA+AES014ELA	-
102	208/230/240 (3 phase)	7.8/ 9.6/ 10.4	AES010EHA	AXB012SPA
		12.0/ 14.7/ 16.0	AES016EHA	AXB012SPA
		18.6/ 22.8/ 24.8	AES024EHA	AXB015SPA
		24.0/ 29.4/ 32.0	AES032EHA	AXB015SPA
		31.8/ 39.0/ 42.4*	AES032EHA+AES010EHA	AXB017SPA
	460/480 (3 phase)	12.8/ 13.9	AES014ELA	AXB011SPA
		15.2/ 16.5	AES016ELA	AXB011SPA
		25.6/ 27.8	AES027ELA	AXB014SPA
		30.4/ 33.0	AES033ELA	AXB014SPA
		38.4/ 41.7*	AES027ELA+AES014ELA	AXB016SPA
120	208/230/240 (3 phase)	7.8/ 9.6/ 10.4	AES010EHA	AXB012SPA
		12.0/ 14.7/ 16.0	AES016EHA	AXB012SPA
		24.0/ 29.4/ 32.0	AES032EHA	AXB015SPA
		31.8/ 39.0/ 42.4*	AES032EHA+AES010EHA	AXB017SPA
		37.6/ 46.2/ 50.0*	AES032EHA+AES016EHA	AXB017SPA
	460/480 (3 phase)	15.2/ 16.5	AES016ELA	AXB011SPA
		25.6/ 27.8	AES027ELA	AXB014SPA
		30.4/ 33.0	AES033ELA	AXB014SPA
		38.4/ 41.7*	AES027ELA+AES014ELA	AXB016SPA
		46.0/ 50.0*	AES033ELA+AES016ELA	AXB016SPA
156	208 / 230 / 240 (3 phase)	14.0 / 17.3 / 18.8	AES140EHA	(none)
		25.7 / 31.4 / 34.2	AES034EHA	(none)
		42.3 / 51.7 / 56.1	AES056EHA	(none)
	460 / 480 (3 phase)	13.7 / 14.9	AES136ELA	(none)
		29.8 / 32.4	AES132ELA	(none)
		50.5 / 55.0	AES055ELA	(none)
180	208 / 230 / 240 (3 phase)	25.7 / 31.4 / 34.2	AES034EHA	(none)
		42.3 / 51.7 / 56.1	AES056EHA	(none)
	460 / 480 (3 phase)	29.8 / 32.4	AES132ELA	(none)
		50.5 / 55.0	AES055ELA	(none)

\* Requires both heater packages to provide kW indicated

## PHYSICAL DATA – PHH036–072

UNIT SIZE PHH	036	048	060	072
<b>NOMINAL CAPACITY (tons)</b>	3	4	5	6
<b>OPERATING WEIGHT (lb)</b>				
Unit	550	560	630	630
Economizer	50	50	50	50
<b>COMPRESSOR</b>				
	Scroll			
Quantity	1	1	1	1
Oil (oz)	42	42	53	80
<b>REFRIGERANT TYPE</b>				
	R-22			
Operating Charge (lb)	12.0	12.0	18.3	17.7
<b>OUTDOOR COIL</b>				
	Enhanced Copper Tubes, Aluminum Fins, Fixed Orifice Metering Device			
Rows...Fins/in.	2...17	2...17	2...17	2...17
Total Face Area (sq ft)	16.53	16.53	21.25	21.25
<b>OUTDOOR FAN</b>				
	Propeller Type			
Quantity...Diameter (in.)	1...22	1...22	1...22	1...22
Nominal Cfm	3500	3500	3500	3500
Motor Hp...Rpm	1/8...825	1/8...825	1/4...1100	1/4...1100
<b>INDOOR COIL</b>				
	Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Fixed Orifice Metering Device			
Rows...Fins/in.	2...15	3...15	4...15	4...15
Total Face Area (sq ft)	5.5	5.5	7.33	7.33
<b>INDOOR FAN</b>				
	Centrifugal Type			
Quantity...Size (in.)	Std 1...10 x 10	Std 1...10 x 10	Std 1...10 x 10	Std 1...10 x 10
Type Drive	High-Static Belt	High-Static Belt	High-Static Belt	High-Static Belt
Nominal Cfm	1200	1600	2000	2400
Maximum Continuous Bhp	Std 1.20	Std 1.20	1.30/2.40*	2.40
Motor Frame Size	High-Static 48	High-Static 48	2.90	2.90
Nominal Rpm High/Low	Std 1620	Std 1620	56	56
Fan Rpm Range	High-Static 1725	High-Static 1725	56	56
Motor Bearing Type	Std 680–1044	Std 770–1185	1725	—
Maximum Allowable Rpm	High-Static 1075–1455	High-Static 1075–1455	1725	1725
Motor Pulley Pitch Diameter Min/Max (in.)	Ball 2100	Ball 2100	1300–1685	1300–1685
Nominal Motor Shaft Diameter (in.)	Std 1.9/2.9	Std 1.9/2.9	Ball 2100	Ball 2100
Fan Pulley Pitch Diameter (in.)	High-Static 2.8/3.8	High-Static 2.8/3.8	2.4/3.4	2.4/3.4
Belt, Quantity...Type...Length (in.)	Std 1/2	Std 1/2	3.4/4.4	3.4/4.4
Pulley Center Line Distance (in.)	High-Static 5/8	High-Static 5/8	5/8	5/8
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std 4.5	Std 4.5	4.5	3.7
Movable Pulley Maximum Full Turns From Closed Position	High-Static 4.5	High-Static 4.5	4.5	4.5
Factory Setting	Std 1...A...34	Std 1...A...34	1...A...39	1...A...40
Factory Speed Setting (rpm)	High-Static 1...A...39	High-Static 1...A...39	1...A...40	1...A...40
Fan Shaft Diameter at Pulley (in.)	Std 10.0–12.4	Std 10.0–12.4	14.7–15.5	14.7–15.5
	High-Static 10.0–12.4	High-Static 10.0–12.4	14.7–15.5	14.7–15.5
	Std 48	Std 70	80	80
	High-Static 65	High-Static 65	60	60
	Std 5	Std 5	6	5
	High-Static 6	High-Static 6	5	5
	Std 3	Std 3	3	3
	High-Static 3 1/2	High-Static 3 1/2	3 1/2	3 1/2
	Std 826	Std 936	1249	1305
	High-Static 1233	High-Static 1233	1416	1416
	Std 5/8	Std 5/8	5/8	5/8
<b>HIGH-PRESSURE SWITCH (psig)</b>				
Standard Compressor Internal Relief Cutout				625
Reset (Auto.)				428
				320
<b>LOSS OF CHARGE (Low-Pressure Switch) (Liquid Line) (psig)</b>				
Cutout				7 ± 3
Reset (Auto.)				22 ± 5
<b>FREEZE PROTECTION THERMOSTAT</b>				
Opens (F)				30
Closes (F)				45
<b>OUTDOOR-AIR INLET SCREENS</b>				
	Cleanable.			
	Screen quantity and size varies with option selected.			
<b>RETURN-AIR FILTERS</b>				
	Throwaway			
Quantity...Size (in.)	4...16 x 16 x 2			

**Bhp** – Brake horsepower

\* Single Phase/Three Phase

**NOTE:** 1-Phase and 3-Phase data for 3, 4, and 5 Ton models  
3-Phase data for 6 Ton models

## PHYSICAL DATA – PHH090–120

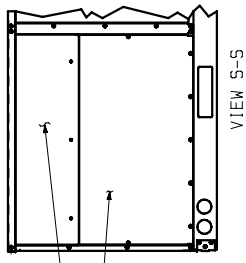
<b>BASE UNIT PHH</b>	<b>090</b>	<b>102</b>	<b>120</b>
<b>NOMINAL CAPACITY (tons)</b>	7 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	10
<b>OPERATING WEIGHT (lb)</b>			
Unit Economizer	870 75	1000 75	1000 75
<b>COMPRESSOR</b>			
	Scroll		
Quantity	2	2	2
Oil (oz) (each compr)	57	70	57
<b>REFRIGERANT TYPE</b>			
	R-22		
Operating Charge (lb)			
Circuit 1	9.5	11.0	10.7
Circuit 2	9.5	11.0	10.8
<b>OUTDOOR COIL</b>			
	Enhanced Copper Tubes, Aluminum Fins, Fixed Orifice Metering Device		
Rows...Fins/in.	2...17	2...17	2...17
Total Face Area (sq ft)	20.5	25.1	25.1
<b>OUTDOOR FAN</b>			
	Propeller		
Quantity...Diameter (in.)	2...22	2...22	2...22
Nominal Cfm	6500	6500	6500
Motor Hp...Rpm	1/4...1100	1/4...1100	1/4...1100
<b>INDOOR COIL</b>			
	Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Fixed Orifice Metering Device		
Rows...Fins/in.	3...15	4...15	4...15
Total Face Area (sq ft)	8.9	11.1	11.1
<b>INDOOR FAN</b>			
	Centrifugal Type		
Quantity...Size (in.)	Standard 1...15 x 15	Standard 1...15 x 15	Standard 1...15 x 15
Type Drive	High-Static Standard Belt High-Static Belt	High-Static Standard Belt High-Static Belt	High-Static Standard Belt High-Static Belt
Nominal Cfm	3000	3400	4000
Maximum Continuous Bhp	Standard 2.90 High-Static 3.70	Standard 2.90 High-Static 3.70	Standard 3.70 High-Static 5.25
Motor Frame Size	Standard 56 High-Static 56	Standard 56 High-Static 56	Standard 56 High-Static 56
Nominal Rpm	Standard 1725 High-Static 1725	Standard 1725 High-Static 1725	Standard 1725 High-Static 1725
Fan Rpm Range	Standard 730–950 High-Static 860–1080	Standard 840–1085 High-Static 860–1080	Standard 860–1080 High-Static 922–1219
Motor Bearing Type	Ball	Ball	Ball
Maximum Allowable Rpm	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Standard 3.4/4.4 High-Static 4.0/5.0	Standard 3.4/4.4 High-Static 4.0/5.0	Standard 4.0/5.0 High-Static 3.1/4.1
Nominal Motor Shaft Diameter (in.)	Standard 7/8 High-Static 7/8	Standard 7/8 High-Static 7/8	Standard 7/8 High-Static 7/8
Fan Pulley Pitch Diameter (in.)	Standard 8.0 High-Static 8.0	Standard 7.0 High-Static 8.0	Standard 8.0 High-Static 5.8
Belt, Quantity...Type...Length (in.)	Standard 1...A...51 High-Static 1...A...53	Standard 1...A...51 High-Static 1...A...53	Standard 1...A...53 High-Static 1...BX...48
Pulley Center Line Distance (in.)	Standard 16.75–19.25 High-Static 16.75–19.25	Standard 16.75–19.25 High-Static 16.75–19.25	Standard 15.85–17.50 High-Static 15.85–17.50
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Standard 45 High-Static 45	Standard 45 High-Static 45	Standard 45 High-Static 60
Movable Pulley Maximum Full Turns from Closed Position	Standard 5 High-Static 5	Standard 5 High-Static 5	Standard 5 High-Static 6
Factory Setting	Standard 5 High-Static 5	Standard 5 High-Static 5	Standard 5 High-Static 5
Factory Speed Setting (rpm)	Standard 730 High-Static 860	Standard 840 High-Static 860	Standard 860 High-Static 972
Fan Shaft Diameter at Pulley (in.)	1	1	1
<b>HIGH-PRESSURE SWITCH (psig)</b>			
Standard Compressor Internal Relief		625	
Cutout		428	
Reset (Auto.)		320	
<b>LOSS-OF-CHARGE/LOW-PRESSURE SWITCH (Liquid Line) (psig)</b>			
Cutout		7 ± 3	
Reset (Auto.)		22 ± 5	
<b>FREEZE PROTECTION THERMOSTAT</b>			
Opens (F)		30	
Closes (F)		45	
<b>OUTDOOR-AIR INLET SCREENS</b>			
	Cleanable.		
	Screen quantity and size varies with option selected.		
<b>OUTDOOR-AIR INLET SCREENS</b>			
	Cleanable.		
Quantity...Size (in.)	4...16 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2

Bhp – Brake horsepower

# BASE UNIT DIMENSIONS - PHH036-072

CONNECTION SIZES	
A	1 3/8" DIA. [351] FIELD POWER SUPPLY HOLE
B	2" DIA. [511] POWER SUPPLY KNOCK-OUT
C	1 3/4" DIA. [441] CHARGING PORT HOLE
D	7/8" DIA. [221] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	2 1/2" DIA. [641] POWER SUPPLY KNOCK-OUT

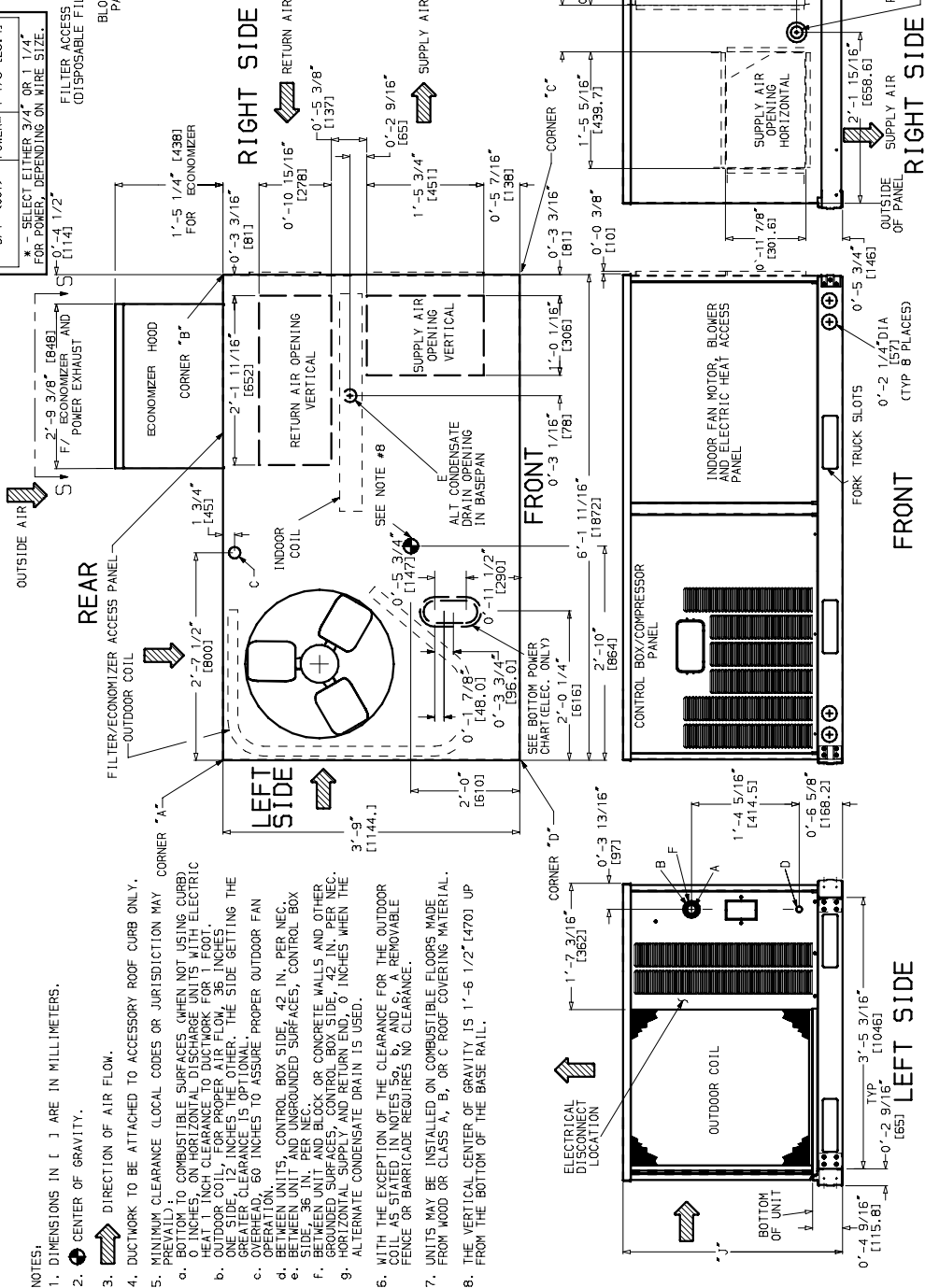
BOTTOM POWER CHART, THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES - DN8THP/ROD/AT	
WIRE THREADED CONDUIT SIZE	REQ'D HOLE USE SIZES (MAX.)
1/2"	7/8" [22.2]
3/4" (001)	1 1/8" [28.2]
1/2" POWER	1 1/8" [28.4]



UNIT	ECONOMIZER WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		"J"	
	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	FT	IN.
PHH036	550	249	50	22.7	90	40.9	135	61	140	64	2'-9 5/16"	[846.5]
PHH048	560	254	50	22.7	90	40.9	135	61	140	64	2'-9 5/16"	[846.5]
PHH060	630	286	50	22.7	90	40.9	135	61	140	64	3'-5 5/16"	[1050]
PHH072	630	286	50	22.7	90	40.9	135	61	140	64	3'-5 5/16"	[1050]

### NOTES:

- DIMENSIONS IN [ ] ARE IN MILLIMETERS.
- CENTER OF GRAVITY.
- DIRECTION OF AIR FLOW.
- DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
- MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
  - BOTTOM TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) - 18 INCHES ON REAR AND 12 INCHES ON TOP.
  - HEAT EXCHANGER TO DUCTWORK FOR FOOT OUTDOOR COIL FOR PROPER AIR FLOW, 36 INCHES.
  - ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
  - OVERHEAD, 60 INCHES TO ASSURE PROPER OUTDOOR FAN OPERATION.
  - BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
  - BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
  - HORIZONTAL SUPPLEY AND RETURN LINES 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
- WITH THE EXCEPTION OF THE CLEARANCE FOR THE OUTDOOR COIL AS STATED IN NOTES 5a, b, AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
- UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL.
- THE VERTICAL CENTER OF GRAVITY IS 1'-6 1/2" [470] UP FROM THE BOTTOM OF THE BASE RAIL.



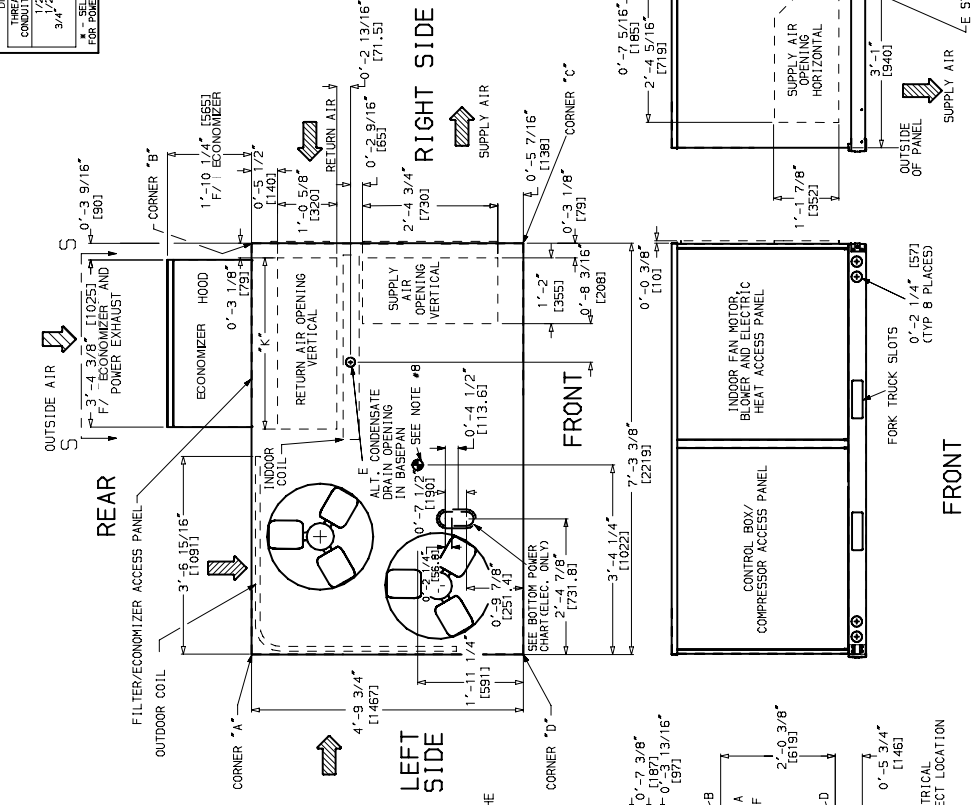
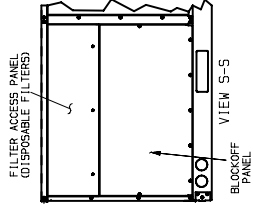
# BASE UNIT DIMENSIONS - PHH090-120

UNIT	STD. WEIGHT		ECONOMIZER WEIGHT		VERT. ECONOMIZER W/ P.E. WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		H		J		K				
	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	FT	IN.	MM	FT	IN.	MM	FT	IN.	MM
PHH090	870	395	75	34.1	145	65.9	90	183	83	237	108	252	114	632	3'-5 5/16"	1050	2'-9 11/16"	856					
PHH102, 120	1000	454					231	105	97	289	122	286	130	885	4'-1 5/16"	1253	3'-0 3/8"	924					

**BOTTOM POWER CHART**  
WIRE ACCESS REQUIRED FOR USE IN BIPHASE/3PH/480V/101

WIRE GAUGE	1/2"	3/4" (001)
CONDUIT SIZE	1/2"	3/4" (001)
REDUCED HOLE SIZE	3/8"	1/2"
WIRE TYPE	24V	24V
WIRE TYPE	7/8" (22, 2)	7/8" (22, 2)
WIRE TYPE	1 1/8" (28, 4)	1 1/8" (28, 4)

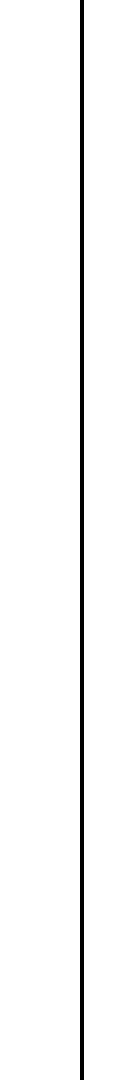
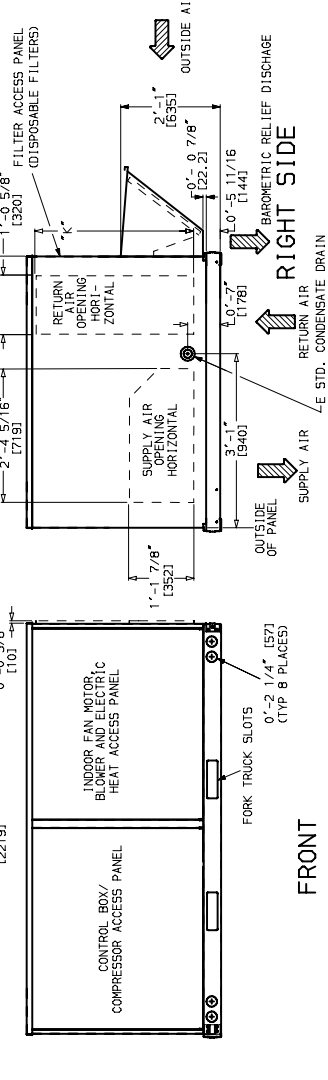
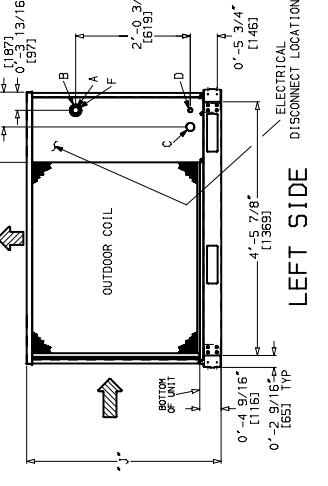
\* SELECT EITHER 3/4" OR 1 1/4" FOR POWER, DEPENDING ON WIRE SIZE.



- NOTES:**
- DIMENSIONS IN [ ] ARE IN MILLIMETERS.
  - ⊕ CENTER OF GRAVITY.
  - ➔ DIRECTION OF AIR FLOW.
  - DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
  - MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
    - a. BOTTOM TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES, ON HORIZONTAL DISCHARGE UNITS WITH ELECTRIC HEAT, 1 INCH CLEARANCE TO DUCTWORK FOR 1 FOOT.
    - b. OUTDOOR COILS, 1 INCHES ABOVE FLOW, OTHER FLOW, GREATER CLEARANCE IS OPTIONAL. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
    - c. OVERHEAD, 60 INCHES TO ASSURE PROPER OUTDOOR FAN OPERATION.
    - d. BETWEEN UNITS, CONTROL BOX SIDE 42 IN., PER NEC.
    - e. BETWEEN UNITS, UNROUND SURFACES, CONTROL BOX SIDE 36 IN., PER NEC.
    - f. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN., PER NEC.
    - g. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
  - WITH THE EXCEPTION OF THE CLEARANCE FOR THE OUTDOOR COIL, AS STATED IN NOTES 5a, b, AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
  - UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL.
  - THE VERTICAL CENTER OF GRAVITY IS 1'-7 1/2" FOR 090 AND 2'-0 16/101" FOR 102 AND 012 UP FROM THE BOTTOM OF THE BASE RAIL.

**CONNECTION SIZES**

A	1 3/8" DIA. (351) FIELD POWER SUPPLY HOLE
B	2 1/2" DIA. (64) POWER SUPPLY KNOCK-OUT
C	3 7/8" DIA. (99) CONDENSATE DRAIN PORT HOLE
D	3 7/8" DIA. (99) FIELD CONDENSATE DRAIN HOLE
E	3/4" DIA. (19) CONDENSATE DRAIN
F	2" DIA. (51) POWER SUPPLY KNOCK-OUT





**PERFORMANCE DATA - PHH036-120  
COOLING CAPACITIES**

PHH036 (3 TONS)										
Temp (F) Outdoor Entering Air (Edb)		Indoor Entering Air — Cfm/BF								
		900/0.12			1200/0.15			1500/0.18		
		Indoor Entering Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	41.2	37.8	34.4	42.9	39.6	36.3	43.6	40.6	37.5
	SHC	19.8	24.5	28.8	21.5	27.6	32.9	22.5	30.1	36.3
	kW	2.11	2.08	2.05	2.12	2.10	2.07	2.12	2.10	2.08
85	TC	39.9	36.5	33.1	41.9	38.2	34.9	42.5	39.2	36.1
	SHC	19.4	24.0	28.2	21.2	27.2	32.4	22.6	29.8	35.9
	kW	2.36	2.34	2.31	2.38	2.35	2.33	2.38	2.36	2.35
95	TC	38.6	35.0	31.7	40.4	36.7	33.4	41.3	37.6	34.8
	SHC	18.9	23.4	27.4	20.8	26.6	31.6	22.4	29.2	34.7
	kW	2.65	2.62	2.58	2.66	2.63	2.61	2.67	2.64	2.63
105	TC	37.1	33.2	30.0	38.7	35.0	31.5	39.3	36.0	33.2
	SHC	18.3	22.7	26.6	20.3	26.1	30.7	21.7	29.0	33.2
	kW	2.96	2.92	2.88	2.98	2.95	2.90	2.97	2.96	2.93
115	TC	35.1	31.4	28.0	36.7	32.8	29.7	37.7	33.8	31.6
	SHC	17.6	21.9	25.6	19.7	25.2	29.6	21.5	28.1	31.6
	kW	3.29	3.25	3.20	3.31	3.27	3.23	3.32	3.29	3.26
125	TC	33.0	29.0	25.7	34.4	30.6	27.8	35.4	31.5	29.8
	SHC	16.9	21.0	24.5	19.0	24.3	27.8	20.9	27.1	29.7
	kW	3.65	3.59	3.53	3.68	3.62	3.57	3.69	3.64	3.61

PHH048 (4 TONS)										
Temp (F) Outdoor Entering Air (Edb)		Indoor Entering Air — Cfm/BF								
		1200/0.1			1600/0.12			2000/0.15		
		Indoor Entering Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	51.0	48.9	43.9	52.3	50.2	46.0	53.7	51.5	48.1
	SHC	24.1	33.1	40.3	26.0	37.0	44.2	27.8	40.9	48.0
	kW	2.65	2.64	2.60	2.66	2.65	2.61	2.67	2.66	2.63
85	TC	48.9	47.1	41.9	50.7	48.4	44.2	52.6	49.8	46.6
	SHC	22.9	32.2	40.2	25.4	36.4	43.4	27.9	40.6	46.6
	kW	2.99	2.98	2.94	3.01	3.00	2.96	3.03	3.01	2.99
95	TC	47.1	45.1	39.2	49.0	46.3	42.1	50.8	47.6	44.9
	SHC	22.3	31.5	39.2	24.9	35.6	42.1	27.4	39.8	44.9
	kW	3.37	3.37	3.31	3.40	3.38	3.34	3.42	3.39	3.37
105	TC	44.9	42.9	37.5	46.8	44.1	40.3	48.7	45.4	43.2
	SHC	21.3	30.7	37.5	24.1	34.8	40.3	26.9	39.0	43.1
	kW	3.79	3.78	3.71	3.82	3.80	3.75	3.84	3.81	3.79
115	TC	42.9	40.8	35.2	44.6	41.9	38.3	46.3	43.0	41.3
	SHC	20.4	30.1	35.2	23.3	34.0	38.3	26.1	37.9	41.3
	kW	4.24	4.23	4.15	4.26	4.24	4.19	4.29	4.25	4.23
125	TC	40.9	38.2	32.9	42.2	39.3	36.1	43.5	40.5	39.3
	SHC	19.8	29.1	32.9	22.4	33.0	36.1	25.1	36.9	39.3
	kW	4.72	4.70	4.62	4.73	4.71	4.66	4.74	4.72	4.71

**LEGEND**

**Shaded Areas** = Standard Ratings

**BF** — Bypass Factor

**Edb** — Entering Dry-Bulb

**NOTES:**

- Direct interpolation is permissible. Do not extrapolate.
- The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

$t_{wlb}$  = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil ( $h_{lwb}$ )

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where:  $h_{ewb}$  = Enthalpy of air entering evaporator coil

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

**Ewb** — Entering Wet-Bulb

**kW** — Compressor Motor Power Input

**SHC** — Sensible Heat Capacity (1000 Btuh) Gross

**TC** — Total Capacity (1000 Btuh) Gross

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (°F)					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
Correction Factor						
.05	1.04	2.07	3.11	4.14	5.18	Use formula shown at right.
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.  
Correction Factor = 1.10 x (1-BF) x (edb-80).

**PERFORMANCE DATA – PHH036–120(cont.)  
COOLING CAPACITIES**

<b>PHH060 (5 Tons)</b>																	
<b>Temp (F) Outdoor Entering Air (Edb)</b>		<b>Indoor Entering Air — Cfm/BF</b>															
		<b>1500/0.17</b>				<b>1750/0.25</b>				<b>2000/0.31</b>				<b>2500/0.42</b>			
		<b>Indoor Entering Air — Ewb (F)</b>															
		<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>	<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>	<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>	<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>
<b>75</b>	<b>TC</b>	70.2	65.3	59.9	56.6	71.7	66.8	61.9	59.7	72.8	67.8	63.4	62.4	74.1	69.9	65.8	65.8
	<b>SHC kW</b>	31.6	40.6	49.2	54.1	33.3	43.5	53.8	57.0	34.8	46.0	57.8	59.6	37.5	51.8	62.9	62.9
<b>85</b>	<b>TC</b>	68.7	63.3	57.4	54.2	70.3	65.1	59.3	57.8	71.8	66.3	60.9	60.5	73.2	68.5	64.5	64.4
	<b>SHC kW</b>	31.3	40.0	48.3	51.8	33.1	43.2	52.8	55.2	34.9	46.2	56.8	57.7	38.0	52.5	61.6	61.5
<b>95</b>	<b>TC</b>	66.7	60.6	52.0	50.1	68.4	62.4	55.5	54.7	69.1	63.8	58.2	58.2	71.2	65.6	62.2	62.2
	<b>SHC kW</b>	30.7	39.1	46.2	47.8	32.7	42.5	51.3	52.3	34.2	45.8	55.5	55.5	38.0	51.6	59.4	59.4
<b>105</b>	<b>TC</b>	63.7	55.4	45.8	45.8	65.6	58.6	50.2	50.1	66.9	60.5	53.3	53.6	68.2	62.4	59.5	59.5
	<b>SHC kW</b>	29.8	37.4	43.5	43.7	31.9	41.3	47.9	47.9	33.9	44.8	50.9	51.2	37.3	51.1	56.8	56.8
<b>115</b>	<b>TC</b>	60.2	47.9	41.2	41.2	62.0	50.9	45.2	45.2	63.3	52.8	48.2	48.2	65.1	56.2	54.2	54.1
	<b>SHC kW</b>	28.8	34.8	39.3	39.3	30.9	38.8	43.1	43.2	32.9	42.4	46.1	46.0	36.8	49.2	51.8	51.7
	<b>kW</b>	5.55	5.43	5.33	5.33	5.57	5.46	5.40	5.40	5.58	5.49	5.44	5.44	5.59	5.53	5.50	5.50

<b>PHH072 (6 Tons)</b>																	
<b>Temp (F) Outdoor Entering Air (Edb)</b>		<b>Indoor Entering Air — Cfm/BF</b>															
		<b>1800/0.06</b>				<b>2100/0.066</b>				<b>2400/0.071</b>				<b>3000/0.088</b>			
		<b>Indoor Entering Air — Ewb (F)</b>															
		<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>	<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>	<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>	<b>72</b>	<b>67</b>	<b>62</b>	<b>57</b>
<b>75</b>	<b>TC</b>	83.2	77.6	71.6	67.9	84.7	79.8	73.6	71.5	85.9	81.0	75.0	74.3	88.4	82.9	78.4	78.3
	<b>SHC kW</b>	39.7	50.4	60.6	66.6	41.6	54.3	65.9	70.1	43.4	57.6	70.6	72.8	47.2	63.9	76.9	76.8
<b>85</b>	<b>TC</b>	81.5	75.5	69.0	64.8	83.2	77.3	71.1	69.4	84.5	78.5	72.7	72.2	86.2	80.8	76.5	76.5
	<b>SHC kW</b>	39.2	49.8	59.6	63.6	41.4	53.5	65.0	68.0	43.3	56.9	69.7	70.8	47.1	64.1	75.0	75.0
<b>95</b>	<b>TC</b>	78.8	72.5	64.1	61.8	80.9	74.5	67.0	66.1	82.0	76.0	69.9	69.9	83.7	78.1	74.2	74.1
	<b>SHC kW</b>	38.4	48.6	57.4	60.6	40.8	52.6	63.2	64.8	42.8	56.4	68.3	68.5	46.8	63.7	72.7	72.7
<b>105</b>	<b>TC</b>	76.2	69.5	58.6	57.8	77.9	71.3	63.4	63.1	79.3	72.7	67.2	67.2	81.1	74.5	71.3	71.2
	<b>SHC kW</b>	37.6	47.4	55.0	56.6	39.9	51.4	61.4	61.9	42.2	55.3	65.9	65.9	46.5	62.5	69.9	69.9
<b>115</b>	<b>TC</b>	72.5	65.1	54.8	54.7	74.3	67.8	58.6	58.6	75.6	69.1	63.2	63.2	77.3	70.9	68.4	68.4
	<b>SHC kW</b>	36.3	45.8	53.2	53.6	38.7	50.2	57.4	57.5	41.1	54.0	62.0	62.0	45.5	61.3	67.1	67.1
	<b>kW</b>	7.37	7.24	7.08	7.07	7.43	7.30	7.16	7.16	7.48	7.34	7.21	7.21	7.52	7.38	7.32	7.32

<b>PHH090 (7½ Tons)</b>										
<b>Temp (F) Outdoor Entering Air (Edb)</b>		<b>Indoor Entering Air — Cfm/BF</b>								
		<b>2250/0.12</b>			<b>3000/0.15</b>			<b>3750/0.18</b>		
		<b>Indoor Entering Air — Ewb (F)</b>								
		<b>72</b>	<b>67</b>	<b>62</b>	<b>72</b>	<b>67</b>	<b>62</b>	<b>72</b>	<b>67</b>	<b>62</b>
<b>75</b>	<b>TC</b>	97.6	92.5	84.3	100.8	95.6	89.9	101.6	97.8	91.7
	<b>SHC kW</b>	47.7	61.0	72.7	51.5	67.3	83.8	55.0	74.4	89.7
<b>85</b>	<b>TC</b>	97.2	89.9	79.8	100.0	94.1	86.7	102.4	96.0	89.9
	<b>SHC kW</b>	48.1	60.2	70.5	51.7	68.1	82.4	55.8	74.1	89.3
<b>95</b>	<b>TC</b>	94.4	86.9	75.0	98.2	91.3	81.8	99.6	93.7	87.3
	<b>SHC kW</b>	47.3	59.2	68.1	51.7	67.5	79.8	55.0	74.8	87.3
<b>105</b>	<b>TC</b>	91.7	82.2	70.7	94.8	87.3	76.6	97.0	90.1	83.4
	<b>SHC kW</b>	46.3	57.4	65.9	50.9	66.3	76.4	54.8	74.1	83.4
<b>115</b>	<b>TC</b>	87.7	77.4	66.9	91.7	81.6	72.5	93.9	85.3	78.8
	<b>SHC kW</b>	44.9	55.4	64.0	50.3	64.2	72.5	55.0	72.5	78.6
<b>125</b>	<b>TC</b>	83.6	73.3	66.7	87.1	76.0	69.1	89.5	79.0	74.4
	<b>SHC kW</b>	43.6	53.9	63.8	48.7	62.0	69.1	53.7	70.1	74.4
	<b>kW</b>	10.38	10.16	9.94	10.49	10.27	10.14	10.53	10.36	10.25

**PERFORMANCE DATA – PHH036–120 (cont.)  
COOLING CAPACITIES**

PHH102 (8½ Tons)										
Temp (F) Outdoor Entering Air (Edb)		Indoor Entering Air — Cfm/BF								
		2550/0.03			3400/0.04			4250/0.05		
		Indoor Entering Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	116.4	105.6	94.8	118.9	110.4	99.4	120.4	112.9	104.3
	SHC	55.7	69.2	82.0	58.6	79.7	95.8	61.6	89.2	104.2
	kW	6.01	5.89	5.8	6.04	5.97	5.87	6.07	6.01	5.93
85	TC	117.6	102.1	91.1	121.0	106.7	95.6	117.5	109.3	101.3
	SHC	58.4	67.9	80.4	64.1	78.6	93.9	61.0	88.4	101.2
	kW	6.47	6.72	6.61	6.52	6.80	6.69	6.91	6.85	6.77
95	TC	113.7	98.0	86.1	117.4	102.3	91.3	113.4	104.7	97.9
	SHC	57.4	66.5	78.2	63.5	77.2	91.1	59.9	87.2	97.8
	kW	7.34	7.63	7.49	7.40	7.72	7.60	7.82	7.77	7.69
105	TC	109.8	93.0	78.7	113.2	97.3	85.9	108.9	99.9	93.7
	SHC	56.2	64.6	75.0	62.4	75.5	85.9	58.7	85.5	93.6
	kW	8.28	8.59	8.42	8.36	8.71	8.57	8.81	8.74	8.68
115	TC	100.2	86.4	72.7	104.5	90.0	80.8	106.0	93.2	88.0
	SHC	50.4	62.1	71.9	57.2	73.0	80.8	63.4	83.2	88.0
	kW	9.79	9.60	9.40	9.91	9.71	9.59	9.95	9.79	9.71
125	TC	94.0	76.6	63.1	98.8	80.1	68.1	101.0	84.4	75.1
	SHC	48.3	58.5	63.1	55.4	69.2	68.1	61.9	79.8	75.1
	kW	10.91	10.65	10.45	11.03	10.78	10.61	11.1	10.86	10.73

PHH120 (10 Tons)										
Temp (F) Outdoor Entering Air (Edb)		Indoor Entering Air — Cfm/BF								
		3000/0.03			4000/0.04			5000/0.06		
		Indoor Entering Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
75	TC	136.0	124.0	111.4	141.2	129.0	116.6	145.6	132.0	121.2
	SHC	64.6	80.8	96.0	71.2	92.4	111.8	78.6	103.2	121.0
	kW	7.51	7.35	7.20	7.61	7.45	7.29	7.72	7.53	7.39
85	TC	132.6	119.6	106.6	137.6	124.4	112.0	140.4	127.4	118.0
	SHC	63.6	79.2	94.0	70.6	91.4	110.0	77.0	102.6	118.0
	kW	8.40	8.23	8.09	8.50	8.33	8.17	8.58	8.40	8.27
95	TC	127.8	114.6	99.4	133.2	119.4	107.2	136.2	121.8	114.2
	SHC	62.2	77.6	90.8	69.6	89.8	107.0	76.8	101.2	113.8
	kW	9.36	9.18	9.01	9.48	9.30	9.15	9.56	9.36	9.24
105	TC	122.4	108.8	92.0	127.4	113.6	101.4	130.4	116.0	109.6
	SHC	60.4	75.4	87.4	68.0	88.0	101.4	75.4	99.4	109.4
	kW	10.41	10.26	10.02	10.53	10.35	10.22	10.63	10.43	10.35
115	TC	116.8	101.8	86.6	121.2	106.6	94.8	123.6	109.2	104.6
	SHC	58.6	72.8	84.6	66.0	85.4	94.8	73.4	97.0	104.6
	kW	11.58	11.37	11.15	11.68	11.51	11.35	11.76	11.60	11.51
125	TC	110.6	95.8	84.6	114.6	98.4	88.8	117.0	100.8	96.4
	SHC	56.4	70.6	83.4	64.4	82.4	88.8	71.4	93.8	96.4
	kW	12.87	12.62	12.36	12.97	12.73	12.60	13.03	12.83	12.77

**LEGEND**

Shaded Areas = Standard Ratings

BF — Bypass Factor

Edb — Entering Dry-Bulb

**NOTES:**

3. Direct interpolation is permissible. Do not extrapolate.

4. The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

$t_{wb}$  = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil ( $h_{lwb}$ )

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where:  $h_{ewb}$  = Enthalpy of air entering evaporator coil

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

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (°F)					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
Correction Factor						
.05	1.04	2.07	3.11	4.14	5.18	Use formula shown at right.
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	

Ewb — Entering Wet-Bulb

kW — Compressor Motor Power Input

SHC — Sensible Heat Capacity (1000 Btuh) Gross

TC — Total Capacity (1000 Btuh) Gross

Interpolation is permissible.  
Correction Factor =  $1.10 \times (1 - BF) \times (edb - 80)$ .

**PERFORMANCE DATA – PHH036–120**  
**INSTANTANEOUS AND INTEGRATED HEATING RATINGS**

PHH 036 (3 Tons)																						
Return Air (F db)	Cfm (Standard Air)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-20		-10		0		10		17		30		40		47		50		60		
55	900	Cap.	10.3	9.47	13.7	12.6	16.8	15.4	20.1	18.5	23.5	21.3	27.6	24.2	31.9	31.9	35.1	35.1	36.3	36.3	40.3	40.3
		kW	1.48	1.58	1.66	1.75	1.85	1.97	2.11	2.22	2.27	2.41										
	1200	Cap.	10.8	9.92	14.2	13.0	17.3	15.9	20.7	19.0	24.0	21.7	28.3	24.8	32.8	32.8	36.2	36.2	37.4	37.4	41.5	41.5
		kW	1.45	1.52	1.59	1.66	1.73	1.82	1.94	2.03	2.06	2.18										
	1500	Cap.	11.1	10.2	14.6	13.4	17.6	16.2	21.2	19.4	24.4	22.1	28.9	25.3	33.5	33.5	36.5	36.5	37.7	37.7	41.2	41.2
		kW	1.43	1.49	1.54	1.60	1.66	1.74	1.83	1.90	1.92	2.00										
70	900	Cap.	8.67	7.97	11.9	10.9	15.1	13.9	18.6	17.1	22.2	20.2	26.4	23.1	30.5	30.5	33.6	33.6	34.7	34.7	39.0	39.0
		kW	1.69	1.83	1.95	2.08	2.21	2.38	2.54	2.67	2.72	2.92										
	1200	Cap.	9.15	8.42	12.4	11.4	15.7	14.5	19.3	17.7	22.9	20.7	27.1	23.8	31.4	31.4	34.6	34.6	35.8	35.8	40.0	40.0
		kW	1.67	1.78	1.88	1.99	2.09	2.22	2.35	2.45	2.49	2.64										
	1500	Cap.	9.55	8.78	12.8	11.8	16.2	14.9	19.8	18.2	23.3	21.1	27.7	24.3	32.0	32.0	35.2	35.2	36.4	36.4	40.2	40.2
		kW	1.65	1.75	1.84	1.93	2.02	2.12	2.23	2.32	2.35	2.46										
80	900	Cap.	7.32	6.73	10.6	9.79	14.1	12.9	17.7	16.2	21.4	19.4	25.6	22.4	29.5	29.5	32.5	32.5	33.7	33.7	38.1	38.1
		kW	1.83	1.99	2.14	2.30	2.45	2.64	2.82	2.97	3.02	3.25										
	1200	Cap.	7.80	7.17	11.2	10.3	14.7	13.5	18.4	16.8	22.1	20.1	26.3	23.1	30.4	30.4	33.6	33.6	34.7	34.7	39.0	39.0
		kW	1.81	1.95	2.08	2.20	2.33	2.48	2.62	2.73	2.78	2.94										
	1500	Cap.	8.22	7.56	11.7	10.7	15.2	14.0	18.8	17.3	22.6	20.5	26.9	23.5	31.1	31.1	34.3	34.3	35.5	35.5	39.6	39.6
		kW	1.79	1.92	2.04	2.15	2.25	2.38	2.50	2.60	2.63	2.76										

PHH 048 (4 Tons)																						
Return Air (F db)	Cfm (Standard Air)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-20		-10		0		10		20		30		40		47		50		60		
55	1200	Cap.	14.0	12.9	17.7	17.7	21.7	21.7	26.0	26.0	30.4	30.4	35.9	31.5	41.4	41.4	45.4	45.4	46.9	46.9	52.3	52.3
		kW	1.83	1.96	2.08	2.20	2.32	2.48	2.65	2.78	2.83	3.02										
	1600	Cap.	1.46	13.4	18.3	18.3	22.4	22.4	26.6	26.6	31.0	31.0	36.7	32.1	42.3	42.3	46.5	46.5	48.0	48.0	53.4	53.4
		kW	1.79	1.90	1.99	2.09	2.18	2.31	2.44	2.55	2.59	2.74										
	2000	Cap.	15.1	13.9	18.8	18.8	22.9	22.9	27.0	27.0	31.5	31.5	37.2	32.6	43.0	43.0	47.2	47.2	48.8	48.8	54.2	54.2
		kW	1.77	1.86	1.94	2.02	2.10	2.21	2.32	2.42	2.45	2.59										
70	1200	Cap.	11.9	11.0	17.7	17.7	21.7	21.7	26.0	26.0	30.4	30.4	35.9	31.5	41.4	41.4	45.4	45.4	46.9	46.9	52.3	52.3
		kW	2.08	1.96	2.08	2.20	2.32	2.48	2.65	2.78	2.83	3.02										
	1600	Cap.	12.6	11.6	18.3	18.3	22.4	22.4	26.6	26.6	31.0	31.0	36.7	32.1	42.3	42.3	46.5	46.5	48.0	48.0	53.4	53.4
		kW	2.05	1.90	1.99	2.09	2.18	2.31	2.44	2.55	2.59	2.74										
	2000	Cap.	13.1	12.0	18.8	18.8	22.9	22.9	27.0	27.0	31.5	31.5	37.2	32.6	43.0	43.0	47.2	47.2	48.8	48.8	54.2	54.2
		kW	2.02	1.86	1.94	2.02	2.10	2.21	2.32	2.42	2.45	2.59										
80	1200	Cap.	10.1	9.3	17.7	17.7	21.7	21.7	26.0	26.0	30.4	30.4	35.9	31.5	41.4	41.4	45.4	45.4	46.9	46.9	52.3	52.3
		kW	2.22	1.96	2.08	2.20	2.32	2.48	2.65	2.78	2.83	3.02										
	1600	Cap.	10.7	9.9	18.3	18.3	22.4	22.4	26.6	26.6	31.0	31.0	36.7	32.1	42.3	42.3	46.5	46.5	48.0	48.0	53.4	53.4
		kW	2.20	1.90	1.99	2.09	2.18	2.31	2.44	2.55	2.59	2.74										
	2000	Cap.	11.3	10.4	18.8	18.8	22.9	22.9	27.0	27.0	31.5	31.5	37.2	32.6	43.0	43.0	47.2	47.2	48.8	48.8	54.2	54.2
		kW	2.18	1.86	1.94	2.02	2.10	2.21	2.32	2.42	2.45	2.59										

**LEGEND**

- Cap.** — Heating Capacity (1000 Btu/h) (includes indoor-fan motor heat)
- kW** — Total Power Input (includes compressor motor power input, outdoor-fan motor input, and indoor-fan motor input)
- rh** — Relative Humidity

**NOTES:**

1.  indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

**PERFORMANCE DATA – PHH036–120(cont.)  
INSTANTANEOUS AND INTEGRATED HEATING RATINGS**

PHH060 (5 Tons)																						
Return Air (F db)	Cfm (Standard Air)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-20		-10		0		10		17		30		40		47		50		60		
55	1500	Cap.	15.6	14.3	20.5	18.8	25.6	21.8	35.4	32.3	35.4	32.3	43.6	38.2	50.7	50.7	56.2	56.2	63.3	63.3	63.0	63.0
		kW	3.16		3.26		3.36		3.54		3.54		3.72		3.88		4.01		4.20		4.18	
	1750	Cap.	16.0	14.7	20.9	19.2	26.0	22.1	35.8	32.7	35.8	32.7	44.6	39.1	51.3	51.3	56.4	56.4	62.9	62.9	63.0	63.0
		kW	3.19		3.28		3.36		3.52		3.52		3.67		3.80		3.90		4.04		4.04	
	2000	Cap.	16.9	15.6	21.9	20.2	27.0	23.0	36.9	33.7	36.9	33.7	45.6	40.1	52.3	52.3	56.7	56.7	62.8	62.8	62.6	62.6
		kW	3.41		3.49		3.56		3.69		3.69		3.83		3.93		4.01		4.12		4.11	
	2500	Cap.	18.9	17.6	23.9	22.1	29.1	25.0	38.9	35.7	38.9	35.7	47.8	42.1	53.5	53.5	56.9	56.9	62.2	62.2	62.5	62.5
		kW	3.92		3.99		4.04		4.15		4.15		4.25		4.32		4.37		4.45		4.45	
70	1500	Cap.	12.5	11.5	17.9	16.5	23.4	19.9	33.2	30.2	33.2	30.2	41.7	36.5	48.8	48.8	54.2	54.2	62.7	62.7	62.7	62.7
		kW	3.46		3.63		3.78		4.01		4.01		4.23		4.44		4.60		4.86		4.85	
	1750	Cap.	13.0	11.9	18.4	16.9	23.9	20.3	33.8	30.8	33.8	30.8	42.3	37.1	49.5	49.5	55.0	55.0	62.1	62.1	63.1	63.1
		kW	3.5		3.65		3.78		3.98		3.98		4.17		4.34		4.48		4.66		4.68	
	2000	Cap.	13.9	12.9	19.4	17.9	24.9	21.3	34.9	31.8	34.9	31.8	43.5	38.2	50.6	50.6	56.2	56.2	63.0	63.0	63.2	63.2
		kW	3.73		3.87		3.98		4.15		4.15		4.32		4.47		4.58		4.73		4.73	
	2500	Cap.	16.0	14.9	21.5	19.9	27.0	23.3	37.1	34.0	37.1	34.0	45.8	40.4	52.9	52.9	57.7	57.7	63.3	63.3	63.1	63.1
		kW	4.24		4.37		4.46		4.60		4.60		4.74		4.85		4.92		5.03		5.01	
80	1500	Cap.	9.93	9.14	15.7	14.5	21.5	18.2	31.6	28.8	31.6	28.8	39.9	35.0	46.9	46.9	52.8	52.8	61.9	61.9	62.1	62.1
		kW	3.65		3.87		4.06		4.36		4.36		4.59		4.82		5.02		5.35		5.35	
	1750	Cap.	10.3	9.51	16.2	14.9	22.0	18.7	32.2	29.4	32.2	29.4	40.7	35.7	47.7	47.7	53.6	53.6	62.1	62.1	62.5	62.5
		kW	3.70		3.90		4.07		4.33		4.33		4.53		4.73		4.89		5.14		5.14	
	2000	Cap.	11.3	10.5	17.2	15.9	23.1	19.7	33.3	30.4	33.3	30.4	42.1	37.0	49.0	49.0	54.9	54.9	63.0	63.0	62.7	62.7
		kW	3.92		4.11		4.27		4.50		4.50		4.67		4.85		4.99		5.19		5.18	
	2500	Cap.	13.4	12.5	19.4	18.0	25.3	21.8	35.6	32.6	35.6	32.6	44.4	39.2	51.7	51.7	57.0	57.0	63.8	63.8	63.8	63.8
		kW	4.45		4.62		4.75		4.94		4.94		5.09		5.23		5.32		5.46		5.45	

PHH072 (6 Tons)																						
Return Air (F db)	Cfm (Standard Air)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-20		-10		0		10		17		30		40		47		50		60		
55	1800	Cap.	16.5	15.2	20.8	19.1	26.4	22.4	33.6	30.8	41.0	37.6	51.3	44.9	61.9	61.9	69.5	69.5	78.0	78.0	77.9	77.9
		kW	3.50		3.63		3.79		4.01		4.18		4.57		4.94		5.22		5.57		5.55	
	2100	Cap.	16.9	15.5	21.2	19.5	27.2	23.1	34.9	32.0	41.8	38.3	52.2	45.8	63.2	63.2	69.6	69.6	75.7	75.7	76.5	76.5
		kW	3.56		3.68		3.84		4.04		4.18		4.54		4.86		5.07		5.30		5.32	
	2400	Cap.	17.2	15.9	21.8	20.0	28.0	23.8	35.6	32.6	43.1	39.5	53.8	47.2	64.1	64.1	69.0	69.0	74.8	74.8	74.3	74.3
		kW	3.64		3.75		3.89		4.08		4.21		4.54		4.82		4.97		5.18		5.15	
	3000	Cap.	18	16.5	23.0	21.1	29.4	25.0	37.4	34.4	45.2	41.4	56.6	49.6	63.2	63.2	65.5	65.5	69.8	69.8	70.6	70.6
		kW	3.79		3.90		4.03		4.19		4.32		4.61		4.77		4.84		4.98		4.99	
70	1800	Cap.	15.2	14.0	18.2	16.7	24.1	20.5	31.1	28.5	38.0	34.8	47.7	41.8	58.4	58.4	67.1	67.1	78.0	78.0	77.9	77.9
		kW	3.97		4.12		4.33		4.57		4.75		5.19		5.59		5.94		6.43		6.41	
	2100	Cap.	15.6	14.4	18.6	17.1	24.8	21.1	32.0	29.4	39.1	35.9	49.1	43.1	59.7	59.7	68.5	68.5	77.3	77.3	76.7	76.7
		kW	4.04		4.18		4.37		4.59		4.76		5.15		5.51		5.81		6.17		6.13	
	2400	Cap.	16.1	14.8	19.0	17.5	25.9	22.0	32.7	30.0	39.9	36.6	51.1	44.7	61.3	61.3	69.0	69.0	75.6	75.6	76.3	76.3
		kW	4.11		4.24		4.43		4.63		4.79		5.17		5.48		5.73		5.97		5.99	
3000	Cap.	16.8	15.5	19.7	18.1	26.7	22.7	34.3	31.5	41.8	38.3	53.5	46.8	63.7	63.7	68.3	68.3	73.0	73.0	73.8	73.8	
	kW	4.28		4.39		4.56		4.75		4.89		5.22		5.49		5.63		5.80		5.82		
80	1800	Cap.	13.6	12.5	17.1	15.7	21.7	18.4	29.2	26.8	36.5	33.4	45.6	40.0	55.3	55.3	64.2	64.2	77.2	77.2	76.9	76.9
		kW	4.20		4.46		4.67		4.95		5.16		5.62		6.02		6.40		7.00		6.98	
	2100	Cap.	14.1	13.0	17.6	16.2	22.6	19.2	30.1	27.6	37.1	34.0	46.9	41.1	57.0	57.0	66.4	66.4	76.3	76.3	77.2	77.2
		kW	4.28		4.52		4.72		4.98		5.16		5.58		5.95		6.30		6.71		6.74	
	2400	Cap.	14.5	13.4	18.0	16.6	23.1	19.6	31.2	28.7	37.9	32.7	48.5	42.5	58.7	58.7	67.7	67.7	76.3	76.3	75.9	75.9
		kW	4.37		4.59		4.77		5.03		5.19		5.59		5.93		6.23		6.57		6.54	
3000	Cap.	15.4	14.1	18.8	17.3	24.1	20.5	32.2	29.6	39.6	36.3	50.4	44.2	61.6	61.6	68.9	68.9	74.3	74.3	74.5	74.5	
	kW	4.54		4.74		4.91		5.14		5.29		5.64		5.95		6.17		6.37		6.36		

**LEGEND**

- Cap.** — Heating Capacity (1000 Btu/h) (includes indoor-fan motor heat)
- kW** — Total Power Input (includes compressor motor power input, outdoor-fan motor input, and indoor-fan motor input)
- rh** — Relative Humidity

**NOTES:**

- 1.  indicates integrated ratings.
- 2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

**PERFORMANCE DATA – PHH03–120(cont.)**  
**INSTANTANEOUS AND INTEGRATED HEATING RATINGS**

PHH090 (7½ Tons)																						
Return Air (F db)	Cfm (Standard Air)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-20		-10		0		10		17		30		40		47		50		60		
55	2250	Cap.	31.4	28.8	37.8	34.9	44.5	41.0	52.1	47.8	57.6	52.5	70.2	61.5	79.9	79.9	87.9	87.9	91.6	91.6	105.9	105.9
		kW	5.32		5.47		5.61		5.74		5.84		6.09		6.72		6.92		7.02		7.48	
	3000	Cap.	33.3	30.6	39.6	36.5	46.3	42.5	53.9	49.4	59.6	54.3	72.1	63.1	81.9	81.9	90.0	90.0	93.9	93.9	105.1	105.1
		kW	5.76		5.90		6.01		6.13		6.23		6.44		7.05		7.25		7.35		7.64	
	3750	Cap.	35.1	32.1	41.4	38.2	48.0	44.1	55.7	51.0	61.3	56.1	73.9	64.7	83.6	83.6	91.8	91.8	94.7	94.7	103.4	103.4
		kW	6.23		6.34		6.44		6.56		6.63		6.85		7.48		7.68		7.75		7.93	
70	2250	Cap.	28.8	26.5	35.9	32.9	43.1	39.8	50.8	46.6	56.4	51.4	68.4	60.0	77.8	77.8	85.6	85.6	89.2	89.2	103.2	103.2
		kW	5.76		5.99		6.21		6.40		6.54		6.85		7.54		7.77		7.89		8.36	
	3000	Cap.	30.6	28.2	37.8	34.7	45.1	41.6	52.5	48.2	58.2	53.1	70.2	61.5	79.7	79.7	87.5	87.5	91.4	91.4	105.3	105.3
		kW	6.19		6.40		6.60		6.77		6.89		7.14		7.83		8.03		8.16		8.61	
	3750	Cap.	32.3	29.8	39.4	36.3	46.8	43.8	54.3	49.8	60.0	54.7	72.1	63.3	81.7	81.7	89.6	89.6	93.3	93.3	105.5	105.5
		kW	6.63		6.85		7.00		7.18		7.28		7.53		8.22		8.43		8.53		8.88	
80	2250	Cap.	26.3	24.1	33.9	31.2	41.7	38.4	49.6	45.7	55.5	50.6	67.2	58.8	76.4	76.4	84.0	84.0	87.7	87.7	101.1	101.1
		kW	6.01		6.34		6.62		6.87		7.06		7.39		8.18		8.43		8.55		9.06	
	3000	Cap.	28.0	25.9	35.9	33.1	43.7	40.2	51.3	47.2	57.2	52.3	69.0	60.6	78.4	78.4	86.1	86.1	89.8	89.8	103.4	103.4
		kW	6.44		6.75		7.00		7.22		7.37		7.68		8.43		8.65		8.78		9.25	
	3750	Cap.	29.8	27.4	37.8	34.7	45.5	41.9	53.3	48.8	59.0	53.9	71.0	62.1	80.1	80.1	88.1	88.1	91.8	91.8	105.3	105.3
		kW	6.89		7.18		7.41		7.60		7.76		8.03		8.80		9.00		9.13		9.58	

PHH102 (8½ Tons)																						
Return Air (F db)	Cfm (Standard Air)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-20		-10		0		10		20		30		40		47		50		60		
55	2550	Cap.	31.6	29.1	39.1	36.0	47.2	43.5	56.3	51.8	65.4	59.3	75.3	66.0	86.1	86.1	97.9	97.9	108.0	108.0	113.5	113.5
		kW	3.73		4.01		4.30		4.66		5.01		5.37		5.79		6.23		6.52		6.80	
	3400	Cap.	32.9	30.2	40.5	37.2	48.3	44.5	57.5	52.7	66.5	60.3	76.5	67.1	87.5	87.5	97.4	97.4	106.1	106.1	109.9	109.9
		kW	3.62		3.86		4.10		4.39		4.67		4.96		5.29		5.54		5.71		5.89	
	4250	Cap.	33.9	31.2	41.5	38.1	49.3	45.4	58.5	53.6	67.5	61.2	77.6	67.9	86.6	86.6	94.6	94.6	102.5	102.5	105.6	105.6
		kW	3.55		3.77		3.98		4.23		4.47		4.72		4.92		5.09		5.21		5.33	
70	2550	Cap.	28.9	26.6	36.9	34.0	45.5	41.8	55.0	50.5	64.4	58.4	74.2	65.0	84.5	84.5	95.8	95.8	107.1	107.1	114.3	114.3
		kW	4.38		4.76		5.14		5.54		5.98		6.45		6.92		7.41		7.82		8.26	
	3400	Cap.	30.2	27.8	38.4	35.3	46.9	43.0	56.4	51.8	65.6	59.5	75.4	66.1	86.0	86.0	97.4	97.4	107.3	107.3	111.9	111.9
		kW	4.27		4.61		4.91		5.25		5.61		5.98		6.36		6.74		6.98		7.20	
	4250	Cap.	31.4	28.8	39.5	36.4	47.9	44.2	57.5	52.7	66.6	60.4	76.4	67.0	87.1	87.1	97.2	97.2	106.3	106.3	109.1	109.1
		kW	4.21		4.51		4.79		5.09		5.40		5.70		6.03		6.28		6.46		6.60	
80	2550	Cap.	26.3	24.2	34.9	32.1	43.8	40.3	53.6	49.2	63.3	57.4	73.4	64.3	83.7	83.7	94.4	94.4	106.5	106.5	112.5	112.5
		kW	4.82		5.27		5.72		6.19		6.66		7.21		7.76		8.29		8.79		9.23	
	3400	Cap.	27.8	25.5	36.4	33.5	45.3	41.7	55.1	50.6	64.7	58.7	74.7	65.4	85.0	85.0	96.2	96.2	107.1	107.1	110.0	110.0
		kW	4.72		5.11		5.49		5.88		6.28		6.72		7.14		7.57		7.90		8.06	
	4250	Cap.	29.0	26.7	37.6	34.7	46.4	42.7	56.5	51.8	65.9	59.6	75.7	66.4	86.2	86.2	96.9	96.9	106.2	106.2	110.8	110.8
		kW	4.66		5.02		5.35		5.70		6.05		6.42		6.79		7.11		7.34		7.54	

**LEGEND**

Cap. — Heating Capacity (1000 Btu/h) (includes indoor-fan motor heat)  
kW — Total Power Input (includes compressor motor power input, outdoor-fan motor input, and indoor-fan motor input)  
rh — Relative Humidity

**NOTES:**

1. [Shaded cell] indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

**PERFORMANCE DATA – PHH036–120(cont.)**  
**INSTANTANEOUS AND INTEGRATED HEATING RATINGS**

PHH120 (10 Tons)																						
Return Air (F db)	Cfm (Standard Air)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-20		-10		0		10		17		30		40		47		50		60		
55	3000	Cap.	37.7	34.6	45.5	41.9	53.5	49.2	62.6	57.5	69.2	63.1	84.3	74.0	101.3	101.3	111.3	111.3	116.0	116.0	134.2	134.2
		kW	6.87		7.07		7.25		7.43		7.55		7.88		8.26		8.52		8.64		9.20	
	4000	Cap.	40.0	36.7	47.6	43.8	55.6	51.1	64.8	59.4	71.6	65.2	86.7	75.8	103.7	103.7	114.0	114.0	118.9	118.9	133.2	133.2
		kW	7.45		7.63		7.78		7.93		8.05		8.33		8.67		8.92		9.05		9.40	
	5000	Cap.	42.2	38.6	49.7	45.9	57.7	53.0	66.9	61.2	73.7	67.4	88.8	77.7	105.9	105.9	116.2	116.2	119.9	119.9	131.0	131.0
		kW	8.05		8.20		8.33		8.48		8.58		8.86		9.20		9.45		9.53		9.76	
70	3000	Cap.	34.6	31.8	43.1	39.6	51.8	47.8	61.0	56.1	67.8	61.7	82.2	72.1	98.5	98.5	108.4	108.4	113.0	113.0	130.7	130.7
		kW	7.45		7.75		8.03		8.28		8.45		8.86		9.28		9.55		9.71		10.29	
	4000	Cap.	36.7	33.9	45.5	41.7	54.2	49.9	63.1	57.9	69.9	63.8	84.3	74.0	101.0	101.0	110.8	110.8	115.8	115.8	133.4	133.4
		kW	8.00		8.28		8.53		8.76		8.91		9.23		9.63		9.88		10.04		10.59	
	5000	Cap.	38.9	35.8	47.3	43.6	56.3	51.8	65.2	59.8	72.1	65.7	86.7	76.1	103.5	103.5	113.5	113.5	118.2	118.2	133.7	133.7
		kW	8.58		8.86		9.06		9.28		9.41		9.73		10.11		10.37		10.49		10.92	
80	3000	Cap.	31.6	29.0	40.7	37.4	50.2	46.2	59.6	54.9	66.7	60.8	80.8	70.7	96.8	96.8	106.4	106.4	111.1	111.1	128.0	128.0
		kW	7.78		8.20		8.56		8.88		9.13		9.56		10.06		10.37		10.52		11.15	
	4000	Cap.	33.7	31.1	43.1	39.8	52.5	48.3	61.9	56.8	68.8	62.9	82.9	72.8	99.3	99.3	109.1	109.1	113.8	113.8	131.0	131.0
		kW	8.33		8.73		9.06		9.33		9.53		9.93		10.37		10.64		10.80		11.38	
	5000	Cap.	35.8	33.0	45.5	41.7	54.6	50.4	64.1	58.6	70.9	64.8	85.3	74.7	101.5	101.5	111.6	111.6	116.2	116.2	133.4	133.4
		kW	8.91		9.28		9.58		9.83		10.04		10.39		10.82		11.08		11.23		11.78	

**LEGEND**

- Cap. — Heating Capacity (1000 Btuh) (includes indoor-fan motor heat)
- kW — Total Power Input (includes compressor motor power input, outdoor-fan motor input, and indoor-fan motor input)
- rh — Relative Humidity

**NOTES:**

1.  indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

**PERFORMANCE DATA – PHH036–120**  
**FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH036 (3 TONS) STANDARD MOTOR (BELT DRIVE)* – SINGLE AND THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	566	0.14	142	690	0.23	228	791	0.32	320	879	0.42	418	957	0.52	522
1000	598	0.17	173	718	0.27	267	817	0.37	366	903	0.47	471	981	0.58	581
1100	632	0.21	210	748	0.31	311	844	0.42	418	929	0.53	530	1006	0.65	646
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	<b>1057</b>	<b>0.80</b>	<b>796</b>
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	<b>1085</b>	<b>0.89</b>	<b>881</b>
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	<b>1112</b>	<b>0.98</b>	<b>974</b>

PHH036 (3 TONS) STANDARD MOTOR (BELT DRIVE)* (cont) – SINGLE AND THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1029	0.63	630	1095	0.75	742	1157	0.86	859	1216	0.99	980	1272	1.11	1105
1000	1052	0.70	695	1118	0.82	814	1179	0.94	937	1237	1.07	1064	1293	1.20	1195
1100	1076	0.77	767	1141	0.90	892	1202	1.03	1021	1260	1.16	1154	—	—	—
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	—	—	—	—	—	—
1300	1126	0.94	930	1189	1.07	1069	—	—	—	—	—	—	—	—	—
1400	1152	1.03	1023	1215	1.17	1168	—	—	—	—	—	—	—	—	—
1500	1179	1.13	1123	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 680 to 1044 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 1.20

3. See General Notes for Fan Performance following this section

PHH036 (3 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	566	0.14	142	690	0.23	228	791	0.32	320	879	0.42	418	957	0.52	522
1000	598	0.17	173	718	0.27	267	817	0.37	366	903	0.47	471	981	0.58	581
1100	632	0.21	210	748	0.31	311	844	0.42	418	929	0.53	530	1006	0.65	646
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	<b>1057</b>	<b>0.80</b>	<b>796</b>
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	1085	0.89	881
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	1112	0.98	974

PHH036 (3 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont) – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1029	0.63	630	1095	0.75	742	1157	0.86	859	1216	0.99	980	1272	1.11	1105
1000	1052	0.70	695	1118	0.82	814	1179	0.94	937	1237	1.07	1064	1293	1.20	1195
1100	1076	0.77	767	1141	0.90	892	1202	1.03	1021	1260	1.16	1154	1314	1.30	1291
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	1282	1.26	1252	1337	1.40	1395
1300	1126	0.94	930	1189	1.07	1069	1249	1.22	1211	1306	1.36	1356	1360	1.51	1506
1400	1152	1.03	1023	1215	1.17	1168	1274	1.32	1317	1330	1.48	1469	1384	1.63	1625
1500	1179	1.13	1123	1241	1.28	1275	1300	1.44	1431	1355	1.60	1590	1408	1.76	1752

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1075 to 1455 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.40

3. See General Notes for Fan Performance following this section



**PERFORMANCE DATA – PHH036–120  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH048 (4 TONS) STANDARD MOTOR (BELT DRIVE)* – SINGLE AND THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	1057	0.80	796
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	1085	0.89	881
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	1112	0.98	974
1600	811	0.49	487	909	0.63	629	994	0.78	774	1071	0.93	923	1141	1.08	1076
1700	849	0.57	565	943	0.72	715	1026	0.87	869	1101	1.03	1025	1170	1.19	1185
1800	887	0.65	651	978	0.81	810	1059	0.98	972	1133	1.14	1136	—	—	—
1900	926	0.75	746	1014	0.92	914	1092	1.09	1084	—	—	—	—	—	—
2000	965	0.86	852	1050	1.03	1028	—	—	—	—	—	—	—	—	—

PHH048 (4 TONS) STANDARD MOTOR (BELT DRIVE)* (cont) – SINGLE AND THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	—	—	—	—	—	—
1300	1126	0.94	930	1189	1.07	1069	—	—	—	—	—	—	—	—	—
1400	1152	1.03	1023	1215	1.17	1168	—	—	—	—	—	—	—	—	—
1500	1179	1.13	1123	—	—	—	—	—	—	—	—	—	—	—	—
1600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 770 to 1185 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required
2. Maximum continuous Bhp is 1.20
3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH048 (4 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	1057	0.80	796
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	1085	0.89	881
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	1112	0.98	974
1600	811	0.49	487	909	0.63	629	994	0.78	774	1071	0.93	923	1141	1.08	1076
1700	849	0.57	565	943	0.72	715	1026	0.87	869	1101	1.03	1025	1170	1.19	1185
1800	887	0.65	651	978	0.81	810	1059	0.98	972	1133	1.14	1136	1200	1.31	1304
1900	926	0.75	746	1014	0.92	914	1092	1.09	1084	1164	1.26	1257	1231	1.44	1432
2000	965	0.86	852	1050	1.03	1028	1127	1.21	1206	1197	1.39	1387	1262	1.58	1570

PHH048 (4 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont) – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	1282	1.26	1252	1337	1.40	1395
1300	1126	0.94	930	1189	1.07	1069	1249	1.22	1211	1306	1.36	1356	1360	1.51	1506
1400	1152	1.03	1023	1215	1.17	1168	1274	1.32	1317	1330	1.48	1469	1384	1.63	1625
1500	1179	1.13	1123	1241	1.28	1275	1300	1.44	1431	1355	1.60	1590	1408	1.76	1752
1600	1206	1.24	1231	1268	1.40	1391	1326	1.56	1553	1381	1.73	1719	1433	1.90	1888
1700	1235	1.36	1349	1295	1.52	1515	1352	1.69	1685	1407	1.87	1858	<b>1459</b>	<b>2.04</b>	<b>2034</b>
1800	1264	1.48	1475	1323	1.66	1649	1380	1.84	1826	1434	2.02	2006	<b>1485</b>	<b>2.20</b>	<b>2189</b>
1900	1293	1.62	1611	1352	1.80	1792	1408	1.99	1976	<b>1461</b>	<b>2.17</b>	<b>2163</b>	<b>1512</b>	<b>2.37</b>	<b>2353</b>
2000	1324	1.77	1756	1381	1.96	1945	1436	2.15	2137	<b>1489</b>	<b>2.34</b>	<b>2332</b>	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1075 to 1455 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required
2. Maximum continuous Bhp is 2.40
3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* — SINGLE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	790	0.40	353	897	0.53	471	991	0.68	600	1075	0.83	739	1152	1.00	888
1600	828	0.46	412	931	0.60	536	1022	0.75	670	1104	0.92	813	1180	1.09	966
1700	866	0.54	478	966	0.68	608	1054	0.84	747	1134	1.01	895	1208	1.19	1053
1800	905	0.62	551	1001	0.77	687	1087	0.94	832	1165	1.11	985	1238	1.29	1148
1900	944	0.71	633	1037	0.87	774	1120	1.04	925	1197	1.22	1084	—	—	—
2000	983	0.81	723	1073	0.98	870	1154	1.16	1026	—	—	—	—	—	—
2100	1023	0.92	821	1110	1.10	975	1189	1.28	1137	—	—	—	—	—	—
2200	1063	1.05	929	1147	1.23	1089	—	—	—	—	—	—	—	—	—
2300	1104	1.18	1046	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* — SINGLE–PHASE UNITS (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1224	1.18	1045	—	—	—	—	—	—	—	—	—	—	—	—
1600	1250	1.27	1128	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1035 to 1460 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 1.30

3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* — THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	790	0.40	353	897	0.53	471	991	0.68	600	1075	0.83	739	1152	1.00	888
1600	828	0.46	412	931	0.60	536	1022	0.75	670	1104	0.92	813	1180	1.09	966
1700	866	0.54	478	966	0.68	608	1054	0.84	747	1134	1.01	895	1208	1.19	1053
1800	905	0.62	551	1001	0.77	687	1087	0.94	832	1165	1.11	985	1238	1.29	1148
1900	944	0.71	633	1037	0.87	774	1120	1.04	925	1197	1.22	1084	1268	1.41	1251
2000	983	0.81	723	1073	0.98	870	1154	1.16	1026	1229	1.34	1190	1299	1.53	1362
2100	1023	0.92	821	1110	1.10	975	1189	1.28	1137	1262	1.47	1306	1330	1.67	1483
2200	1063	1.05	929	1147	1.23	1089	1224	1.41	1256	1295	1.61	1431	1362	1.82	1614
2300	1104	1.18	1046	1185	1.37	1212	1260	1.56	1386	1329	1.76	1567	1395	1.98	1754
2400	1145	1.32	1174	1223	1.52	1346	1296	1.72	1526	1364	1.93	1712	1428	2.15	1905
2500	1185	1.48	1311	1262	1.68	1490	1333	1.89	1676	1399	2.10	1868	1462	2.33	2067

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* — THREE–PHASE UNITS (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1224	1.18	1045	1291	1.36	1212	1354	1.56	1387	1414	1.77	1570	1472	1.98	1761
1600	1250	1.27	1128	1316	1.46	1299	1379	1.66	1478	1438	1.87	1664	1495	2.09	1858
1700	1278	1.37	1219	1343	1.57	1394	1405	1.77	1576	1463	1.99	1766	1520	2.21	1964
1800	1306	1.48	1318	1370	1.69	1497	1431	1.90	1683	1489	2.11	1877	1545	2.34	2078
1900	1335	1.61	1426	1398	1.81	1609	1458	2.03	1799	1515	2.25	1997	—	—	—
2000	1364	1.74	1542	1427	1.95	1730	1486	2.17	1925	1542	2.39	2126	—	—	—
2100	1395	1.88	1668	1456	2.09	1860	1514	2.32	2060	—	—	—	—	—	—
2200	1426	2.03	1804	1486	2.25	2001	—	—	—	—	—	—	—	—	—
2300	1457	2.19	1949	—	—	—	—	—	—	—	—	—	—	—	—
2400	1489	2.37	2106	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1035 to 1460 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.40

3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH060 (5 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	790	0.40	353	897	0.53	471	991	0.68	600	1075	0.83	739	1152	1.00	888
1600	828	0.46	412	931	0.60	536	1022	0.75	670	1104	0.92	813	1180	1.09	966
1700	866	0.54	478	966	0.68	608	1054	0.84	747	1134	1.01	895	1208	1.19	1053
1800	905	0.62	551	1001	0.77	687	1087	0.94	832	1165	1.11	985	1238	1.29	1148
1900	944	0.71	633	1037	0.87	774	1120	1.04	925	1197	1.22	1084	1268	1.41	1251
2000	983	0.81	723	1073	0.98	870	1154	1.16	1026	1229	1.34	1190	1299	1.53	1362
2100	1023	0.92	821	1110	1.10	975	1189	1.28	1137	1262	1.47	1306	1330	1.67	1483
2200	1063	1.05	929	1147	1.23	1089	1224	1.41	1256	1295	1.61	1431	1362	1.82	1614
2300	1104	1.18	1046	1185	1.37	1212	1260	1.56	1386	1329	1.76	1567	1395	1.98	1754
2400	1145	1.32	1174	1223	1.52	1346	1296	1.72	1526	1364	1.93	1712	1428	2.15	1905
2500	1185	1.48	1311	1262	1.68	1490	1333	1.89	1676	1399	2.10	1868	1462	2.33	2067

PHH060 (5 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont) – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1224	1.18	1045	1291	1.36	1212	1354	1.56	1387	1414	1.77	1570	1472	1.98	1761
1600	1250	1.27	1128	1316	1.46	1299	1379	1.66	1478	1438	1.87	1664	1495	2.09	1858
1700	1278	1.37	1219	1343	1.57	1394	1405	1.77	1576	1463	1.99	1766	1520	2.21	1964
1800	1306	1.48	1318	1370	1.69	1497	1431	1.90	1683	1489	2.11	1877	1545	2.34	2078
1900	1335	1.61	1426	1398	1.81	1609	1458	2.03	1799	1515	2.25	1997	1570	2.48	2202
2000	1364	1.74	1542	1427	1.95	1730	1486	2.17	1925	1542	2.39	2126	1596	2.63	2335
2100	1395	1.88	1668	1456	2.09	1860	1514	2.32	2060	1570	2.55	2265	1623	2.79	2478
2200	1426	2.03	1804	1486	2.25	2001	1543	2.48	2204	1598	2.72	2415	—	—	—
2300	1457	2.19	1949	1516	2.42	2151	1573	2.66	2360	1627	2.90	2574	—	—	—
2400	1489	2.37	2106	1547	2.60	2312	1603	2.84	2526	—	—	—	—	—	—
2500	1522	2.56	2272	1579	2.80	2484	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1300 to 1685 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.90

3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH072 (6 TONS) STANDARD MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	907	0.63	558	1006	0.80	708	1092	0.97	860	1169	1.14	1015	1239	1.32	1174
1900	945	0.72	638	1042	0.90	796	1126	1.08	956	1201	1.26	1119	1271	1.45	1285
2000	984	0.82	727	1078	1.00	892	1160	1.19	1060	1235	1.39	1230	1303	1.58	1403
2100	1024	0.93	823	1115	1.12	997	1195	1.32	1173	1268	1.52	1350	1335	1.72	1531
2200	1063	1.05	929	1152	1.25	1111	1230	1.46	1294	1302	1.67	1480	1368	1.88	1668
2300	1103	1.18	1044	1189	1.39	1234	1266	1.60	1425	1337	1.82	1618	1402	2.04	1814
2400	1143	1.32	1168	1227	1.54	1367	1302	1.76	1566	1371	1.99	1767	1435	2.22	1970
2500	1183	1.47	1303	1265	1.70	1510	1339	1.93	1717	1406	2.17	1926	—	—	—
2600	1224	1.63	1448	1303	1.87	1663	1375	2.12	1878	1442	2.36	2095	—	—	—
2700	1264	1.81	1604	1342	2.06	1828	1412	2.31	2051	—	—	—	—	—	—
2800	1305	1.99	1772	1381	2.26	2003	—	—	—	—	—	—	—	—	—
2900	1346	2.20	1951	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

PHH072 (6 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1304	1.51	1337	1365	1.69	1503	1422	1.88	1674	1477	2.08	1848	1528	2.28	2025
1900	1335	1.64	1454	1395	1.83	1627	1452	2.03	1804	1506	2.23	1984	—	—	—
2000	1366	1.78	1580	1426	1.98	1760	1482	2.19	1943	1535	2.40	2130	—	—	—
2100	1398	1.93	1715	1457	2.14	1901	1512	2.35	2091	—	—	—	—	—	—
2200	1430	2.09	1858	1488	2.31	2052	—	—	—	—	—	—	—	—	—
2300	1462	2.27	2012	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1119 to 1585 rpm. All other rpms require field-supplied drive.

**NOTES**

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 2.40
3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH072 (6 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	907	0.63	558	1006	0.80	708	1092	0.97	860	1169	1.14	1015	1239	1.32	1174
1900	945	0.72	638	1042	0.90	796	1126	1.08	956	1201	1.26	1119	1271	1.45	1285
2000	984	0.82	727	1078	1.00	892	1160	1.19	1060	1235	1.39	1230	1303	1.58	1403
2100	1024	0.93	823	1115	1.12	997	1195	1.32	1173	1268	1.52	1350	1335	1.72	1531
2200	1063	1.05	929	1152	1.25	1111	1230	1.46	1294	1302	1.67	1480	1368	1.88	1668
2300	1103	1.18	1044	1189	1.39	1234	1266	1.60	1425	1337	1.82	1618	1402	2.04	1814
2400	1143	1.32	1168	1227	1.54	1367	1302	1.76	1566	1371	1.99	1767	1435	2.22	1970
2500	1183	1.47	1303	1265	1.70	1510	1339	1.93	1717	1406	2.17	1926	1470	2.41	2136
2600	1224	1.63	1448	1303	1.87	1663	1375	2.12	1878	1442	2.36	2095	1504	2.60	2313
2700	1264	1.81	1604	1342	2.06	1828	1412	2.31	2051	1478	2.56	2275	1539	2.82	2501
2800	1305	1.99	1772	1381	2.26	2003	1450	2.52	2235	1514	2.78	2467	—	—	—
2900	1346	2.20	1951	1420	2.47	2191	1488	2.74	2431	—	—	—	—	—	—
3000	1387	2.41	2142	1459	2.69	2391	—	—	—	—	—	—	—	—	—

PHH072 (6 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1304	1.51	1337	1365	1.69	1503	1422	1.88	1674	1477	2.08	1848	1528	2.28	2025
1900	1335	1.64	1454	1395	1.83	1627	1452	2.03	1804	1506	2.23	1984	1557	2.44	2168
2000	1366	1.78	1580	1426	1.98	1760	1482	2.19	1943	1535	2.40	2130	1586	2.61	2319
2100	1398	1.93	1715	1457	2.14	1901	1512	2.35	2091	1565	2.57	2284	1616	2.79	2481
2200	1430	2.09	1858	1488	2.31	2052	1543	2.53	2249	1596	2.76	2449	—	—	—
2300	1462	2.27	2012	1520	2.49	2212	1574	2.72	2416	—	—	—	—	—	—
2400	1495	2.45	2175	1552	2.68	2383	—	—	—	—	—	—	—	—	—
2500	1529	2.64	2349	1585	2.89	2564	—	—	—	—	—	—	—	—	—
2600	1562	2.85	2533	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1300 to 1685 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.90

3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH090 (7 1/2 TONS) STANDARD MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	511	0.53	492	591	0.73	680	660	0.95	885	722	1.19	1106	779	1.44	1342
2300	519	0.56	518	597	0.76	709	666	0.98	916	727	1.22	1140	784	1.48	1378
2400	534	0.61	571	611	0.82	768	678	1.05	982	739	1.30	1210	795	1.56	1453
2500	550	0.67	629	624	0.89	832	690	1.13	1051	750	1.38	1285	805	1.64	1533
2550	558	0.71	660	631	0.93	866	697	1.17	1088	756	1.42	1324	811	1.69	1574
2600	565	0.74	691	638	0.97	901	703	1.21	1125	762	1.46	1365	816	1.73	1617
2700	581	0.81	758	652	1.04	974	716	1.29	1204	774	1.55	1449	828	1.83	1707
2800	597	0.89	829	667	1.13	1051	729	1.38	1287	786	1.65	1538	839	1.93	1801
2900	613	0.97	905	681	1.22	1133	742	1.48	1376	799	1.75	1632	851	2.04	1900
3000	630	1.06	985	696	1.31	1220	756	1.58	1469	811	1.86	1731	863	2.15	2004
3100	646	1.15	1071	711	1.41	1313	770	1.68	1568	824	1.97	1835	875	2.27	2114
3200	663	1.25	1162	726	1.51	1411	784	1.79	1672	837	2.09	1944	888	2.39	2229
3300	679	1.35	1259	741	1.62	1514	798	1.91	1781	851	2.21	2060	900	2.52	2351
3400	696	1.46	1361	756	1.74	1623	812	2.03	1896	864	2.34	2181	913	2.66	2478
3500	713	1.58	1469	772	1.86	1737	827	2.16	2017	878	2.48	2308	926	2.80	2610
3600	729	1.70	1583	787	1.99	1857	841	2.30	2144	892	2.62	2441	—	—	—
3700	746	1.83	1703	803	2.13	1985	856	2.44	2277	906	2.77	2580	—	—	—
3750	755	1.89	1766	811	2.20	2051	864	2.52	2346	913	2.84	2653	—	—	—

PHH090 (7 1/2 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	832	1.71	1592	882	1.99	1855	928	2.29	2131	<b>973</b>	<b>2.59</b>	<b>2420</b>	—	—	—
2300	837	1.75	1630	886	2.03	1896	933	2.33	2174	<b>977</b>	<b>2.64</b>	<b>2463</b>	—	—	—
2400	847	1.83	1710	896	2.12	1980	942	2.43	2262	<b>986</b>	<b>2.74</b>	<b>2556</b>	—	—	—
2500	857	1.92	1794	905	2.22	2069	<b>951</b>	<b>2.52</b>	<b>2355</b>	<b>995</b>	<b>2.84</b>	<b>2653</b>	—	—	—
2550	862	1.97	1838	910	2.27	2114	<b>956</b>	<b>2.58</b>	<b>2403</b>	<b>999</b>	<b>2.90</b>	<b>2704</b>	—	—	—
2600	867	2.02	1884	915	2.32	2162	<b>961</b>	<b>2.63</b>	<b>2453</b>	—	—	—	—	—	—
2700	878	2.12	1978	926	2.42	2261	<b>971</b>	<b>2.74</b>	<b>2556</b>	—	—	—	—	—	—
2800	889	2.23	2077	936	2.54	2365	<b>981</b>	<b>2.86</b>	<b>2664</b>	—	—	—	—	—	—
2900	900	2.34	2181	947	2.65	2474	—	—	—	—	—	—	—	—	—
3000	912	2.46	2290	<b>958</b>	<b>2.78</b>	<b>2588</b>	—	—	—	—	—	—	—	—	—
3100	923	2.58	2406	<b>969</b>	<b>2.90</b>	<b>2708</b>	—	—	—	—	—	—	—	—	—
3200	935	2.71	2526	—	—	—	—	—	—	—	—	—	—	—	—
3300	947	2.84	2652	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 730 to 950 rpm. All other rpms require drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.90

3. See General Notes for Fan Performance following this section

field–supplied



**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH090 (7 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	511	0.53	492	591	0.73	680	660	0.95	885	722	1.19	1106	779	1.44	1342
2300	519	0.56	518	597	0.76	709	666	0.98	916	727	1.22	1140	784	1.48	1378
2400	534	0.61	571	611	0.82	768	678	1.05	982	739	1.30	1210	795	1.56	1453
2500	550	0.67	629	624	0.89	832	690	1.13	1051	750	1.38	1285	805	1.64	1533
2550	558	0.71	660	631	0.93	866	697	1.17	1088	756	1.42	1324	811	1.69	1574
2600	565	0.74	691	638	0.97	901	703	1.21	1125	762	1.46	1365	816	1.73	1617
2700	581	0.81	758	652	1.04	974	716	1.29	1204	774	1.55	1449	828	1.83	1707
2800	597	0.89	829	667	1.13	1051	729	1.38	1287	786	1.65	1538	839	1.93	1801
2900	613	0.97	905	681	1.22	1133	742	1.48	1376	799	1.75	1632	851	2.04	1900
3000	630	1.06	985	696	1.31	1220	756	1.58	1469	811	1.86	1731	863	2.15	2004
3100	646	1.15	1071	711	1.41	1313	770	1.68	1568	824	1.97	1835	875	2.27	2114
3200	663	1.25	1162	726	1.51	1411	784	1.79	1672	837	2.09	1944	888	2.39	2229
3300	679	1.35	1259	741	1.62	1514	798	1.91	1781	851	2.21	2060	900	2.52	2351
3400	696	1.46	1361	756	1.74	1623	812	2.03	1896	864	2.34	2181	913	2.66	2478
3500	713	1.58	1469	772	1.86	1737	827	2.16	2017	878	2.48	2308	926	2.80	2610
3600	729	1.70	1583	787	1.99	1857	841	2.30	2144	892	2.62	2441	939	2.95	2749
3700	746	1.83	1703	803	2.13	1985	856	2.44	2277	906	2.77	2580	953	3.10	2894
3750	755	1.89	1766	811	2.20	2051	864	2.52	2346	913	2.84	2653	959	3.18	2969

PHH090 (7 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	832	1.71	1592	882	1.99	1855	928	2.29	2131	973	2.59	2420	1015	2.92	2720
2300	837	1.75	1630	886	2.03	1896	933	2.33	2174	977	2.64	2463	1020	2.97	2766
2400	847	1.83	1710	896	2.12	1980	942	2.43	2262	986	2.74	2556	1028	3.07	2861
2500	857	1.92	1794	905	2.22	2069	951	2.52	2355	995	2.84	2653	1037	3.18	2962
2550	862	1.97	1838	910	2.27	2114	956	2.58	2403	999	2.90	2704	1041	3.23	3014
2600	867	2.02	1884	915	2.32	2162	961	2.63	2453	1004	2.95	2755	1045	3.29	3068
2700	878	2.12	1978	926	2.42	2261	971	2.74	2556	1013	3.07	2862	1055	3.41	3180
2800	889	2.23	2077	936	2.54	2365	981	2.86	2664	1023	3.19	2975	1064	3.54	3297
2900	900	2.34	2181	947	2.65	2474	991	2.98	2778	1033	3.32	3094	1073	3.67	3419
3000	912	2.46	2290	958	2.78	2588	1001	3.11	2897	1043	3.45	3217	<b>1083</b>	<b>3.80</b>	<b>3547</b>
3100	923	2.58	2406	969	2.90	2708	1012	3.24	3022	1053	3.59	3347	<b>1093</b>	<b>3.95</b>	<b>3682</b>
3200	935	2.71	2526	980	3.04	2834	1023	3.38	3152	1064	3.73	3482	<b>1103</b>	<b>4.10</b>	<b>3821</b>
3300	947	2.84	2652	992	3.18	2966	1034	3.53	3289	1075	3.89	3623	—	—	—
3400	959	2.99	2785	1003	3.33	3103	1045	3.68	3432	<b>1086</b>	<b>4.04</b>	<b>3771</b>	—	—	—
3500	972	3.13	2923	1015	3.48	3246	1057	3.84	3581	—	—	—	—	—	—
3600	984	3.29	3068	1027	3.64	3396	1068	4.01	3736	—	—	—	—	—	—
3700	997	3.45	3218	1040	3.81	3553	1080	4.18	3897	—	—	—	—	—	—
3750	1004	3.54	3296	1046	3.90	3633	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 860 to 1080 rpm. All other rpms require field–supplied drive.

**NOTES**

- 1. Boldface** indicates field–supplied drive required
- Maximum continuous Bhp is 3.70
- See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH102 (8 1/2 TONS) STANDARD MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	489	0.41	386	564	0.54	506	629	0.67	625	688	0.80	745	741	0.93	866
2600	502	0.45	424	576	0.59	548	640	0.72	672	697	0.85	797	750	0.99	923
2700	515	0.50	465	587	0.64	594	650	0.77	723	707	0.91	852	760	1.05	982
2800	529	0.55	508	599	0.69	642	661	0.83	776	718	0.98	910	769	1.12	1044
2900	542	0.59	555	611	0.74	693	672	0.89	832	728	1.04	970	779	1.19	1109
3000	556	0.65	604	623	0.80	748	684	0.95	891	738	1.11	1034	789	1.26	1177
3100	569	0.70	656	636	0.86	805	695	1.02	953	749	1.18	1100	799	1.34	1249
3200	583	0.76	712	648	0.93	865	707	1.09	1018	760	1.26	1170	809	1.42	1323
3300	597	0.83	770	661	1.00	929	718	1.17	1086	771	1.33	1244	820	1.50	1401
3400	611	0.89	832	674	1.07	996	730	1.24	1158	782	1.42	1320	831	1.59	1483
3500	625	0.96	898	687	1.14	1066	742	1.32	1233	794	1.50	1400	841	1.68	1567
3600	639	1.04	967	700	1.22	1140	754	1.41	1312	805	1.59	1484	852	1.78	1656
3700	654	1.11	1040	713	1.31	1218	767	1.50	1395	817	1.69	1571	863	1.87	1748
3800	668	1.20	1116	726	1.39	1299	779	1.59	1481	828	1.78	1662	874	1.98	1844
3900	683	1.28	1197	739	1.48	1385	792	1.69	1572	840	1.88	1758	886	2.08	1943
4000	697	1.37	1281	753	1.58	1474	804	1.79	1666	852	1.99	1857	897	2.20	2048
4100	712	1.47	1370	766	1.68	1567	817	1.89	1764	864	2.10	1960	909	2.31	2155
4200	726	1.57	1462	780	1.79	1665	830	2.00	1866	876	2.22	2067	920	2.43	2268
4300	741	1.67	1559	794	1.89	1767	843	2.12	1973	889	2.34	2179	932	2.56	2384

PHH102 (8 1/2 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	791	1.06	988	837	1.19	1112	881	1.33	1236	922	1.46	1362	962	1.60	1490
2600	799	1.12	1049	845	1.26	1177	889	1.40	1306	930	1.54	1436	969	1.68	1568
2700	808	1.19	1113	854	1.34	1245	897	1.48	1378	938	1.62	1513	977	1.77	1648
2800	817	1.26	1179	863	1.41	1316	905	1.56	1454	946	1.71	1592	985	1.86	1732
2900	827	1.34	1249	872	1.49	1390	914	1.64	1532	954	1.80	1675	993	1.95	1819
3000	836	1.42	1322	881	1.57	1467	923	1.73	1613	963	1.89	1761	1001	2.05	1909
3100	846	1.50	1398	890	1.66	1547	932	1.82	1698	972	1.98	1849	1010	2.15	2002
3200	856	1.58	1477	899	1.75	1631	941	1.92	1786	980	2.08	1942	1018	2.25	2099
3300	866	1.67	1559	909	1.84	1718	950	2.01	1878	989	2.19	2038	1027	2.36	2199
3400	876	1.76	1645	919	1.94	1808	960	2.12	1972	998	2.29	2137	1036	2.47	2303
3500	886	1.86	1734	929	2.04	1902	969	2.22	2071	1008	2.40	2240	1045	2.58	2410
3600	897	1.96	1827	939	2.14	2000	979	2.33	2173	1017	2.52	2347	1054	2.70	2521
3700	907	2.06	1924	949	2.25	2101	989	2.44	2279	1027	2.63	2457	1063	2.83	2636
3800	918	2.17	2025	959	2.37	2207	999	2.56	2389	1036	2.76	2571	—	—	—
3900	929	2.28	2130	970	2.48	2316	1009	2.68	2502	1046	2.88	2690	—	—	—
4000	940	2.40	2238	980	2.61	2429	1019	2.81	2620	—	—	—	—	—	—
4100	951	2.52	2351	991	2.73	2547	—	—	—	—	—	—	—	—	—
4200	962	2.65	2468	1002	2.86	2668	—	—	—	—	—	—	—	—	—
4300	973	2.78	2589	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 840 to 1085 rpm. All other rpms require field-supplied drive.

**NOTES**

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 2.90
3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH102 (8 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	489	0.41	386	564	0.54	506	629	0.67	625	688	0.80	745	741	0.93	866
2600	502	0.45	424	576	0.59	548	640	0.72	672	697	0.85	797	750	0.99	923
2700	515	0.50	465	587	0.64	594	650	0.77	723	707	0.91	852	760	1.05	982
2800	529	0.55	508	599	0.69	642	661	0.83	776	718	0.98	910	769	1.12	1044
2900	542	0.59	555	611	0.74	693	672	0.89	832	728	1.04	970	779	1.19	1109
3000	556	0.65	604	623	0.80	748	684	0.95	891	738	1.11	1034	789	1.26	1177
3100	569	0.70	656	636	0.86	805	695	1.02	953	749	1.18	1100	799	1.34	1249
3200	583	0.76	712	648	0.93	865	707	1.09	1018	760	1.26	1170	809	1.42	1323
3300	597	0.83	770	661	1.00	929	718	1.17	1086	771	1.33	1244	820	1.50	1401
3400	611	0.89	832	674	1.07	996	730	1.24	1158	782	1.42	1320	831	1.59	1483
3500	625	0.96	898	687	1.14	1066	742	1.32	1233	794	1.50	1400	841	1.68	1567
3600	639	1.04	967	700	1.22	1140	754	1.41	1312	805	1.59	1484	852	1.78	1656
3700	654	1.11	1040	713	1.31	1218	767	1.50	1395	817	1.69	1571	863	1.87	1748
3800	668	1.20	1116	726	1.39	1299	779	1.59	1481	828	1.78	1662	874	1.98	1844
3900	683	1.28	1197	739	1.48	1385	792	1.69	1572	840	1.88	1758	886	2.08	1943
4000	697	1.37	1281	753	1.58	1474	804	1.79	1666	852	1.99	1857	897	2.20	2048
4100	712	1.47	1370	766	1.68	1567	817	1.89	1764	864	2.10	1960	909	2.31	2155
4200	726	1.57	1462	780	1.79	1665	830	2.00	1866	876	2.22	2067	920	2.43	2268
4300	741	1.67	1559	794	1.89	1767	843	2.12	1973	889	2.34	2179	932	2.56	2384

PHH102 (8 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	791	1.06	988	837	1.19	1112	881	1.33	1236	922	1.46	1362	962	1.60	1490
2600	799	1.12	1049	845	1.26	1177	889	1.40	1306	930	1.54	1436	969	1.68	1568
2700	808	1.19	1113	854	1.34	1245	897	1.48	1378	938	1.62	1513	977	1.77	1648
2800	817	1.26	1179	863	1.41	1316	905	1.56	1454	946	1.71	1592	985	1.86	1732
2900	827	1.34	1249	872	1.49	1390	914	1.64	1532	954	1.80	1675	993	1.95	1819
3000	836	1.42	1322	881	1.57	1467	923	1.73	1613	963	1.89	1761	1001	2.05	1909
3100	846	1.50	1398	890	1.66	1547	932	1.82	1698	972	1.98	1849	1010	2.15	2002
3200	856	1.58	1477	899	1.75	1631	941	1.92	1786	980	2.08	1942	1018	2.25	2099
3300	866	1.67	1559	909	1.84	1718	950	2.01	1878	989	2.19	2038	1027	2.36	2199
3400	876	1.76	1645	919	1.94	1808	960	2.12	1972	998	2.29	2137	1036	2.47	2303
3500	886	1.86	1734	929	2.04	1902	969	2.22	2071	1008	2.40	2240	1045	2.58	2410
3600	897	1.96	1827	939	2.14	2000	979	2.33	2173	1017	2.52	2347	1054	2.70	2521
3700	907	2.06	1924	949	2.25	2101	989	2.44	2279	1027	2.63	2457	1063	2.83	2636
3800	918	2.17	2025	959	2.37	2207	999	2.56	2389	1036	2.76	2571	1073	2.95	2755
3900	929	2.28	2130	970	2.48	2316	1009	2.68	2502	1046	2.88	2690	<b>1082</b>	<b>3.09</b>	<b>2877</b>
4000	940	2.40	2238	980	2.61	2429	1019	2.81	2620	1056	3.02	2812	<b>1092</b>	<b>3.22</b>	<b>3004</b>
4100	951	2.52	2351	991	2.73	2547	1029	2.94	2743	1066	3.15	2939	<b>1102</b>	<b>3.36</b>	<b>3136</b>
4200	962	2.65	2468	1002	2.86	2668	1040	3.08	2869	1076	3.29	3070	<b>1112</b>	<b>3.51</b>	<b>3271</b>
4300	973	2.78	2589	1013	3.00	2794	1050	3.22	2999	<b>1087</b>	<b>3.44</b>	<b>3205</b>	<b>1122</b>	<b>3.66</b>	<b>3411</b>

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 860 to 1080 rpm. All other rpms require field–supplied drive.

**NOTES**

- 1. Boldface** indicates field–supplied drive required
- Maximum continuous Bhp is 3.70
- See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH120 (10 TONS) STANDARD MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	556	0.65	604	623	0.80	748	684	0.95	891	738	1.11	1034	789	1.26	1177
3100	569	0.70	656	636	0.86	805	695	1.02	953	749	1.18	1100	799	1.34	1249
3200	583	0.76	712	648	0.93	865	707	1.09	1018	760	1.26	1170	809	1.42	1323
3300	597	0.83	770	661	1.00	929	718	1.17	1086	771	1.33	1244	820	1.50	1401
3400	611	0.89	832	674	1.07	996	730	1.24	1158	782	1.42	1320	831	1.59	1483
3500	625	0.96	898	687	1.14	1066	742	1.32	1233	794	1.50	1400	841	1.68	1567
3600	639	1.04	967	700	1.22	1140	754	1.41	1312	805	1.59	1484	852	1.78	1656
3700	654	1.11	1040	713	1.31	1218	767	1.50	1395	817	1.69	1571	863	1.87	1748
3800	668	1.20	1116	726	1.39	1299	779	1.59	1481	828	1.78	1662	874	1.98	1844
3900	683	1.28	1197	739	1.48	1385	792	1.69	1572	840	1.88	1758	886	2.08	1943
4000	697	1.37	1281	753	1.58	1474	804	1.79	1666	852	1.99	1857	897	2.20	2048
4100	712	1.47	1370	766	1.68	1567	817	1.89	1764	864	2.10	1960	909	2.31	2155
4200	726	1.57	1462	780	1.79	1665	830	2.00	1866	876	2.22	2067	920	2.43	2268
4300	741	1.67	1559	794	1.89	1767	843	2.12	1973	889	2.34	2179	932	2.56	2384
4400	755	1.78	1660	807	2.01	1873	856	2.23	2084	901	2.46	2295	944	2.69	2505
4500	770	1.89	1766	821	2.13	1984	869	2.36	2200	914	2.59	2415	956	2.82	2630
4600	785	2.01	1876	835	2.25	2099	882	2.49	2320	926	2.72	2541	968	2.96	2760
4700	800	2.14	1991	849	2.38	2219	895	2.62	2445	939	2.86	2670	980	3.10	2895
4800	815	2.26	2111	863	2.51	2344	909	2.76	2575	952	3.01	2805	993	3.25	3034
4900	829	2.40	2235	877	2.65	2473	922	2.91	2709	965	3.16	2944	1005	3.41	3178
5000	844	2.54	2365	891	2.80	2608	936	3.06	2849	978	3.31	3089	1018	3.57	3328

PHH120 (10 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	836	1.42	1322	881	1.57	1467	923	1.73	1613	963	1.89	1761	1001	2.05	1909
3100	846	1.50	1398	890	1.66	1547	932	1.82	1698	972	1.98	1849	1010	2.15	2002
3200	856	1.58	1477	899	1.75	1631	941	1.92	1786	980	2.08	1942	1018	2.25	2099
3300	866	1.67	1559	909	1.84	1718	950	2.01	1878	989	2.19	2038	1027	2.36	2199
3400	876	1.76	1645	919	1.94	1808	960	2.12	1972	998	2.29	2137	1036	2.47	2303
3500	886	1.86	1734	929	2.04	1902	969	2.22	2071	1008	2.40	2240	1045	2.58	2410
3600	897	1.96	1827	939	2.14	2000	979	2.33	2173	1017	2.52	2347	1054	2.70	2521
3700	907	2.06	1924	949	2.25	2101	989	2.44	2279	1027	2.63	2457	1063	2.83	2636
3800	918	2.17	2025	959	2.37	2207	999	2.56	2389	1036	2.76	2571	1073	2.95	2755
3900	929	2.28	2130	970	2.48	2316	1009	2.68	2502	1046	2.88	2690	<b>1082</b>	<b>3.09</b>	<b>2877</b>
4000	940	2.40	2238	980	2.61	2429	1019	2.81	2620	1056	3.02	2812	<b>1092</b>	<b>3.22</b>	<b>3004</b>
4100	951	2.52	2351	991	2.73	2547	1029	2.94	2743	1066	3.15	2939	<b>1102</b>	<b>3.36</b>	<b>3136</b>
4200	962	2.65	2468	1002	2.86	2668	1040	3.08	2869	1076	3.29	3070	<b>1112</b>	<b>3.51</b>	<b>3271</b>
4300	973	2.78	2589	1013	3.00	2794	1050	3.22	2999	<b>1087</b>	<b>3.44</b>	<b>3205</b>	<b>1122</b>	<b>3.66</b>	<b>3411</b>
4400	985	2.91	2715	1024	3.14	2924	1061	3.36	3134	<b>1097</b>	<b>3.59</b>	<b>3345</b>	—	—	—
4500	996	3.05	2845	1035	3.28	3059	1072	3.51	3274	—	—	—	—	—	—
4600	1008	3.20	2979	1046	3.43	3199	<b>1083</b>	<b>3.67</b>	<b>3418</b>	—	—	—	—	—	—
4700	1020	3.34	3119	1058	3.58	3343	—	—	—	—	—	—	—	—	—
4800	1032	3.50	3263	—	—	—	—	—	—	—	—	—	—	—	—
4900	1044	3.66	3413	—	—	—	—	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor  
 \*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

**NOTES**

- 1. Boldface** indicates field-supplied drive required
- Maximum continuous Bhp is 3.70
- See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE VERTICAL DISCHARGE UNITS**

PHH120 (10 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	556	0.65	604	623	0.80	748	684	0.95	891	738	1.11	1034	789	1.26	1177
3100	569	0.70	656	636	0.86	805	695	1.02	953	749	1.18	1100	799	1.34	1249
3200	583	0.76	712	648	0.93	865	707	1.09	1018	760	1.26	1170	809	1.42	1323
3300	597	0.83	770	661	1.00	929	718	1.17	1086	771	1.33	1244	820	1.50	1401
3400	611	0.89	832	674	1.07	996	730	1.24	1158	782	1.42	1320	831	1.59	1483
3500	625	0.96	898	687	1.14	1066	742	1.32	1233	794	1.50	1400	841	1.68	1567
3600	639	1.04	967	700	1.22	1140	754	1.41	1312	805	1.59	1484	852	1.78	1656
3700	654	1.11	1040	713	1.31	1218	767	1.50	1395	817	1.69	1571	863	1.87	1748
3800	668	1.20	1116	726	1.39	1299	779	1.59	1481	828	1.78	1662	874	1.98	1844
3900	683	1.28	1197	739	1.48	1385	792	1.69	1572	840	1.88	1758	886	2.08	1943
4000	697	1.37	1281	753	1.58	1474	804	1.79	1666	852	1.99	1857	897	2.20	2048
4100	712	1.47	1370	766	1.68	1567	817	1.89	1764	864	2.10	1960	909	2.31	2155
4200	726	1.57	1462	780	1.79	1665	830	2.00	1866	876	2.22	2067	920	2.43	2268
4300	741	1.67	1559	794	1.89	1767	843	2.12	1973	889	2.34	2179	932	2.56	2384
4400	755	1.78	1660	807	2.01	1873	856	2.23	2084	901	2.46	2295	944	2.69	2505
4500	770	1.89	1766	821	2.13	1984	869	2.36	2200	914	2.59	2415	956	2.82	2630
4600	785	2.01	1876	835	2.25	2099	882	2.49	2320	926	2.72	2541	968	2.96	2760
4700	800	2.14	1991	849	2.38	2219	895	2.62	2445	939	2.86	2670	980	3.10	2895
4800	815	2.26	2111	863	2.51	2344	909	2.76	2575	952	3.01	2805	993	3.25	3034
4900	829	2.40	2235	877	2.65	2473	922	2.91	2709	965	3.16	2944	1005	3.41	3178
5000	844	2.54	2365	891	2.80	2608	936	3.06	2849	978	3.31	3089	1018	3.57	3328

PHH120 (10 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	836	1.42	1322	881	1.57	1467	923	1.73	1613	963	1.89	1761	1001	2.05	1909
3100	846	1.50	1398	890	1.66	1547	932	1.82	1698	972	1.98	1849	1010	2.15	2002
3200	856	1.58	1477	899	1.75	1631	941	1.92	1786	980	2.08	1942	1018	2.25	2099
3300	866	1.67	1559	909	1.84	1718	950	2.01	1878	989	2.19	2038	1027	2.36	2199
3400	876	1.76	1645	919	1.94	1808	960	2.12	1972	998	2.29	2137	1036	2.47	2303
3500	886	1.86	1734	929	2.04	1902	969	2.22	2071	1008	2.40	2240	1045	2.58	2410
3600	897	1.96	1827	939	2.14	2000	979	2.33	2173	1017	2.52	2347	1054	2.70	2521
3700	907	2.06	1924	949	2.25	2101	989	2.44	2279	1027	2.63	2457	1063	2.83	2636
3800	918	2.17	2025	959	2.37	2207	999	2.56	2389	1036	2.76	2571	1073	2.95	2755
3900	929	2.28	2130	970	2.48	2316	1009	2.68	2502	1046	2.88	2690	1082	3.09	2877
4000	940	2.40	2238	980	2.61	2429	1019	2.81	2620	1056	3.02	2812	1092	3.22	3004
4100	951	2.52	2351	991	2.73	2547	1029	2.94	2743	1066	3.15	2939	1102	3.36	3136
4200	962	2.65	2468	1002	2.86	2668	1040	3.08	2869	1076	3.29	3070	1112	3.51	3271
4300	973	2.78	2589	1013	3.00	2794	1050	3.22	2999	1087	3.44	3205	1122	3.66	3411
4400	985	2.91	2715	1024	3.14	2924	1061	3.36	3134	1097	3.59	3345	1132	3.81	3555
4500	996	3.05	2845	1035	3.28	3059	1072	3.51	3274	1108	3.74	3489	1142	3.97	3704
4600	1008	3.20	2979	1046	3.43	3199	1083	3.67	3418	1118	3.90	3638	1152	4.14	3857
4700	1020	3.34	3119	1058	3.58	3343	1094	3.83	3567	1129	4.07	3792	1163	4.31	4016
4800	1032	3.50	3263	1069	3.74	3492	1105	3.99	3721	1140	4.24	3950	1174	4.48	4179
4900	1044	3.66	3413	1081	3.91	3646	1117	4.16	3880	1151	4.41	4113	1184	4.66	4347
5000	1056	3.82	3566	1093	4.08	3805	1128	4.34	4044	1162	4.59	4282	1195	4.85	4520

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 922 to 1219 rpm. All other rpms require field–supplied drive.

**NOTES**

- 1. Boldface** indicates field–supplied drive required
- Maximum continuous Bhp is 5.25
- See General Notes for Fan Performance following this section

**GENERAL NOTES FOR FAN PERFORMANCE TABLES:**

- Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Indoor Fan Motor Performance table.
- Values include losses for filters, unit casing, and wet coils. Refer to Accessory/FIOP Static Pressure tables for accessory static pressure information.
- Use of a field–supplied motor may affect wire sizing.
- Interpolation is permissible. Do not extrapolate.

**PERFORMANCE DATA - PHH036-120  
FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH036 (3 TONS) STANDARD MOTOR (BELT DRIVE)* – SINGLE AND THREE-PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	554	0.14	134	681	0.22	222	783	0.32	316	870	0.42	416	947	0.53	523
1000	583	0.16	163	707	0.26	257	808	0.36	358	894	0.47	465	971	0.58	578
1100	612	0.20	195	735	0.30	298	834	0.41	406	919	0.52	519	995	0.64	638
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	<b>1045</b>	<b>0.78</b>	<b>777</b>
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	<b>1071</b>	<b>0.86</b>	<b>857</b>
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	<b>1097</b>	<b>0.95</b>	<b>942</b>

PHH036 (3 TONS) STANDARD MOTOR (BELT DRIVE)* (cont) – SINGLE AND THREE-PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1017	0.64	635	1082	0.76	753	<b>1143</b>	<b>0.88</b>	<b>876</b>	1200	1.01	<b>1004</b>	1254	1.14	1136
1000	1041	0.70	696	<b>1105</b>	<b>0.82</b>	<b>820</b>	<b>1166</b>	<b>0.95</b>	<b>948</b>	1223	1.09	<b>1081</b>	—	—	—
1100	1065	0.77	<b>763</b>	<b>1129</b>	<b>0.90</b>	<b>892</b>	<b>1189</b>	<b>1.03</b>	<b>1026</b>	1245	1.17	<b>1165</b>	—	—	—
1200	1089	0.84	<b>835</b>	<b>1153</b>	<b>0.98</b>	<b>971</b>	<b>1212</b>	<b>1.12</b>	<b>1111</b>	—	—	—	—	—	—
1300	1114	0.92	<b>915</b>	<b>1177</b>	<b>1.06</b>	<b>1056</b>	—	—	—	—	—	—	—	—	—
1400	1139	1.01	<b>1000</b>	<b>1202</b>	<b>1.15</b>	<b>1149</b>	—	—	—	—	—	—	—	—	—
1500	1164	1.10	<b>1093</b>	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 680 to 1044 rpm. All other rpms require field-supplied drive.

**NOTES**

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 1.20
3. See General Notes for Fan Performance following this section

PHH036 (3 TONS) HIGH-STATIC MOTOR (BELT DRIVE)* – THREE-PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	554	0.14	134	681	0.22	222	783	0.32	316	870	0.42	416	947	0.53	523
1000	583	0.16	163	707	0.26	257	808	0.36	358	894	0.47	465	971	0.58	578
1100	612	0.20	195	735	0.30	298	834	0.41	406	919	0.52	519	995	0.64	638
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	1045	0.78	777
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	1071	0.86	857
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	1097	0.95	942

PHH036 (3 TONS) HIGH-STATIC MOTOR (BELT DRIVE)* (cont) – THREE-PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1017	0.64	<b>635</b>	1082	0.76	753	1143	0.88	876	1200	1.01	1004	1254	1.14	1136
1000	1041	0.70	<b>696</b>	1105	0.82	820	1166	0.95	948	1223	1.09	1081	1276	1.23	1219
1100	1065	0.77	<b>763</b>	1129	0.90	892	1189	1.03	1026	1245	1.17	1165	1299	1.32	1308
1200	1089	0.84	835	1153	0.98	971	1212	1.12	1111	1269	1.26	1256	1322	1.41	1404
1300	1114	0.92	915	1177	1.06	1056	1236	1.21	1202	1292	1.36	1353	1346	1.52	1508
1400	1139	1.01	1000	1202	1.15	1149	1261	1.31	1301	1316	1.47	1457	1369	1.63	1618
1500	1164	1.10	1093	1227	1.25	1248	1285	1.41	1407	1341	1.58	1570	1394	1.75	1736

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

**NOTES**

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 2.40
3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH048 (4 TONS) STANDARD MOTOR (BELT DRIVE)* – SINGLE AND THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	1045	0.78	777
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	1071	0.86	857
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	1097	0.95	942
1600	771	0.44	440	879	0.59	584	971	0.74	731	1051	0.89	881	1124	1.04	1035
1700	804	0.51	507	910	0.66	661	1000	0.82	816	1079	0.98	974	1151	1.14	1136
1800	837	0.59	582	941	0.75	745	1029	0.91	909	1107	1.08	1075	—	—	—
1900	871	0.67	665	972	0.84	837	1059	1.02	1010	1136	1.19	1184	—	—	—
2000	906	0.76	756	1004	0.94	938	1089	1.12	1119	—	—	—	—	—	—

PHH048 (4 TONS) STANDARD MOTOR (BELT DRIVE)* (cont) – SINGLE AND THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	835	1153	0.98	971	1212	1.12	1111	—	—	—	—	—	—
1300	1114	0.92	915	1177	1.06	1056	—	—	—	—	—	—	—	—	—
1400	1139	1.01	1000	1202	1.15	1149	—	—	—	—	—	—	—	—	—
1500	1164	1.10	1093	—	—	—	—	—	—	—	—	—	—	—	—
1600	1190	1.20	1193	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 770 to 1185 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required
2. Maximum continuous Bhp is 1.20
3. See General Notes for Fan Performance following this section

PHH048 (4 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	1045	0.78	777
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	1071	0.86	857
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	1097	0.95	942
1600	771	0.44	440	879	0.59	584	971	0.74	731	1051	0.89	881	1124	1.04	1035
1700	804	0.51	507	910	0.66	661	1000	0.82	816	1079	0.98	974	1151	1.14	1136
1800	837	0.59	582	941	0.75	745	1029	0.91	909	1107	1.08	1075	1178	1.25	1244
1900	871	0.67	665	972	0.84	837	1059	1.02	1010	1136	1.19	1184	1206	1.37	1361
2000	906	0.76	756	1004	0.94	938	1089	1.12	1119	1165	1.31	1301	1234	1.49	1486

**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH048 (4 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont) – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	835	1153	0.98	971	1212	1.12	1111	1269	1.26	1256	1322	1.41	1404
1300	1114	0.92	915	1177	1.06	1056	1236	1.21	1202	1292	1.36	1353	1346	1.52	1508
1400	1139	1.01	1000	1202	1.15	1149	1261	1.31	1301	1316	1.47	1457	1369	1.63	1618
1500	1164	1.10	1093	1227	1.25	1248	1285	1.41	1407	1341	1.58	1570	1394	1.75	1736
1600	1190	1.20	1193	1252	1.36	1355	1311	1.53	1520	1366	1.70	1690	1418	1.87	1863
1700	1217	1.31	1301	1278	1.48	1470	1336	1.65	1642	1391	1.83	1818	1443	2.01	1998
1800	1244	1.42	1417	1305	1.60	1593	1362	1.78	1772	1416	1.97	1955	<b>1468</b>	<b>2.15</b>	<b>2141</b>
1900	1271	1.55	1541	1331	1.73	1724	1388	1.92	1911	1442	2.11	2101	<b>1494</b>	<b>2.31</b>	<b>2294</b>
2000	1298	1.68	1674	1358	1.87	1865	1415	2.07	2059	<b>1468</b>	<b>2.27</b>	<b>2256</b>	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1075 to 1455 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.40

3. See General Notes for Fan Performance following this section

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* – SINGLE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	724	0.33	295	837	0.45	402	937	0.59	524	1028	0.74	660	1111	0.91	808
1600	757	0.39	343	866	0.51	455	962	0.65	580	1050	0.81	719	1132	0.98	870
1700	790	0.45	398	894	0.58	514	988	0.72	643	1074	0.88	784	1154	1.06	938
1800	823	0.52	458	924	0.65	579	1015	0.80	712	1099	0.96	857	1177	1.14	1013
1900	857	0.59	525	955	0.73	650	1043	0.89	787	1125	1.05	936	1201	1.23	1096
2000	892	0.67	599	986	0.82	729	1072	0.98	870	1151	1.15	1022	—	—	—
2100	927	0.77	680	1017	0.92	815	1101	1.08	960	1178	1.26	1116	—	—	—
2200	962	0.87	769	1050	1.02	909	1131	1.19	1059	—	—	—	—	—	—
2300	997	0.97	865	1082	1.14	1010	—	—	—	—	—	—	—	—	—
2400	1033	1.09	970	1115	1.26	1120	—	—	—	—	—	—	—	—	—
2500	1069	1.22	1084	—	—	—	—	—	—	—	—	—	—	—	—

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* – SINGLE–PHASE UNITS (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1188	1.09	970	1261	1.29	1143	—	—	—	—	—	—	—	—	—
1600	1208	1.16	1033	—	—	—	—	—	—	—	—	—	—	—	—
1700	1229	1.24	1103	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1035 to 1460 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 1.30

3. See General Notes for Fan Performance following this section



**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	724	0.33	295	837	0.45	402	937	0.59	524	1028	0.74	660	1111	0.91	808
1600	757	0.39	343	866	0.51	455	962	0.65	580	1050	0.81	719	1132	0.98	870
1700	790	0.45	398	894	0.58	514	988	0.72	643	1074	0.88	784	1154	1.06	938
1800	823	0.52	458	924	0.65	579	1015	0.80	712	1099	0.96	857	1177	1.14	1013
1900	857	0.59	525	955	0.73	650	1043	0.89	787	1125	1.05	936	1201	1.23	1096
2000	892	0.67	599	986	0.82	729	1072	0.98	870	1151	1.15	1022	1226	1.33	1185
2100	927	0.77	680	1017	0.92	815	1101	1.08	960	1178	1.26	1116	1251	1.44	1283
2200	962	0.87	769	1050	1.02	909	1131	1.19	1059	1206	1.37	1218	1277	1.56	1389
2300	997	0.97	865	1082	1.14	1010	1161	1.31	1165	1235	1.50	1329	1304	1.69	1503
2400	1033	1.09	970	1115	1.26	1120	1192	1.44	1279	1264	1.63	1448	1332	1.83	1625
2500	1069	1.22	1084	1149	1.39	1239	1223	1.58	1403	1293	1.77	1576	1360	1.98	1757

PHH060 (5 TONS) STANDARD MOTOR (BELT DRIVE)* – THREE–PHASE UNITS (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1188	1.09	970	1261	1.29	1143	1330	1.49	1327	1395	1.71	1523	1457	1.95	1729
1600	1208	1.16	1033	1279	1.36	1208	1347	1.57	1394	1412	1.79	1590	1474	2.02	1797
1700	1229	1.24	1103	1299	1.44	1280	1366	1.65	1468	1429	1.88	1665	1490	2.11	1873
1800	1250	1.33	1181	1319	1.53	1360	1385	1.74	1549	1448	1.97	1748	1508	2.20	1957
1900	1273	1.43	1266	1341	1.63	1447	1405	1.84	1638	<b>1467</b>	<b>2.07</b>	<b>1839</b>	<b>1527</b>	<b>2.31</b>	<b>2050</b>
2000	1296	1.53	1359	1363	1.74	1542	1427	1.95	1736	<b>1488</b>	<b>2.18</b>	<b>1939</b>	—	—	—
2100	1320	1.64	1459	1386	1.85	1646	1448	2.07	1842	<b>1508</b>	<b>2.30</b>	<b>2047</b>	—	—	—
2200	1345	1.77	1568	1409	1.98	1758	<b>1471</b>	<b>2.20</b>	<b>1956</b>	—	—	—	—	—	—
2300	1371	1.90	1686	1434	2.11	1878	<b>1494</b>	<b>2.34</b>	<b>2080</b>	—	—	—	—	—	—
2400	1397	2.04	1812	1459	2.26	2008	—	—	—	—	—	—	—	—	—
2500	1424	2.19	1948	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.

**NOTES**

1. **Boldface** indicates field-supplied drive required

2. Maximum continuous Bhp is 2.40

3. See General Notes for Fan Performance following this section

PHH060 (5 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* – THREE–PHASE UNITS															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	724	0.33	295	837	0.45	402	937	0.59	524	1028	0.74	660	1111	0.91	808
1600	757	0.39	343	866	0.51	455	962	0.65	580	1050	0.81	719	1132	0.98	870
1700	790	0.45	398	894	0.58	514	988	0.72	643	1074	0.88	784	1154	1.06	938
1800	823	0.52	458	924	0.65	579	1015	0.80	712	1099	0.96	857	1177	1.14	1013
1900	857	0.59	525	955	0.73	650	1043	0.89	787	1125	1.05	936	1201	1.23	1096
2000	892	0.67	599	986	0.82	729	1072	0.98	870	1151	1.15	1022	1226	1.33	1185
2100	927	0.77	680	1017	0.92	815	1101	1.08	960	1178	1.26	1116	1251	1.44	1283
2200	962	0.87	769	1050	1.02	909	1131	1.19	1059	1206	1.37	1218	1277	1.56	1389
2300	997	0.97	865	1082	1.14	1010	1161	1.31	1165	1235	1.50	1329	1304	1.69	1503
2400	1033	1.09	970	1115	1.26	1120	1192	1.44	1279	1264	1.63	1448	1332	1.83	1625
2500	1069	1.22	1084	1149	1.39	1239	1223	1.58	1403	1293	1.77	1576	1360	1.98	1757

**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

<b>PHH060 (5 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont) – THREE–PHASE UNITS</b>															
<b>Airflow (Cfm)</b>	<b>External Static Pressure (in. wg)</b>														
	<b>1.2</b>			<b>1.4</b>			<b>1.6</b>			<b>1.8</b>			<b>2.0</b>		
	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>
1500	1188	1.09	970	1261	1.29	1143	1330	1.49	1327	1395	1.71	1523	1457	1.95	1729
1600	1208	1.16	1033	1279	1.36	1208	1347	1.57	1394	1412	1.79	1590	1474	2.02	1797
1700	1229	1.24	1103	1299	1.44	1280	1366	1.65	1468	1429	1.88	1665	1490	2.11	1873
1800	1250	1.33	1181	1319	1.53	1360	1385	1.74	1549	1448	1.97	1748	1508	2.20	1957
1900	1273	1.43	1266	1341	1.63	1447	1405	1.84	1638	1467	2.07	1839	1527	2.31	2050
2000	1296	1.53	1359	1363	1.74	1542	1427	1.95	1736	1488	2.18	1939	1546	2.42	2151
2100	1320	1.64	1459	1386	1.85	1646	1448	2.07	1842	1508	2.30	2047	1566	2.55	2262
2200	1345	1.77	1568	1409	1.98	1758	1471	2.20	1956	1530	2.44	2164	1587	2.68	2380
2300	1371	1.90	1686	1434	2.11	1878	1494	2.34	2080	1553	2.58	2290	1609	2.83	2509
2400	1397	2.04	1812	1459	2.26	2008	1518	2.49	2213	1576	2.73	2425	—	—	—
2500	1424	2.19	1948	1484	2.42	2147	1543	2.65	2355	1599	2.89	2571	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1300 to 1685 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.90

3. See General Notes for Fan Performance following this section

<b>PHH072 (6 TONS) STANDARD MOTOR (BELT DRIVE)*</b>															
<b>Airflow (Cfm)</b>	<b>External Static Pressure (in. wg)</b>														
	<b>0.2</b>			<b>0.4</b>			<b>0.6</b>			<b>0.8</b>			<b>1.0</b>		
	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>
1800	822	0.51	455	927	0.66	589	1018	0.82	728	1100	0.98	873	1174	1.15	1024
1900	855	0.59	520	957	0.74	659	1046	0.91	805	1127	1.08	956	1200	1.25	1113
2000	889	0.66	591	988	0.83	737	1075	1.00	888	1154	1.18	1045	1226	1.36	1208
2100	923	0.75	668	1019	0.92	821	1104	1.10	979	1182	1.29	1142	1253	1.48	1310
2200	957	0.85	753	1051	1.03	912	1134	1.21	1077	1210	1.40	1245	1280	1.60	1419
2300	992	0.95	845	1083	1.14	1011	1164	1.33	1182	1239	1.53	1357	1308	1.73	1537
2400	1026	1.06	945	1115	1.26	1118	1195	1.46	1295	1268	1.66	1476	1336	1.87	1662
2500	1061	1.19	1053	1148	1.39	1233	1226	1.59	1416	1297	1.81	1604	1364	2.02	1796
2600	1097	1.32	1169	1181	1.53	1356	1257	1.74	1546	1327	1.96	1740	1393	2.18	1938
2700	1132	1.46	1294	1214	1.67	1487	1289	1.90	1684	1358	2.12	1885	1422	2.35	2089
2800	1168	1.61	1428	1247	1.83	1629	1320	2.06	1832	1388	2.30	2039	—	—	—
2900	1204	1.77	1572	1281	2.00	1779	1353	2.24	1989	—	—	—	—	—	—
3000	1240	1.94	1725	1315	2.18	1939	—	—	—	—	—	—	—	—	—

<b>PHH072 (6 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)</b>															
<b>Airflow (Cfm)</b>	<b>External Static Pressure (in. wg)</b>														
	<b>1.2</b>			<b>1.4</b>			<b>1.6</b>			<b>1.8</b>			<b>2.0</b>		
	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>	<b>Rpm</b>	<b>Bhp</b>	<b>Watts</b>
1800	1244	1.33	1182	1308	1.51	1345	1369	1.70	1513	1427	1.90	1687	1483	2.10	1867
1900	1268	1.44	1275	1332	1.63	1443	1393	1.82	1617	1450	2.02	1796	1505	2.23	1979
2000	1294	1.55	1376	1357	1.74	1549	1417	1.95	1727	1474	2.15	1911	1528	2.36	2100
2100	1320	1.67	1483	1382	1.87	1662	1441	2.08	1845	1498	2.29	2034	—	—	—
2200	1346	1.80	1598	1408	2.01	1782	1466	2.22	1971	—	—	—	—	—	—
2300	1372	1.94	1721	1434	2.15	1911	1491	2.37	2105	—	—	—	—	—	—
2400	1400	2.09	1852	1460	2.31	2047	—	—	—	—	—	—	—	—	—
2500	1427	2.24	1992	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Motor drive range: 1119 to 1585 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required

2. Maximum continuous Bhp is 2.40

3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH072 (6 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	822	0.51	455	927	0.66	589	1018	0.82	728	1100	0.98	873	1174	1.15	1024
1900	855	0.59	520	957	0.74	659	1046	0.91	805	1127	1.08	956	1200	1.25	1113
2000	889	0.66	591	988	0.83	737	1075	1.00	888	1154	1.18	1045	1226	1.36	1208
2100	923	0.75	668	1019	0.92	821	1104	1.10	979	1182	1.29	1142	1253	1.48	1310
2200	957	0.85	753	1051	1.03	912	1134	1.21	1077	1210	1.40	1245	1280	1.60	1419
2300	992	0.95	845	1083	1.14	1011	1164	1.33	1182	1239	1.53	1357	1308	1.73	1537
2400	1026	1.06	945	1115	1.26	1118	1195	1.46	1295	1268	1.66	1476	1336	1.87	1662
2500	1061	1.19	1053	1148	1.39	1233	1226	1.59	1416	1297	1.81	1604	1364	2.02	1796
2600	1097	1.32	1169	1181	1.53	1356	1257	1.74	1546	1327	1.96	1740	1393	2.18	1938
2700	1132	1.46	1294	1214	1.67	1487	1289	1.90	1684	1358	2.12	1885	1422	2.35	2089
2800	1168	1.61	1428	1247	1.83	1629	1320	2.06	1832	1388	2.30	2039	1452	2.53	2249
2900	1204	1.77	1572	1281	2.00	1779	1353	2.24	1989	1419	2.48	2202	1482	2.72	2419
3000	1240	1.94	1725	1315	2.18	1939	1385	2.43	2156	1451	2.68	2376	—	—	—

PHH072 (6 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1244	1.33	1182	1308	1.51	1345	1369	1.70	1513	1427	1.90	1687	1483	2.10	1867
1900	1268	1.44	1275	1332	1.63	1443	1393	1.82	1617	1450	2.02	1796	1505	2.23	1979
2000	1294	1.55	1376	1357	1.74	1549	1417	1.95	1727	1474	2.15	1911	1528	2.36	2100
2100	1320	1.67	1483	1382	1.87	1662	1441	2.08	1845	1498	2.29	2034	1552	2.51	2227
2200	1346	1.80	1598	1408	2.01	1782	1466	2.22	1971	1522	2.44	2165	1575	2.66	2363
2300	1372	1.94	1721	1434	2.15	1911	1491	2.37	2105	1547	2.59	2304	1600	2.82	2507
2400	1400	2.09	1852	1460	2.31	2047	1517	2.53	2247	1572	2.76	2451	—	—	—
2500	1427	2.24	1992	1487	2.47	2192	1543	2.70	2398	—	—	—	—	—	—
2600	1455	2.41	2140	1514	2.64	2346	1570	2.88	2557	—	—	—	—	—	—
2700	1483	2.59	2297	1541	2.83	2509	—	—	—	—	—	—	—	—	—
2800	1512	2.77	2463	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor  
 \*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

**NOTES**

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 2.90
3. See General Notes for Fan Performance following this section

PERFORMANCE DATA – PHH036–120(cont.)

FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS

PHH090 (7 1/2 TONS) STANDARD MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	465	0.43	402	555	0.64	596	629	0.86	802	694	1.10	1021	753	1.34	1252
2300	471	0.45	421	560	0.66	618	634	0.89	828	699	1.13	1050	757	1.38	1283
2400	483	0.49	461	571	0.71	665	644	0.94	881	708	1.19	1109	766	1.45	1348
2500	495	0.54	503	581	0.77	715	654	1.01	937	717	1.26	1171	775	1.52	1416
2550	501	0.56	526	587	0.79	740	659	1.04	967	722	1.29	1204	779	1.56	1452
2600	507	0.59	549	592	0.82	767	664	1.07	996	727	1.33	1237	784	1.60	1488
2700	519	0.64	597	603	0.88	823	674	1.14	1059	737	1.40	1306	793	1.68	1563
2800	532	0.70	649	614	0.95	882	684	1.21	1125	746	1.48	1378	803	1.76	1641
2900	544	0.75	703	625	1.01	944	695	1.28	1194	756	1.56	1453	812	1.85	1723
3000	557	0.82	761	637	1.08	1009	705	1.36	1266	766	1.64	1533	822	1.94	1808
3100	570	0.88	823	648	1.16	1079	716	1.44	1342	776	1.73	1615	831	2.03	1897
3200	583	0.95	888	660	1.23	1151	727	1.53	1422	787	1.82	1702	841	2.13	1991
3300	596	1.03	957	672	1.32	1228	738	1.61	1506	797	1.92	1792	851	2.24	2088
3400	609	1.10	1030	684	1.40	1308	749	1.71	1593	808	2.02	1887	861	2.35	2188
3500	622	1.19	1106	696	1.49	1392	760	1.81	1685	818	2.13	1985	872	2.46	2294
3600	635	1.27	1187	708	1.59	1481	771	1.91	1781	829	2.24	2088	882	2.58	2403
3700	649	1.36	1272	720	1.69	1573	783	2.02	1881	840	2.35	2195	892	2.70	2517
3750	655	1.41	1316	726	1.74	1621	789	2.07	1932	845	2.41	2250	897	2.76	2575

PHH090 (7 1/2 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	806	1.60	1494	856	1.87	1747	903	2.15	2009	947	2.45	2282	<b>988</b>	<b>2.75</b>	<b>2564</b>
2300	811	1.64	1528	860	1.91	1784	907	2.20	2048	950	2.49	2323	<b>992</b>	<b>2.80</b>	<b>2607</b>
2400	819	1.71	1599	868	1.99	1859	915	2.28	2129	<b>958</b>	<b>2.58</b>	<b>2410</b>	<b>1000</b>	<b>2.89</b>	<b>2698</b>
2500	828	1.79	1672	877	2.08	1938	923	2.37	2214	<b>966</b>	<b>2.68</b>	<b>2499</b>	—	—	—
2550	832	1.83	1710	881	2.12	1979	927	2.42	2258	<b>971</b>	<b>2.73</b>	<b>2545</b>	—	—	—
2600	836	1.88	1749	885	2.17	2021	931	2.47	2302	<b>975</b>	<b>2.78</b>	<b>2592</b>	—	—	—
2700	845	1.96	1830	894	2.26	2107	940	2.57	2394	<b>983</b>	<b>2.88</b>	<b>2689</b>	—	—	—
2800	854	2.05	1914	903	2.36	2197	948	2.67	2488	—	—	—	—	—	—
2900	864	2.15	2002	912	2.46	2290	<b>957</b>	<b>2.77</b>	<b>2587</b>	—	—	—	—	—	—
3000	873	2.24	2093	921	2.56	2388	<b>966</b>	<b>2.89</b>	<b>2691</b>	—	—	—	—	—	—
3100	882	2.35	2189	930	2.67	2489	—	—	—	—	—	—	—	—	—
3200	892	2.45	2288	939	2.78	2595	—	—	—	—	—	—	—	—	—
3300	901	2.56	2391	948	2.90	2704	—	—	—	—	—	—	—	—	—
3400	911	2.68	2499	—	—	—	—	—	—	—	—	—	—	—	—
3500	921	2.80	2610	—	—	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 730 to 950 rpm. All other rpms require drive.

NOTES

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 2.90
3. See General Notes for Fan Performance following this section

field-supplied

**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH090 (7 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	465	0.43	402	555	0.64	596	629	0.86	802	694	1.10	1021	753	1.34	1252
2300	471	0.45	421	560	0.66	618	634	0.89	828	699	1.13	1050	757	1.38	1283
2400	483	0.49	461	571	0.71	665	644	0.94	881	708	1.19	1109	766	1.45	1348
2500	495	0.54	503	581	0.77	715	654	1.01	937	717	1.26	1171	775	1.52	1416
2550	501	0.56	526	587	0.79	740	659	1.04	967	722	1.29	1204	779	1.56	1452
2600	507	0.59	549	592	0.82	767	664	1.07	996	727	1.33	1237	784	1.60	1488
2700	519	0.64	597	603	0.88	823	674	1.14	1059	737	1.40	1306	793	1.68	1563
2800	532	0.70	649	614	0.95	882	684	1.21	1125	746	1.48	1378	803	1.76	1641
2900	544	0.75	703	625	1.01	944	695	1.28	1194	756	1.56	1453	812	1.85	1723
3000	557	0.82	761	637	1.08	1009	705	1.36	1266	766	1.64	1533	822	1.94	1808
3100	570	0.88	823	648	1.16	1079	716	1.44	1342	776	1.73	1615	831	2.03	1897
3200	583	0.95	888	660	1.23	1151	727	1.53	1422	787	1.82	1702	841	2.13	1991
3300	596	1.03	957	672	1.32	1228	738	1.61	1506	797	1.92	1792	851	2.24	2088
3400	609	1.10	1030	684	1.40	1308	749	1.71	1593	808	2.02	1887	861	2.35	2188
3500	622	1.19	1106	696	1.49	1392	760	1.81	1685	818	2.13	1985	872	2.46	2294
3600	635	1.27	1187	708	1.59	1481	771	1.91	1781	829	2.24	2088	882	2.58	2403
3700	649	1.36	1272	720	1.69	1573	783	2.02	1881	840	2.35	2195	892	2.70	2517
3750	655	1.41	1316	726	1.74	1621	789	2.07	1932	845	2.41	2250	897	2.76	2575

PHH090 (7 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	806	1.60	1494	856	1.87	1747	903	2.15	2009	947	2.45	2282	988	2.75	2564
2300	811	1.64	1528	860	1.91	1784	907	2.20	2048	950	2.49	2323	992	2.80	2607
2400	819	1.71	1599	868	1.99	1859	915	2.28	2129	958	2.58	2410	1000	2.89	2698
2500	828	1.79	1672	877	2.08	1938	923	2.37	2214	966	2.68	2499	1008	3.00	2793
2550	832	1.83	1710	881	2.12	1979	927	2.42	2258	971	2.73	2545	1012	3.05	2842
2600	836	1.88	1749	885	2.17	2021	931	2.47	2302	975	2.78	2592	1016	3.10	2891
2700	845	1.96	1830	894	2.26	2107	940	2.57	2394	983	2.88	2689	1024	3.21	2993
2800	854	2.05	1914	903	2.36	2197	948	2.67	2488	991	2.99	2790	1032	3.32	3099
2900	864	2.15	2002	912	2.46	2290	957	2.77	2587	1000	3.10	2894	1041	3.44	3209
3000	873	2.24	2093	921	2.56	2388	966	2.89	2691	1008	3.22	3003	1049	3.56	3323
3100	882	2.35	2189	930	2.67	2489	975	3.00	2798	1017	3.34	3115	1057	3.69	3441
3200	892	2.45	2288	939	2.78	2595	984	3.12	2909	1026	3.47	3233	1066	3.82	3564
3300	901	2.56	2391	948	2.90	2704	993	3.24	3024	1035	3.60	3353	1075	3.96	3690
3400	911	2.68	2499	958	3.02	2817	1002	3.37	3144	1044	3.73	3479	<b>1084</b>	<b>4.10</b>	<b>3821</b>
3500	921	2.80	2610	967	3.15	2935	1011	3.50	3268	1053	3.87	3608	—	—	—
3600	931	2.92	2726	977	3.28	3057	1021	3.64	3396	1062	4.01	3743	—	—	—
3700	941	3.05	2847	987	3.41	3184	1030	3.78	3529	1071	4.16	3882	—	—	—
3750	946	3.12	2908	992	3.48	3249	1035	3.86	3597	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 860 to 1080 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required
2. Maximum continuous Bhp is 3.70
3. See General Notes for Fan Performance following this section

PERFORMANCE DATA – PHH036–120(cont.)

FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS

PHH102 (8 1/2 TONS) STANDARD MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	462	0.37	348	541	0.50	467	614	0.64	594	681	0.78	728	744	0.93	868
2600	474	0.41	381	551	0.54	505	622	0.68	635	688	0.83	773	750	0.98	916
2700	486	0.45	417	561	0.58	545	630	0.73	679	695	0.88	820	756	1.04	967
2800	498	0.49	456	571	0.63	587	639	0.78	725	702	0.93	870	762	1.09	1020
2900	510	0.53	497	581	0.68	632	648	0.83	774	710	0.99	922	768	1.15	1076
3000	523	0.58	541	592	0.73	680	657	0.88	825	718	1.05	977	775	1.22	1135
3100	536	0.63	587	603	0.78	730	666	0.94	879	726	1.11	1035	783	1.28	1196
3200	549	0.68	637	614	0.84	783	676	1.00	936	735	1.17	1096	790	1.35	1260
3300	562	0.74	689	626	0.90	839	686	1.07	996	743	1.24	1159	798	1.42	1328
3400	575	0.80	744	637	0.96	898	696	1.14	1059	752	1.31	1226	806	1.50	1398
3500	588	0.86	802	649	1.03	961	707	1.21	1125	762	1.39	1296	815	1.58	1472
3600	601	0.93	864	661	1.10	1026	717	1.28	1194	771	1.47	1369	823	1.66	1548
3700	614	1.00	929	673	1.17	1095	728	1.36	1267	781	1.55	1445	832	1.75	1629
3800	628	1.07	997	685	1.25	1167	739	1.44	1343	791	1.64	1525	841	1.84	1712
3900	641	1.15	1069	697	1.33	1243	750	1.53	1423	801	1.72	1608	850	1.93	1799
4000	655	1.23	1144	709	1.42	1322	761	1.61	1506	812	1.82	1695	860	2.03	1890
4100	668	1.31	1223	722	1.51	1405	773	1.71	1593	822	1.92	1786	870	2.13	1984
4200	682	1.40	1305	734	1.60	1492	784	1.80	1683	833	2.02	1880	880	2.23	2082
4300	696	1.49	1392	747	1.70	1582	796	1.91	1777	844	2.12	1979	890	2.34	2184

PHH102 (8 1/2 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	804	1.09	1013	861	1.25	1164	915	1.41	1319	967	1.59	1479	1017	1.76	1642
2600	809	1.14	1065	864	1.31	1219	918	1.48	1378	969	1.65	1541	1018	1.83	1708
2700	813	1.20	1119	869	1.37	1277	921	1.54	1439	972	1.72	1606	1021	1.90	1776
2800	819	1.26	1176	873	1.43	1337	925	1.61	1503	975	1.79	1673	1023	1.98	1847
2900	824	1.32	1235	878	1.50	1400	929	1.68	1569	978	1.87	1742	1026	2.06	1920
3000	830	1.39	1298	883	1.57	1466	934	1.76	1638	982	1.95	1815	1029	2.14	1996
3100	837	1.46	1363	889	1.65	1534	938	1.83	1710	986	2.03	1891	1033	2.23	2075
3200	843	1.53	1431	894	1.72	1606	944	1.91	1785	991	2.11	1969	1037	2.31	2157
3300	850	1.61	1502	901	1.80	1680	949	2.00	1863	996	2.20	2051	1041	2.40	2242
3400	858	1.69	1576	907	1.88	1758	955	2.09	1944	1001	2.29	2135	1046	2.50	2331
3500	865	1.77	1653	914	1.97	1838	961	2.18	2029	1007	2.38	2223	1051	2.60	2422
3600	873	1.86	1733	921	2.06	1922	967	2.27	2116	1012	2.48	2314	1056	2.70	2516
3700	881	1.95	1816	928	2.16	2010	974	2.37	2207	1019	2.58	2409	1062	2.80	2615
3800	889	2.04	1904	936	2.25	2100	981	2.47	2302	1025	2.69	2507	—	—	—
3900	898	2.14	1995	944	2.35	2195	988	2.57	2399	1032	2.80	2608	—	—	—
4000	907	2.24	2089	952	2.46	2293	996	2.68	2501	—	—	—	—	—	—
4100	916	2.35	2187	960	2.57	2395	1004	2.80	2607	—	—	—	—	—	—
4200	925	2.45	2289	969	2.68	2500	—	—	—	—	—	—	—	—	—
4300	934	2.57	2395	978	2.80	2610	—	—	—	—	—	—	—	—	—

LEGEND

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 840 to 1085 rpm. All other rpms require field-supplied drive.

NOTES

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 2.90
3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)**  
**FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH102 (8 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	462	0.37	348	541	0.50	467	614	0.64	594	681	0.78	728	744	0.93	868
2600	474	0.41	381	551	0.54	505	622	0.68	635	688	0.83	773	750	0.98	916
2700	486	0.45	417	561	0.58	545	630	0.73	679	695	0.88	820	756	1.04	967
2800	498	0.49	456	571	0.63	587	639	0.78	725	702	0.93	870	762	1.09	1020
2900	510	0.53	497	581	0.68	632	648	0.83	774	710	0.99	922	768	1.15	1076
3000	523	0.58	541	592	0.73	680	657	0.88	825	718	1.05	977	775	1.22	1135
3100	536	0.63	587	603	0.78	730	666	0.94	879	726	1.11	1035	783	1.28	1196
3200	549	0.68	637	614	0.84	783	676	1.00	936	735	1.17	1096	790	1.35	1260
3300	562	0.74	689	626	0.90	839	686	1.07	996	743	1.24	1159	798	1.42	1328
3400	575	0.80	744	637	0.96	898	696	1.14	1059	752	1.31	1226	806	1.50	1398
3500	588	0.86	802	649	1.03	961	707	1.21	1125	762	1.39	1296	815	1.58	1472
3600	601	0.93	864	661	1.10	1026	717	1.28	1194	771	1.47	1369	823	1.66	1548
3700	614	1.00	929	673	1.17	1095	728	1.36	1267	781	1.55	1445	832	1.75	1629
3800	628	1.07	997	685	1.25	1167	739	1.44	1343	791	1.64	1525	841	1.84	1712
3900	641	1.15	1069	697	1.33	1243	750	1.53	1423	801	1.72	1608	850	1.93	1799
4000	655	1.23	1144	709	1.42	1322	761	1.61	1506	812	1.82	1695	860	2.03	1890
4100	668	1.31	1223	722	1.51	1405	773	1.71	1593	822	1.92	1786	870	2.13	1984
4200	682	1.40	1305	734	1.60	1492	784	1.80	1683	833	2.02	1880	880	2.23	2082
4300	696	1.49	1392	747	1.70	1582	796	1.91	1777	844	2.12	1979	890	2.34	2184

PHH102 (8 1/2 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2500	<b>804</b>	<b>1.09</b>	<b>1013</b>	861	1.25	1164	915	1.41	1319	967	1.59	1479	1017	1.76	1642
2600	<b>809</b>	<b>1.14</b>	<b>1065</b>	864	1.31	1219	918	1.48	1378	969	1.65	1541	1018	1.83	1708
2700	<b>813</b>	<b>1.20</b>	<b>1119</b>	869	1.37	1277	921	1.54	1439	972	1.72	1606	1021	1.90	1776
2800	<b>819</b>	<b>1.26</b>	<b>1176</b>	873	1.43	1337	925	1.61	1503	975	1.79	1673	1023	1.98	1847
2900	<b>824</b>	<b>1.32</b>	<b>1235</b>	878	1.50	1400	929	1.68	1569	978	1.87	1742	1026	2.06	1920
3000	<b>830</b>	<b>1.39</b>	<b>1298</b>	883	1.57	1466	934	1.76	1638	982	1.95	1815	1029	2.14	1996
3100	<b>837</b>	<b>1.46</b>	<b>1363</b>	889	1.65	1534	938	1.83	1710	986	2.03	1891	1033	2.23	2075
3200	<b>843</b>	<b>1.53</b>	<b>1431</b>	894	1.72	1606	944	1.91	1785	991	2.11	1969	1037	2.31	2157
3300	<b>850</b>	<b>1.61</b>	<b>1502</b>	901	1.80	1680	949	2.00	1863	996	2.20	2051	1041	2.40	2242
3400	<b>858</b>	<b>1.69</b>	<b>1576</b>	907	1.88	1758	955	2.09	1944	1001	2.29	2135	1046	2.50	2331
3500	865	1.77	1653	914	1.97	1838	961	2.18	2029	1007	2.38	2223	1051	2.60	2422
3600	873	1.86	1733	921	2.06	1922	967	2.27	2116	1012	2.48	2314	1056	2.70	2516
3700	881	1.95	1816	928	2.16	2010	974	2.37	2207	1019	2.58	2409	1062	2.80	2615
3800	889	2.04	1904	936	2.25	2100	981	2.47	2302	1025	2.69	2507	1068	2.91	2716
3900	898	2.14	1995	944	2.35	2195	988	2.57	2399	1032	2.80	2608	1074	3.03	2821
4000	907	2.24	2089	952	2.46	2293	996	2.68	2501	1038	2.91	2713	1080	3.14	2930
4100	916	2.35	2187	960	2.57	2395	1004	2.80	2607	1046	3.03	2822	<b>1087</b>	<b>3.26</b>	<b>3042</b>
4200	925	2.45	2289	969	2.68	2500	1011	2.91	2716	1053	3.15	2935	<b>1094</b>	<b>3.39</b>	<b>3159</b>
4300	934	2.57	2395	978	2.80	2610	1020	3.03	2828	1061	3.27	3052	<b>1101</b>	<b>3.52</b>	<b>3279</b>

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

**NOTES**

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 3.70
3. See General Notes for Fan Performance following this section

PERFORMANCE DATA – PHH036–120(cont.)

FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS

PHH120 (10 TONS) STANDARD MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	523	0.58	541	592	0.73	680	657	0.88	825	718	1.05	977	775	1.22	1135
3100	536	0.63	587	603	0.78	730	666	0.94	879	726	1.11	1035	783	1.28	1196
3200	549	0.68	637	614	0.84	783	676	1.00	936	735	1.17	1096	790	1.35	1260
3300	562	0.74	689	626	0.90	839	686	1.07	996	743	1.24	1159	798	1.42	1328
3400	575	0.80	744	637	0.96	898	696	1.14	1059	752	1.31	1226	806	1.50	1398
3500	588	0.86	802	649	1.03	961	707	1.21	1125	762	1.39	1296	815	1.58	1472
3600	601	0.93	864	661	1.10	1026	717	1.28	1194	771	1.47	1369	823	1.66	1548
3700	614	1.00	929	673	1.17	1095	728	1.36	1267	781	1.55	1445	832	1.75	1629
3800	628	1.07	997	685	1.25	1167	739	1.44	1343	791	1.64	1525	841	1.84	1712
3900	641	1.15	1069	697	1.33	1243	750	1.53	1423	801	1.72	1608	850	1.93	1799
4000	655	1.23	1144	709	1.42	1322	761	1.61	1506	812	1.82	1695	860	2.03	1890
4100	668	1.31	1223	722	1.51	1405	773	1.71	1593	822	1.92	1786	870	2.13	1984
4200	682	1.40	1305	734	1.60	1492	784	1.80	1683	833	2.02	1880	880	2.23	2082
4300	696	1.49	1392	747	1.70	1582	796	1.91	1777	844	2.12	1979	890	2.34	2184
4400	710	1.59	1482	760	1.80	1677	808	2.01	1876	855	2.23	2081	900	2.46	2290
4500	723	1.69	1577	773	1.90	1775	820	2.12	1978	866	2.35	2187	910	2.57	2400
4600	737	1.80	1675	785	2.01	1877	832	2.24	2085	877	2.46	2297	921	2.70	2514
4700	751	1.91	1778	798	2.13	1984	844	2.35	2195	889	2.59	2412	932	2.82	2633
4800	765	2.02	1885	812	2.25	2095	856	2.48	2310	900	2.71	2531	942	2.95	2756
4900	779	2.14	1996	825	2.37	2210	869	2.61	2430	912	2.85	2654	953	3.09	2883
5000	793	2.26	2112	838	2.50	2330	881	2.74	2554	923	2.98	2782	965	3.23	3014

PHH120 (10 TONS) STANDARD MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	830	1.39	1298	883	1.57	1466	934	1.76	1638	982	1.95	1815	1029	2.14	1996
3100	837	1.46	1363	889	1.65	1534	938	1.83	1710	986	2.03	1891	1033	2.23	2075
3200	843	1.53	1431	894	1.72	1606	944	1.91	1785	991	2.11	1969	1037	2.31	2157
3300	850	1.61	1502	901	1.80	1680	949	2.00	1863	996	2.20	2051	1041	2.40	2242
3400	858	1.69	1576	907	1.88	1758	955	2.09	1944	1001	2.29	2135	1046	2.50	2331
3500	865	1.77	1653	914	1.97	1838	961	2.18	2029	1007	2.38	2223	1051	2.60	2422
3600	873	1.86	1733	921	2.06	1922	967	2.27	2116	1012	2.48	2314	1056	2.70	2516
3700	881	1.95	1816	928	2.16	2010	974	2.37	2207	1019	2.58	2409	1062	2.80	2615
3800	889	2.04	1904	936	2.25	2100	981	2.47	2302	1025	2.69	2507	1068	2.91	2716
3900	898	2.14	1995	944	2.35	2195	988	2.57	2399	1032	2.80	2608	1074	3.03	2821
4000	907	2.24	2089	952	2.46	2293	996	2.68	2501	1038	2.91	2713	1080	3.14	2930
4100	916	2.35	2187	960	2.57	2395	1004	2.80	2607	1046	3.03	2822	<b>1087</b>	<b>3.26</b>	<b>3042</b>
4200	925	2.45	2289	969	2.68	2500	1011	2.91	2716	1053	3.15	2935	<b>1094</b>	<b>3.39</b>	<b>3159</b>
4300	934	2.57	2395	978	2.80	2610	1020	3.03	2828	1061	3.27	3052	<b>1101</b>	<b>3.52</b>	<b>3279</b>
4400	944	2.69	2504	986	2.92	2723	1028	3.16	2946	1068	3.40	3173	<b>1108</b>	<b>3.65</b>	<b>3403</b>
4500	954	2.81	2618	996	3.05	2840	1037	3.29	3067	1076	3.54	3297	—	—	—
4600	963	2.93	2736	1005	3.18	2962	1045	3.42	3192	<b>1085</b>	<b>3.67</b>	<b>3426</b>	—	—	—
4700	974	3.07	2858	1014	3.31	3088	1054	3.56	3322	—	—	—	—	—	—
4800	984	3.20	2985	1024	3.45	3219	—	—	—	—	—	—	—	—	—
4900	994	3.34	3116	1034	3.60	3353	—	—	—	—	—	—	—	—	—
5000	1005	3.49	3251	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp – Brake Horsepower  
Watts – Input Watts to Motor

\*Motor drive range: 860 to 1080 rpm. All other rpms require field-supplied drive.

NOTES

1. **Boldface** indicates field-supplied drive required
2. Maximum continuous Bhp is 3.70
3. See General Notes for Fan Performance following this section



**PERFORMANCE DATA – PHH036–120(cont.)  
FAN PERFORMANCE HORIZONTAL DISCHARGE UNITS**

PHH120 (10 TONS) HIGH–STATIC MOTOR (BELT DRIVE)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	523	0.58	541	592	0.73	680	657	0.88	825	718	1.05	977	775	1.22	1135
3100	536	0.63	587	603	0.78	730	666	0.94	879	726	1.11	1035	783	1.28	1196
3200	549	0.68	637	614	0.84	783	676	1.00	936	735	1.17	1096	790	1.35	1260
3300	562	0.74	689	626	0.90	839	686	1.07	996	743	1.24	1159	798	1.42	1328
3400	575	0.80	744	637	0.96	898	696	1.14	1059	752	1.31	1226	806	1.50	1398
3500	588	0.86	802	649	1.03	961	707	1.21	1125	762	1.39	1296	815	1.58	1472
3600	601	0.93	864	661	1.10	1026	717	1.28	1194	771	1.47	1369	823	1.66	1548
3700	614	1.00	929	673	1.17	1095	728	1.36	1267	781	1.55	1445	832	1.75	1629
3800	628	1.07	997	685	1.25	1167	739	1.44	1343	791	1.64	1525	841	1.84	1712
3900	641	1.15	1069	697	1.33	1243	750	1.53	1423	801	1.72	1608	850	1.93	1799
4000	655	1.23	1144	709	1.42	1322	761	1.61	1506	812	1.82	1695	860	2.03	1890
4100	668	1.31	1223	722	1.51	1405	773	1.71	1593	822	1.92	1786	870	2.13	1984
4200	682	1.40	1305	734	1.60	1492	784	1.80	1683	833	2.02	1880	880	2.23	2082
4300	696	1.49	1392	747	1.70	1582	796	1.91	1777	844	2.12	1979	890	2.34	2184
4400	710	1.59	1482	760	1.80	1677	808	2.01	1876	855	2.23	2081	900	2.46	2290
4500	723	1.69	1577	773	1.90	1775	820	2.12	1978	866	2.35	2187	910	2.57	2400
4600	737	1.80	1675	785	2.01	1877	832	2.24	2085	877	2.46	2297	921	2.70	2514
4700	751	1.91	1778	798	2.13	1984	844	2.35	2195	889	2.59	2412	932	2.82	2633
4800	765	2.02	1885	812	2.25	2095	856	2.48	2310	900	2.71	2531	942	2.95	2756
4900	779	2.14	1996	825	2.37	2210	869	2.61	2430	912	2.85	2654	953	3.09	2883
5000	793	2.26	2112	838	2.50	2330	881	2.74	2554	923	2.98	2782	965	3.23	3014

PHH120 (10 TONS) HIGH–STATIC MOTOR (BELT DRIVE)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	830	1.39	1298	883	1.57	1466	934	1.76	1638	982	1.95	1815	1029	2.14	1996
3100	837	1.46	1363	889	1.65	1534	938	1.83	1710	986	2.03	1891	1033	2.23	2075
3200	843	1.53	1431	894	1.72	1606	944	1.91	1785	991	2.11	1969	1037	2.31	2157
3300	850	1.61	1502	901	1.80	1680	949	2.00	1863	996	2.20	2051	1041	2.40	2242
3400	858	1.69	1576	907	1.88	1758	955	2.09	1944	1001	2.29	2135	1046	2.50	2331
3500	865	1.77	1653	914	1.97	1838	961	2.18	2029	1007	2.38	2223	1051	2.60	2422
3600	873	1.86	1733	921	2.06	1922	967	2.27	2116	1012	2.48	2314	1056	2.70	2516
3700	881	1.95	1816	928	2.16	2010	974	2.37	2207	1019	2.58	2409	1062	2.80	2615
3800	889	2.04	1904	936	2.25	2100	981	2.47	2302	1025	2.69	2507	1068	2.91	2716
3900	898	2.14	1995	944	2.35	2195	988	2.57	2399	1032	2.80	2608	1074	3.03	2821
4000	907	2.24	2089	952	2.46	2293	996	2.68	2501	1038	2.91	2713	1080	3.14	2930
4100	916	2.35	2187	960	2.57	2395	1004	2.80	2607	1046	3.03	2822	1087	3.26	3042
4200	925	2.45	2289	969	2.68	2500	1011	2.91	2716	1053	3.15	2935	1094	3.39	3159
4300	934	2.57	2395	978	2.80	2610	1020	3.03	2828	1061	3.27	3052	1101	3.52	3279
4400	944	2.69	2504	986	2.92	2723	1028	3.16	2946	1068	3.40	3173	1108	3.65	3403
4500	954	2.81	2618	996	3.05	2840	1037	3.29	3067	1076	3.54	3297	1115	3.79	3531
4600	963	2.93	2736	1005	3.18	2962	1045	3.42	3192	1085	3.67	3426	1123	3.93	3664
4700	974	3.07	2858	1014	3.31	3088	1054	3.56	3322	1093	3.82	3560	1131	4.08	3801
4800	984	3.20	2985	1024	3.45	3219	1063	3.71	3456	1102	3.96	3697	1139	4.23	3943
4900	994	3.34	3116	1034	3.60	3353	1073	3.85	3594	1111	4.12	3839	1148	4.38	4088
5000	1005	3.49	3251	1044	3.74	3492	1082	4.01	3737	1119	4.27	3986	1156	4.55	4238

**LEGEND**

**Bhp** – Brake Horsepower  
**Watts** – Input Watts to Motor

\*Motor drive range: 922 to 1219 rpm. All other rpms require field–supplied drive.

**NOTES**

1. **Boldface** indicates field–supplied drive required
2. Maximum continuous Bhp is 5.25
3. See General Notes for Fan Performance following this section

**PERFORMANCE DATA – PHH036–120(cont.)**

**GENERAL NOTES FOR FAN PERFORMANCE TABLES:**

1. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Indoor Fan Motor Performance table.
2. Values include losses for filters, unit casing, and wet coils. Refer to Accessory/FIOP Static Pressure tables for accessory static pressure information.
3. Use of a field-supplied motor may affect wire sizing.
4. Interpolation is permissible. Do not extrapolate.

**FAN RPM AT MOTOR PULLEY SETTINGS\***

UNIT PHH	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
036†	1044	1008	971	935	898	862	826	789	753	716	680	—	—
036**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
048†	1185	1144	1102	1061	1019	978	936	895	853	812	770	—	—
048**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
060†	1460	1425	1390	1355	1319	1284	1249	1214	1179	1144	1108	1073	1038
060**	1685	1647	1608	1570	1531	1493	1454	1416	1377	1339	1300	—	—
072†	1585	1538	1492	1445	1399	1352	1305	1259	1212	1166	1119	—	—
072**	1685	1647	1608	1570	1531	1493	1454	1416	1377	1339	1300	—	—
090†	950	930	905	885	865	840	820	795	775	750	730	—	—
090**	1080	1060	1035	1015	990	970	950	925	905	880	860	—	—
102†	1085	1061	1036	1012	987	963	938	914	889	865	840	—	—
102**	1080	1058	1036	1014	992	970	948	926	904	882	860	—	—
120†	1080	1060	1035	1015	990	970	950	925	905	880	860	—	—
120**	1219	1195	1170	1145	1120	1095	1071	1046	1021	996	972	947	922

\*Approximate fan rpm shown

† Indicates alternate motor and drive package

\*\*Indicates high-static motor and drive package

**INDOOR FAN MOTOR PERFORMANCE – STANDARD MOTORS**

UNIT PHH	UNIT VOLTAGE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	MAXIMUM AMP DRAW	MOTOR EFFICIENCY
036	208/230–1–60	1.20	1195	4.9	75.0
	208/230–3–60	1.20	1195	4.9	75.0
	460–3–60			2.3	75.0
048	208/230–1–60	1.20	1195	4.9	75.0
	208/230–3–60	1.20	1195	4.9	75.0
	460–3–60			2.3	75.0
060	208/230–1–60	1.30	1290	7.6	74.0
	208/230–3–60	2.40	2120	6.0	84.0
	460–3–60			3.0	84.0
072	208/230–3–60	2.40	2120	6.0	84.0
	460–3–60			3.0	84.0
090, 102	208/230–3–60	2.90	2615	8.6	80.0
	460–3–60	2.90	2615	3.9	80.0
120	208/230–3–60	3.70	3313	11.7	85.0
	460–3–60	3.70	3313	5.5	85.0

**LEGEND**

**BHP** – Brake Horsepower

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

**PERFORMANCE DATA – PHH036–120(cont.)**  
**INDOOR FAN MOTOR PERFORMANCE – HIGH-STATIC MOTORS**

UNIT PHH	UNIT VOLTAGE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	MAXIMUM AMP DRAW	MOTOR EFFICIENCY
036	208/230–3–60	2.40	2120	6.0	75
	460–3–60			3.0	75
048	208/230–3–60	2.40	2120	6.0	75
	460–3–60			3.0	75
060	208/230–3–60	2.90	2615	8.6	84
	460–3–60			3.9	84
072	208/230–3–60	2.90	2615	8.6	84
	460–3–60			3.9	84
090, 102	208/230–3–60	3.70	3313	11.7	80
	460–3–60			5.5	80
120	208/230–3–60	5.25	4400	17.3	85
	460–3–60			8.5	85

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

**ACCESSORY ELECTRIC HEATER STATIC PRESSURE\* (in. wg) – PHH036–072**

COMPONENT	CFM									
	600	900	1200	1400	1600	1800	2000	2200	2400	2600
1 Heater Module	0.03	0.05	0.07	0.09	0.09	0.10	0.11	0.11	0.12	0.13
2 Heater Modules	0.14	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18

**ACCESSORY ELECTRIC HEATER STATIC PRESSURE\* (in. wg) – PHH090–120**

COMPONENT	CFM									
	2250	2500	3000	3500	4000	4500	5000	5500	6000	6250
1 Heater Module	0.02	0.03	0.05	0.07	0.08	0.10	0.12	0.14	0.16	0.17
2 Heater Modules	0.03	0.05	0.07	0.09	0.12	0.14	0.16	0.19	0.21	0.20

**ACCESSORY/FIOP ECONOMIZER STATIC PRESSURE\* (in. wg) – PHH036–072**

COMPONENT	CFM								
	1250	1500	1750	2000	2250	2500	2750	3000	
Vertical Economizer	0.045	0.065	0.08	0.12	0.145	0.175	0.22	0.255	
Horizontal Economizer	—	—	0.1	0.125	0.15	0.18	0.225	0.275	

**LEGEND**  
**FIOP** – Factory Installed Option  
 \*The static pressure must be added to external static pressure. The sum and indoor-entering air cfm should be used in conjunction with the Fan Performance tables to determine blower rpm and watts.  
**NOTE:** Performance is for the DN series Economizer

**ACCESSORY/FIOP ECONOMIZER STATIC PRESSURE\* (in. wg) – PHH090–120**

COMPONENT	CFM													
	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	6250
Vertical Economizer	0.06	0.075	0.09	0.115	0.13	0.15	0.17	0.195	0.22	0.25	0.285	0.325	0.36	—
Horizontal Economizer	—	0.1	0.125	0.15	0.18	0.21	0.25	0.275	0.3	0.34	0.388	—	—	—

**LEGEND**  
**FIOP** – Factory Installed Option  
 \*The static pressure must be added to external static pressure. The sum and evaporator-entering air cfm should be used in conjunction with the Fan Performance tables to determine blower rpm and watts.  
**NOTE:** The rooftop unit return air configuration determines the economizer configuration (vertical or horizontal).  
**NOTE:** Performance is for the DN series Economizer

**PERFORMANCE DATA – PHH036–120**

**MULTIPLICATION FACTORS**

HEATER RATING VOLTAGE	ACTUAL HEATER VOLTAGE										
	200	208	230	240	380	440	460	480	550	575	600
240	0.694	0.751	0.918	1.000	—	—	—	—	—	—	—
480	—	—	—	—	0.626	0.840	0.918	1.000	—	—	—
600	—	—	—	—	—	—	—	—	0.840	0.918	1.000

**NOTES:**

The following equation converts kW of heat energy to Btuh:

$\text{kW} \times 3.413 = \text{Btuh}$ .

EXAMPLE: 34 kW (at 230 v) heater on 208 v

= 34.0 (.751 mult factor)

= 25.5 kW capacity at 208 v.

**OUTDOOR SOUND POWER (TOTAL UNIT)**

PHH	ARI RATING (decibels)	OCTAVE BANDS; Lw (A)							
		63	125	250	500	1000	2000	4000	8000
036,048	76	50.8	63.4	62.2	65.9	69.2	65.9	63.0	56.5
060, 072	80	57.6	70.2	66.9	71.7	74.7	72.2	67.8	62.4
090	82	62.3	69.3	71.5	74.7	76.2	72.9	68.7	61.5
102	84	64.6	71.1	73.3	76.9	77.6	73.7	70.6	63.7
120	84	64.6	71.1	73.3	76.9	77.6	73.7	70.6	63.7

ARI – Air Conditioning and Refrigeration Institute

Lw(A) – Unit A – Weighted Sound Power Level

**ELECTRICAL DATA – PHH036–120**

**STANDARD MOTOR UNITS**

UNIT PHH	NOMINAL VOLTAGE V–PH–Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
036 (3 Tons)	208/230–1–60	187	254	16.0	88.0	0.7	4.9	—/— 3.3/4.4 4.9/6.5 6.5/8.7 7.9/10.5 9.8/13.0	—/— 15.9/18.3 23.6/27.1 31.3/36.3 38.0/43.8 47.1/54.2	25.6/25.6 45.5/48.5 55.1/59.5 64.7/71.0 73.1/80.4 84.5/93.4	30/30** 50/50** 60/60** 70/80 80/90 90/100	25/25 43/46 52/56 61/67 69/75 79/87	101/101 117/120 125/128 133/138 139/145 148/155††
	208/230–3–60	187	254	10.3	77.0	0.7	4.9	—/— 3.3/4.4 4.9/6.5 6.5/8.7 7.9/10.5 12.0/16.0	—/— 9.2/10.6 13.6/15.6 18.0/20.9 21.9/25.3 33.3/38.5	18.5/18.5 30.0/31.7 35.5/38.0 41.0/44.6 45.9/50.1 60.1/66.6	20/20** 30/35** 40/40** 45/45** 50/60** 70/70	18/18 29/30 34/36 39/42 43/47 57/63	90/90 99/101 104/106 108/111 112/116 124/129
	460–3–60	414	508	5.1	39.0	0.4	2.2	— 6.0 8.8 11.5 14.0	— 7.2 10.6 13.8 16.8	9.0 18.0 22.2 26.2 30.0	15** 20** 25** 30** 30**	9 17 21 25 28	46 53 57 60 63
048 (4 Tons)	208/230–1–60	187	254	18.3	109.0	0.7	4.9	—/— 3.3/4.4 6.5/8.7 9.8/13.0 13.1/17.4 15.8/21.0	—/— 15.9/18.3 31.3/36.3 47.1/54.2 63.0/72.5 76.0/87.5	28.5/28.5 48.4/51.4 67.6/73.9 87.4/96.2 107.2/119.1 123.5/137.9	30/30** 50/60** 70/80 90/100 110/125 125/150	27/27 46/49 63/69 82/90 100/111 115/128	122/122 138/141 154/159 169/176†† 185/195†† 198/210††
	208/230–3–60	187	254	12.4	88.0	0.7	4.9	—/— 4.9/6.5 6.5/8.7 12.0/16.0 15.8/21.0	—/— 13.6/15.6 18.0/20.9 33.3/38.5 43.9/50.5	21.1/21.1 38.1/40.6 43.6/47.2 62.7/69.2 76.0/84.2	25/25** 40/45** 45/50** 70/70 80/90	21/21 36/39 41/45 59/65 71/79	101/101 115/117 119/122 135/140 145/152
	460–3–60	414	508	6.4	44.0	0.4	2.2	— 6.0 11.5 14.0 23.0	— 7.2 13.8 16.8 27.7	10.6 19.6 27.9 31.6 45.2	15** 20** 30** 35** 50**	10 19 26 30 42	51 58 65 68 79
060 (5 Tons)	208/230–1–60	187	254	25.0	150.0	1.5	7.6	—/— 4.9/6.5 6.5/8.7 9.8/16.0 13.1/17.4 15.8/21.0	—/— 23.6/27.1 31.3/36.3 47.1/54.2 63.0/72.5 76.0/87.5	40.4/40.4 69.9/74.2 79.5/85.7 99.2/108.1 119.1/131.0 135.4/149.7	45/45** 70/80 80/90 100/110 125/150 150/150	39/39 66/70 75/81 93/102 112/123 127/140	188/188 211/215 219/224†† 235/242†† 251/260†† 264/275††
	208/230–3–60	187	254	17.3	123.0	1.5	5.8	—/— 4.9/6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	28.9/28.9 45.9/48.4 56.3/60.6 70.6/77.1 83.8/92.1 97.9/108.7	30/30** 50/50** 60/70 80/80 90/100 100/110	28/28 44/46 53/57 67/73 79/86 92/102	168/168 181/183 190/193 201/208 212/218†† 223/232††
	460–3–60	414	508	9.0	62.0	0.8	2.6	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	13.9 22.9 31.2 34.9 48.5 51.5	15** 25** 35** 35** 50** 60**	14 22 29 33 45 48	92 100 106 109 120 123
072 (6 Tons)	208/230–3–60	187	254	20.5	156.0	1.4	5.8	—/— 4.9/6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	32.8/32.8 49.8/52.3 60.2/64.5 74.5/81.0 87.7/96.0 101.8/112.6	35/35** 50/60** 70/70 80/90 90/100 110/125	32/32 47/50 57/61 70/76 82/90 95/105	200/200 214/216 222/225 233/239 244/251†† 255/264††
	460–3–60	414	508	9.6	70.0	0.6	2.6	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	15.2 24.2 32.5 36.2 49.8 53.6	20** 25** 35** 40** 50** 60**	15 23 31 34 47 50	92 99 106 109 120 123

**ELECTRICAL DATA – PHH036–120(cont.)  
STANDARD MOTOR UNITS**

UNIT PHH	NOMINAL VOLTAGE (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (each)		OFM (each)	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
<b>090</b> (7½ Tons)	208/230–3–60	187	254	12.4	88.0	1.4	7.5	— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.8/42.4	— 21.7/ 25.0 33.3/ 38.5 51.6/ 59.7 66.6/ 77.0 88.3/102.0	38.2/ 38.2 65.3/ 69.5 79.8/ 86.3 102.7/112.8 121.5/134.5 148.6/165.7	40/ 40** 70/ 70** 80/ 90 110/125 125/150 150/175	40/ 40 65/ 69 79/ 85 100/109 117/129 142/158	242/242 264/267 275/281†† 294/302†† 309/319†† 330/344††
	460–3–60	414	508	6.4	44.0	0.7	3.4	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	19.2 40.1 44.0 61.0 68.8 82.0	20** 45** 45** 70 70 90	20 39 43 59 66 78	121 138 141 155 161 171
<b>102</b> (8½ Tons)	208/230–3–60	187	254	13.9	105	1.4	7.5	— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.8/42.4	— 21.7/ 25.0 33.3/ 38.5 51.6/ 59.7 66.6/ 77.0 88.3/102.0	41.3/ 41.3 68.4/ 72.5 82.9/ 89.4 105.8/115.9 124.5/137.5 151.7/168.8	45/ 45** 70/ 80** 90/ 90 110/125 125/150 175/175	43/43 68/72 82/88 103/112 120/132 145/161	276/276 298/301 309/315†† 328/336†† 343/353†† 364/378††
	460–3–60	414	508	7.9	55.0	0.7	3.4	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	22.3 43.2 47.0 64.0 71.9 85.0	25** 45** 50** 70 80 90	23 43 46 62 69 81	143 160 163 177 183 193
<b>120</b> (10 Tons)	208/230–3–60	187	254	19.3	123.0	1.4	10.6	— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.8/42.4 37.6/50.0	— 21.7/ 25.0 33.3/ 38.5 51.6/ 59.7 66.6/ 77.0 88.3/102.0 104.4/120.3	56.8/ 56.8 84.0/ 88.1 98.5/105.0 140.1/153.1 167.2/184.3 187.3/177.1	60/ 60** 90/ 90 100/110 150/175 175/200 200/200	60/ 60 85/ 89 98/104 136/148 161/177 180/198	337/337 358/362†† 370/375†† 403/414†† 425/439†† 441/457††
	460–3–60	414	508	10.0	62.0	0.7	4.8	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	28.7 53.5 70.5 78.3 91.5 88.8	30** 60** 80 80 100 100	30 53 69 76 88 99	170 189 203 209 220†† 230††

See Legend and Notes for Electrical Data following this section.

**ELECTRICAL DATA – PHH036–120(cont.)  
HIGH-STATIC MOTOR UNITS**

UNIT PHH	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
036 (3 Tons)	208/230–3–60	187	254	10.3	77.0	0.7	5.8	—/— 3.3/4.4 4.9/6.5 6.5/8.7 7.9/10.5 12.0/16.0	—/— 9.2/10.6 13.6/15.6 18.0/20.9 21.9/25.3 33.3/38.5	19.4/19.4 30.9/32.6 36.4/38.9 41.9/45.5 46.8/51.0 61.0/67.5	20/20 35/35 40/40 45/50 50/60 70/70	19/19 30/32 35/37 40/43 45/48 58/64	120/120 129/130 133/135 138/141 142/145 153/158
	460–3–60	414	508	5.1	39.0	0.4	2.6	— 6.0 8.8 11.5 14.0	— 7.2 10.6 13.8 16.8	9.4 18.4 22.6 26.6 30.4	15** 20** 25** 30** 35**	9 18 22 25 29	60 68 71 74 77
048 (4 Tons)	208/230–3–60	187	254	12.4	88.0	0.7	5.8	—/— 4.9/6.5 6.5/8.7 12.0/16.0 15.8/21.0	—/— 13.6/15.6 18.0/20.9 33.3/38.5 43.9/50.5	22.0/22.0 39.0/41.5 44.5/48.1 63.6/70.1 76.9/85.1	25/25 40/45 45/50 70/80 80/90	22/22 37/40 42/46 60/66 72/80	131/131 144/146 149/152 164/169 175/181††
	460–3–60	414	508	6.4	44.0	0.4	2.6	— 6.0 11.5 14.0 23.0	— 7.2 13.8 16.8 27.7	11.0 20.0 28.3 32.0 45.6	15** 20** 30** 35** 50**	11 19 27 30 43	65 73 79 82 93
060 (5 Tons)	208/230–3–60	187	254	17.3	123.0	1.5	7.5	—/— 4.9/6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	30.6/30.6 47.6/50.1 58.0/62.3 72.3/78.8 85.5/93.8 99.6/110.4	35/35 50/60 60/70 80/80 90/100 100/125	30/30 46/48 55/59 69/75 81/88 94/104	187/187 200/202 209/212 220/225 231/237** 242/251**
	460–3–60	414	508	8.4	70.0	0.8	3.4	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	14.7 23.7 32.0 35.7 49.3 52.3	15** 25** 35** 40** 50** 60**	14 23 30 34 46 49	102 109 116 119 130 132
072 (6 Tons)	208/230–3–60	187	254	20.5	156.0	1.4	7.5	—/— 4.9/6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	34.5/34.5 51.5/54.0 61.9/66.2 76.2/82.7 89.4/97.7 103.5/114.3	35/35 60/60 70/70 80/90 90/100 110/125	34/34 49/52 59/63 72/78 84/92 97/107	219/219 233/235 241/244 252/258 263/270** 274/283**
	460–3–60	414	508	9.6	70.0	0.6	3.4	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	16.0 25.0 33.3 37.0 50.6 54.4	20** 25** 35** 40** 60** 60**	16 24 32 35 47 51	107 114 120 123 134 137

UNIT PHH	NOMINAL VOLTAGE (V-Ph-Hz)	VOLTAGE RANGE		COMPRESSOR (each)		OFM (each)	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
090 (7½ Tons)	208/230–3–60	187	254	12.4	88.0	1.4	10.6	— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.8/42.4	— 21.7/25.0 33.3/38.5 51.6/59.7 66.6/77.0 88.3/102.0	41.3/41.3 68.4/72.6 82.9/89.4 105.8/115.9 124.6/137.6 151.7/168.8	45/45** 70/80 90/90 110/125 125/150 175/175	44/44 69/73 82/88 103/113 121/132 145/169	267/267 288/292 300/305†† 318/336†† 333/344†† 355/369††
	460–3–60	414	508	6.4	44.0	0.7	4.8	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	20.6 41.5 45.4 62.4 70.2 83.4	25** 45** 50** 70 80 90	22 41 45 60 68 80	134 150 153 167 173 184
102 (8½ Tons)	208/230–3–60	187	254	13.9	105	1.4	10.6	— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.8/42.4	— 21.7/25.0 33.3/38.5 51.6/59.7 66.6/77.0 88.3/102.0	44.4/44.4 71.5/75.6 86.0/92.5 108.9/119.0 127.6/140.6 154.8/171.9	45/45** 80/80 90/100 110/125 150/150 175/175	47/47 72/76 85/91 106/116 124/136 149/164	301/301 322/326 334/339†† 352/360†† 367/378†† 389/403††
	460–3–60	414	508	7.9	55.0	0.7	4.8	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	23.7 44.6 48.4 65.4 73.3 86.4	25** 45** 50** 70 80 90	25 44 48 63 71 83	156 172 175 189 195 206
120 (10 Tons)	208/230–3–60	187	254	19.3	123.0	1.4	15.0	— 7.8/10.4 12.0/16.0 24.0/32.0 31.8/42.4 37.5/50.0	— 21.7/25.0 33.3/38.5 66.6/77.0 88.3/102.0 104.4/120.3	61.2/61.2 88.4/92.5 102.9/109.4 144.5/157.5 171.6/188.7 191.7/181.5	70/70 90/100 110/110 150/175 175/200 200/200	65/65 90/94 103/109 141/153 166/182 185/203	360/360 382/385†† 393/399†† 427/437†† 448/462†† 464/480††
	460–3–60	414	508	10.0	62.0	0.7	7.4	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	31.3 56.1 73.1 80.9 94.1 96.4	35** 60** 80 90 100 100	33 56 72 79 91 102	181 201 215 221 231†† 241††

See Legend and Notes for Electrical Data following this section.

Specifications subject to change without notice.

## ELECTRICAL DATA – PHH036–120(cont.)

### LEGEND

- FLA** — Full Load Amps
- HACR** — Heating, Air Conditioning and Refrigeration
- IFM** — Indoor Fan Motor
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCP** — Maximum Overcurrent Protection
- NEC** — National Electrical Code
- OFM** — Outdoor Fan Motor
- RLA** — Rated Load Amps



\*Heaters are field installed only.

†Used to determine minimum disconnect size per NEC.

\*\*Heater capacity (kW) is based on heater voltage of 208 v, 240 v and 480 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.

††Fuse or HACR circuit breaker.

\*\*\*Optional disconnect switch is unavailable.

### NOTES:

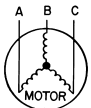
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.

2. **Unbalanced 3–Phase Supply Voltage** *Never operate a motor where a phase imbalance in supply voltage is greater than 2%.* Use the following formula to determine the percent of voltage imbalance.

% Voltage Imbalance

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

Example: Supply voltage is 460–3–60.



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

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

$$= \frac{31371}{3}$$

$$= 10457$$

$$= 457$$

Determine maximum deviation from average voltage.

- (AB) 457 – 452 = 5 v
- (BC) 464 – 457 = 7 v
- (AC) 457 – 455 = 2 v

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

$$\begin{aligned} \text{\% Voltage Imbalance} &= 100 \times \frac{7}{457} \\ &= 1.53\% \end{aligned}$$

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.

### POWER EXHAUST ELECTRICAL DATA

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MOCP (for separate power source)
DNPWREXH021A01	N/A	0.68	15
DNPWREXH022A01	3.4	N/A	15
DNPWREXH023A01	N/A	1.4	15
DNPWREXH028A01	1.7	N/A	15
DNPWREXH029A01	N/A	0.7	15
DNPWREXH030A01	1.6	N/A	15

N/A — Not available

Model	Application Usage	Volt/Phase/Hz	Unit			
			LRA	FLA	MCA	Fuse Size
AXB035PEH	072	208/230/1/60	10.2	4.3	5.4	10
AXB035PEL	072	460/1/60	4.1	1.7	2.2	4
AXB035PES	072	575/1/60	4.1	1.7	2.2	4
AXB145PEH	90	208–230/1/60	10.2	4.3	5.4	8
AXB145PEL	90	460/1/60	4.1	1.7	2.2	5
AXB145PES	90	575/1/60	4.1	1.7	2.2	5
AXB245PEH	102, 120	208–230/1/60	24.9	5.0	6.3	10
AXB245PEL	102, 120	460/1/60	N/A	2.2	2.8	5
AXB245PES	102, 120	575/1/60	N/A	1.5	1.9	4

NOTE: AXB power exhaust is wired single phase, drop third leg when installing.

NOTE: If a single power source is to be used, size wire to include power exhaust MCA and MOCP.

Check MCA and MOCP when power exhaust is powered through the unit. Determine the new MCA including the power exhaust using the following formula:

$$\text{MCA New} = \text{MCA unit only} + \text{MCA of Power Exhaust}$$

For example, using a PHH060 unit with MCA = 35.6 and MOCP = 40, with DNPWREXH030A01 power exhaust.

$$\text{MCA New} = 35.6 \text{ amps} + 1.6 \text{ amps} = 37.2 \text{ amps}$$

If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 40 amps and the MCA New is below 40; therefore the MOCP is acceptable. If “MCA New” is larger than the published MOCP, raise the MOCP to the next larger size. In all cases, the MOCP for the power exhaust should be 15 amps per NEC.



# TYPICAL WIRING SCHEMATICS PHH072 - 208/230v 3 phase SHOWN

208/230-3-60

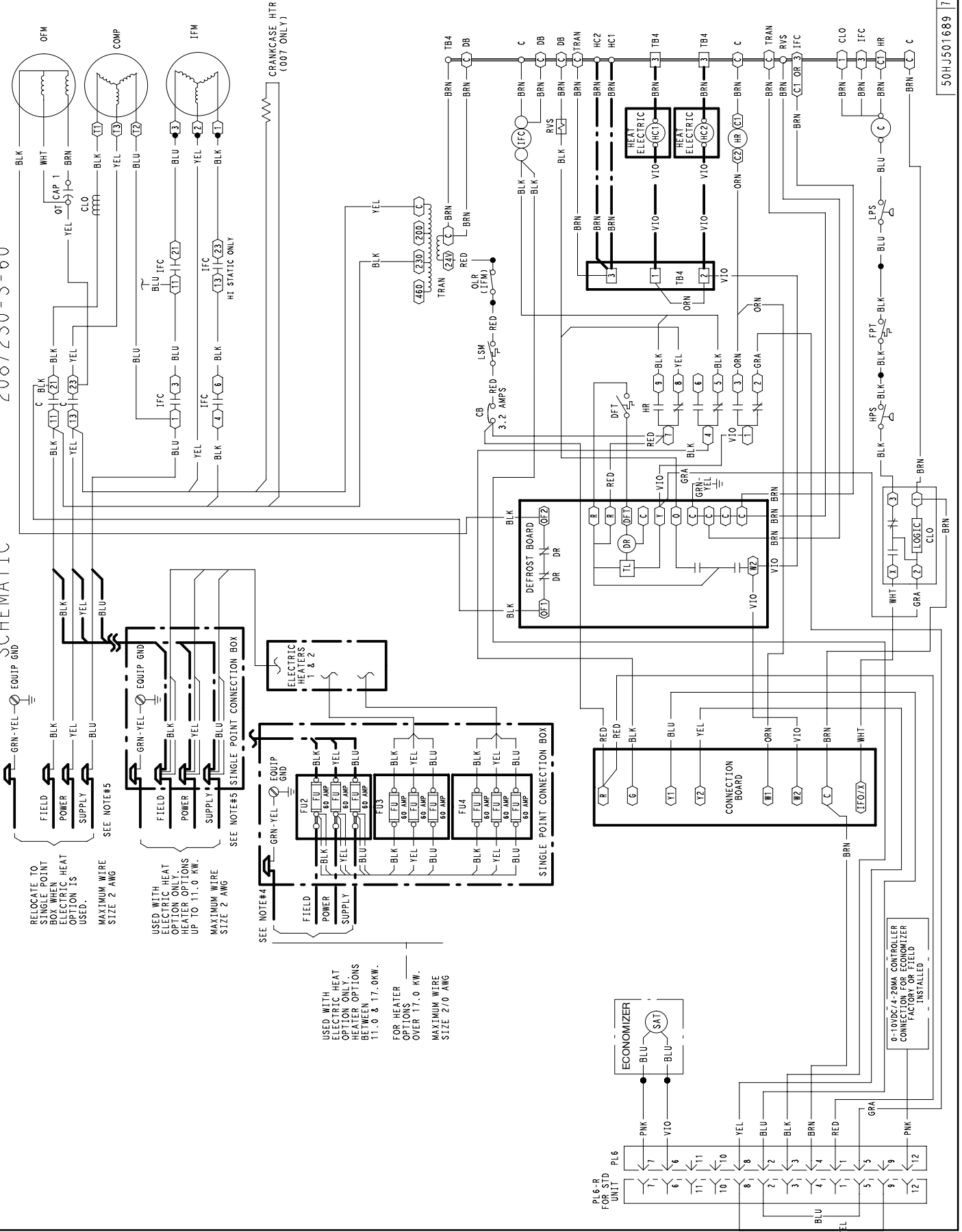
## SCHEMATIC

BELOCATE TO SINGLE POINT BOX WHEN ELECTRIC HEAT OPTION IS USED.  
MAXIMUM WIRE SIZE 2 AWG

USED WITH ELECTRIC HEAT OPTION ONLY. HEATER OPTIONS UP TO 11.0 KW.  
MAXIMUM WIRE SIZE 2 AWG

SEE NOTE#4

USED WITH ELECTRIC HEAT OPTION ONLY. HEATER OPTIONS BETWEEN 11.0 & 17.0 KW.  
FOR HEATER OPTIONS OVER 17.0 KW.  
MAXIMUM WIRE SIZE 2/0 AWG



50HJ501689 7.0

# TYPICAL WIRING SCHEMATICS (cont.)

## LEGEND FOR WIRING - PHH072

- NOTES
- IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
  - COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
  - TRAN IS WIRED FOR 230V UNIT. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY DISCONNECT BLK WIRE FROM 230V TAP (ORN) AND CONNECT TO 208V TAP (RED). INSULATE END OF 230V WIRE.
  - USE COPPER, COPPER CLAD, ALUMINUM OR ALUMINUM CONNECTORS.
  - USE COPPER CONDUCTOR ONLY.

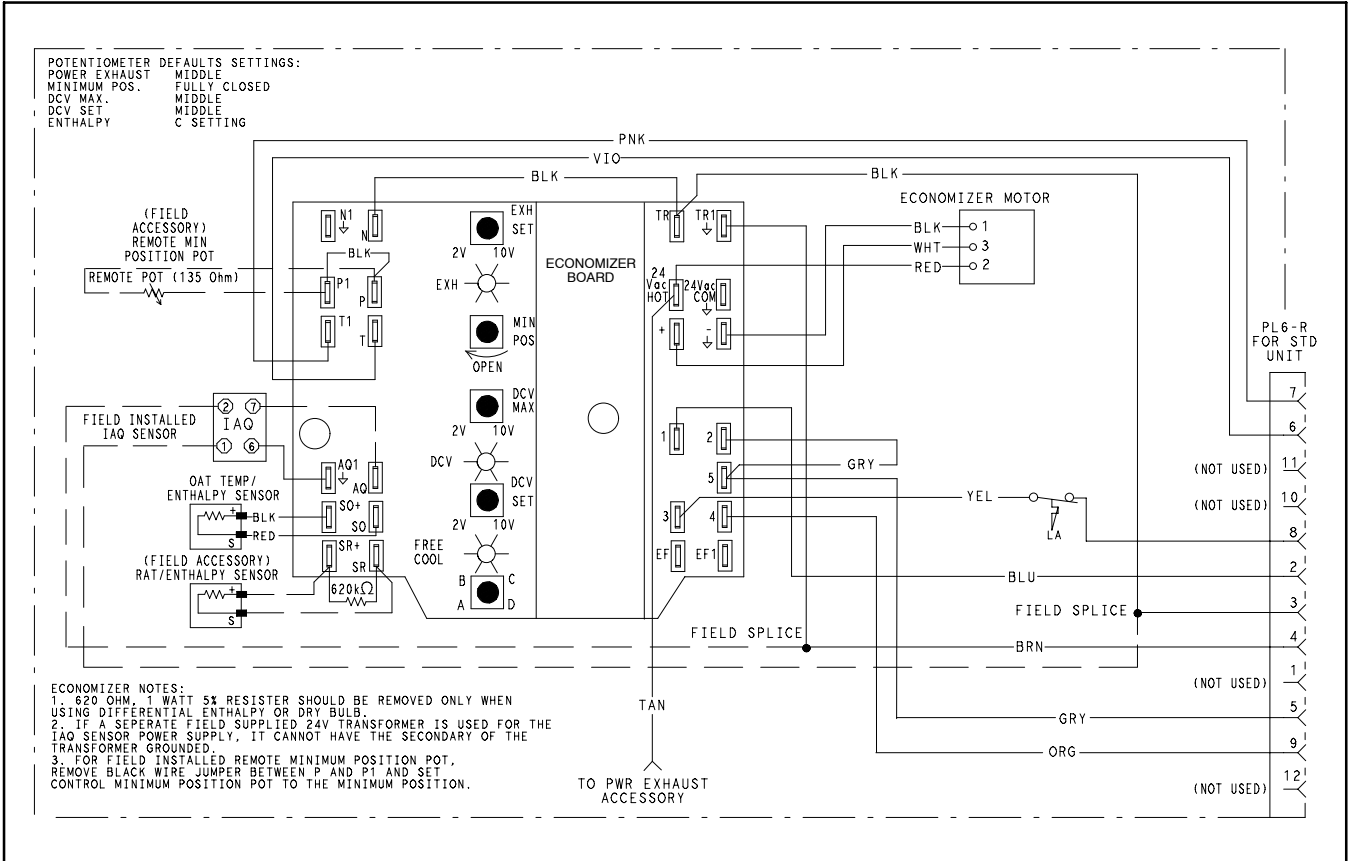
VOLTAGE RATING	CB		MUST TRIP AMPS
	MFG. PT. NO.		
24V	POTTER & BRUMFIELD		3.2
	W28X-1024-3.2		

### LEGEND

- FIELD SPLICE
- MARKED WIRE
- TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- TERMINAL BLOCK
- SPLICE
- SPLICE (MARKED)
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- ACCESSORY OR OPTIONAL WIRING
- TO INDICATE COMMON POTENTIAL ONLY:
- NOT TO REPRESENT WIRING

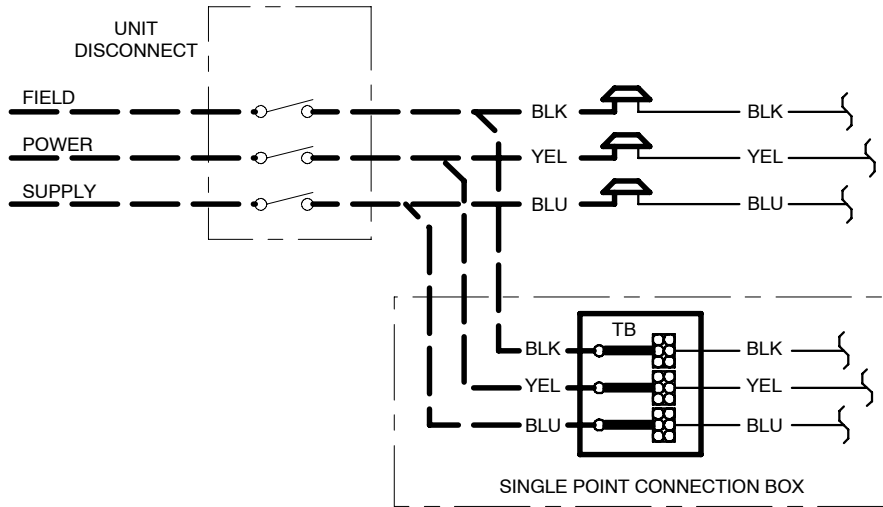
- C CONTACTOR, COMPRESSOR
- CAP CAPACITOR
- CB CIRCUIT BREAKER
- CC COOLING COMPENSATOR
- CLO COMPRESSOR LOCKOUT
- COMP COMPRESSOR MOTOR
- DB DEFROST BOARD
- DFT DEFROST THERMOSTAT
- FPT FREEZE UP PROTECTION THERMOSTAT
- FU FUSE
- GND GROUND
- HC HEATER CONTACTOR (STRIP HEAT)
- HP HEAT PUMP
- HPS HIGH PRESSURE SWITCH
- HR HEATER RELAY
- IAQ INDOOR AIR QUALITY SENSORS
- IARH INDOOR AIR RELATIVE HUMIDITY SEN
- IFC INDOOR FAN CONTACTOR
- IFM INDOOR FAN MOTOR
- LA LOW AMBIENT LOCKOUT
- LPS LOW PRESSURE SWITCH
- LSM LIMIT SWITCH (MANUAL RESET)
- OARH OUTDOOR AIR RELATIVE HUMIDITY SEN
- OAT OUTDOOR AIR TEMP. SEN
- OFM OUTDOOR FAN MOTOR
- OLR OVERLOAD RELAY
- P PLUG
- PL PLUG ASSEMBLY
- POT POTENTIOMETER
- QT QUADRUPLE TERMINAL
- R RELAY
- RAT RETURN AIR TEMP. SEN
- RVS REVERSING VALVE SOLENOID
- SAT SUPPLY AIR TEMP. SEN
- TB TERMINAL BLOCK
- TDR TIME DELAY RELAY
- TRAN TRANSFORMER

## ECONOMIZER WIRING - PHH072



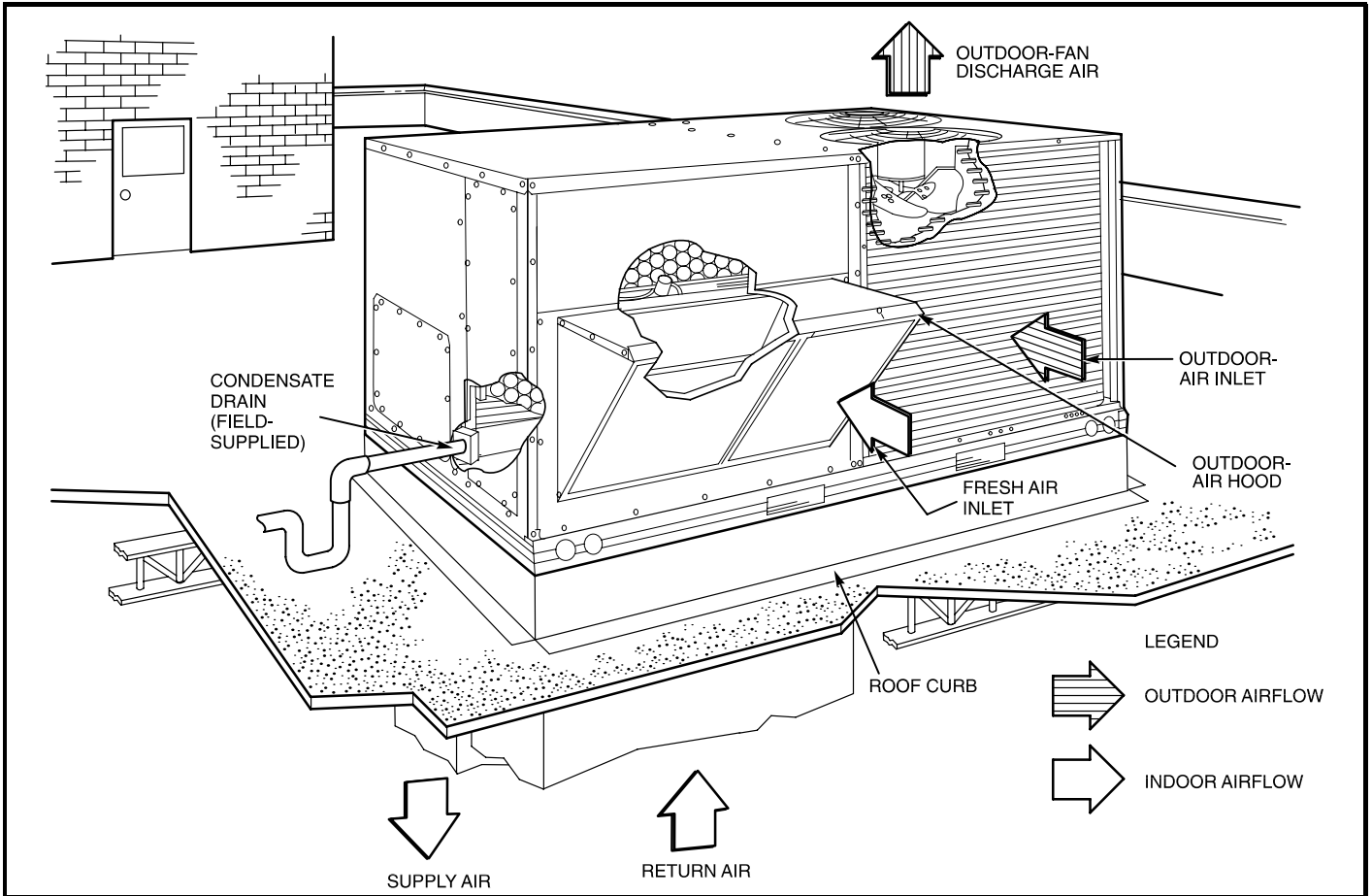
**NOTE:** Wiring is for the DN series Economizer

TYPICAL WIRING SCHEMATICS (cont.)  
NON-FUSED DISCONNECT – PHH036-120

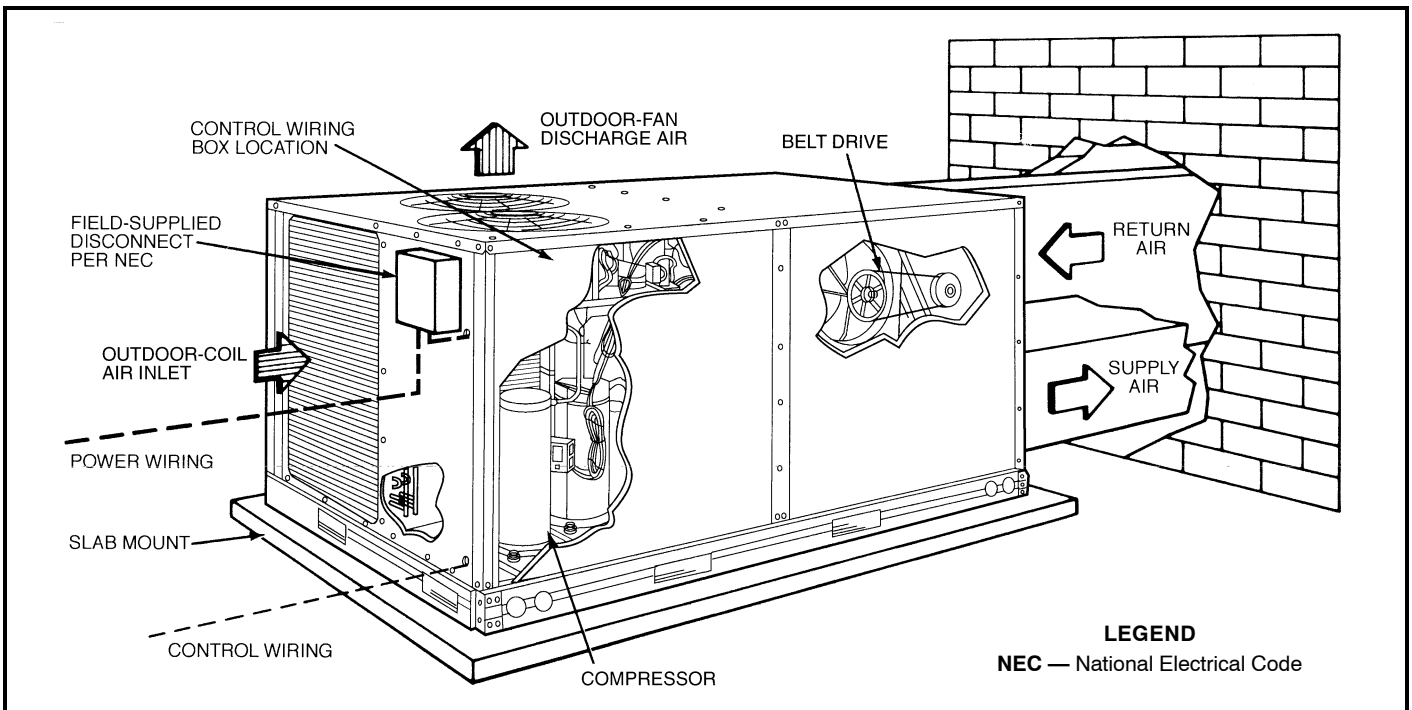


**NOTE:** Use copper conductors only.

**TYPICAL PIPING AND WIRING  
VERTICAL DISCHARGE DUCTING – PHH036-120**



**HORIZONTAL DISCHARGE DUCTING**

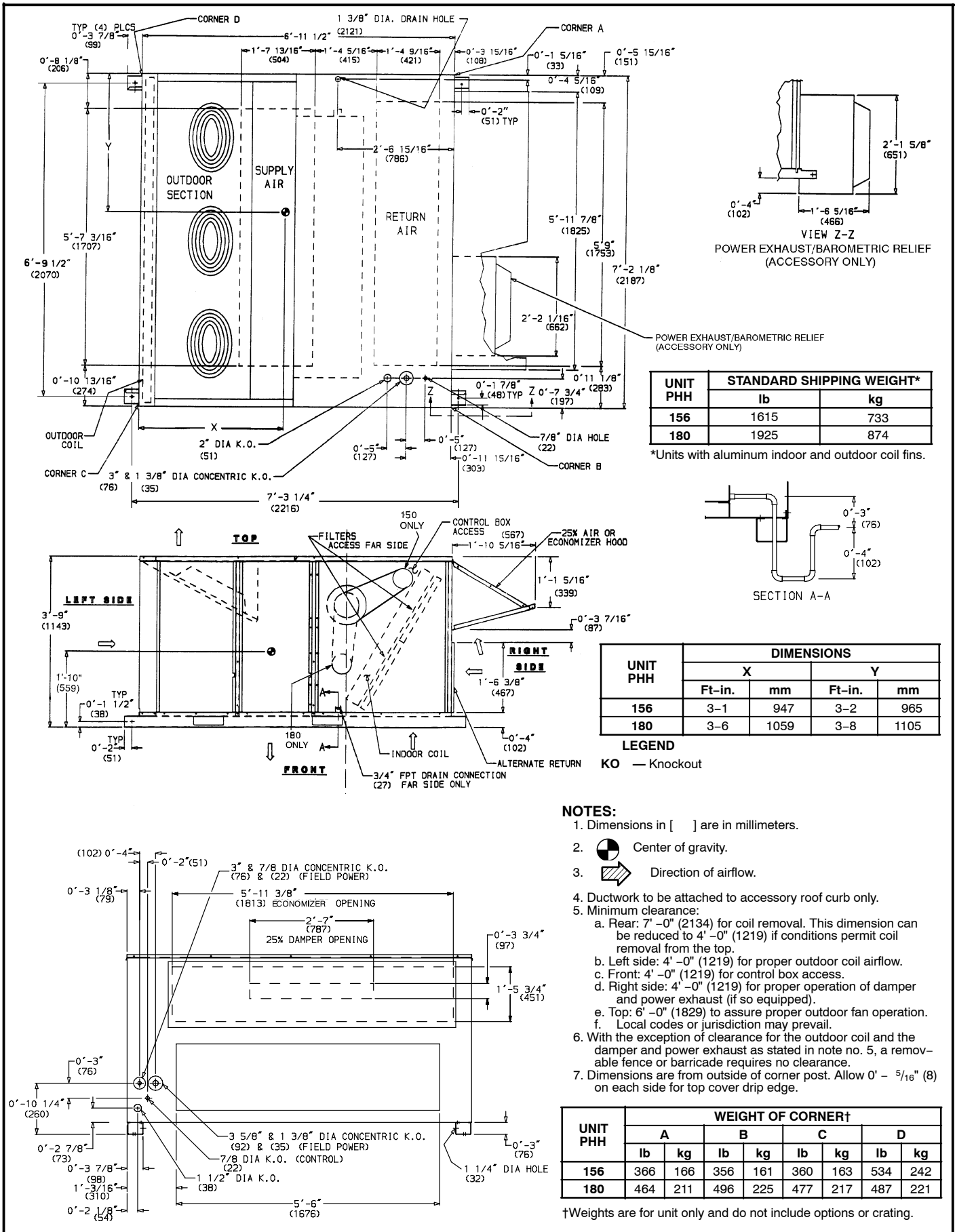


**PHYSICAL DATA – PHH156, 180**

<b>UNIT SIZE – PHH (208/230 V, 460 V)</b>	<b>156</b>	<b>180</b>
<b>NOMINAL CAPACITY (tons)</b>	12.5	15
<b>OPERATING WT (lb)</b>		
<b>Unit</b>	1615	1925
<b>Economizer</b>	90	90
<b>COMPRESSOR</b> <span style="float:right">Semi-Hermetic</span>		
<b>Model Number (Quantity)</b>	06D-328 (1)	06D-818 (2)
<b>Cylinders</b>	6	4
<b>Capacity Staging (%)</b>	0,66,100	0,50,100
<b>Oil Change (oz)</b>	115	88 (each)
<b>REFRIGERANT TYPE</b> <span style="float:right">R-22</span>		
<b>Charge (lb)</b>		
<b>System 1</b>	26.0	16.5
<b>System 2</b>	—	16.5
<b>OUTDOOR COIL</b> <span style="float:right">3/8 in. Enhanced Copper Tubes, Aluminum Lanced or Copper Plate Fins</span>		
<b>Rows</b>	3	3
<b>Fins/in.</b>	15	15
<b>Total Face Area (sq ft)</b>	21.7	21.7
<b>OUTDOOR FAN</b> <span style="float:right">Propeller Type, Direct Drive</span>		
<b>Nominal Cfm</b>	9,000	9,000
<b>Number...Diameter (in.)</b>	3...22	3...22
<b>Motor Hp (1075 Rpm)</b>	1/2	1/2
<b>Watts Input (Total)</b>	1090	1090
<b>INDOOR COIL</b> <span style="float:right">3/8-in. Enhanced Copper Tubes, Aluminum Double Wavy or Copper Plate Fins, Face Split</span>		
<b>Rows</b>	3	3
<b>Fins/in.</b>	15	15
<b>Total Face Area (sq ft)</b>	17.5	17.5
<b>INDOOR FAN</b> <span style="float:right">Centrifugal, Adjustable Pitch Belt Drive</span>		
<b>Quantity...Size (in.)</b>	2...10 x 10	2...12 x 12
<b>Nominal Cfm</b>	5000	6000
<b>Maximum Continuous Bhp</b>	4.25	5.90
<b>Fan Rpm Range</b>	891-1179	817-1038
	STD	817-1038
	ALT	1082-1303
<b>Motor Nominal Rpm</b>	1725	1745
<b>Maximum Allowable Rpm</b>	1550	1550
<b>Motor Pulley Pitch Diameter (in.)</b>	3.1-4.1	3.7-4.7
	STD	3.7-4.7
	ALT	4.9-5.9
<b>Fan Pulley Pitch Diameter (in.)</b>	6.0	7.9
	STD	7.9
	ALT	7.9
<b>Belt, Quantity...Type...Length (in.)</b>	1...BX...42	1...BX...46
	STD	1...BX...46
	ALT	1...BX...50
<b>Pulley Center Line Distance (in.)</b>	13.5-15.5	13.3-14.8
<b>Factory Setting</b>	3.5	3.5
<b>Factory Speed Setting</b>	1035	934
	STD	1199
	ALT	1199
<b>Motor Hp (Service Factor)</b>	3.7 (1.15)	5 (1.15)
<b>Motor Frame Size</b>	56H	184T
<b>Motor Efficiency</b>	0.86	0.875
<b>HIGH-PRESSURE SWITCH</b>		
<b>Cutout (psig)</b>		426
<b>Reset (psig)</b>		320
<b>LOW PRESSURE/LOSS-OF-CHARGE SWITCH</b>		
<b>Cutout (psig)</b>		7
<b>Reset (psig)</b>		22
<b>FREEZE PROTECTION THERMOSTAT (F)</b>		
<b>Opens</b>		30 ± 5
<b>Closes</b>		45 ± 5
<b>OUTDOOR AIR INLET SCREENS</b> <span style="float:right">Cleanable</span>		
<b>Economizer, Quantity...Size (in.)</b>		2...20 x 25 x 1
		1...20 x 20 x 1
<b>RETURN-AIR FILTERS (Type)</b> <span style="float:right">10% Efficient — 2-in. Throwaway Fiberglass</span>		
<b>Quantity...Size (in.)</b>		4...20 x 20 x 2
		4..16 x 20 x 2
<b>POWER EXHAUST *</b> <span style="float:right">1/2 Hp 208/230 or 460 V Motor, Direct Drive Propeller Fan (Factory Wired for 460 V)</span>		

\* Performance is for the DN series Power Exhaust

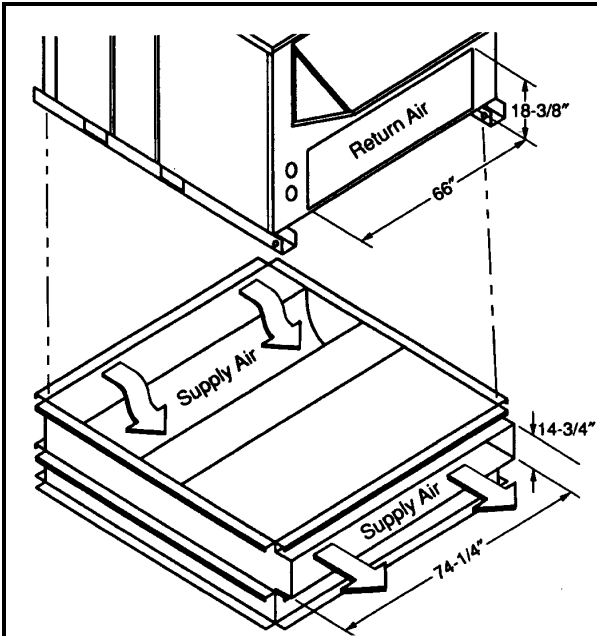
# Base Unit Dimensions – PHH156, 180



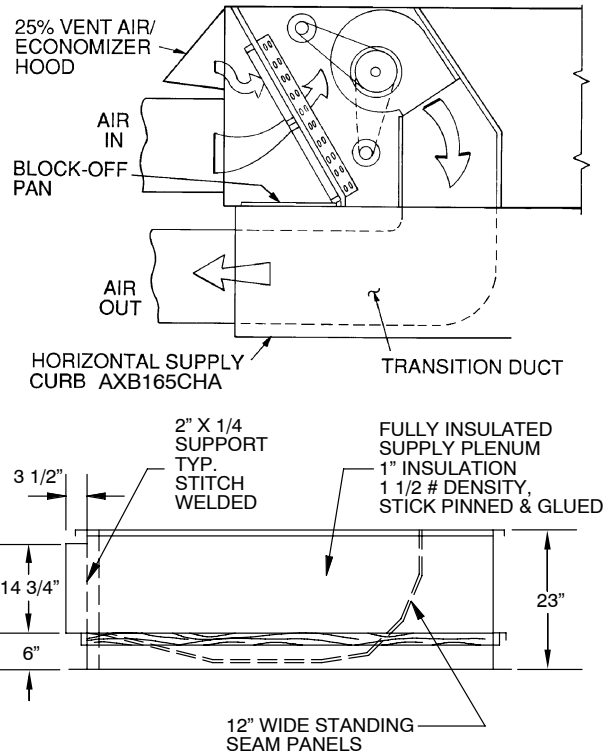
### NOTES:

- Dimensions in [ ] are in millimeters.
- Center of gravity.
- Direction of airflow.
- Ductwork to be attached to accessory roof curb only.
- Minimum clearance:
  - Rear: 7'-0" (2134) for coil removal. This dimension can be reduced to 4'-0" (1219) if conditions permit coil removal from the top.
  - Left side: 4'-0" (1219) for proper outdoor coil airflow.
  - Front: 4'-0" (1219) for control box access.
  - Right side: 4'-0" (1219) for proper operation of damper and power exhaust (if so equipped).
  - Top: 6'-0" (1829) to assure proper outdoor fan operation.
  - Local codes or jurisdiction may prevail.
- With the exception of clearance for the outdoor coil and the damper and power exhaust as stated in note no. 5, a removable fence or barricade requires no clearance.
- Dimensions are from outside of corner post. Allow 0' - 5/16" (8) on each side for top cover drip edge.

**ACCESSORY DIMENSIONS – PHH156, 180  
HORIZONTAL ADAPTER INSTALLATION**

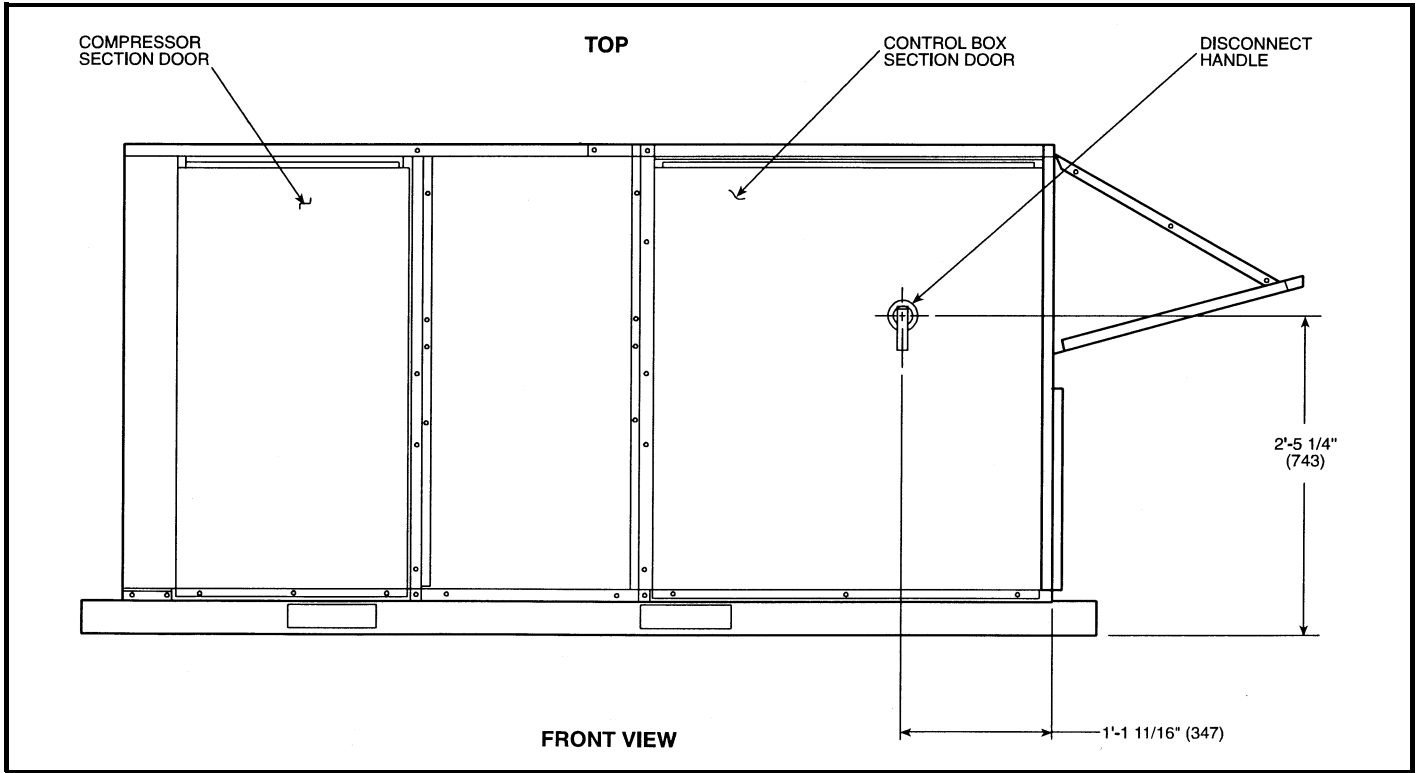


**NOTE:** AXB165CHA is a horizontal adapter and includes an insulated transition duct. The pressure drop through the adapter curb is negligible. Power exhaust and barometric relief accessory are not available with horizontal adapter. For horizontal return applications: The power exhaust and barometric relief dampers must be installed in the return air duct.

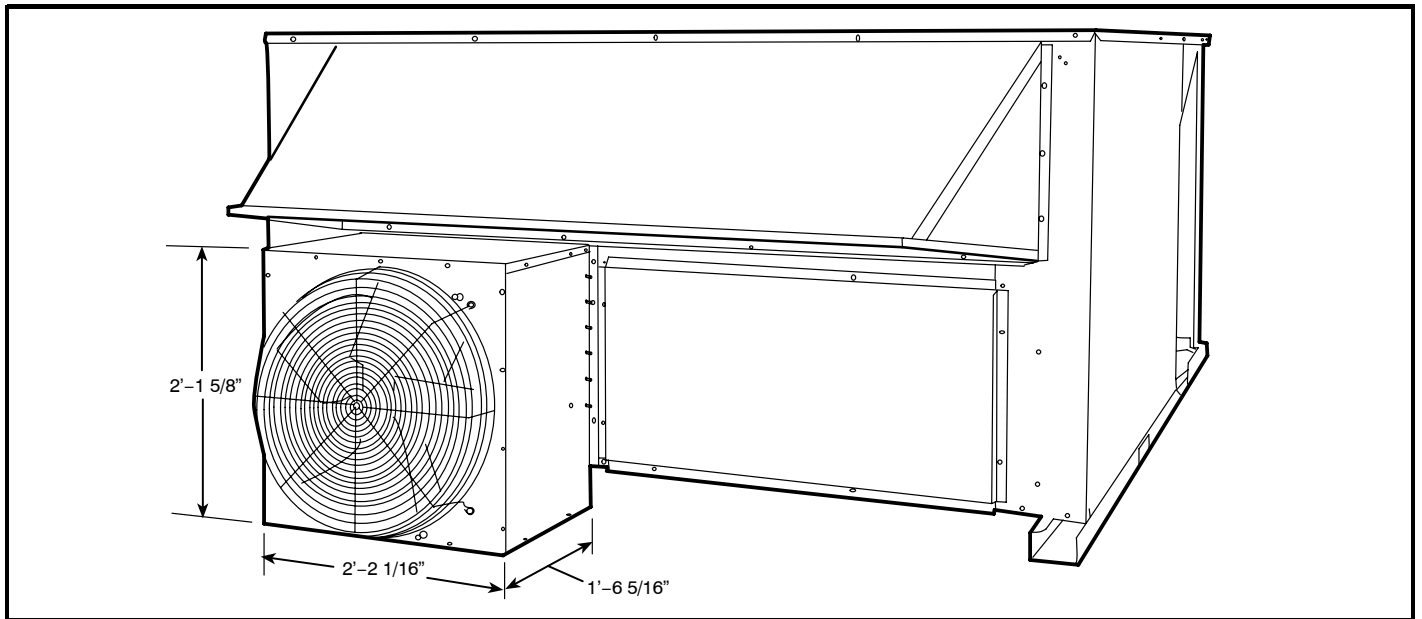


ACCESSORY PACKAGE NO.	CURB HEIGHT	DESCRIPTION
AXB165CHA	1' - 11" (584)	Horizontal Adapter Roof Curb

**ACCESSORY DIMENSIONS - PHH156, 180 (cont.)  
NON-FUSED DISCONNECT**



**POWER EXHAUST**





**PERFORMANCE DATA – PHH156,180**

**COOLING CAPACITIES**

PHH156 (12½ Tons)																
Temp (F) Outdoor Entering Air (Edb)		Indoor Entering Air — Cfm/BF														
		3750/0.04			4500/0.05			5000/0.05			5625/0.06			6250/0.07		
		Indoor Entering Air — Ewb (F)														
		72	67	62	72	67	62	72	67	62	72	67	62	72	67	62
75	TC	167.0	154.0	140.0	171.0	158.0	144.0	173.0	159.0	146.0	171.0	162.0	148.0	173.0	161.0	151.0
	SHC	79.6	100.0	120.0	85.0	108.0	131.0	87.5	114.0	138.0	94.5	120.0	146.0	97.7	127.0	150.0
	kW	10.00	9.77	9.50	10.10	9.87	9.61	10.20	9.93	9.68	10.20	10.00	9.74	10.20	10.00	9.80
85	TC	160.0	148.0	133.0	164.0	151.0	137.0	167.0	154.0	140.0	168.0	155.0	143.0	166.0	157.0	146.0
	SHC	77.6	98.9	118.0	82.0	107.0	129.0	86.1	113.0	136.0	89.6	118.0	142.0	95.3	125.0	146.0
	kW	11.10	10.80	10.40	11.20	10.90	10.60	11.30	11.00	10.70	11.30	11.00	10.80	11.30	11.10	10.80
95	TC	155.0	141.0	127.0	157.0	144.0	131.0	160.0	146.0	133.0	161.0	149.0	137.0	163.0	149.0	140.0
	SHC	76.1	96.3	115.0	80.3	105.0	126.0	84.4	110.0	132.0	86.5	117.0	137.0	91.7	121.0	140.0
	kW	12.20	11.80	11.40	12.20	11.90	11.50	12.40	12.00	11.60	12.40	12.10	11.80	12.50	12.10	11.90
105	TC	147.0	133.0	120.0	150.0	137.0	124.0	152.0	138.0	127.0	153.0	140.0	131.0	154.0	141.0	134.0
	SHC	73.6	93.3	112.0	78.5	102.0	123.0	81.6	108.0	127.0	85.1	114.0	131.0	88.6	120.0	134.0
	kW	13.20	12.70	12.30	13.30	12.90	12.50	13.40	13.00	12.60	13.50	13.10	12.80	13.50	13.10	12.90
115	TC	140.0	126.0	112.0	141.0	129.0	118.0	144.0	130.0	121.0	144.0	131.0	125.0	146.0	133.0	128.0
	SHC	71.4	90.3	109.0	75.1	99.1	117.0	78.9	104.0	121.0	81.9	110.0	125.0	87.0	117.0	128.0
	kW	14.20	13.70	13.20	14.30	13.90	13.50	14.40	14.00	13.70	14.50	14.00	13.90	14.60	14.10	14.00
125	TC	131.0	118.0	105.0	134.0	120.0	111.0	135.0	122.0	115.0	137.0	123.0	118.0	136.0	124.0	121.0
	SHC	68.1	87.6	105.0	73.5	96.4	111.0	75.7	102.0	115.0	80.7	108.0	118.0	83.4	113.0	121.0
	kW	15.20	14.70	14.10	15.40	14.90	14.50	15.40	14.90	14.70	15.60	15.00	14.90	15.60	15.10	15.00

PHH180 (15 Tons)																
Temp (F) Outdoor Entering Air (Edb)		Indoor Entering Air — Cfm/BF														
		4500/0.06			5250/0.08			6000/0.10			6750/0.10			7500/0.12		
		Indoor Entering Air — Ewb (F)														
		72	67	62	72	67	62	72	67	62	72	67	62	72	67	62
75	TC	210.0	192.0	173.4	216.0	196.6	178.4	220.0	202.0	182.2	222.0	204.0	185.6	224.0	206.0	190.2
	SHC	100.6	125.2	148.2	106.0	134.0	160.6	110.6	143.0	172.2	115.0	151.2	183.2	120.2	158.2	190.0
	kW	13.58	13.12	12.66	13.76	13.28	12.84	13.88	13.44	12.98	13.96	13.52	13.10	14.02	13.60	13.26
85	TC	202.0	183.0	164.4	208.0	187.8	169.0	212.0	191.4	172.8	212.0	194.0	177.2	214.0	195.8	182.2
	SHC	98.0	121.8	144.2	103.8	131.2	156.4	109.0	140.0	168.6	112.0	148.0	177.0	116.2	155.6	182.2
	kW	14.86	14.32	13.78	15.08	14.52	13.98	15.22	14.66	14.14	15.26	14.78	14.30	15.34	14.86	14.50
95	TC	192.4	173.2	155.0	196.2	177.8	159.2	200.0	180.8	163.4	202.0	183.4	169.0	204.0	185.4	174.2
	SHC	94.8	118.0	140.0	100.2	127.4	152.6	105.6	136.4	163.4	110.6	144.8	169.0	114.2	153.2	173.8
	kW	16.16	15.52	14.88	16.32	15.72	15.10	16.48	15.88	15.30	16.62	16.00	15.54	16.64	16.12	15.76
105	TC	182.0	163.0	145.0	186.4	167.0	149.4	188.6	170.0	155.4	191.0	172.2	160.8	193.0	173.8	165.2
	SHC	91.0	114.2	135.2	96.8	123.6	147.6	101.8	132.6	155.2	107.2	141.2	160.6	112.2	149.6	165.2
	kW	17.36	16.64	15.92	17.58	16.86	16.16	17.70	17.04	16.48	17.84	17.18	16.74	17.94	17.28	16.96
115	TC	171.2	152.4	134.8	175.0	156.2	140.6	177.8	158.8	146.8	179.4	160.8	152.2	179.6	162.2	156.4
	SHC	87.4	110.2	130.8	92.6	119.4	140.6	98.8	128.2	146.8	103.6	136.8	151.8	107.2	144.6	156.2
	kW	18.54	17.72	16.90	18.76	17.94	17.24	18.94	18.12	17.60	19.02	18.28	17.90	19.04	18.38	18.16
125	TC	159.4	141.2	125.0	162.8	143.8	132.0	165.6	147.0	137.8	166.6	148.8	143.0	168.2	150.0	146.8
	SHC	83.6	105.8	125.0	89.0	115.0	131.8	94.4	123.6	137.8	99.8	132.2	142.8	105.0	139.6	146.6
	kW	19.64	18.74	17.88	19.86	19.00	18.34	20.00	19.12	18.72	20.20	19.28	19.00	20.20	19.40	19.28

**LEGEND**

- BF — Bypass Factor
- Edb — Entering Dry-Bulb
- Ewb — Entering Wet-Bulb
- kW — Compressor Motor Power Input
- SHC — Sensible Heat Capacity (1000 Btuh) Gross
- TC — Total Capacity (1000 Btuh) Gross

**NOTES:**

1. Direct interpolation is permissible. Do not extrapolate.
2. The following formulas may be used:

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

$t_{wb}$  = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil ( $h_{lw}$ )

$$h_{lw} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where:  $h_{ewb}$  = Enthalpy of air entering evaporator coil

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

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMP (°F)					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
Correction Factor						
.05	1.04	2.07	3.11	4.14	5.18	Use formula shown at right.
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.  
Correction Factor = 1.10 x (1-BF) x (edb-80).

**PERFORMANCE DATA – PHH156,180 (cont.)**  
**INTEGRATED HEATING CAPACITIES**

PHH156 (12 1/2 Tons)																					
CFM	Return Air Temp F (db)	Temp Air Entering Outdoor Coil (F db at 75% RH)																			
		-10		0		10		17		20		30		40		47		50		60	
		Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW
3750	55	40.4	7.81	53.0	8.35	65.6	8.89	74.5	9.27	78.5	9.47	91.9	10.10	120.0	11.00	140.0	11.50	147.0	11.80	168.0	12.60
	70	37.7	8.19	49.8	8.85	61.9	9.51	70.3	9.97	74.1	10.20	86.8	11.00	114.0	11.90	133.0	12.50	139.0	12.90	161.0	13.90
	80	35.4	8.41	47.1	9.15	58.8	9.89	67.0	10.40	70.8	10.70	83.4	11.50	109.0	12.50	128.0	13.20	134.0	13.60	156.0	14.70
4500	55	40.3	7.98	53.9	8.49	67.5	9.00	77.0	9.35	80.9	9.54	93.8	10.10	123.0	10.90	144.0	11.40	149.0	11.60	167.0	12.30
	70	36.7	8.38	49.8	9.00	62.9	9.62	72.0	10.00	75.9	10.30	88.6	11.00	116.0	11.80	136.0	12.50	142.0	12.70	163.0	13.60
	80	33.2	8.64	46.4	9.32	59.6	10.00	68.7	10.50	72.6	10.70	85.2	11.50	112.0	12.50	131.0	13.10	137.0	13.40	159.0	14.50
5000	55	41.0	8.11	54.7	8.60	68.4	9.09	78.0	9.43	81.9	9.60	95.0	10.20	124.0	10.90	144.0	11.40	149.0	11.60	165.0	12.10
	70	44.7	8.45	55.2	9.07	65.7	9.69	73.1	10.10	76.9	10.30	89.7	11.00	118.0	11.90	138.0	12.50	143.0	12.70	163.0	13.50
	80	33.6	8.76	47.0	9.43	60.4	10.10	69.8	10.60	73.6	10.80	86.3	11.60	113.0	12.50	132.0	13.10	139.0	13.40	160.0	14.40
5625	55	42.0	8.27	55.7	8.74	69.4	9.21	79.0	9.54	83.0	9.71	96.2	10.30	124.0	10.90	144.0	11.40	148.0	11.50	164.0	12.10
	70	42.7	8.66	54.3	9.24	65.9	9.82	74.1	10.20	77.9	10.40	90.9	11.10	120.0	11.90	140.0	12.50	145.0	12.70	163.0	13.40
	80	34.5	8.94	48.0	9.57	61.5	10.20	70.9	10.70	74.7	10.90	87.4	11.60	115.0	12.50	134.0	13.10	140.0	13.40	160.0	14.30
6250	55	44.0	8.43	57.3	8.89	70.6	9.35	79.9	9.67	83.9	9.83	97.3	10.40	124.0	11.00	143.0	11.40	147.0	11.50	160.0	12.00
	70	45.7	8.79	56.8	9.37	67.9	9.95	75.6	10.40	79.4	10.50	91.9	11.20	120.0	12.00	140.0	12.50	145.0	12.70	161.0	13.30
	80	35.2	9.04	48.8	9.72	62.4	10.40	71.9	10.80	75.7	11.00	88.4	11.70	117.0	12.60	136.0	13.20	142.0	13.40	159.0	14.20

PHH180 (15 Tons)																					
CFM	Return Air Temp F (db)	Temp Air Entering Outdoor Coil (F db at 75% RH)																			
		-10		0		10		17		20		30		40		47		50		60	
		Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW	Cap.	kW
3750	55	46.4	9.80	60.8	10.60	75.6	11.34	85.8	11.84	91.4	12.10	110.0	12.96	150.2	14.00	178.2	14.72	189.4	15.08	228.0	16.32
	70	39.6	10.04	54.4	10.96	69.8	11.86	80.4	12.48	85.8	12.78	103.4	13.82	141.6	15.02	168.4	15.84	179.0	16.26	214.0	17.64
	80	35.0	10.20	50.2	11.20	65.8	12.20	76.8	12.90	81.8	13.24	99.2	14.38	136.0	15.70	161.8	16.60	172.0	17.04	206.0	18.52
4500	55	47.8	10.02	62.0	10.78	77.0	11.48	87.6	11.96	93.2	12.20	112.0	12.98	153.2	13.92	182.2	14.58	193.4	14.90	230.0	15.94
	70	40.6	10.26	55.8	11.16	71.2	12.00	82.0	12.60	87.4	12.90	105.4	13.86	144.6	14.98	172.0	15.74	182.8	16.12	220.0	17.36
	80	36.0	10.44	51.6	11.40	67.4	12.36	78.4	13.04	83.6	13.36	101.0	14.44	138.8	15.68	165.2	16.52	175.8	16.94	212.0	18.30
5000	55	48.6	10.26	63.0	10.98	78.4	11.64	89.2	12.10	94.8	12.32	113.6	13.06	155.2	13.94	184.4	14.56	195.8	14.86	234.0	15.80
	70	41.8	10.50	56.8	11.36	72.6	12.18	83.6	12.76	89.0	13.04	107.2	13.96	147.0	15.00	174.8	15.74	185.8	16.08	222.0	17.24
	80	37.2	10.66	52.8	11.62	68.6	12.54	79.8	13.20	85.0	13.50	103.0	14.56	141.4	15.72	168.2	16.52	179.0	16.90	216.0	18.18
5625	55	49.2	10.50	63.8	11.18	79.4	11.82	90.2	12.26	96.0	12.46	115.2	13.18	158.0	14.02	187.8	14.60	198.4	14.84	234.0	15.64
	70	42.6	10.72	58.0	11.58	73.6	12.38	84.6	12.92	90.2	13.20	108.6	14.08	149.2	15.08	177.6	15.78	188.4	16.10	224.0	17.14
	80	38.2	10.88	54.0	11.84	69.8	12.74	81.0	13.38	86.4	13.68	104.4	14.68	143.4	15.80	170.8	16.58	181.6	16.94	218.0	18.14
6250	55	50.0	10.72	64.6	11.40	80.2	12.00	91.0	12.42	97.0	12.64	116.6	13.30	159.8	14.14	190.0	14.70	200.0	14.92	234.0	15.58
	70	43.4	10.96	58.8	11.80	74.6	12.58	85.6	13.12	91.2	13.36	110.0	14.22	151.0	15.20	179.6	15.88	190.2	16.16	226.0	17.12
	80	39.0	11.12	54.8	12.06	70.8	12.94	82.0	13.56	87.6	13.86	105.6	14.84	145.0	15.92	172.6	16.66	183.6	17.00	220.0	18.16

**LEGEND**

- Cap.** — Capacity (1000 Btuh)
- Edb** — Entering Air Dry-Bulb Temperature (F)
- Ldb** — Leaving Air Dry-Bulb Temperature (F)
- kW** — Compressor and Outdoor-Fan Power Input
- RH** — Relative Humidity

2. Direct interpolation is permissible. Do not extrapolate.
3. When using auxiliary and/or supplementary heating, the maximum allowable leaving-air temperature is 140 F.

$$Ldb\ F = Edb\ F + \frac{\text{Total heating cap. (Btuh)}}{1.10 \times \text{airflow cfm}}$$

4. For supplementary glycol coil:

$$\text{Fluid flow Gpm} = \frac{\text{fluid capacity (Btuh)}}{500 \times \text{fluid temperature drop (F)}}$$

**NOTES:**

1. Integrated heating capacity ratings shown are not adjusted for the effects of the indoor-fan motor power and heat. A deduction has been made for defrosting the outdoor coils at temperatures below 40 F.

**PERFORMANCE DATA – PHH156,180 (cont.)**  
**FAN PERFORMANCE – VERTICAL DISCHARGE UNITS**

PHH156 (208/230 V AND 460 V) (12½ TONS)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	724	481	0.55	838	685	0.78	937	889	1.01	1028	1097	1.25	1111	1309	1.49
4000	754	613	0.70	865	824	0.94	962	1034	1.18	1050	1247	1.42	1131	1463	1.67
4250	786	757	0.86	893	975	1.11	987	1191	1.36	1073	1408	1.60	1152	1629	1.86
4500	818	914	1.04	922	1138	1.30	1013	1360	1.55	1097	1583	1.80	1174	1808	2.06
4750	850	1084	1.23	951	1313	1.50	1040	1541	1.76	1122	1770	2.02	1197	2000	2.28
5000	883	1267	1.44	980	1501	1.71	1068	1736	1.98	1147	1969	2.24	1221	2204	2.51
5250	917	1464	1.67	1011	1703	1.94	1096	1943	2.21	1174	2183	2.49	1246	2423	2.76
5500	950	1675	1.91	1041	1918	2.19	1124	2165	2.47	1201	2409	2.75	1272	2655	3.02
5750	985	1901	2.17	1072	2147	2.45	1153	2400	2.73	1228	2650	3.02	1298	2901	3.31
6000	1020	2142	2.44	1103	2391	2.72	1183	2649	3.02	1256	2905	3.31	1324	3160	3.60
6250	1055	2398	2.73	1135	2650	3.02	1213	2912	3.32	1284	3175	3.62	1352	3435	3.91

PHH156 (208/230 V AND 460 V) (12½ TONS)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3750	1190	1526	1.74	1265	1746	1.99	1337	1972	2.25	1405	2199	2.51	1471	2431	2.77
4000	1208	1684	1.92	1281	1908	2.17	1351	2136	2.43	1418	2368	2.70	1483	2603	2.97
4250	1227	1853	2.11	1299	2082	2.37	1367	2313	2.64	1433	2548	2.90	1496	2787	3.18
4500	1247	2036	2.32	1317	2268	2.58	1384	2503	2.85	1448	2742	3.12	1510	2983	3.40
4750	1269	2232	2.54	1337	2468	2.81	1403	2707	3.08	1465	2948	3.36	1526	3194	3.64
5000	1291	2441	2.78	1358	2680	3.05	1422	2923	3.33	1484	3168	3.61	1544	3418	3.89
5250	1315	2664	3.03	1380	2907	3.31	1443	3154	3.59	1503	3403	3.88	1562	3655	4.16
5500	1339	2900	3.30	1403	3148	3.59	1464	3398	3.87	1524	3651	4.16	—	—	—
5750	1364	3151	3.59	1426	3403	3.88	1486	3657	4.17	—	—	—	—	—	—
6000	1389	3416	3.89	1450	3672	4.18	—	—	—	—	—	—	—	—	—
6250	1415	3695	4.21	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Standard drive range is 891 to 1179 rpm. Alternate drive range is 1227 to 1559. Other rpms may require a field-supplied drive.

**NOTES:**

1. Maximum continuous Bhp is 4.25 and maximum continuous watts are 3775. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Fan performance is identical for horizontal discharge applications using horizontal adapter curb (AXB165CHA).
3. See General Notes for Fan Performance following this section.

**PERFORMANCE DATA – PHH156,180 (cont.)  
FAN PERFORMANCE – VERTICAL DISCHARGE UNITS**

PHH180 (15 TONS)*															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	584	717	0.8	695	952	1.1	798	1205	1.3	893	1483	1.7	984	1786	2.0
4800	609	839	0.9	717	1085	1.2	815	1346	1.5	907	1630	1.8	994	1938	2.2
5100	634	971	1.1	738	1229	1.4	833	1500	1.7	921	1791	2.0	1006	2104	2.4
5400	660	1118	1.3	760	1389	1.6	852	1669	1.9	937	1968	2.2	1019	2286	2.6
5700	687	1284	1.4	783	1566	1.8	873	1858	2.1	956	2165	2.4	1034	2490	2.8
6000	712	1458	1.6	805	1752	2.0	892	2055	2.3	973	2371	2.7	1049	2703	3.0
6300	736	1644	1.8	826	1952	2.2	911	2265	2.5	990	2591	2.9	1064	2930	3.3
6600	763	1856	2.1	851	2176	2.4	933	2502	2.8	1010	2837	3.2	1082	3186	3.6
6900	788	2078	2.3	873	2410	2.7	954	2747	3.1	1029	3093	3.5	1099	3451	3.9
7200	813	2316	2.6	896	2662	3.0	975	3011	3.4	1048	3367	3.8	1117	3734	4.2
7500	841	2584	2.9	921	2943	3.3	998	3304	3.7	1070	3672	4.1	1137	4049	4.5

PHH180 (15 TONS)* (cont)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
4500	1070	2113	2.4	1151	2458	2.8	1229	2819	3.2	1302	3194	3.6	—	—	—
4800	1078	2269	2.5	1157	2620	2.9	1233	2990	3.3	1306	3374	3.8	—	—	—
5100	1086	2439	2.7	1164	2795	3.1	1238	3170	3.5	—	—	—	—	—	—
5400	1097	2626	2.9	1172	2986	3.3	1245	3366	3.8	—	—	—	—	—	—
5700	1110	2835	3.2	1183	3200	3.6	1253	3584	4.0	—	—	—	—	—	—
6000	1122	3053	3.4	1193	3422	3.8	1262	3810	4.3	—	—	—	—	—	—
6300	1135	3286	3.7	1204	3660	4.1	1271	4052	4.5	—	—	—	—	—	—
6600	1151	3549	4.0	1218	3928	4.4	1283	4325	4.8	—	—	—	—	—	—
6900	1167	3821	4.3	1232	4207	4.7	1295	4608	5.2	—	—	—	—	—	—
7200	1183	4113	4.6	1246	4505	5.0	—	—	—	—	—	—	—	—	—
7500	1202	4437	5.0	1264	4837	5.4	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** – Brake Horsepower

**Watts** – Input Watts to Motor

\*Standard drive range is 817 to 1038 rpm. Alternate drive range is 1082 to 1303. Other rpms may require a field-supplied drive.

**NOTES:**

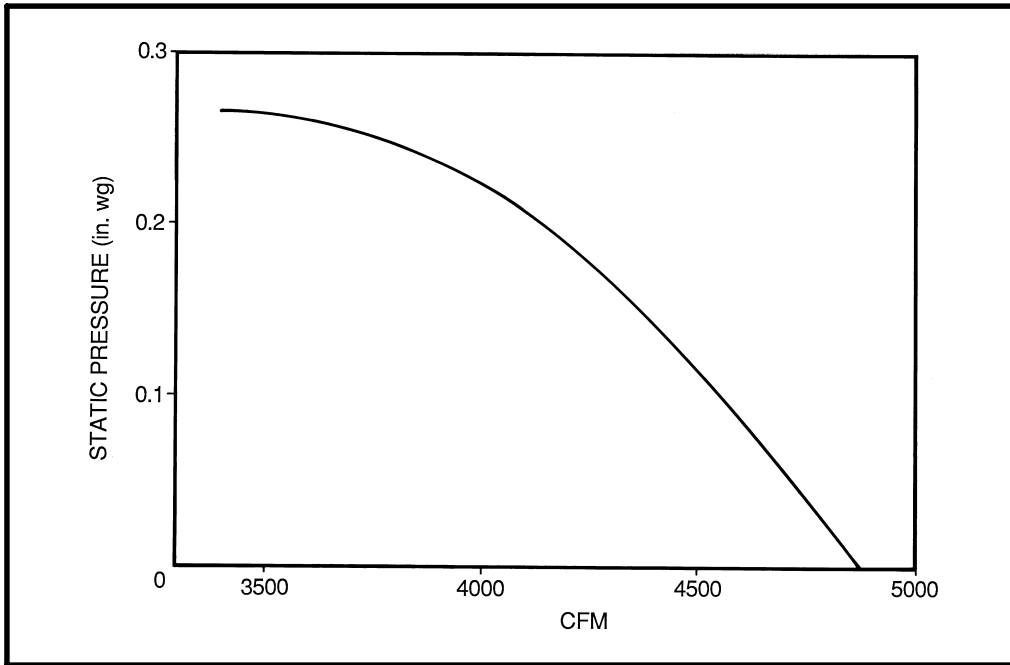
1. Maximum continuous Bhp is 5.90 and maximum continuous watts are 5180. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Fan performance is identical for horizontal discharge applications using horizontal adapter curb (AXB165CHA).
3. See General Notes for Fan Performance following this section.

**GENERAL NOTES FOR FAN PERFORMANCE TABLES:**

1. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Indoor Fan Motor Performance table.
2. Values include losses for filters, unit casing, and wet coils. Refer to Accessory/FIOP Static Pressure tables for accessory static pressure information.
3. Use of a field-supplied motor may affect wire sizing.
4. Interpolation is permissible. Do not extrapolate.

**PERFORMANCE DATA – PHH156,180 (cont.)**

**FAN PERFORMANCE USING ACCESSORY POWER EXHAUST**



**NOTE:** Performance is for the DN series Power Exhaust

**FAN RPM AT MOTOR PULLEY SETTINGS**

UNIT PHH	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
156 (208/230 V and 460 V)†	—	—	1179	1150	1121	1093	1064	1035	1006	978	949	920	891
156 (208/230 V and 460 V)**	—	—	1559	1522	1488	1455	1422	1389	1356	1323	1289	1256	1227
180†	—	—	1038	1023	1001	979	956	934	912	890	868	846	817
180**	—	—	1303	1288	1266	1244	1222	1199	1177	1155	1133	1111	1082

\*Approximate fan rpm shown.

†Indicates standard motor and drive package.

\*\*Indicates standard motor and alternate drive package.

**INDOOR-FAN MOTOR PERFORMANCE – STANDARD MOTORS**

UNIT PHH	UNIT VOLTAGE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	MAXIMUM AMP DRAW	MOTOR EFFICIENCY
156	208/230-3-60	4.25	3775	10.5	85.8
	460-3-60			4.9	85.8
180	208/230-3-60	5.90	5180	15.8	87.5
	460-3-60			7.9	87.5

**Bhp** – Brake Horsepower

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

**ACCESSORY/FIOP STATIC PRESSURE\* (in. wg)**

ACCESSORY/FIOP	UNIT SIZE	UNIT VOLTAGE	kW	CFM							
				3750	4500	5000	5600	6000	6250	7200	7500
Electric Heaters	156	208/230-3-60	14-34	0.05	0.05	0.07	0.08	0.09	0.09	0.11	0.12
			42,56	0.06	0.06	0.08	0.10	0.12	0.13	0.16	0.17
	180	208/230-3-60	26,34	*	*	*	0.08	0.09	0.09	0.11	0.12
			42,59	*	*	*	0.10	0.12	0.13	0.16	0.17
Economizer	156,180	All	—	0.03	0.04	0.05	0.06	0.07	0.07	0.08	0.10

**FIOP** – Factory Installed Option

\*Units with electric heat are not designed to operate at these ranges.

**NOTE:**

1. Heaters are rated at 208/240v, 480v, and 600v.

2. The static pressure must be added to external static pressure. The sum and the indoor-air section entering-air cfm should then be used in conjunction with the Fan Performance table to determine blower rpm, bhp, and watts.

**ELECTRICAL DATA – PHH156,180**

**ELECTRIC HEATING CAPACITIES**

UNIT PHH	HEATER kW			HEATER STAGES	% HEAT PER STAGE	MAXIMUM STAGES*
	Unit Voltages					
	208	230	460			
156	14	19	15	1	100	1
	26	34	32	2	50/50	2
	42	56	55	2	33/67	3
180	26	34	32	2	50/50	2
	42	56	55	2	33/67	3
	—	—	—	2	50/50	4

\*Maximum number of stage using accessory outdoor-air thermostats.

**NOTE:**

1. Heaters are rated at 208/240v, 480v, and 600v. See Multiplication Factors Table below.

**MULTIPLICATION FACTORS**

HEATER RATING VOLTAGE	ACTUAL HEATER VOLTAGE										
	200	208	230	240	380	440	460	480	550	575	600
240	0.694	0.751	0.918	1.000	—	—	—	—	—	—	—
480	—	—	—	—	0.626	0.840	0.918	1.000	—	—	—
600	—	—	—	—	—	—	—	—	0.840	0.918	1.000

**NOTE:**

The following equation converts kW of heat energy to Btuh: kW x 3.413 = Btuh

Example:

34 kW (at 230 v) heater on 208 v  
 = 34.0 (.751 mult factor)  
 = 25.5 kW capacity at 208 v.

UNIT PHH	VOLTAGE (3 PH, 60 Hz)	VOLT AGE RANGE		COMPRESSOR				OUTDOOR FAN MOTOR		INDOOR FAN MOTOR		POWER EXHAUST **		ELECTRIC HEAT *		POWER SUPPLY		DISCONNECT SIZING	
				No. 1		No. 2		Qty	FLA (ea)	Hp	FLA		LRA	FLA	kW	MCA	MOCP†	RLA	LRA
		Min	Max	RLA	LRA	RLA	LRA												
156	208/230	187	253	39.7	228	—	—	3	1.7	3.7	10.5/10.5	—	—	—/—	—/—	65/65	100/100	64/64	387/387
												4.6	18.8	39/45 72/82 117/135	14/19 26/34 42/56	114/122 125/150 175/175 225/225	84/64 94/107 147/167		
	460	414	508	19.9	114	—	—	3	0.8	3.7	4.8	—	—	—	—	32	50	31	189
												2.3	6.0	18 39 66	15 32 55	70/70 119/126 175/175 225/225	69/69 69/69 100/112 152/173		
180	208/230	187	253	28.2	160	28.2	160	3	1.7	5	15.8/158	—	—	—/—	—/—	84/84	110/110	89/89	499/485
												4.6	18.8	72/82 117/135	26/34 42/56	174/187 231/219	101/112 153/173		
	460	414	508	14.1	80	14.1	80	3	0.8	5	7.9	—	—	—	—	42	50	44	238
												2.3	6.0	39 66	32 55	179/191 235/224	106/118 158/179		

**LEGEND**

- FLA — Full Load Amps
- HACR — Heating, Air Conditioning and Refrigeration
- LRA — Locked Rotor Amps
- MCA — Minimum Circuit Amps
- MOCP — Maximum Overcurrent Protection
- NEC — National Electrical Code
- RLA — Rated Load Amps

\*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, 480 v, 600v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly .

† Fuse or HACR circuit breaker. This is the maximum size permissible; smaller fuse sizes may be used where conditions permit.

**NOTES:**

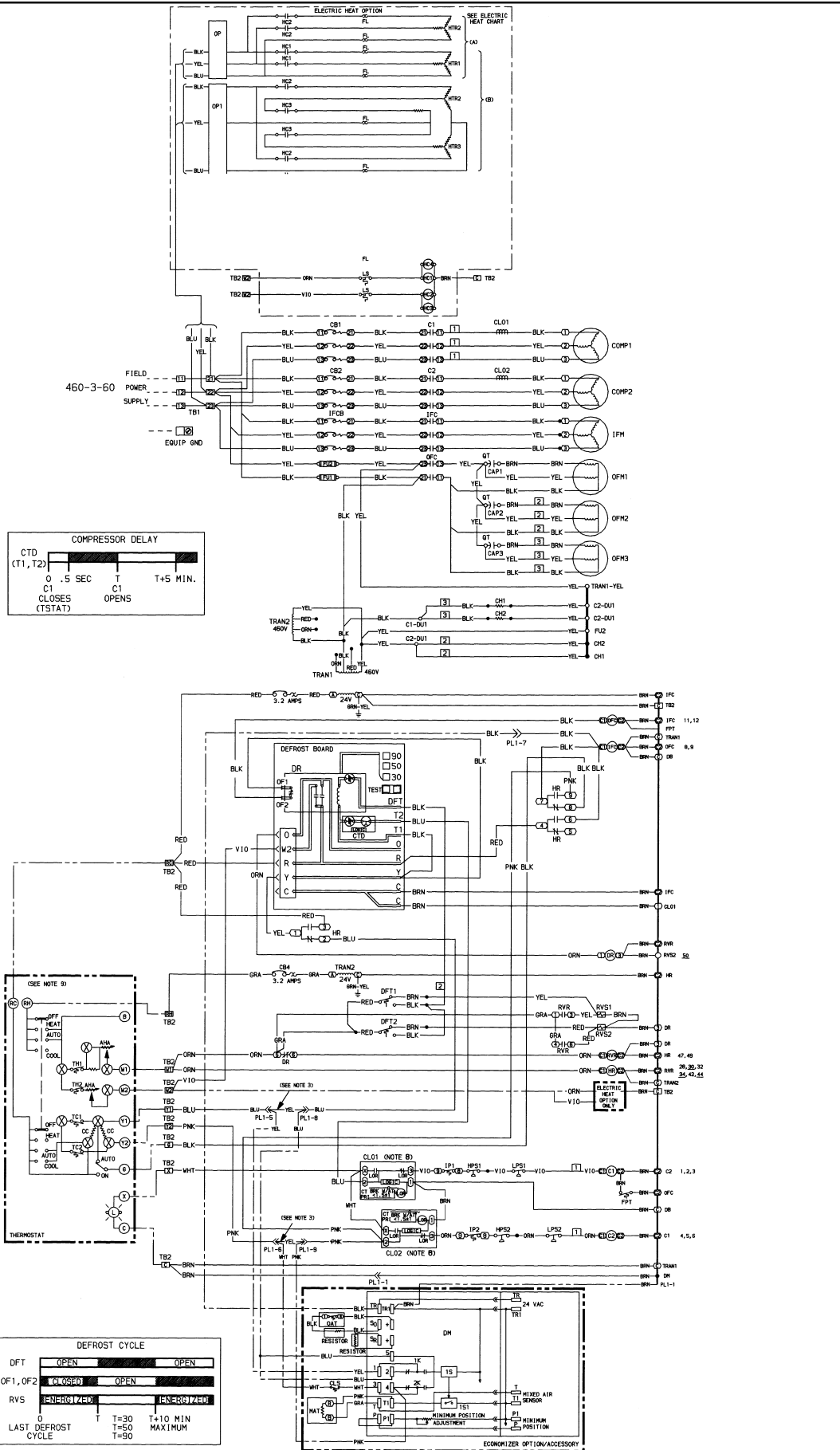
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.
2. MCA calculation for units with electric heaters over 50 kW = (1.25 x IFM amps) + (1.00 x heater FLA).



\*\* NOTE: Performance is for the DN series Power Exhaust

# TYPICAL WIRING SCHEMATIC - PHH180, 460v Shown

ELECTRIC HEAT		
	480V AMPS	480V kW
A	39	32.4
B	66	54.9















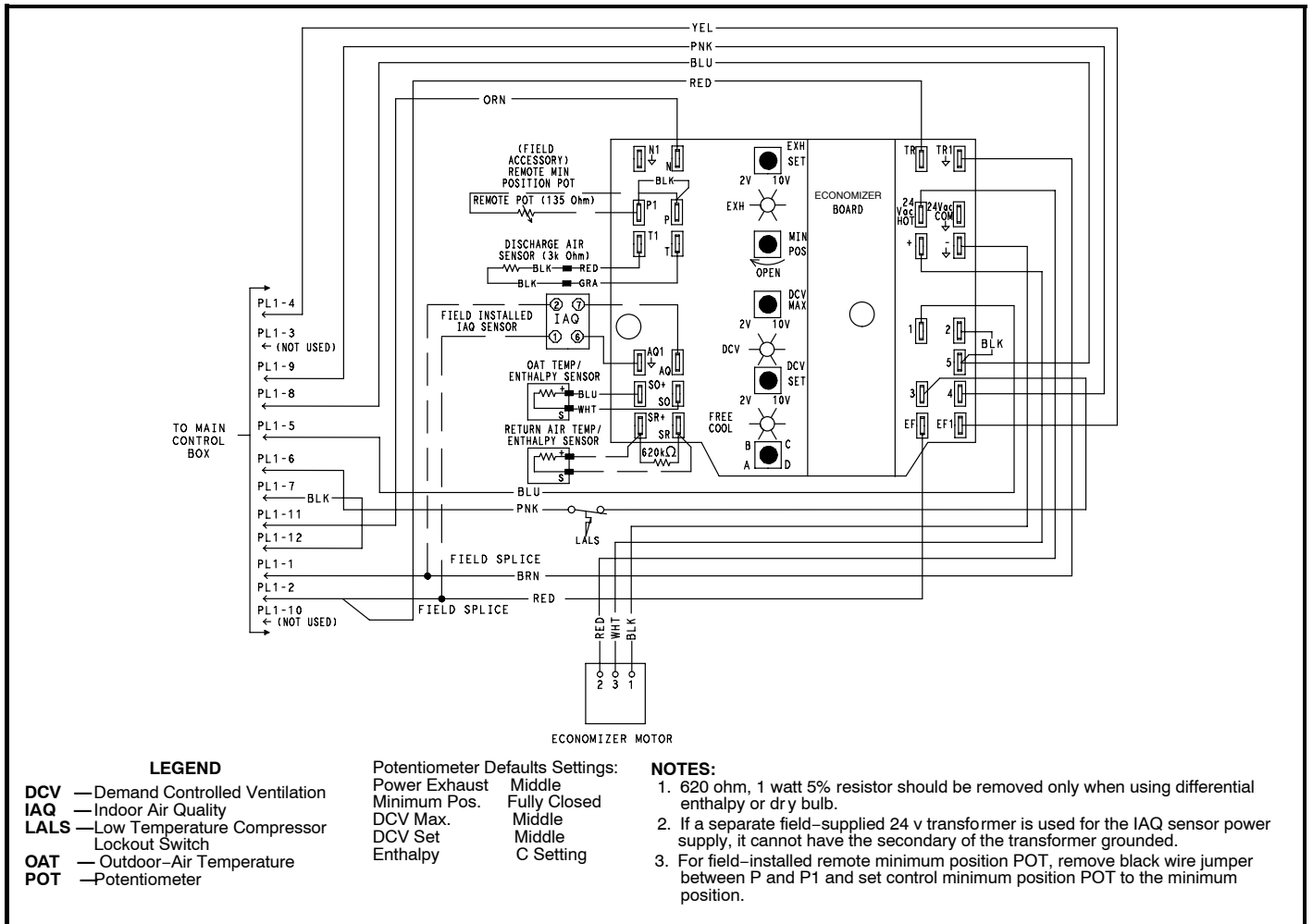
# TYPICAL WIRING SCHEMATIC ECONOMIZER WIRING – PHH156,180

## LEGEND

- C** – Contactor, Compressor
- CAP** – Capacitor
- CB** – Circuit Breaker
- CH** – Crankcase Heater
- CLO** – Compressor Lockout
- COMP** – Compressor Motor
- DB** – Defrost Board
- DFT** – Defrost Thermostat
- FL** – Freeze Protection Limit Switch
- FPT** – Freeze Protection Thermostat
- FU** – Fuse
- GND** – Ground
- HC** – Heater Contactor (Electric Heater)
- HPS** – High-Pressure Switch
- HR** – Heater Relay
- HTR** – Heater
- IFC** – Indoor Fan Contactor
- IFCB** – Indoor Fan Circuit Breaker
- IFM** – Indoor Fan Motor
- IP** – Internal Protection
- LPS** – Low-Pressure/Loss of Charge Switch
- LS** – Limit Switch
- OFM** – Outdoor Fan Motor
- OP** – Overhead Protection
- QT** – Quadruple Terminal

- RVR** – Reversing Valve
- RVS** – Reversing Valve Solenoid
- TB** – Terminal Block
- TRAN** – Transformer

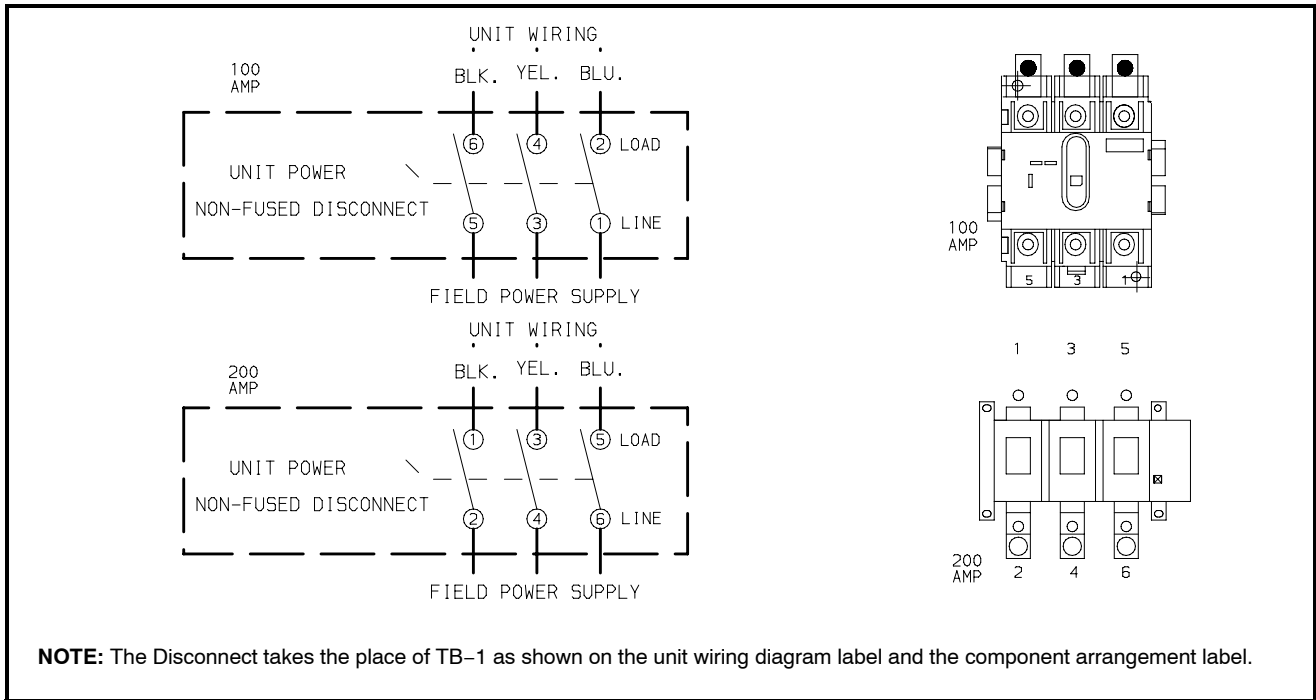
-  Field Splice
-  Terminal (Marked)
-  Marked Wire
-  Terminal (Unmarked)
-  Terminal Block
-  Splice
-  Splice Marked
-  Factory Wiring
-  Field Control Wiring
-  Field Power Wiring
-  Accessory or Optional Wiring
-  To indicate common potential only. Not to represent wiring.



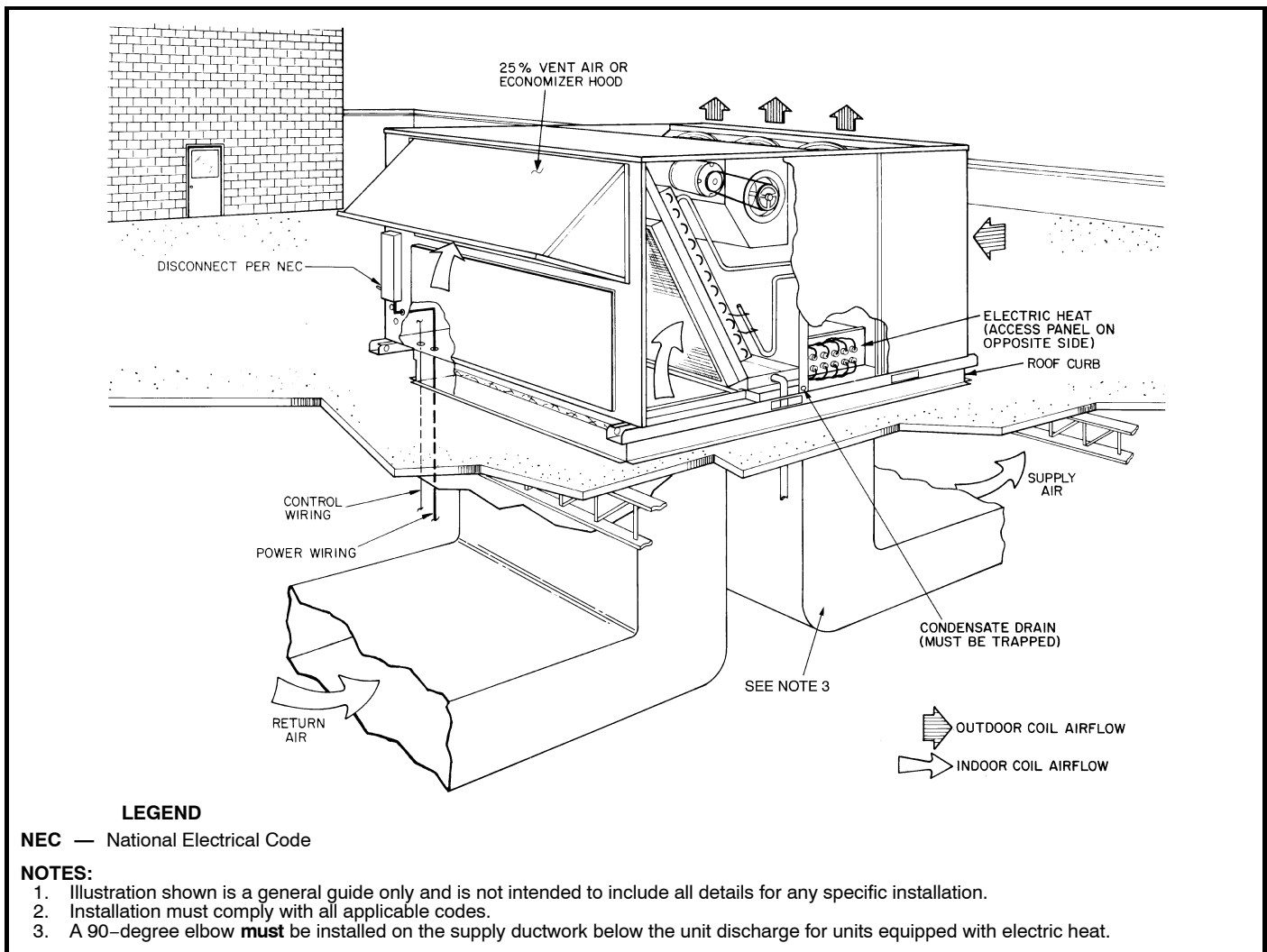
**NOTE:** Wiring is for the DN series Economizer



**TYPICAL WIRING SCHEMATIC – PHH156,180**  
**NON-FUSED DISCONNECT**



**TYPICAL PIPING AND WIRING – PHH156,180**



**CONSTANT VOLUME APPLICATION**

**PART 1 — GENERAL**

**1.01 SYSTEM DESCRIPTION**

Outdoor rooftop mounted, electrically controlled air-to-air heat pump unit utilizing scroll compressor (PHH036–120) reciprocating, semi-hermetic compressor(s) (PHH156–180) for cooling duty and electric resistance coils for heating duty. Unit shall discharge supply air vertically or horizontally (with horizontal supply/return adapter assembly or roof curb) as shown on contract drawings.

**1.02 QUALITY ASSURANCE**

- A. Unit shall be rated in accordance with ARI Standards 210/ 240 or 360 and 270. Designed in accordance with UL Standard 1995. Units shall be Energy Star qualified.
- B. Unit shall be designed to conform to ASHRAE 15, latest revision.
- C. Unit shall be UL–tested and certified in accordance with ANSI Z21.47 Standards and UL–listed and certified under Canadian standards as a total package for safety requirements.
- D. Roof curb shall be designed to conform to NRCA Standards.
- E. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- F. Unit casing shall be capable of withstanding 500–hour salt spray exposure per ASTM B117 (scribed specimen).
- G. Unit shall be designed in accordance with ISO 9001:2000, and shall be manufactured in a facility registered to ISO 9001:2000.
- H. Each unit shall be subjected to a completely automated run testing on the assembly line. Units contain a factory–supplied printout indicating tested pressures, amperages, data, and inspectors; providing certification of the unit status at the time of manufacture.

**1.03 DELIVERY, STORAGE, AND HANDLING**

Unit shall be stored and handled per manufacturer’s recommendations.

**PART 2 — PRODUCTS**

**2.01 EQUIPMENT (STANDARD)**

**A. General:**

Factory assembled, single–piece heat pump unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, refrigerant charge (R–22), and special features required prior to field start–up.

**B. Unit Cabinet:**

- 1. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a pre–painted baked enamel finish on all externally exposed surfaces.
- 2. Indoor fan compartment interior cabinet surfaces shall be insulated with a minimum 1/2–in. thick, 1 lb. density, flexible fiberglass insulation, neoprene coated on the air side.
- 3. Cabinet panels shall be easily removable for servicing.
- 4. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
- 5. Unit shall have a factory–installed, sloped condensate drain pan made of a non–corrosive material, providing a minimum 3/4–in. 14 NPT connection with both vertical and horizontal drains, and shall comply with ASHRAE Standard 62.
- 6. Unit shall have a factory–installed filter access panel to provide filter access with tool–less removal.
- 7. Unit shall have standard thru–the–bottom gas and power connection capability (accessory kit is required).

**C. Fans:**

**1. Indoor Fan:**

- a. (PHH036–120) Fan shall be belt driven as shown on the equipment drawings. Belt drive shall include an adjustable–pitch motor pulley.
- b. (PHH156–180) Fan shall be belt driven with an adjustable–pitch motor pulley. The standard fan drive shall

have a factory–installed low–medium static pressure fan drive. The alternate fan drive option shall have a factory–installed high–static pressure fan drive.

- c. Fan wheel shall be double–inlet type with forward–curved blades.
- d. Bearings shall be sealed, permanently lubricated ball–bearing type for longer life and lower maintenance.
- e. Bearings shall be pillow block type (180 only).
- 2. Indoor fan shall be made from steel with a corrosion–resistant finish and shall be dynamically balanced.
- 3. Outdoor fan shall be of the direct–driven (with totally enclosed motors) propeller type and shall discharge air vertically.
- 4. Outdoor fan shall have aluminum blades riveted to corrosion–resistant steel spiders and shall be dynamically balanced.
- D. Compressor(s):
  - 1. Scroll compressor (PHH036–120), reciprocating, semi–hermetic compressor(s) (PHH156–180) with factory–installed crankcase heaters.
  - 2. Factory mounted on rubber grommets and internally spring mounted for vibration isolation.
  - 3. On dual electrically and mechanically independent circuits (090–120,180).
  - 4. The size 156 unit semi–hermetic compressor shall be equipped with an electric unloader for capacity control.
- E. Coils:
  - 1. Standard indoor and outdoor coils shall have copper or aluminum plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
  - 2. Coils shall be leak tested at 156 psig (1034 kPa) and pressure tested at 450 psig (3103 kPa).
  - 3. Coils:
    - a. Copper–fin coils shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.
- F. Heating Section:
  - 1. May be equipped with field–installed electric resistance heater(s) of the characteristics shown in the equipment schedule.
  - 2. Heater elements shall be open wire, adequately supported and insulated with ceramic bushings.
- G. Refrigerant Components: Refrigerant circuit components shall include:
  - 1. Fixed orifice metering system.
  - 2. Refrigerant filter drier.
  - 3. Reversing valve.
  - 4. Service gage connections on suction, discharge, and liquid lines.
- H. Filter Section:
  - 1. Standard filter section shall consist of factory–installed, low velocity, throwaway 2–in. thick fiberglass filters of commercially available sizes.
  - 2. Filter face velocity shall not exceed 320 fpm at nominal airflows.
  - 3. Filter section should use only one size filter.
  - 4. Filters shall be accessible through an access panel with “no–tool” removal.

## GUIDE SPECIFICATIONS – PHH036–180 (cont.)

### I. Controls and Safeties:

1. Unit Controls: Unit shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side.

#### 2. Safeties:

a. Unit shall incorporate a solid-state compressor protector which provides anti-cycle reset capability at the space thermostat, should any of the following standard safety devices trip and shut off compressor.

- 1) Compressor overtemperature, overcurrent.
- 2) Loss-of-charge/low-pressure switch.
- 3) Freeze-protection thermostat, evaporator coil.
- 4) High-pressure switch.
- 5) Automatic reset motor thermal overload protector. The lockout protection shall be easily disconnected at the control board, if necessary.

b. Heating section shall be provided with the following minimum protections:

- 1) High-temperature limit switches.
- 2) Overcurrent protection.

c. Unit shall incorporate an outdoor coil defrost system to prevent excessive frost accumulation during heating duty, and shall be controlled as follows:

- 1) Defrost shall be initiated on the basis of time and coil temperature.
- 2) A 30/50/90-minute timer shall activate defrost cycle only if the coil temperature is low enough to indicate a heavy frost condition.
- 3) Defrost cycle shall terminate when defrost thermostats are satisfied and shall have a positive termination time of 10 minutes.

### J. Operating Characteristics:

1. Unit shall be capable of starting and running at 125° F ambient outdoor temperature, meeting maximum load criteria of ARI Standard 210/240 or 360 at ± 10% voltage.

2. Compressor with standard controls shall be capable of operation down to 25° F (PHH036–120), 40° F (PHH156–180) (in cooling mode) ambient outdoor temperature.

3. Compressor with standard controls shall be capable of operation down to –20° F (in heating mode) ambient outdoor temperature.

4. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using accessory electric heaters.

### K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single factory-predrilled location.

### L. Motors:

1. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have line break thermal and current overload protection.

2. Indoor-fan motor shall have permanently lubricated bearings and inherent automatic-reset thermal overload protection.

3. Totally enclosed outdoor-fan motor shall have permanently lubricated bearings, and inherent automatic-reset thermal overload protection.

### M. Special Features

#### 1. Integrated Economizers

a. Integrated integral modulating type capable of simultaneous economizer and compressor operation.

b. Available as a factory-installed option in vertical supply/return configuration only. (Available as a field-installed accessory for dedicated horizontal and/or vertical supply return configurations.)

c. Includes all hardware and controls to provide cooling with outdoor air.

d. Equipped with low-leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.

e. Capable of introducing up to 100% outdoor air.

f. Economizer shall be equipped with a barometric relief damper.

g. Designed to close damper(s) during loss-of power situations with spring return built into motor.

h. Dry bulb outdoor-air temperature sensor shall be provided as standard. Outdoor air sensor set point is adjustable and shall range from 40° to 100° F. For the economizer, the return air sensor, indoor enthalpy sensor, and outdoor enthalpy sensor shall be provided as field installed accessories to provide enthalpy control, differential enthalpy control, and differential dry bulb temperature control.

i. Economizer controller shall use a mixed air thermistor mounted on the evaporator fan housing to control economizer operation to a supply air temperature of 55° F.

j. The economizer shall have a gear-driven parallel blade design.

k. Economizer microprocessor control shall provide control of internal building pressure through its accessory power exhaust function. Factory set at 100%, with a range of 0% to 100%.

l. Economizer Microprocessor Occupied Minimum Damper Position Setting maintains the minimum airflow into the building during occupied period providing design ventilation rate for full occupancy (damper position during heating). A remote potentiometer may be used to override the set point.

m. Economizer Microprocessor Unoccupied Minimum Damper Position Setting – The economizer damper shall be completely closed when the unit is in the occupied mode.

n. Economizer controller IAQ/DCV control modulates the outdoor-air damper to provide ventilation based on the optional 2 to 10 vdc CO2 sensor input.

o. Compressor lockout sensor (opens at 35° F, closes at 50° F).

p. Actuator shall be direct coupled to economizer gear, eliminating linkage arms and rods.

q. Control LEDs:

1. When the outdoor-air damper is capable of providing free cooling, the “Free Cool” LED shall illuminate.

2. The IAQ LED indicates when the module is on the DCV mode.

3. The EXH LED indicates when the exhaust fan contact is closed.

r. Remote Minimum Position Control – A field-installed accessory remote potentiometer shall allow the outdoor-air damper to be opened or closed beyond the minimum position in the occupied mode for modified ventilation.

## CONTROLS

### SEQUENCE OF OPERATION — PHH036—120

**Units Without Economizer** — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor—fan contactor (IFC), reversing valve solenoid (RVS1 for sizes 036—72) (RVS1 and RVS2 for sizes 090—120) and compressor contactor are energized and indoor—fan motor, compressor, and outdoor fan starts. The outdoor—fan motor runs continuously while unit is cooling.

**Heating, Units Without Economizer** — Upon a request for heating from the space thermostat, terminal W1 will be energized with 24 v. The IFC, outdoor—fan contactor (OFC), C1, and C2 will be energized. The indoor fan, outdoor fans, and compressor no. 1, and compressor no. 2 are energized and reversing valves are deenergized and switch position. If the space temperature continues to fall while W1 is energized, W2 will be energized with 24 v, and the heater contactor(s) (HC) will be energized, which will energize the electric heater(s).

When the space thermostat is satisfied, W2 will be deenergized first, and the electric heater(s) will be deenergized. Upon a further rise in space temperature, W1 will be deenergized.

**Cooling, Units With Economizer** — When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor—air damper is modulated by the Economizer control to provide a 50° to 55°F mixed—air temperature into the zone. As the mixed—air temperature fluctuates above 55° or below 50° F, the dampers will be modulated (open or close) to bring the mixed—air temperature back within control.

If mechanical cooling is utilized with free cooling, the outdoor—air damper will maintain its current position at the time the compressor is started. If the increase in cooling capacity causes the mixed—air temperature to drop below 45° F, then the outdoor—air damper position will be decreased to the minimum position. If the mixed—air temperature continues to fall, the outdoor—air damper will close. Control returns to normal once the mixed—air temperature rises above 48° F.

If optional power exhaust is installed, as the outdoor—air damper opens and closes, the power exhaust fans will be energized and deenergized.

If field—installed accessory CO<sub>2</sub> sensors are connected to the Economizer control, a demand controlled ventilation strategy will begin to operate. As the CO<sub>2</sub> level in the zone increases above the CO<sub>2</sub> set point, the minimum position of the damper will be increased proportionally. As the CO<sub>2</sub> level decreases because of the increase in fresh air, the outdoor—air damper will be proportionally closed.

For Economizer operation, there must be a thermostat call for the fan (G). If the unit is occupied and the fan is on, the damper will operate at minimum position. Otherwise, the damper will be closed.

When the Economizer control is in the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the Economizer damper to the minimum position.

On the initial power to the Economizer control, it will take the damper up to 2½ minutes before it begins to position itself. Any change in damper position will take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between 1½ and 2½ minutes.

If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed—air temperature set point at 50 to 55° F.

If there is a further demand for cooling (cooling second stage — Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed—air temperature set point. The Economizer damper will be open at maximum position. Economizer operation is limited to a single compressor.

**Heating, Units With Economizer** — When the room temperature calls for heat through terminal W1, the indoor (evaporator) fan contactor (IFC) and heater contactor no. 1 (HC1) are energized and the reversing valve(s) deenergize and switches position. On units equipped for 2 stages of heat, when additional heat is needed, heater contactor no. 2 is energized through W2. The economizer damper

moves to the minimum position. When the thermostat is satisfied, the damper moves to the fully closed position.

**Defrost (PHH036—072)** — As frost builds up on the outdoor coil, the coil temperature drops below 28°F. When this outdoor—coil temperature drop is sensed by the defrost thermostat (DFT) and the defrost timer is at the end of a timed period (adjustable at 30, 50, or 90 minutes), the unit operates in a defrost cycle controlled by the defrost timer and thermostat. During this cycle, the reversing valve solenoid (RVS) is energized and the outdoor fan shuts off. The electric heaters (if installed) will be energized.

The unit continues to defrost until the coil temperature as measured by DFT reaches 65°F, or the duration of defrost cycle completes a 10—minute period.

At the end of the defrost cycle, the electric heaters (if installed) and the reversing valve will be deenergized, and the outdoor—fan motor will be energized. The unit will now operate in the Heating mode.

If the thermostat is satisfied during a defrost cycle, the unit will continue in the Defrost mode until the time or temperature constraints are satisfied.

**Defrost (PHH090—120)** — When the temperature of the outdoor coil drops below 28°F as sensed by the defrost thermostat (DFT2) and the defrost timer is at the end of a timed period (adjustable at 30, 50, or 90 minutes), reversing valve solenoids (RVS1 and RVS2) are energized and the OFC is deenergized. This switches the position of the reversing valves and shuts off the outdoor fan. The electric heaters (if installed) will be energized.

The unit continues to defrost until the coil temperature as measured by DFT2 reaches 65°F, or the duration of defrost cycle completes a 10—minute period.

During the Defrost mode, if circuit 1 defrosts first, RVS1 will oscillate between Heating and Cooling modes until the Defrost mode is complete.

At the end of the defrost cycle, the electric heaters (if installed) will be deenergized; the reversing valves switch and the outdoor—fan motor will be energized. The unit will now operate in the Heating mode.

If the space thermostat is satisfied during a defrost cycle, the unit will continue in the Defrost mode until the time or temperature constraints are satisfied.

**Automatic Changeover** — When the system selection switch is set at AUTO. position, unit automatically changes from heating operation to cooling operation when the temperature of the conditioned space rises to the cooling level setting. When the temperature of the conditioned space falls to the heating level setting, unit automatically changes from cooling to heating operation (with a 3°F deadband in between).

**Continuous Air Circulation** — Turn unit power on. Set system control at OFF position. Set fan switch at ON position. The indoor—fan contactor is energized through the thermostat switch and the indoor fan runs continuously.

**Compressor Protection** — If unit operation is interrupted by an open high—pressure switch, low—pressure switch, indoor coil freezestat, or by compressor internal line—break device (overcurrent or overtemperature), and compressor is calling for either cooling or heating, the cycle locking protection device simultaneously locks out unit and lights a warning light on the thermostat. Restart the unit by manually turning thermostat to OFF and then to ON position. If any of the protective devices opens again, the unit continues to lock out until corrective action is taken.

**NOTE:** If the unit fails to operate due to compressor overcurrent condition, restart by manually resetting circuit breakers at the unit. Restart cannot be accomplished at the room thermostat.

**Emergency Heat** — If compressor is inoperative due to a tripped safety device (high or low pressure, indoor coil freezestat, overcurrent, or overtemperature), the cycle—locking device locks out the compressor and lights a warning light on the room thermostat. When the switch is on (thermostat is set to the EM HT position), compressor circuit and outdoor thermostats are bypassed, and the second stage of thermostat energizes the indoor blower and the electric resistance heaters.

## CONTROLS PHH036–180 (cont.)

### SEQUENCE OF OPERATION — PHH156,180

**Cooling, Units Without Economizer** — With unit main power on, set thermostat to COOL position and desired room temperature. Set fan switch at AUTO. (on demand) or ON continuous) position. On a rise in room temperature, cooling contactor no. 1 in the thermostat closes. The indoor and outdoor fan motors start. If the 5–minute compressor time–delay (CTD) on the defrost board (DB) is satisfied, then compressor no. 1 (PHH180) or unloaded compressor (PHH156) contactor is energized and compressor will start. Compressor cycles on demand of the thermostat to satisfy room conditions. Each time the cooling contactor no. 1 opens, the CTD starts the 5–minute delay.

On PHH180 units, with an additional rise in room temperature, cooling contactor no. 2 in the thermostat closes, energizing compressor contactor no. 2. Compressor no. 2 starts and cycles on demand of the thermostat to satisfy the occupied space demands.

On PHH156 units, compressor runs fully loaded on a call for second–stage cooling.

**Cooling, Units With Economizer** — Upon a call for cooling, when outdoor ambient temperature is above the temperature control setting, the indoor and outdoor fans and compressor(s) energize. The economizer damper moves to vent position.

Upon a first–stage call for cooling, when outdoor ambient temperature is below the temperature control setting, the indoor fan starts and economizer damper modulates to maintain mixed–air temperature. The compressor(s) remains off.

Upon a second–stage call for cooling, compressor no. 1 (PHH180) or loaded compressor (PHH156) is energized and mechanical cooling is integrated with economizer cooling. Compressor no. 2 (PHH180) is locked out. If the air temperature is below 50°F, a cooling lockout switch prevents the compressor(s) from running. When supply–air temperature drops below a fixed set point, the economizer damper modulates to maintain the temperature at the fixed set point.

A freeze protection thermostat (FPT) is located on the indoor coil. It detects frost build–up and turns off the compressor(s), allowing the coil to clear. Once frost has melted, the compressor can be reenergized.

**Heating, Units Without Economizer** — With unit main power on, set thermostat at HEAT position and desired room temperature. Set fan switch at AUTO. (on demand) or ON (continuous) position.

On a drop in room temperature, heating contactor no. 1 in the thermostat closes, energizing heat relay (HR), reversing valve relay (RVR), reversing valve solenoids (RVS1 and RVS2) and compressor no. 2 contactor. Compressor (size 156) or compressor no. 2 (size 180) and indoor and outdoor fan motors start. If the 5–minute CTD on the DB is satisfied, then compressor no. 1 contactor is energized and compressor no. 1 will start.

On units equipped with electric heat, when additional heat is needed, heating contactor no. 2 in the thermostat closes, energizing W2.

**Heating, Units With Economizer** — With unit main power on, set thermostat at HEAT position and desired room temperature. Set fan switch at AUTO. (on demand) or ON (continuous) position.

On a drop in room temperature, heating contactor no. 1 in the thermostat closes, energizing heat relay (HR), reversing valve relay (RVR), reversing valve solenoids (RVS1 and RVS2) and compressor no. 2 contactor. Compressor no. 2 (size 180) and indoor and outdoor fan motors start. If the 5–minute CTD on the DB is satisfied, then compressor (size 156) or compressor no. 1 (180) contactor is energized and compressor (156) or compressor no. 1 (180) will start. The outdoor–air damper stays at vent position while the indoor fan is operating.

On units equipped with electric heat, when additional heat is needed, heating contactor no. 2 in the thermostat closes, energizing W2.

**Defrost Cycle** — When the temperature of the outdoor coil drops below 28°F as sensed by the defrost thermostat (DFT1 or DFT2), the defrost timer starts. At the end of a timed period (field set at 30, 50, or 90 minutes), the defrost cycle will begin. The defrost board energizes terminals O and W2, energizes the defrost relay (DR), deenergizes the reversing valve solenoids (RVS1 and RVS2), and energizes the electric heat. The outdoor–fan motor will stop.

During the defrost mode, when a circuit defrosts, RVS will oscillate between heating and cooling modes until defrost mode is complete. At the end of the defrost cycle, the electric heaters (if applicable) will be deenergized, the reversing valve solenoids will be energized, and the outdoor fans will start.