



GUIDE SPECIFICATIONS AQUARIUS II

AP Series Two Stage R-410A

GENERAL

Units shall be performance certified to ISO standard 13256-1 for Water Loop Heat Pump, Ground Water Heat Pump and Ground Loop Heat Pump applications. Units shall be Underwriter Laboratories (UL and ULc) listed for safety on all models. Each unit shall be run tested at the factory. Each unit shall be pallet mounted and stretch wrapped. The units shall be manufactured in an ISO9001:2000 certified facility.

The units shall be warranted by the manufacturer against defects in materials and workmanship for a period of i) in the case of residentially sold units having the last digit of the serial number as a 'T'; five years on all parts and 10 years on the refrigerant circuit components ii) on all other units; five years on the compressor and one year on all other parts.

The units shall be designed to operate with entering fluid temperatures between 50°F (10°C) and 110°F (43.3°C) in cooling and temperatures between 20°F (-6.6°C) and 80°F (27°C) in heating as manufactured by FHP Manufacturing in Fort Lauderdale, Florida.

CASING & CABINET

The cabinet shall be fabricated from heavy-gauge steel finished with a vinyl coated black cabinet and decorative gold anodized aluminum front panel for corrosion protection. The interior shall be insulated with ½" (12.7mm) thick foil faced glass fiber. All units shall allow sufficient service access to replace the compressor without unit removal. One blower and two compressor compartment access panels shall be removable with supply and return ductwork in place. A duct collar shall be provided on the supply air opening. A filter rack with 2" (50.8 mm) thick disposable filters and a 1" (25.4mm) return air duct collar shall be provided with each unit. Air filters shall be MERV 11 rated. The units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise, and to permit service testing without air bypass. Units shall have a stainless steel condensate drain pan. The compressor shall have a floating base pan to minimize noise transmissions.

REFRIGERATION CIRCUITS

All units shall contain a sealed refrigerant circuit including a two stage scroll compressor, bi-directional thermal expansion valve metering device, finned tube air-to-refrigerant heat exchanger, refrigerant reversing valve and service ports. Compressor shall be high efficiency two stage scroll type, designed for heat pump duty, quiet operation and mounted on rubber vibration isolators. Compressor motors shall be equipped with overload protection. Refrigerant reversing valves shall be pilot operated sliding piston type with replaceable encapsulated magnetic coils energized only during the cooling cycle. The finned tube coil shall be constructed of lanced aluminum fins not exceeding fourteen fins per inch bonded to rifled copper tubes in a staggered pattern not less than three rows deep and have a 450 PSIG (3100 kPa) working pressure. Coils shall have a baked polyester enamel coating for protection against most airborne chemicals. Coil end plates shall be aluminum. The coaxial water-to-refrigerant heat exchanger shall be constructed of a convoluted copper (optional cupronickel) inner tube and steel outer tube with a designed refrigerant working pressure of 450 PSIG (3100 kPa) and a designed water side working pressure of no less than 400 PSIG (2750 kPa). The water-to-refrigerant heat exchanger shall be insulated to prevent condensation at low fluid temperatures.

FAN MOTOR & ASSEMBLY

The fan shall be direct drive centrifugal forward curved type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low velocity operation. The fan housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of

the fan motor. The fan motor shall be an ECM-2 microprocessor controlled DC type motor with internal programming factory set for the specific unit and featuring soft start/stop and a delay off feature for maximum efficiency and quiet operation. Air flow rates shall be varied according to the staging of the unit. There will further be provisions for adjusting the air delivery of the motor and blower by +/- 15% from rated air flow.

ELECTRICAL

Controls and safety devices will be factory wired and mounted within the unit. Controls shall include comfort alert module, compressor contactor, 24V transformer, reversing valve coil and solid state lock-out controller (UPM). The UPM controller shall include the following features: diagnostic LED's, low pressure bypass time delay (to prevent nuisance low pressure lock-outs during operation with low fluid temperatures), anti short cycle time delay, random start time delay and one time intelligent reset. When the safety controls are activated the lock-out circuit shall reset itself the first time. If the safety controls are subsequently activated within one hour, then the lock-out circuit shall disable the compressor until it is reset at the thermostat or main circuit breaker to prevent compressor operation during fault conditions. A lock-out indicating terminal shall be provided in the low voltage circuit. Safety devices include a low pressure cutout set at 40 PSIG (280 kPa) for loss of charge protection (freezestat and/or high discharge gas temperature sensor is not acceptable) and a high pressure cutout control set at 600 PSIG (4100 kPa).

The ECM motor interface board shall provide a screw type terminal block for thermostat connection, LED's to indicate thermostat status and air delivery. It shall also provide a means of changing the motor program to any of up to four pre-programmed options. Direct wiring of the motor control harness to the thermostat is not acceptable.

A terminal block with screw terminals shall be provided for control wiring. An optional condensate overflow device shall be factory installed to stop compressor operation if drain pan overflow is imminent. An optional energy management relay to allow unit control by an external source shall be factory installed.

PIPING

Supply, return water and condensate drain connections shall be brass female pipe thread fittings and mounted flush to cabinet exterior.

INTERNAL ELECTRIC HEAT

208/230-1-60 volt units shall be equipped with optional factory installed internal electric resistance heat for auxiliary and emergency heat. Electric heater must be Underwriter's Laboratories (UL and ULc) approved for safety when installed in the unit. External heater packages or heater packages not specifically listed for use with the unit are unacceptable. Electric heater packages shall include a heater collar mounted to the blower outlet, individual thermal overload protected heater elements no greater than 5kW each and magnetic contactors. Heater packages shall have a separate power supply connection from the compressor and this power supply shall also power the unit blower motor and control transformer for safe operation.

HEAT RECOVERY PACKAGE

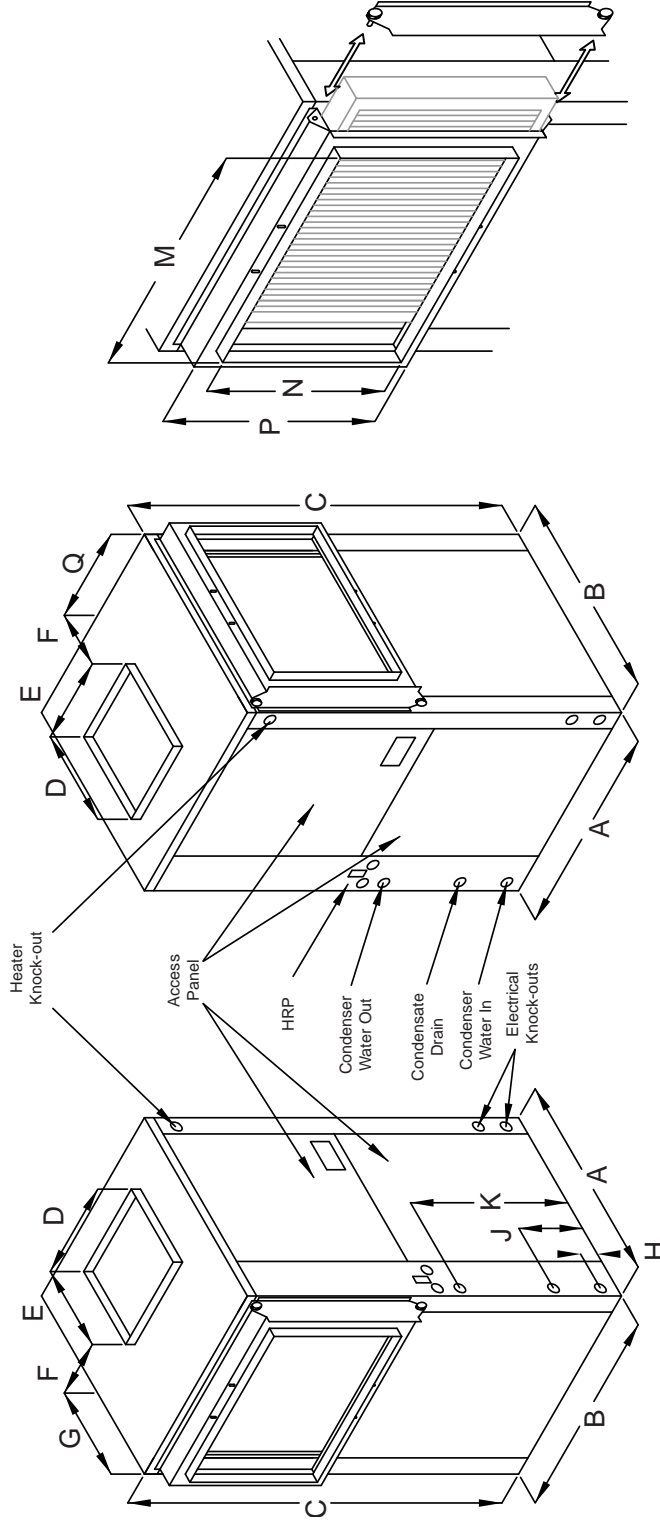
208/230 volt units shall be equipped with an optional factory installed internal heat recovery kit for domestic hot water production. This kit shall include an internally protected pump, double walled coaxial water-to-refrigerant heat exchanger, 140°F (60°C) hot water temperature limit switch and an on/off switch/circuit breaker.



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AP Two Stage Series Vertical Dimensions

| MODEL | A | B | C | D | E | F | G | H | J | K | M | N | P | Q | Condenser Water Connections | Recommended Replacement Nominal Filter Size |
|-------|-------|-------|--------|-------|-------|------|------|------|-------|-------|--------------------|---------------------|--------------------|------|-----------------------------|---|
| | Width | Depth | Height | | | | | | | | R/A Duct Fig Width | R/A Duct Fig Height | Filter Rack Height | | | |
| AP025 | 21.50 | 26.00 | 47.25 | 13.75 | 15.75 | 6.13 | 5.25 | 5.25 | 8.00 | 16.25 | 22.00 | 22.00 | 24.00 | 4.00 | 3/4" F.P.T. | 24 X 24 X 2 |
| AP035 | 24.00 | 33.25 | 47.25 | 15.75 | 15.75 | 8.25 | 6.37 | 5.25 | 8.00 | 16.25 | 28.00 | 22.00 | 24.00 | 4.00 | 3/4" F.P.T. | 24 X 30 X 2 |
| AP049 | 26.00 | 33.25 | 58.00 | 17.75 | 17.75 | 8.50 | 7.25 | 3.25 | 10.25 | 17.25 | 28.00 | 30.00 | 32.00 | 4.00 | 1" F.P.T. | 16 X 30 X 2 (2) |
| AP061 | 26.00 | 33.25 | 66.25 | 17.75 | 17.75 | 8.38 | 6.38 | 3.25 | 10.25 | 17.25 | 28.00 | 38.00 | 40.00 | 4.00 | 1" F.P.T. | 20 X 30 X 2 (2) |
| AP071 | 26.00 | 33.25 | 66.25 | 17.75 | 17.75 | 8.38 | 6.38 | 3.25 | 10.25 | 19.50 | 28.00 | 38.00 | 40.00 | 4.00 | 1" F.P.T. | 20 X 30 X 2 (2) |



Left Hand Return (FLT)

Right Hand Return (FRT)

NOTES: All dimensions within +/- 0.125".

All condensate drain connections are 3/4" FPT.

All Heat Recovery Kit connections are 1/2" FPT.

Internal electric heat available on 208-230/1/60 top discharge units only

Internal Heat Recovery Kit available on 208-230 volt units only.

Specifications subject to change without notice.

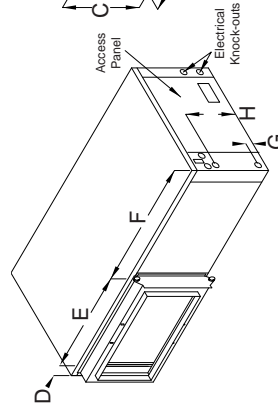


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AP Two Stage Series Horizontal Dimensions

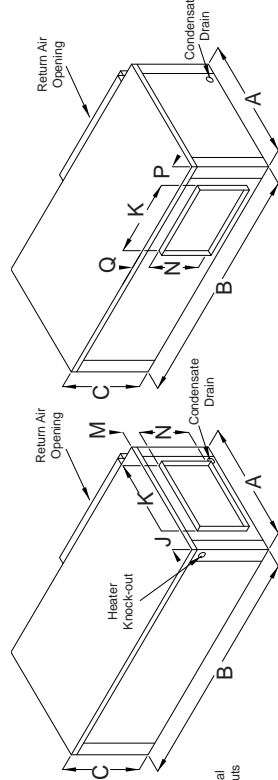
| MODEL | A B C D E F G H J K M N P Q R T | | Condenser Water Connections | Recommended Replacement Norm. Filter Size | | | | | | | | | | | | |
|-------|---------------------------------|-------|-----------------------------|---|--------|--------------------|--------------------|---------------------|------|-------|------|------|-------|-------|-------------|-----------------|
| | Width | Depth | | | Height | R/A Duct Fig Width | Filter Rack Height | R/A Duct Fig Height | | | | | | | | |
| AP025 | 26.00 | 54.50 | 22.00 | 2.00 | 30.00 | 22.50 | 5.25 | 16.25 | 4.50 | 15.75 | 4.50 | 3.00 | 20.00 | 18.00 | 3/4" F.P.T. | 16 X 20 X 2 (2) |
| AP035 | 30.00 | 68.00 | 22.00 | 2.50 | 34.00 | 32.00 | 5.25 | 16.25 | 5.81 | 15.75 | 5.81 | 3.00 | 20.00 | 18.00 | 3/4" F.P.T. | 18 X 20 X 2 (2) |
| AP049 | 30.00 | 68.00 | 22.00 | 2.50 | 34.00 | 32.00 | 5.25 | 19.25 | 7.66 | 17.75 | 7.66 | 2.00 | 20.00 | 18.00 | 1" F.P.T. | 18 X 20 X 2 (2) |
| AP061 | 30.00 | 89.00 | 22.00 | 2.50 | 54.00 | 31.50 | 3.25 | 17.25 | 3.50 | 17.75 | 3.75 | 3.75 | 1.00 | 20.00 | 1" F.P.T. | 20x28x2 (2) |
| AP071 | 30.00 | 89.00 | 22.00 | 2.50 | 54.00 | 31.50 | 3.25 | 19.50 | 3.50 | 17.75 | 3.75 | 3.75 | 1.00 | 20.00 | 1" F.P.T. | 20x28x2 (2) |

Left Hand Return
 End Blow (FLE)



Left Hand
 Return

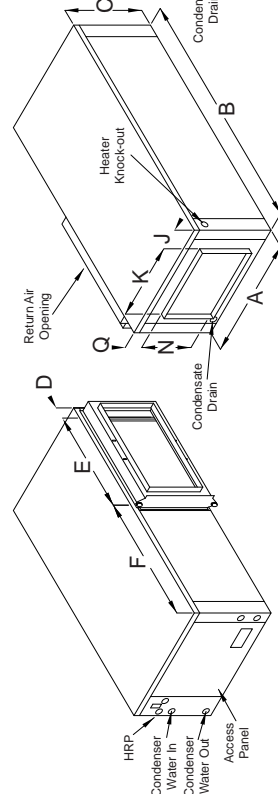
Left Hand Return
 Straight Through (FLS)



NOTES:

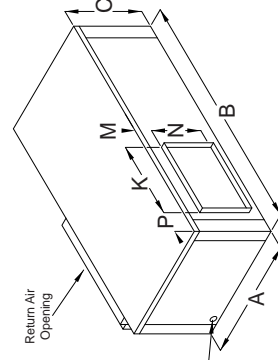
- All dimensions within +/- 0.125".
- All condensate drain connections are 3/4" FPT.
- All Heat Recovery connections are 1/2" FPT.
- Internal electric heat available on 208-230 volt units only
- Internal Loop Pump available on 208-230 volt units only.
- Internal Heat Recovery Kit available on 208-230 volt units only.
- Units can be field converted between end blow and straight through supply air configurations. Specifications subject to change without notice.

Right Hand Return
 End Blow (FRE)



Right Hand
 Return

Right Hand Return
 Straight Through (FRS)

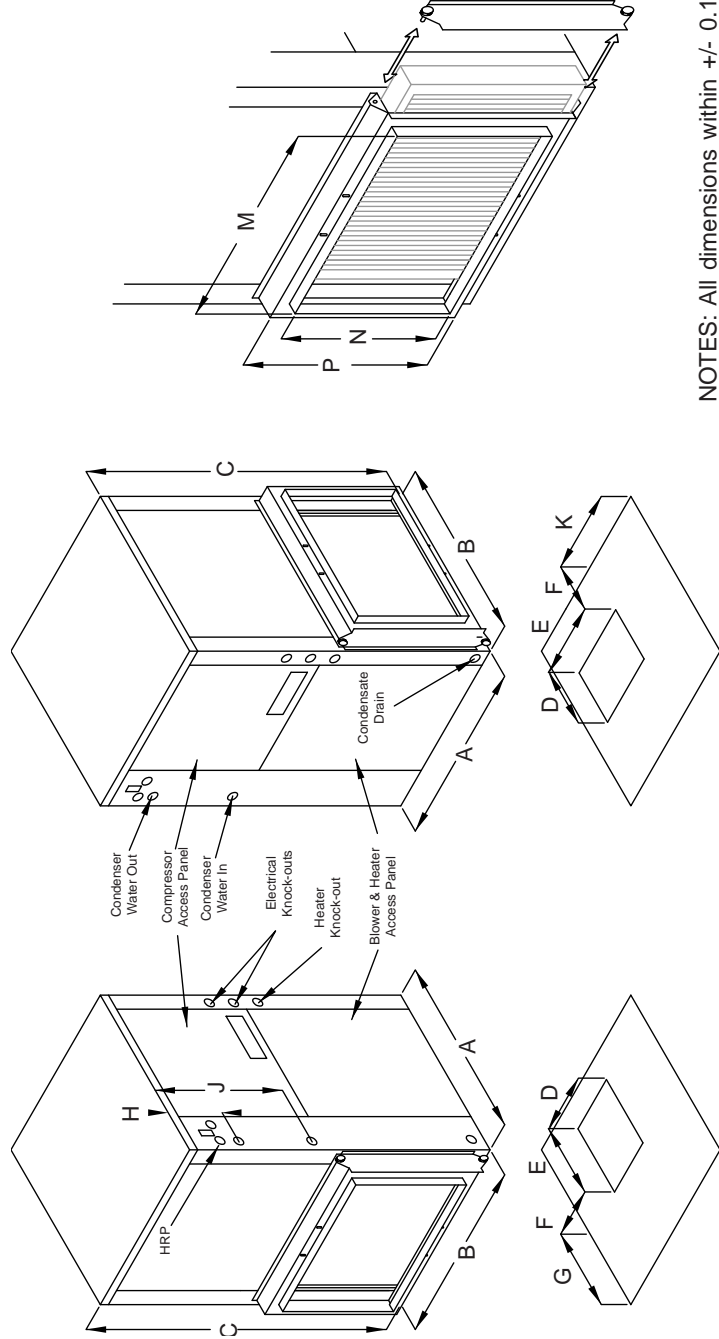




AP Two Stage Series Counterflow Dimensions

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| MODEL | A | B | C | D | E | F | G | H | J | K | M | N | P | Condenser Water Connections | Recommended Replacement Nominal Filler Size |
|-------|-------|-------|--------|----------------|----------------|----------------|------|------|-------|--------------------|---------------------|--------------------|-------|-----------------------------|---|
| | Width | Depth | Height | Blower Opening | Blower Opening | Blower Opening | | | | R/A Duct Fig Width | R/A Duct Fig Height | Filler Rack Height | | | |
| AP025 | 21.50 | 26.00 | 47.25 | 9.25 | 10.25 | 8.38 | 5.00 | 7.50 | 18.50 | 10.25 | 22.00 | 22.00 | 24.00 | 3/4" F.P.T. | 24 X 24 X 2 |
| AP035 | 24.00 | 33.25 | 47.25 | 9.25 | 10.25 | 11.13 | 6.88 | 7.50 | 18.50 | 12.00 | 28.00 | 22.00 | 24.00 | 3/4" F.P.T. | 24 X 30 X 2 |
| AP049 | 26.00 | 33.25 | 58.00 | 10.50 | 11.50 | 10.63 | 5.00 | 7.00 | 20.25 | 10.50 | 28.00 | 30.00 | 32.00 | 1" F.P.T. | 16 X 30 X 2 (2) |
| AP061 | 26.00 | 33.25 | 66.25 | 11.80 | 12.50 | 9.75 | 4.50 | 7.00 | 21.00 | 11.00 | 28.00 | 38.00 | 40.00 | 1" F.P.T. | 20 X 30 X 2 (2) |
| AP071 | 26.00 | 33.25 | 66.25 | 12.25 | 13.50 | 9.75 | 4.50 | 7.00 | 23.25 | 11.00 | 28.00 | 38.00 | 40.00 | 1" F.P.T. | 20 X 30 X 2 (2) |



NOTES: All dimensions within +/- 0.125".

All condensate drain connections are 3/4" FPT.

All Heat Recovery Kit connections are 1/2" FPT.

Internal electric heat available on 208-230/1/60 bottom discharge units only

Internal Loop Pump available on 208-230 volt units only.

Internal Heat Recovery Kit available on 208-230 volt units only.

Specifications subject to change without notice.

Left Hand Return (FLB)
Right Hand Return (FRB)



PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP025 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 11.4 | 52.0 | 2.8 | 1/3 | - | - | 18.8 | 30 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 3.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 9 x 7 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 290 lbs | 315 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | 860 | | | | | | | | |
| Norm | | | | 750 | | | | | | | | |
| - | | | | 640 | | | | | | | | |



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 750 CFM and 8.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 20,000 | 19.3 | 23,000 | 6.5 | 22,500 | 32.5 | 19,500 | 5.5 | 22,000 | 27.8 | 16,600 | 4.7 |

FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 5.0 | 2.0 | 0.9 |
| 7.0 | 3.6 | 1.6 |
| 9.0 | 5.7 | 2.5 |
| 11.0 | 8.2 | 3.5 |
| 13.0 | 11.0 | 4.8 |

CAPACITY DATA - PART LOAD

| COOLING All performance at 750 CFM and 8.0 GPM | | | | | | | | EFT Range (Standard) 50°F to 100°F | |
|--|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|---------------------------------------|--|
| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER | | |
| 50° | 70°db | 19.80 | 12.73 | 0.64 | 0.65 | 22.03 | 30.4 | | |
| 60° | | 19.09 | 12.37 | 0.65 | 0.77 | 21.70 | 24.9 | | |
| 70° | | 18.37 | 12.05 | 0.66 | 0.88 | 21.38 | 20.9 | | |
| 85° | | 17.30 | 11.65 | 0.67 | 1.05 | 20.89 | 16.4 | | |
| 100° | | 16.22 | 11.31 | 0.70 | 1.22 | 20.40 | 13.3 | | |
| 50° | 75°db | 21.22 | 15.24 | 0.72 | 0.66 | 23.46 | 32.4 | | |
| 60° | | 20.46 | 14.81 | 0.72 | 0.77 | 23.09 | 26.6 | | |
| 70° | | 19.69 | 14.43 | 0.73 | 0.89 | 22.71 | 22.2 | | |
| 85° | | 18.54 | 13.95 | 0.75 | 1.06 | 22.15 | 17.5 | | |
| 100° | | 17.39 | 13.55 | 0.78 | 1.23 | 21.59 | 14.1 | | |
| 50° | 80°db | 23.30 | 16.83 | 0.72 | 0.66 | 25.56 | 35.3 | | |
| 60° | | 22.46 | 16.36 | 0.73 | 0.78 | 25.11 | 28.9 | | |
| 70° | | 21.62 | 15.95 | 0.74 | 0.89 | 24.67 | 24.2 | | |
| 85° | | 20.36 | 15.41 | 0.76 | 1.07 | 24.00 | 19.1 | | |
| 100° | | 19.10 | 14.97 | 0.78 | 1.24 | 23.33 | 15.4 | | |
| 50° | 85°db | 25.38 | 18.44 | 0.73 | 0.66 | 27.65 | 38.2 | | |
| 60° | | 24.47 | 17.93 | 0.73 | 0.78 | 27.14 | 31.3 | | |
| 70° | | 23.56 | 17.47 | 0.74 | 0.90 | 26.62 | 26.2 | | |
| 85° | | 22.19 | 16.89 | 0.76 | 1.07 | 25.85 | 20.7 | | |
| 100° | | 20.82 | 16.41 | 0.79 | 1.25 | 25.08 | 16.7 | | |

HEATING

| HEATING | | | | | | EFT Range (Standard) 25°F to 80°F | |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|--------------------------------------|--|
| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP | | |
| 50° | 60° | 20.98 | 1.12 | 17.16 | 5.5 | | |
| 60° | | 22.83 | 1.12 | 19.00 | 6.0 | | |
| 70° | | 24.69 | 1.13 | 20.83 | 6.4 | | |
| 80° | | 26.55 | 1.14 | 22.67 | 6.8 | | |
| 50° | | 70° | 19.84 | 1.14 | 15.96 | 5.1 | |
| 60° | 21.59 | | 1.14 | 17.69 | 5.5 | | |
| 70° | 23.35 | | 1.15 | 19.43 | 6.0 | | |
| 80° | 25.10 | | 1.16 | 21.16 | 6.4 | | |
| 50° | 80° | | 18.50 | 1.16 | 14.54 | 4.7 | |
| 60° | | 20.14 | 1.17 | 16.15 | 5.1 | | |
| 70° | | 21.77 | 1.17 | 17.77 | 5.4 | | |
| 80° | | 23.41 | 1.18 | 19.38 | 5.8 | | |

LOW TEMP HEATING

| LOW TEMP HEATING | | | | | | Antifreeze Required | |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-----|---------------------|--|
| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP | | |
| 25° | 60° | 16.01 | 1.10 | 12.25 | 4.3 | | |
| 30° | | 16.92 | 1.11 | 13.15 | 4.5 | | |
| 40° | | 18.74 | 1.11 | 14.95 | 4.9 | | |
| 25° | 70° | 15.15 | 1.12 | 11.32 | 4.0 | | |
| 30° | | 16.01 | 1.12 | 12.17 | 4.2 | | |
| 40° | | 17.73 | 1.13 | 13.87 | 4.6 | | |
| 25° | 80° | 14.13 | 1.15 | 10.22 | 3.6 | | |
| 30° | | 14.93 | 1.15 | 11.02 | 3.8 | | |
| 40° | | 16.54 | 1.15 | 12.60 | 4.2 | | |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
AP025.1IP60 Rev: 1-08

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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP025 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 11.4 | 52.0 | 2.8 | 1/3 | - | - | 18.8 | 30 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 3.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 9 x 7 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 290 lbs | 315 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | | 1100 | | | | | | |
| Norm | | | | | | 950 | | | | | | |
| - | | | | | | 800 | | | | | | |



FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 5.0 | 2.0 | 0.9 |
| 7.0 | 3.6 | 1.6 |
| 9.0 | 5.7 | 2.5 |
| 11.0 | 8.2 | 3.5 |
| 13.0 | 11.0 | 4.8 |

ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 950 CFM and 8.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 27,000 | 16.2 | 32,500 | 5.3 | 31,000 | 25.1 | 26,500 | 4.8 | 28,500 | 19.2 | 20,400 | 4.1 |

CAPACITY DATA - FULL LOAD

| COOLING All performance at 950 CFM and 8.0 GPM | | | | | | | | EFT Range (Standard) 50°F to 100°F | |
|--|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|---------------------------------------|--|
| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER | | |
| 50° | 70°db | 27.31 | 18.01 | 0.66 | 1.19 | 31.36 | 23.0 | | |
| 60° | | 26.05 | 17.32 | 0.67 | 1.34 | 30.62 | 19.5 | | |
| 70° | | 24.78 | 16.69 | 0.67 | 1.49 | 29.87 | 16.6 | | |
| 85° | | 22.89 | 15.82 | 0.69 | 1.72 | 28.76 | 13.3 | | |
| 100° | | 21.00 | 15.02 | 0.72 | 1.95 | 27.65 | 10.8 | | |
| 50° | 75°db | 29.26 | 21.55 | 0.74 | 1.19 | 33.34 | 24.5 | | |
| 60° | | 27.91 | 20.73 | 0.74 | 1.35 | 32.51 | 20.7 | | |
| 70° | | 26.56 | 19.97 | 0.75 | 1.50 | 31.68 | 17.7 | | |
| 85° | | 24.54 | 18.94 | 0.77 | 1.73 | 30.44 | 14.2 | | |
| 100° | | 22.51 | 17.98 | 0.80 | 1.96 | 29.20 | 11.5 | | |
| 50° | 80°db | 32.13 | 23.80 | 0.74 | 1.20 | 36.23 | 26.7 | | |
| 60° | | 30.65 | 22.89 | 0.75 | 1.36 | 35.28 | 22.6 | | |
| 70° | | 29.17 | 22.06 | 0.76 | 1.51 | 34.32 | 19.3 | | |
| 85° | | 26.95 | 20.92 | 0.78 | 1.74 | 32.90 | 15.5 | | |
| 100° | | 24.73 | 19.87 | 0.80 | 1.97 | 31.47 | 12.5 | | |
| 50° | 85°db | 34.99 | 26.07 | 0.75 | 1.21 | 39.12 | 28.9 | | |
| 60° | | 33.38 | 25.08 | 0.75 | 1.37 | 38.04 | 24.4 | | |
| 70° | | 31.77 | 24.17 | 0.76 | 1.52 | 36.97 | 20.9 | | |
| 85° | | 29.36 | 22.92 | 0.78 | 1.76 | 35.35 | 16.7 | | |
| 100° | | 26.94 | 21.77 | 0.81 | 1.99 | 33.73 | 13.5 | | |

HEATING

| HEATING | | | | | | EFT Range (Standard) 25°F to 80°F | |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|--------------------------------------|--|
| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP | | |
| 50° | 60° | 28.16 | 1.71 | 22.32 | 4.8 | | |
| 60° | | 31.67 | 1.81 | 25.49 | 5.1 | | |
| 70° | | 35.18 | 1.91 | 28.66 | 5.4 | | |
| 80° | | 38.70 | 2.01 | 31.83 | 5.6 | | |
| 50° | | 70° | 26.63 | 1.74 | 20.69 | 4.5 | |
| 60° | 29.95 | | 1.84 | 23.66 | 4.8 | | |
| 70° | 33.27 | | 1.95 | 26.63 | 5.0 | | |
| 80° | 36.59 | | 2.05 | 29.60 | 5.2 | | |
| 50° | 80° | | 24.83 | 1.78 | 18.76 | 4.1 | |
| 60° | | 27.92 | 1.88 | 21.50 | 4.3 | | |
| 70° | | 31.02 | 1.99 | 24.23 | 4.6 | | |
| 80° | | 34.11 | 2.09 | 26.97 | 4.8 | | |

LOW TEMP HEATING

| LOW TEMP HEATING | | | | | | Antifreeze Required | |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-----|---------------------|--|
| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP | | |
| 25° | 60° | 18.99 | 1.46 | 14.01 | 3.8 | | |
| 30° | | 20.72 | 1.51 | 15.56 | 4.0 | | |
| 40° | | 24.16 | 1.61 | 18.66 | 4.4 | | |
| 25° | 70° | 17.97 | 1.48 | 12.90 | 3.5 | | |
| 30° | | 19.60 | 1.54 | 14.35 | 3.7 | | |
| 40° | | 22.85 | 1.64 | 17.26 | 4.1 | | |
| 25° | 80° | 16.77 | 1.52 | 11.59 | 3.2 | | |
| 30° | | 18.28 | 1.57 | 12.93 | 3.4 | | |
| 40° | | 21.31 | 1.67 | 15.60 | 3.7 | | |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
AP025.2IP60 Rev: 1-08

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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

APO35 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 16.7 | 82.0 | 4.3 | 1/2 | - | - | 27.0 | 40 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 4.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 9 x 7 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 290 lbs | 315 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | 1000 | | | | | | | |
| Norm | | | | | 900 | | | | | | | |
| - | | | | | 800 | | | | | | | |



FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 5 | 2.0 | 0.9 |
| 7 | 3.6 | 1.6 |
| 9 | 5.7 | 2.5 |
| 11 | 8.2 | 3.5 |
| 13 | 11.1 | 4.8 |

ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 1000 CFM and 9.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 25,700 | 19.8 | 29,500 | 6.3 | 29,500 | 34.0 | 24,300 | 5.3 | 28,200 | 28.5 | 22,000 | 4.8 |

CAPACITY DATA - PART LOAD

COOLING All performance at 1000 CFM and 9.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | | 26.07 | 16.75 | 0.64 | 0.81 | 28.82 | 32.3 |
| 60° | 70°db | 24.94 | 16.16 | 0.65 | 0.95 | 28.18 | 26.3 |
| 70° | 61°wb | 23.82 | 15.62 | 0.66 | 1.09 | 27.55 | 21.8 |
| 85° | | 22.13 | 14.90 | 0.67 | 1.31 | 26.59 | 16.9 |
| 100° | | 20.44 | 14.24 | 0.70 | 1.52 | 25.64 | 13.4 |
| 50° | | 27.94 | 20.05 | 0.72 | 0.81 | 30.71 | 34.4 |
| 60° | 75°db | 26.74 | 19.35 | 0.72 | 0.95 | 29.99 | 28.0 |
| 70° | 63°wb | 25.53 | 18.71 | 0.73 | 1.10 | 29.28 | 23.2 |
| 85° | | 23.73 | 17.85 | 0.75 | 1.31 | 28.21 | 18.1 |
| 100° | | 21.92 | 17.07 | 0.78 | 1.53 | 27.14 | 14.3 |
| 50° | | 30.68 | 22.15 | 0.72 | 0.82 | 33.46 | 37.6 |
| 60° | 80°db | 29.36 | 21.38 | 0.73 | 0.96 | 32.64 | 30.5 |
| 70° | 67°wb | 28.04 | 20.67 | 0.74 | 1.11 | 31.81 | 25.3 |
| 85° | | 26.06 | 19.72 | 0.76 | 1.32 | 30.58 | 19.7 |
| 100° | | 24.08 | 18.86 | 0.78 | 1.54 | 29.34 | 15.6 |
| 50° | | 33.42 | 24.28 | 0.73 | 0.82 | 36.22 | 40.6 |
| 60° | 85°db | 31.98 | 23.43 | 0.73 | 0.97 | 35.29 | 33.0 |
| 70° | 71°wb | 30.55 | 22.65 | 0.74 | 1.11 | 34.35 | 27.4 |
| 85° | | 28.39 | 21.61 | 0.76 | 1.33 | 32.94 | 21.3 |
| 100° | | 26.24 | 20.67 | 0.79 | 1.55 | 31.54 | 16.9 |

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-----|
| 50° | | 26.93 | 1.44 | 22.01 | 5.5 |
| 60° | 60° | 29.10 | 1.46 | 24.13 | 5.9 |
| 70° | | 31.28 | 1.47 | 26.26 | 6.2 |
| 80° | | 33.46 | 1.49 | 28.38 | 6.6 |
| 50° | | 25.47 | 1.47 | 20.46 | 5.1 |
| 60° | 70° | 27.52 | 1.48 | 22.47 | 5.4 |
| 70° | | 29.58 | 1.50 | 24.47 | 5.8 |
| 80° | | 31.64 | 1.51 | 26.48 | 6.1 |
| 50° | | 23.75 | 1.50 | 18.64 | 4.6 |
| 60° | 80° | 25.67 | 1.51 | 20.51 | 5.0 |
| 70° | | 27.59 | 1.53 | 22.37 | 5.3 |
| 80° | | 29.50 | 1.54 | 24.23 | 5.6 |

LOW TEMP HEATING Antifreeze Required

| | | | | | |
|-----|-----|-------|------|-------|-----|
| 25° | | 21.06 | 1.40 | 16.27 | 4.4 |
| 30° | 60° | 22.13 | 1.41 | 17.31 | 4.6 |
| 40° | | 24.26 | 1.43 | 19.39 | 5.0 |
| 25° | | 19.93 | 1.43 | 15.05 | 4.1 |
| 30° | 70° | 20.93 | 1.44 | 16.03 | 4.3 |
| 40° | | 22.95 | 1.45 | 18.00 | 4.6 |
| 25° | | 18.59 | 1.46 | 13.62 | 3.7 |
| 30° | 80° | 19.53 | 1.47 | 14.53 | 3.9 |
| 40° | | 21.41 | 1.48 | 16.35 | 4.2 |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
AP035.1IP60 Rev: 1-08

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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

APO35 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 16.7 | 82.0 | 4.3 | 1/2 | - | - | 27.0 | 40 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 4.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 9 x 7 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 290 lbs | 315 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | | 1380 | | | | | | |
| Norm | | | | | | 1200 | | | | | | |
| - | | | | | | 1020 | | | | | | |



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 1200 CFM and 9.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 36.600 | 16.0 | 43.000 | 5.1 | 41.200 | 23.5 | 36.200 | 4.7 | 38.200 | 18.4 | 28.200 | 4.1 |

FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 5 | 2.0 | 0.9 |
| 7 | 3.6 | 1.6 |
| 9 | 5.7 | 2.5 |
| 11 | 8.2 | 3.5 |
| 13 | 11.1 | 4.8 |

CAPACITY DATA - FULL LOAD

COOLING All performance at 1200 CFM and 9.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | 70°db | 36.10 | 23.53 | 0.65 | 1.67 | 41.81 | 21.6 |
| 60° | | 34.64 | 22.76 | 0.66 | 1.86 | 41.00 | 18.6 |
| 70° | | 33.18 | 22.08 | 0.67 | 2.05 | 40.19 | 16.2 |
| 85° | | 30.99 | 21.16 | 0.68 | 2.34 | 38.97 | 13.3 |
| 100° | | 28.80 | 20.36 | 0.71 | 2.62 | 37.75 | 11.0 |
| 50° | 75°db | 38.68 | 28.14 | 0.73 | 1.68 | 44.43 | 23.0 |
| 60° | | 37.12 | 27.23 | 0.73 | 1.87 | 43.52 | 19.8 |
| 70° | | 35.56 | 26.41 | 0.74 | 2.06 | 42.61 | 17.2 |
| 85° | | 33.22 | 25.33 | 0.76 | 2.35 | 41.24 | 14.1 |
| 100° | | 30.87 | 24.37 | 0.79 | 2.64 | 39.87 | 11.7 |
| 50° | 80°db | 42.47 | 31.08 | 0.73 | 1.70 | 48.26 | 25.0 |
| 60° | | 40.75 | 30.08 | 0.74 | 1.89 | 47.20 | 21.6 |
| 70° | | 39.04 | 29.17 | 0.75 | 2.08 | 46.14 | 18.8 |
| 85° | | 36.47 | 27.98 | 0.77 | 2.37 | 44.56 | 15.4 |
| 100° | | 33.91 | 26.92 | 0.79 | 2.66 | 42.97 | 12.8 |
| 50° | 85°db | 46.25 | 34.05 | 0.74 | 1.71 | 52.08 | 27.1 |
| 60° | | 44.39 | 32.95 | 0.74 | 1.90 | 50.88 | 23.3 |
| 70° | | 42.52 | 31.96 | 0.75 | 2.10 | 49.68 | 20.3 |
| 85° | | 39.73 | 30.65 | 0.77 | 2.39 | 47.88 | 16.6 |
| 100° | | 36.94 | 29.49 | 0.80 | 2.68 | 46.08 | 13.8 |

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|
| 50° | 60° | 38.04 | 2.33 | 30.08 | 4.8 |
| 60° | | 42.34 | 2.47 | 33.92 | 5.0 |
| 70° | | 46.64 | 2.60 | 37.75 | 5.2 |
| 80° | | 50.93 | 2.74 | 41.59 | 5.5 |
| 50° | | 70° | 35.97 | 2.37 | 27.87 |
| 60° | 40.03 | | 2.51 | 31.46 | 4.7 |
| 70° | 44.09 | | 2.65 | 35.05 | 4.9 |
| 80° | 48.16 | | 2.79 | 38.64 | 5.1 |
| 50° | 80° | | 33.55 | 2.42 | 25.27 |
| 60° | | 37.33 | 2.57 | 28.57 | 4.3 |
| 70° | | 41.11 | 2.71 | 31.87 | 4.4 |
| 80° | | 44.89 | 2.85 | 35.17 | 4.6 |

LOW TEMP HEATING

Antifreeze Required

| | | | | | |
|-----|-----|-------|------|-------|-----|
| 25° | 60° | 26.76 | 1.99 | 19.96 | 3.9 |
| 30° | | 28.87 | 2.06 | 21.83 | 4.1 |
| 40° | | 33.08 | 2.20 | 25.58 | 4.4 |
| 25° | 70° | 25.32 | 2.03 | 18.39 | 3.7 |
| 30° | | 27.31 | 2.10 | 20.15 | 3.8 |
| 40° | | 31.29 | 2.24 | 23.66 | 4.1 |
| 25° | 80° | 23.62 | 2.07 | 16.55 | 3.3 |
| 30° | | 25.47 | 2.14 | 18.16 | 3.5 |
| 40° | | 29.18 | 2.28 | 21.39 | 3.7 |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP049 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 21.2 | 96.0 | 6.8 | 3/4 | - | - | 35.1 | 50 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 6 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 10x 8 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 318 lbs | 348 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | | 1490 | | | | | | |
| Norm | | | | | | 1300 | | | | | | |
| - | | | | | | 110 | | | | | | |



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 1300 CFM and 12.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|-----|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 37,000 | 20 | 38,500 | 5.9 | 41,200 | 32.5 | 31,500 | 5.0 | 40,200 | 28.0 | 28,000 | 4.6 |

FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 6.0 | 2.3 | 1.0 |
| 7.0 | 3.0 | 1.3 |
| 9.5 | 5.3 | 2.3 |
| 12.0 | 8.0 | 3.5 |
| 16.0 | 13.4 | 5.8 |

CAPACITY DATA - PART LOAD

COOLING All performance at 1300 CFM and 12.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | 70°db | 37.65 | 28.42 | 0.75 | 1.17 | 41.65 | 32.1 |
| 60° | | 36.39 | 27.70 | 0.76 | 1.37 | 41.06 | 26.6 |
| 70° | | 35.12 | 27.08 | 0.77 | 1.57 | 40.47 | 22.4 |
| 85° | | 33.23 | 26.30 | 0.79 | 1.86 | 39.58 | 17.9 |
| 100° | | 31.34 | 25.67 | 0.82 | 2.15 | 38.69 | 14.6 |
| 50° | 75°db | 40.35 | 33.98 | 0.84 | 1.18 | 44.37 | 34.2 |
| 60° | | 39.00 | 33.12 | 0.85 | 1.38 | 43.69 | 28.3 |
| 70° | | 37.65 | 32.38 | 0.86 | 1.57 | 43.02 | 23.9 |
| 85° | | 35.62 | 31.45 | 0.88 | 1.87 | 42.00 | 19.1 |
| 100° | | 33.59 | 30.71 | 0.91 | 2.16 | 40.98 | 15.5 |
| 50° | 80°db | 44.30 | 37.52 | 0.85 | 1.19 | 48.35 | 37.3 |
| 60° | | 42.81 | 36.57 | 0.85 | 1.39 | 47.55 | 30.9 |
| 70° | | 41.33 | 35.76 | 0.87 | 1.59 | 46.74 | 26.1 |
| 85° | | 39.11 | 34.73 | 0.89 | 1.88 | 45.54 | 20.8 |
| 100° | | 36.89 | 33.91 | 0.92 | 2.18 | 44.33 | 16.9 |
| 50° | 85°db | 48.24 | 41.10 | 0.85 | 1.20 | 52.32 | 40.3 |
| 60° | | 46.63 | 40.06 | 0.86 | 1.40 | 51.40 | 33.4 |
| 70° | | 45.02 | 39.16 | 0.87 | 1.60 | 50.47 | 28.2 |
| 85° | | 42.60 | 38.05 | 0.89 | 1.90 | 49.08 | 22.5 |
| 100° | | 40.19 | 37.15 | 0.92 | 2.20 | 47.69 | 18.3 |

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|
| 50° | 60° | 36.30 | 1.93 | 29.72 | 5.5 |
| 60° | | 39.48 | 1.97 | 32.75 | 5.9 |
| 70° | | 42.66 | 2.02 | 35.78 | 6.2 |
| 80° | | 45.84 | 2.06 | 38.82 | 6.5 |
| 50° | | 70° | 34.33 | 1.96 | 27.64 |
| 60° | 37.34 | | 2.01 | 30.49 | 5.5 |
| 70° | 40.34 | | 2.05 | 33.35 | 5.8 |
| 80° | 43.35 | | 2.10 | 36.20 | 6.1 |
| 50° | 80° | | 32.02 | 2.00 | 25.19 |
| 60° | | 34.82 | 2.05 | 27.83 | 5.0 |
| 70° | | 37.62 | 2.09 | 30.47 | 5.3 |
| 80° | | 40.42 | 2.14 | 33.11 | 5.5 |

LOW TEMP HEATING

Antifreeze Required

| | | | | | |
|-----|-----|-------|------|-------|-----|
| 25° | 60° | 27.79 | 1.82 | 21.59 | 4.5 |
| 30° | | 29.35 | 1.84 | 23.08 | 4.7 |
| 40° | | 32.47 | 1.88 | 26.04 | 5.1 |
| 25° | 70° | 26.29 | 1.85 | 19.99 | 4.2 |
| 30° | | 27.77 | 1.87 | 21.38 | 4.4 |
| 40° | | 30.71 | 1.92 | 24.18 | 4.7 |
| 25° | 80° | 24.53 | 1.89 | 18.09 | 3.8 |
| 30° | | 25.90 | 1.91 | 19.39 | 4.0 |
| 40° | | 28.65 | 1.96 | 21.97 | 4.3 |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
AP049.1IP60 Rev: 1-08

FHP MANUFACTURING COMPANY

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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP049 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 21.2 | 96.0 | 6.8 | 3/4 | - | - | 35.1 | 50 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 6.0 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 10x 8 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 318 lbs | 348 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | | 1950 | | | | | | |
| Norm | | | | | | 1700 | | | | | | |
| - | | | | | | 1450 | | | | | | |



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 1700 CFM and 12.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 50,000 | 16.9 | 53,000 | 5.2 | 56,000 | 24.0 | 45,500 | 4.8 | 52,000 | 19.0 | 38,000 | 4.1 |

FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 6.0 | 2.3 | 1.0 |
| 7.0 | 3.0 | 1.3 |
| 9.5 | 5.3 | 2.3 |
| 12.0 | 8.0 | 3.5 |
| 16.0 | 13.4 | 5.8 |

CAPACITY DATA - FULL LOAD

COOLING All performance at 1700 CFM and 12.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | 70°db | 48.95 | 31.89 | 0.65 | 2.28 | 56.74 | 21.4 |
| 60° | | 47.04 | 30.90 | 0.66 | 2.51 | 55.59 | 18.8 |
| 70° | | 45.13 | 30.01 | 0.67 | 2.73 | 54.45 | 16.5 |
| 85° | | 42.27 | 28.85 | 0.68 | 3.06 | 52.72 | 13.8 |
| 100° | | 39.40 | 27.84 | 0.71 | 3.40 | 51.00 | 11.6 |
| 50° | 75°db | 52.46 | 38.15 | 0.73 | 2.30 | 60.29 | 22.9 |
| 60° | | 50.41 | 36.97 | 0.73 | 2.52 | 59.01 | 20.0 |
| 70° | | 48.37 | 35.92 | 0.74 | 2.74 | 57.74 | 17.6 |
| 85° | | 45.31 | 34.54 | 0.76 | 3.08 | 55.82 | 14.7 |
| 100° | | 42.24 | 33.33 | 0.79 | 3.42 | 53.90 | 12.4 |
| 50° | 80°db | 57.59 | 42.14 | 0.73 | 2.31 | 65.48 | 24.9 |
| 60° | | 55.35 | 40.84 | 0.74 | 2.54 | 64.01 | 21.8 |
| 70° | | 53.11 | 39.68 | 0.75 | 2.76 | 62.55 | 19.2 |
| 85° | | 49.75 | 38.15 | 0.77 | 3.10 | 60.35 | 16.0 |
| 100° | | 46.39 | 36.82 | 0.79 | 3.44 | 58.14 | 13.5 |
| 50° | 85°db | 62.72 | 46.16 | 0.74 | 2.33 | 70.67 | 26.9 |
| 60° | | 60.29 | 44.74 | 0.74 | 2.56 | 69.01 | 23.6 |
| 70° | | 57.85 | 43.47 | 0.75 | 2.79 | 67.36 | 20.8 |
| 85° | | 54.20 | 41.80 | 0.77 | 3.13 | 64.87 | 17.3 |
| 100° | | 50.54 | 40.35 | 0.80 | 3.47 | 62.38 | 14.6 |

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|
| 50° | 60° | 48.44 | 2.96 | 38.32 | 4.8 |
| 60° | | 52.79 | 3.05 | 42.38 | 5.1 |
| 70° | | 57.15 | 3.14 | 46.43 | 5.3 |
| 80° | | 61.50 | 3.23 | 50.48 | 5.6 |
| 50° | | 70° | 45.81 | 3.02 | 35.52 |
| 60° | 49.92 | | 3.11 | 39.32 | 4.7 |
| 70° | 54.04 | | 3.20 | 43.13 | 5.0 |
| 80° | 58.15 | | 3.29 | 46.94 | 5.2 |
| 50° | 80° | | 42.72 | 3.08 | 32.21 |
| 60° | | 46.55 | 3.17 | 35.73 | 4.3 |
| 70° | | 50.39 | 3.26 | 39.25 | 4.5 |
| 80° | | 54.22 | 3.36 | 42.76 | 4.7 |

LOW TEMP HEATING

Antifreeze Required

| | | | | | |
|-----|-----|-------|------|-------|-----|
| 25° | 60° | 36.81 | 2.74 | 27.45 | 3.9 |
| 30° | | 38.95 | 2.79 | 29.44 | 4.1 |
| 40° | | 43.22 | 2.87 | 33.41 | 4.4 |
| 25° | 70° | 34.83 | 2.79 | 25.31 | 3.7 |
| 30° | | 36.84 | 2.83 | 27.17 | 3.8 |
| 40° | | 40.88 | 2.93 | 30.89 | 4.1 |
| 25° | 80° | 32.49 | 2.85 | 22.77 | 3.3 |
| 30° | | 34.37 | 2.89 | 24.49 | 3.5 |
| 40° | | 38.13 | 2.99 | 27.93 | 3.7 |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP061 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|-------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 25.7 | 118.0 | 6.8 | 3/4 | - | - | 41.0 | 60 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 7.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 11x 9 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 390 lbs | 415 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | | 1725 | | | | | | |
| Norm | | | | | | 1500 | | | | | | |
| - | | | | | | 1275 | | | | | | |



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 1500 CFM and 14.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 47,000 | 19.0 | 56,500 | 6.2 | 53,000 | 33.0 | 45,000 | 5.2 | 51,000 | 27.7 | 39,000 | 4.6 |

FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 8 | 3.5 | 1.5 |
| 12 | 7.2 | 3.1 |
| 16 | 12.1 | 5.3 |
| 18 | 15.0 | 6.5 |
| 22 | 21.5 | 9.3 |

CAPACITY DATA - PART LOAD

COOLING All performance at 1500 CFM and 14.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | 70°db | 47.18 | 30.54 | 0.65 | 1.27 | 51.51 | 37.3 |
| 60° | | 45.41 | 29.64 | 0.65 | 1.55 | 50.71 | 29.2 |
| 70° | | 43.64 | 28.84 | 0.66 | 1.84 | 49.92 | 23.7 |
| 85° | | 40.98 | 27.79 | 0.68 | 2.27 | 48.73 | 18.0 |
| 100° | | 38.32 | 26.89 | 0.70 | 2.70 | 47.55 | 14.2 |
| 50° | 75°db | 50.53 | 36.44 | 0.72 | 1.27 | 54.87 | 39.7 |
| 60° | | 48.63 | 35.37 | 0.73 | 1.56 | 53.96 | 31.1 |
| 70° | | 46.73 | 34.41 | 0.74 | 1.85 | 53.05 | 25.2 |
| 85° | | 43.89 | 33.17 | 0.76 | 2.28 | 51.69 | 19.2 |
| 100° | | 41.04 | 32.10 | 0.78 | 2.72 | 50.32 | 15.1 |
| 50° | 80°db | 55.42 | 40.19 | 0.73 | 1.28 | 59.80 | 43.2 |
| 60° | | 53.34 | 39.01 | 0.73 | 1.57 | 58.72 | 33.9 |
| 70° | | 51.26 | 37.96 | 0.74 | 1.87 | 57.63 | 27.5 |
| 85° | | 48.14 | 36.59 | 0.76 | 2.30 | 56.00 | 20.9 |
| 100° | | 45.02 | 35.40 | 0.79 | 2.74 | 54.38 | 16.4 |
| 50° | 85°db | 60.31 | 43.98 | 0.73 | 1.29 | 64.73 | 46.6 |
| 60° | | 58.05 | 42.69 | 0.74 | 1.59 | 63.47 | 36.6 |
| 70° | | 55.79 | 41.54 | 0.74 | 1.88 | 62.21 | 29.7 |
| 85° | | 52.40 | 40.04 | 0.76 | 2.32 | 60.32 | 22.6 |
| 100° | | 49.00 | 38.75 | 0.79 | 2.76 | 58.43 | 17.7 |

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|
| 50° | 60° | 49.27 | 2.53 | 40.63 | 5.7 |
| 60° | | 54.35 | 2.59 | 45.50 | 6.1 |
| 70° | | 59.43 | 2.66 | 50.36 | 6.6 |
| 80° | | 64.51 | 2.72 | 55.22 | 6.9 |
| 50° | | 70° | 46.56 | 2.58 | 37.77 |
| 60° | 51.36 | | 2.64 | 42.35 | 5.7 |
| 70° | 56.16 | | 2.71 | 46.92 | 6.1 |
| 80° | 60.97 | | 2.77 | 51.50 | 6.4 |
| 50° | 80° | | 43.39 | 2.63 | 34.39 |
| 60° | | 47.86 | 2.70 | 38.64 | 5.2 |
| 70° | | 52.33 | 2.77 | 42.88 | 5.5 |
| 80° | | 56.80 | 2.83 | 47.12 | 5.9 |

LOW TEMP HEATING

Antifreeze Required

| | | | | | |
|-----|-----|-------|------|-------|-----|
| 25° | 60° | 35.85 | 2.37 | 27.76 | 4.4 |
| 30° | | 38.34 | 2.40 | 30.14 | 4.7 |
| 40° | | 43.32 | 2.47 | 34.91 | 5.1 |
| 25° | 70° | 33.88 | 2.41 | 25.65 | 4.1 |
| 30° | | 36.24 | 2.45 | 27.89 | 4.3 |
| 40° | | 40.94 | 2.51 | 32.37 | 4.8 |
| 25° | 80° | 31.58 | 2.47 | 23.16 | 3.8 |
| 30° | | 33.77 | 2.50 | 25.23 | 4.0 |
| 40° | | 38.15 | 2.57 | 29.39 | 4.4 |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP061 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|-------|--------|-----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 25.7 | 118.0 | 6.8 | 3/4 | - | - | 41.0 | 60 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 7.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 11x 9 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 390 lbs | 415 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | | 2200 | | | | | | |
| Norm | | | | | | 2000 | | | | | | |
| - | | | | | | 1700 | | | | | | |



FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 8 | 3.5 | 1.5 |
| 12 | 7.2 | 3.1 |
| 16 | 12.1 | 5.3 |
| 18 | 15.0 | 6.5 |
| 22 | 21.5 | 9.3 |

ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 2000 CFM and 14.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 64,000 | 16.2 | 78,500 | 5.4 | 71,000 | 23.8 | 65,000 | 5.0 | 67,000 | 18.5 | 49,000 | 4.1 |

CAPACITY DATA - FULL LOAD

COOLING All performance at 2000 CFM and 14.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | 70°db | 62.67 | 40.56 | 0.65 | 2.66 | 71.76 | 23.5 |
| 60° | | 60.48 | 39.48 | 0.65 | 3.01 | 70.76 | 20.1 |
| 70° | | 58.30 | 38.53 | 0.66 | 3.36 | 69.77 | 17.4 |
| 85° | | 55.03 | 37.33 | 0.68 | 3.88 | 68.27 | 14.2 |
| 100° | | 51.76 | 36.33 | 0.70 | 4.40 | 66.78 | 11.8 |
| 50° | 75°db | 67.11 | 48.40 | 0.72 | 2.68 | 76.25 | 25.0 |
| 60° | | 64.77 | 47.11 | 0.73 | 3.03 | 75.11 | 21.4 |
| 70° | | 62.44 | 45.98 | 0.74 | 3.38 | 73.97 | 18.5 |
| 85° | | 58.94 | 44.54 | 0.76 | 3.90 | 72.25 | 15.1 |
| 100° | | 55.43 | 43.35 | 0.78 | 4.43 | 70.54 | 12.5 |
| 50° | 80°db | 73.61 | 53.38 | 0.73 | 2.70 | 82.82 | 27.3 |
| 60° | | 71.05 | 51.96 | 0.73 | 3.05 | 81.47 | 23.3 |
| 70° | | 68.49 | 50.71 | 0.74 | 3.41 | 80.11 | 20.1 |
| 85° | | 64.65 | 49.13 | 0.76 | 3.93 | 78.08 | 16.4 |
| 100° | | 60.81 | 47.82 | 0.79 | 4.46 | 76.04 | 13.6 |
| 50° | 85°db | 80.11 | 58.42 | 0.73 | 2.72 | 89.40 | 29.4 |
| 60° | | 77.32 | 56.86 | 0.74 | 3.08 | 87.82 | 25.1 |
| 70° | | 74.54 | 55.50 | 0.74 | 3.43 | 86.25 | 21.7 |
| 85° | | 70.36 | 53.77 | 0.76 | 3.97 | 83.90 | 17.7 |
| 100° | | 66.19 | 52.33 | 0.79 | 4.50 | 81.54 | 14.7 |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-----|
| 50° | 60° | 67.49 | 3.83 | 54.43 | 5.2 |
| 60° | | 76.05 | 4.05 | 62.22 | 5.5 |
| 70° | | 84.62 | 4.28 | 70.01 | 5.8 |
| 80° | | 93.19 | 4.51 | 77.81 | 6.1 |
| 50° | 70° | 63.78 | 3.90 | 50.48 | 4.8 |
| 60° | | 71.88 | 4.13 | 57.78 | 5.1 |
| 70° | | 79.97 | 4.36 | 65.09 | 5.4 |
| 80° | | 88.06 | 4.59 | 72.40 | 5.6 |
| 50° | 80° | 59.43 | 3.99 | 45.82 | 4.4 |
| 60° | | 66.97 | 4.22 | 52.56 | 4.6 |
| 70° | | 74.50 | 4.46 | 59.29 | 4.9 |
| 80° | | 82.04 | 4.69 | 66.02 | 5.1 |

LOW TEMP HEATING

Antifreeze Required

| | | | | | |
|-----|-----|-------|------|-------|-----|
| 25° | 60° | 45.17 | 3.26 | 34.04 | 4.1 |
| 30° | | 49.37 | 3.38 | 37.85 | 4.3 |
| 40° | | 57.77 | 3.60 | 45.48 | 4.7 |
| 25° | 70° | 42.70 | 3.32 | 31.36 | 3.8 |
| 30° | | 46.66 | 3.44 | 34.93 | 4.0 |
| 40° | | 54.60 | 3.67 | 42.08 | 4.4 |
| 25° | 80° | 39.79 | 3.40 | 28.20 | 3.4 |
| 30° | | 43.49 | 3.52 | 31.49 | 3.6 |
| 40° | | 50.88 | 3.75 | 38.07 | 4.0 |

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

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FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP071 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|-------|--------|----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 29.9 | 138.4 | 7.0 | 1 | - | - | 46.2 | 70 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 7.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 12 x 9 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 450 lbs | 495 lbs | | |

BLOWER PERFORMANCE

| Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included) | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
| + | | | | | | 1600 | | | | | | |
| Norm | | | | | | 1500 | | | | | | |
| - | | | | | | 1200 | | | | | | |



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 1500 CFM and 18.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 53,000 | 18.2 | 65,800 | 5.2 | 59,000 | 28.8 | 53,700 | 4.6 | 57,500 | 25.2 | 47,000 | 4.1 |

FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 8 | 2.5 | 1.1 |
| 12 | 3.6 | 1.6 |
| 16 | 4.3 | 1.9 |
| 18 | 6.9 | 3.0 |
| 22 | 8.2 | 3.6 |

CAPACITY DATA - PART LOAD

COOLING All performance at 1500 CFM and 18.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | 70°db | 51.94 | 33.47 | 0.64 | 1.74 | 57.88 | 29.8 |
| 60° | | 50.20 | 32.62 | 0.65 | 2.03 | 57.11 | 24.8 |
| 70° | | 48.46 | 31.88 | 0.66 | 2.31 | 56.35 | 21.0 |
| 85° | | 45.85 | 30.96 | 0.68 | 2.74 | 55.20 | 16.7 |
| 100° | | 43.25 | 30.23 | 0.70 | 3.17 | 54.05 | 13.7 |
| 50° | 75°db | 55.65 | 40.01 | 0.72 | 1.75 | 61.62 | 31.8 |
| 60° | | 53.79 | 39.00 | 0.73 | 2.04 | 60.74 | 26.4 |
| 70° | | 51.93 | 38.13 | 0.73 | 2.32 | 59.86 | 22.4 |
| 85° | | 49.14 | 37.03 | 0.75 | 2.75 | 58.54 | 17.8 |
| 100° | | 46.35 | 36.15 | 0.78 | 3.18 | 57.21 | 14.6 |
| 50° | 80°db | 61.08 | 44.18 | 0.72 | 1.76 | 67.09 | 34.7 |
| 60° | | 59.04 | 43.06 | 0.73 | 2.05 | 66.04 | 28.8 |
| 70° | | 57.00 | 42.10 | 0.74 | 2.34 | 64.99 | 24.4 |
| 85° | | 53.94 | 40.89 | 0.76 | 2.77 | 63.41 | 19.4 |
| 100° | | 50.88 | 39.92 | 0.78 | 3.21 | 61.83 | 15.9 |
| 50° | 85°db | 66.51 | 48.39 | 0.73 | 1.78 | 72.57 | 37.5 |
| 60° | | 64.29 | 47.16 | 0.73 | 2.07 | 71.35 | 31.1 |
| 70° | | 62.07 | 46.11 | 0.74 | 2.36 | 70.12 | 26.3 |
| 85° | | 58.75 | 44.79 | 0.76 | 2.80 | 68.29 | 21.0 |
| 100° | | 55.42 | 43.73 | 0.79 | 3.23 | 66.45 | 17.1 |

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|
| 50° | 60° | 58.79 | 3.48 | 46.91 | 4.9 |
| 60° | | 64.25 | 3.59 | 51.98 | 5.2 |
| 70° | | 69.71 | 3.71 | 57.05 | 5.5 |
| 80° | | 75.17 | 3.82 | 62.13 | 5.8 |
| 50° | | 70° | 55.58 | 3.54 | 43.49 |
| 60° | 60.74 | | 3.66 | 48.25 | 4.9 |
| 70° | 65.90 | | 3.77 | 53.02 | 5.1 |
| 80° | 71.06 | | 3.89 | 57.78 | 5.4 |
| 50° | 80° | | 51.82 | 3.62 | 39.46 |
| 60° | | 56.62 | 3.74 | 43.86 | 4.4 |
| 70° | | 61.43 | 3.86 | 48.26 | 4.7 |
| 80° | | 66.23 | 3.98 | 52.66 | 4.9 |

LOW TEMP HEATING

Antifreeze Required

| | | | | | |
|-----|-----|-------|------|-------|-----|
| 25° | 60° | 44.26 | 3.20 | 33.35 | 4.1 |
| 30° | | 46.93 | 3.25 | 35.83 | 4.2 |
| 40° | | 52.28 | 3.37 | 40.79 | 4.5 |
| 25° | 70° | 41.85 | 3.25 | 30.75 | 3.8 |
| 30° | | 44.38 | 3.31 | 33.08 | 3.9 |
| 40° | | 49.44 | 3.43 | 37.74 | 4.2 |
| 25° | 80° | 39.03 | 3.32 | 27.68 | 3.4 |
| 30° | | 41.39 | 3.38 | 29.84 | 3.6 |
| 40° | | 46.09 | 3.50 | 34.14 | 3.9 |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
AP071.11P60 Rev: 1-08

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PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP071 AQUARIUS II

ELECTRICAL SPECIFICATIONS

| Electrical Characteristics | Elect. Symbol | Compressor | | Blower | | Loop Pump | | Min. Circuit Amps | Max. Fuse/Breaker |
|----------------------------|---------------|------------|-------|--------|----|-----------|----|-------------------|-------------------|
| | | RLA | LRA | FLA | HP | FLA | HP | | |
| 208/230-1-60 | -1 | 29.9 | 138.4 | 7.0 | 1 | - | - | 46.2 | 70 |

MECHANICAL SPECIFICATIONS

| Refrigerant: R-410A | | | |
|---------------------|-------------|-----------|-----------|
| Air Coil | | | |
| Square Feet | Rows Deep | Tube O.D. | Fins/Inch |
| 7.5 | 3 | 3/8 | 14 |
| Water Coil | | | |
| Type | Work Press | | |
| Coaxial | 450 psig | | |
| Blower Size | Compr Type | | |
| 12x 9 DD | Scroll | | |
| Net Weight | Ship Weight | | |
| 450 lbs | 495 lbs | | |

BLOWER PERFORMANCE

Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included)

| Blower Speed | 0.10 | 0.20 | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 | 0.90 | 1.00 | 1.10 | 1.20 |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|
| + | | | | | | | | | | | | |
| Norm | | | | | | 2300 | | | | | | |
| - | | | | | | 1900 | | | | | | |



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 2300 CFM and 18.0 GPM

| Water Loop | | | | Ground Water | | | | Ground Loop | | | |
|------------|------|----------|-----|--------------|------|----------|-----|-------------|------|----------|-----|
| Cooling | | Heating | | Cooling | | Heating | | Cooling | | Heating | |
| Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP | Capacity | EER | Capacity | COP |
| 72,000 | 16.0 | 89,000 | 5.2 | 78,000 | 21.8 | 73,000 | 4.7 | 74,000 | 18.0 | 58,000 | 4.1 |

FLUID PRESSURE DROP

| Fluid Flow (GPM) | Pressure Drop | |
|------------------|---------------|--------|
| | (FOH) | (PSIG) |
| 8 | 2.5 | 1.1 |
| 12 | 3.6 | 1.6 |
| 16 | 4.3 | 1.9 |
| 18 | 6.9 | 3.0 |
| 22 | 8.2 | 3.6 |

CAPACITY DATA - FULL LOAD

COOLING All performance at 2300 CFM and 18.0 GPM EFT Range (Standard) 50°F to 100°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Sensible Capacity (MBtuH) | Sensible to Total Ratio | Power Input (kW) | Heat of Reject (MBtuH) | EER |
|---------------------------|-------------------------|------------------------|---------------------------|-------------------------|------------------|------------------------|------|
| 50° | 70°db 61°wb | 67.02 | 42.08 | 0.63 | 3.45 | 78.78 | 19.4 |
| 60° | | 65.13 | 41.23 | 0.63 | 3.77 | 77.99 | 17.3 |
| 70° | | 63.23 | 40.53 | 0.64 | 4.09 | 77.20 | 15.5 |
| 85° | | 60.40 | 39.74 | 0.66 | 4.58 | 76.01 | 13.2 |
| 100° | | 57.56 | 39.20 | 0.68 | 5.06 | 74.82 | 11.4 |
| 50° | 75°db 63°wb | 71.82 | 50.34 | 0.70 | 3.46 | 83.65 | 20.7 |
| 60° | | 69.79 | 49.33 | 0.71 | 3.79 | 82.73 | 18.4 |
| 70° | | 67.77 | 48.50 | 0.72 | 4.11 | 81.81 | 16.5 |
| 85° | | 64.73 | 47.55 | 0.73 | 4.60 | 80.43 | 14.1 |
| 100° | | 61.69 | 46.91 | 0.76 | 5.09 | 79.05 | 12.1 |
| 50° | 80°db 67°wb | 78.84 | 55.59 | 0.71 | 3.49 | 90.76 | 22.6 |
| 60° | | 76.62 | 54.48 | 0.71 | 3.82 | 89.65 | 20.1 |
| 70° | | 74.40 | 53.57 | 0.72 | 4.15 | 88.55 | 17.9 |
| 85° | | 71.07 | 52.52 | 0.74 | 4.64 | 86.89 | 15.3 |
| 100° | | 67.74 | 51.82 | 0.76 | 5.13 | 85.24 | 13.2 |
| 50° | 85°db 71°wb | 85.86 | 60.90 | 0.71 | 3.52 | 97.87 | 24.4 |
| 60° | | 83.45 | 59.68 | 0.72 | 3.85 | 96.58 | 21.7 |
| 70° | | 81.03 | 58.68 | 0.72 | 4.18 | 95.29 | 19.4 |
| 85° | | 77.41 | 57.55 | 0.74 | 4.67 | 93.35 | 16.6 |
| 100° | | 73.78 | 56.77 | 0.77 | 5.17 | 91.42 | 14.3 |

HEATING EFT Range (Standard) 25°F to 80°F

| Entering Fluid Temp. (°F) | Entering Air Temp. (°F) | Total Capacity (MBtuH) | Power Input (kW) | Heat of Abs. (MBtuH) | COP |
|---------------------------|-------------------------|------------------------|------------------|----------------------|-------|
| 50° | 60° | 77.31 | 4.74 | 61.12 | 4.8 |
| 60° | | 86.25 | 5.00 | 69.17 | 5.0 |
| 70° | | 95.20 | 5.27 | 77.22 | 5.3 |
| 80° | | 104.14 | 5.53 | 85.28 | 5.5 |
| 50° | | 70° | 73.10 | 4.83 | 56.62 |
| 60° | 81.55 | | 5.09 | 64.16 | 4.7 |
| 70° | 90.00 | | 5.36 | 71.70 | 4.9 |
| 80° | 98.45 | | 5.63 | 79.25 | 5.1 |
| 50° | 80° | | 68.15 | 4.93 | 51.32 |
| 60° | | 76.02 | 5.21 | 58.26 | 4.3 |
| 70° | | 83.89 | 5.48 | 65.20 | 4.5 |
| 80° | | 91.76 | 5.75 | 72.14 | 4.7 |

LOW TEMP HEATING

Antifreeze Required

| 25° | 30° | 40° | 53.87 | 4.09 | 39.91 | 3.9 |
|-----|-------|-------|-------|-------|-------|-----|
| 60° | 58.25 | 4.22 | 43.85 | 4.0 | | |
| | 67.02 | 4.48 | 51.72 | 4.4 | | |
| | 70° | 50.95 | 4.16 | 36.74 | 3.6 | |
| 70° | 55.10 | 4.30 | 40.43 | 3.8 | | |
| | 63.38 | 4.56 | 47.81 | 4.1 | | |
| | 80° | 47.53 | 4.25 | 33.02 | 3.3 | |
| 80° | 51.39 | 4.39 | 36.41 | 3.4 | | |
| | 59.10 | 4.66 | 43.20 | 3.7 | | |

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

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