# COMMERCIAL
## HEAT PUMP WATER HEATERS

# AHPM SERIES
## MODULAR WATER SOURCE HEAT PUMP HEAT PUMP WATER HEATER

The A. O. Smith AHPM-1620 is a modular water-to-water heat pump water heater designed to be an energy-efficient, zero-emissions solution for your commercial water heating needs.

### FEATURES

- Up to 160°F maximum water temperature
- Ambient operating range of 40-120°F
- Absorbs heat from water sources, including return chiller water, process and groundwater
- Environmentally friendly R134a refrigerant
- Double wall condenser for potable water heating
- Suitable for indoor and outdoor applications
- BACnet compatible logic controller optional

### APPLICATIONS

- Restaurants
- Hotels
- Apartment buildings
- Laundry facilities
- Healthcare facilities
- Schools
- Sports arenas
- Gyms
- Prisons
- Military barracks
- Manufacturing facilities, etc

### ONE-YEAR LIMITED WARRANTY

- Backed by 1-year limited warranty, with an option for additional 5-year Extended Compressor Warranty
- For complete warranty information, consult written warranty or go to hotwater.com

**MODEL AHPM-1620**

## SPECIFICATIONS

| | | | | | |
|---|---|---|---|---|---|
| **Operating Conditions** | **Model Number** | | | **AHPM-1620** | |
| | Recovery Rate † | | | 1,938 Gal/hr | |
| | Compressor Type | | | Scroll | |
| | Refrigerant | | | R134a | |
| | Max Water Temperature | | | 160° F | |
| | Source Water Range | | | 40° F - 100° F | |
| | Max Working Water Pressure | | | 150 psig | |
| **Multi-Pass Unit Sizing** | Water Connections | | | 2″ FPT Copper | |
| | Condenser Water Flow Rate | | | 300 GPM | |
| | Condenser Pressure Drop | | | 10.76 ft Head* | |
| | Evaporator Water Flow Rate | | | 300 GPM | |
| | Evaporator Pressure Drop | | | 11.19 ft Head* | |
| | External Head Pressure Allowed by Unit | | | 3.08 ft Head / 50 ft run of 2″ pipe | |
| **Single-Pass Unit Sizing** | Heated Water Connections | | | 1 1/2″ FPT Copper | |
| | Source Water Connections | | | 2″ FPT Copper | |
| | Average Condenser Water Flow Rate | | | 150 GPM | |
| | Condenser Pressure Drop | | | 1.92 ft Head* | |
| | Evaporator Water Flow Rate | | | 300 GPM | |
| | Evaporator Pressure Drop | | | 11.19 ft Head* | |
| | External Head Pressure Allowed by Unit | | | 3.46 ft Head / 50 ft run of 1 1/2″ pipe | |
| **Unit Specifications** | Dry Weight | | | 6,900 lbs | |
| | Operating Weight | | | 7,800 lbs | |
| | Standard Sound Rating | | | 86 dB | |
| | Dimensions (L x W x H) | | | Based on configuration selected | |
| **Power Requirements** | **Voltage** | **Compressor LRA** | **RLA Per Compressor** | **Wire and Disconnect Sizing ††** | |
| | | | | **MCA** | **MOCP / MFS** |
| | 208-230/3/60 | 560 | 92.9 | Based on configuration selected | |
| | 440-480/3/60 | 270 | 49.3 | Based on configuration selected | |
| | 575/3/60 | 198 | 28.2 | Based on configuration selected | |

Note: Pump for heated side provided by A. O. Smith. Customer responsible for providing source side pump.
† Water heated from 50° F to 150° F with 75° F entering source water temperature
†† Max 5 AHPM-270 units per single point electric service
*XXXX ft Head per module

Legend
LRA: Locked Rotor Amps
RLA: Rated Load Amps
MCA: Maximum Current Ampacity (used for wire sizing)
MOCP: Minimum Overcurrent Protection (minimum disconnect size to be used)

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## HEAT PUMP WATER HEATERS

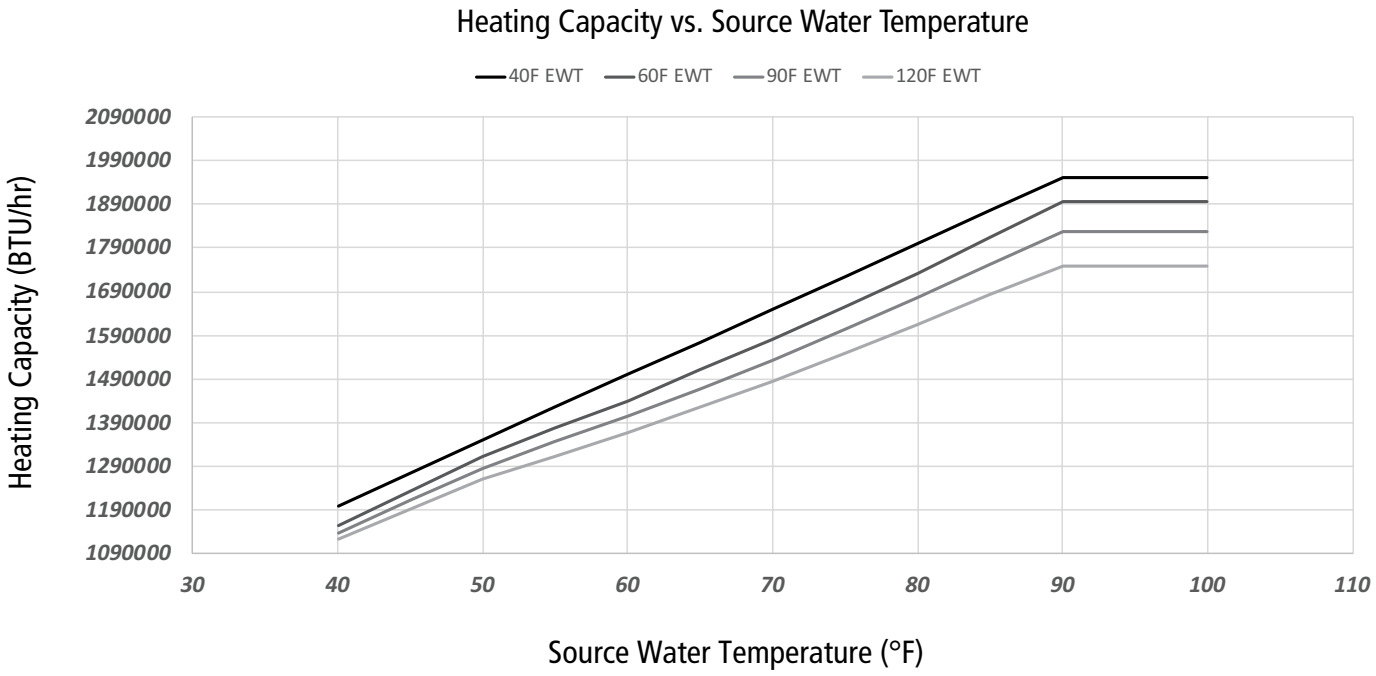
### PERFORMANCE DATA

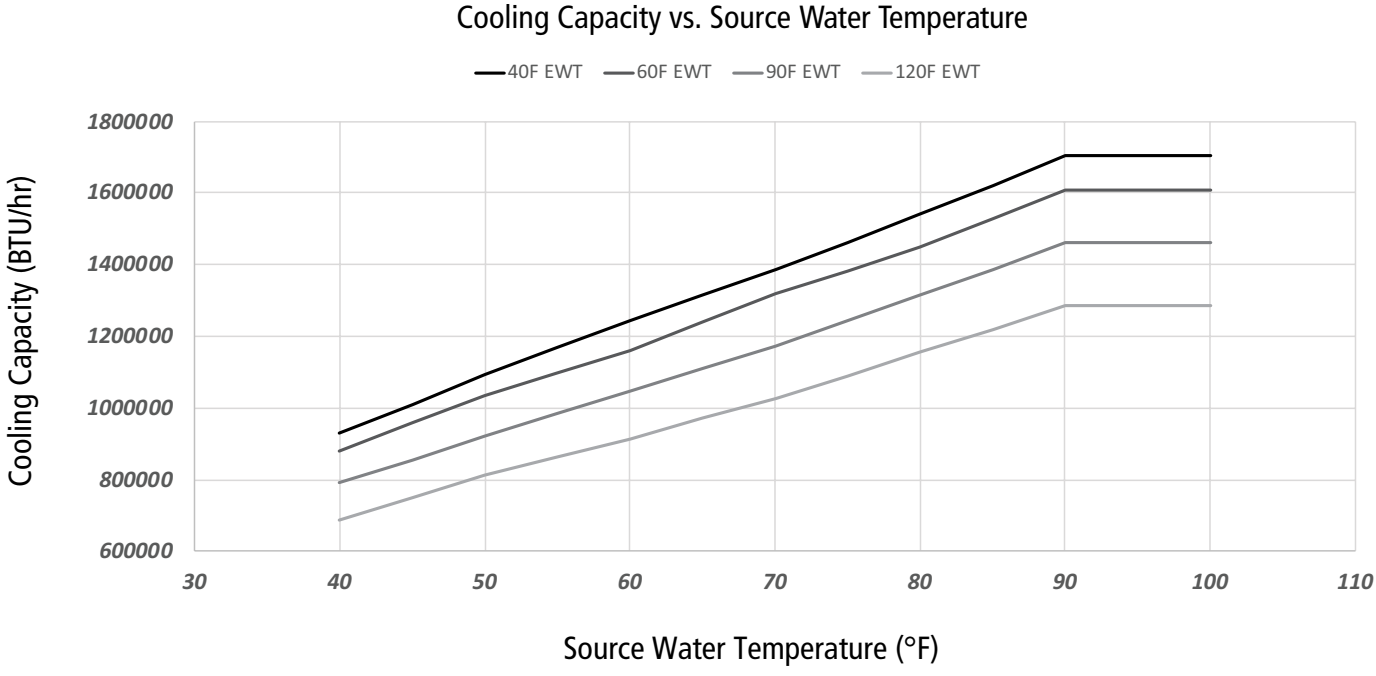
| Model | Entering Source Water Temp(F°) | Leaving Source Water Temp(°F) | Source Cooling Capacity (Btu/hr) | Entering Heated Water Temp(°F) | Leaving Heated Water Temp(°F) | Supply Heating Capacity (Btu/hr) | Power Input (kW) |
|---|---|---|---|---|---|---|---|
| AHPM-1620 | 42°F | 36 | 907900 | 50 | 57.7 | 1159200 | 73.68 |
| | | 36.2 | 880500 | 60 | 67.7 | 1153800 | 79.98 |
| | | 36.4 | 851700 | 70 | 77.7 | 1148400 | 86.76 |
| | | 36.6 | 821500 | 80 | 87.6 | 1142400 | 94.02 |
| | | 36.8 | 791200 | 90 | 97.6 | 1138200 | 101.7 |
| | | 37 | 758800 | 100 | 107.6 | 1133400 | 109.92 |
| | | 37.2 | 725000 | 110 | 117.6 | 1130400 | 118.8 |
| | | 37.4 | 688300 | 120 | 127.6 | 1126200 | 128.22 |
| | | 37.7 | 652800 | 130 | 137.6 | 1125000 | 138.42 |
| | | 37.7 | 646500 | 140 | 147.6 | 1123200 | 142.14 |
| | 50°F | 42.7 | 1068000 | 50 | 58.8 | 1323600 | 74.7 |
| | | 43.1 | 1036200 | 60 | 68.8 | 1312800 | 82.02 |
| | | 43.4 | 1005000 | 70 | 78.7 | 1305600 | 88.02 |
| | | 43.6 | 970800 | 80 | 88.6 | 1296000 | 95.46 |
| | | 43.9 | 921600 | 90 | 98.6 | 1287000 | 103.32 |
| | | 44.1 | 885600 | 100 | 108.6 | 1278000 | 111.72 |
| | | 44.3 | 856800 | 110 | 118.6 | 1269600 | 120.48 |
| | | 44.6 | 811200 | 120 | 128.5 | 1261200 | 130.32 |
| | | 44.9 | 765600 | 130 | 138.5 | 1255800 | 140.82 |
| | | 45.1 | 730800 | 140 | 148.5 | 1249800 | 151.2 |
| | 60°F | 52 | 1196400 | 50 | 59.7 | 1453800 | 75.3 |
| | | 52.3 | 1161300 | 60 | 69.6 | 1440600 | 81.84 |
| | | 52.5 | 1126800 | 70 | 79.6 | 1429800 | 88.8 |
| | | 52.8 | 1087200 | 80 | 89.5 | 1416000 | 96.36 |
| | | 53 | 1049000 | 90 | 99.4 | 1404600 | 104.28 |
| | | 53.3 | 1008000 | 100 | 109.4 | 1393200 | 112.92 |
| | | 53.6 | 965500 | 110 | 119.3 | 1380600 | 121.74 |
| | | 53.9 | 914400 | 120 | 129.3 | 1366200 | 132.42 |
| | | 54.2 | 871900 | 130 | 139.2 | 1357800 | 142.32 |
| | | 54.5 | 823600 | 140 | 149.1 | 1348200 | 151.86 |
| | 70°F | 61.1 | 1337000 | 50 | 60.6 | 1596000 | 75.9 |
| | | 61.2 | 1317600 | 60 | 70.5 | 1579800 | 82.5 |
| | | 61.6 | 1260000 | 70 | 80.5 | 1565400 | 89.58 |
| | | 61.9 | 1216000 | 80 | 90.4 | 1548000 | 97.2 |
| | | 62.2 | 1173600 | 90 | 100.4 | 1533000 | 105.3 |
| | | 62.5 | 1128900 | 100 | 110.3 | 1517400 | 113.94 |
| | | 62.7 | 1080700 | 110 | 120.1 | 1503000 | 123.24 |
| | | 63.1 | 1026000 | 120 | 130 | 1483200 | 134.1 |
| | | 63.5 | 979900 | 130 | 139.9 | 1470000 | 143.76 |
| | | 63.8 | 926600 | 140 | 149.9 | 1456200 | 155.22 |

## PERFORMANCE DATA

| Model | Entering Source Water Temp(F°) | Leaving Source Water Temp(°F) | Source Cooling Capacity (Btu/hr) | Entering Heated Water Temp(°F) | Leaving Heated Water Temp(°F) | Supply Heating Capacity (Btu/hr) | Power Input (kW) |
|---|---|---|---|---|---|---|---|
| AHPM-1620 | 80°F | 70 | 1490400 | 50 | 61.7 | 1750800 | 76.44 |
| | | 70.3 | 1447200 | 60 | 71.5 | 1731000 | 83.16 |
| | | 70.6 | 1405400 | 70 | 81.4 | 1713600 | 90.36 |
| | | 70.9 | 1359300 | 80 | 91.3 | 1693800 | 97.98 |
| | | 71.2 | 1315400 | 90 | 101.2 | 1676400 | 105.6 |
| | | 71.7 | 1259200 | 100 | 111.1 | 1651800 | 114.9 |
| | | 72 | 1208800 | 110 | 121 | 1632600 | 124.26 |
| | | 72.4 | 1154800 | 120 | 131 | 1613400 | 134.34 |
| | | 72.8 | 1098000 | 130 | 140.9 | 1593000 | 145.02 |
| | | 73.1 | 1039600 | 140 | 150.7 | 1574400 | 156.66 |
| | 90°F | 78.9 | 1656700 | 50 | 62.8 | 1919400 | 76.98 |
| | | 79.35 | 1609900 | 60 | 72.7 | 1895400 | 83.76 |
| | | 79.8 | 1563800 | 70 | 82.5 | 1874400 | 93.66 |
| | | 80.25 | 1511200 | 80 | 92.3 | 1848000 | 98.76 |
| | | 80.7 | 1460800 | 90 | 102.1 | 1825800 | 106.8 |
| | | 81.15 | 1404000 | 100 | 111.9 | 1799400 | 115.8 |
| | | 81.6 | 1349400 | 110 | 121.5 | 1777200 | 124.98 |
| | | 82.05 | 1288000 | 120 | 131.1 | 1750200 | 135.3 |
| | | 82.5 | 1227600 | 130 | 140.9 | 1726200 | 145.8 |
| | | 83 | 1163500 | 140 | 150.7 | 1699800 | 157.98 |

## PERFORMANCE CHARTS



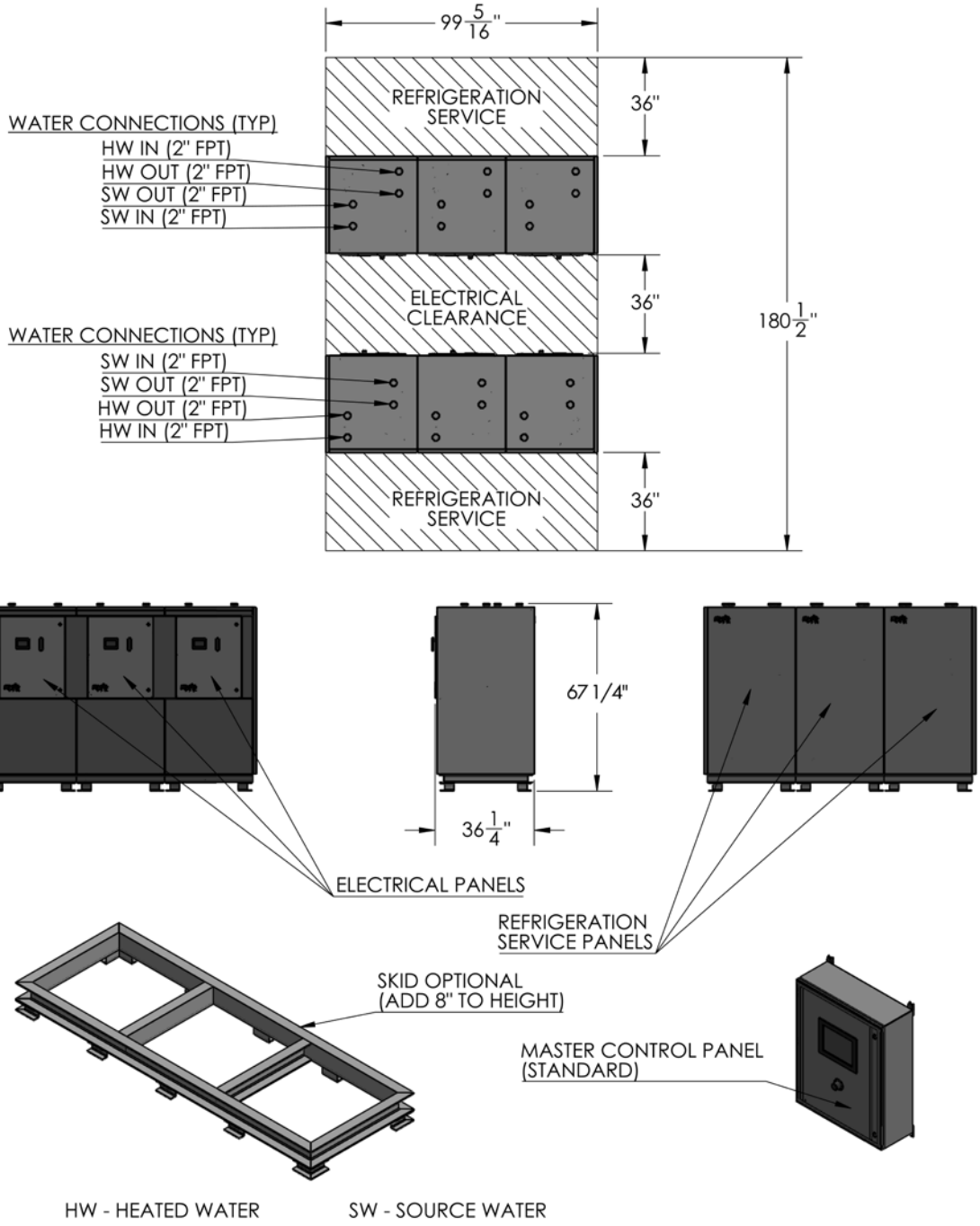




Water heated from 50°F to 150°F with 75°F entering source water temperature

## DIMENSIONS

Customer specific layout available utilizing a combination of six (6) AHPM-270 modules.

(Electrical codes limit a maximum of five (5) AHPM-270 modules on a single electrical service)




NOTE: 36" electrical service clearance per NEC 110.26(A)(1) Working Spaces for "Condition 1."
Check with local codes for additional requirements.

## SUGGESTED SPECIFICATION

The HEAT PUMP shall be A. O. Smith Model AHPM-1620 having a heating capacity capable of 1,662,600 BTU/h and cooling capacity of 1,265,000 BTU/h.

The HEAT PUMP shall have a scroll compressor, factory charged with R134a refrigerant, NSF61-approved stainless steel circulator pump, and double-wall stainless steel condenser for potable water applications. The HEAT PUMP shall be equipped with a stainless steel single-wall heat exchanger evaporator. The complete heat pump assembly shall carry a one (1) year limited warranty.

The HEAT PUMP refrigerant circuit shall contain an adjustable thermal expansion valve, receiver, accumulator, serviceable filter drier and service ports for refrigerant gauges.

The HEAT PUMP shall be certified and listed by TUV to CSA C22.2 No. 236:2015, UL 1995:2015-07 standards. The HEAT PUMP shall be certified for indoor and/or outdoor installation.

The HEAT PUMP shall be constructed with a heavy gauge aluminum jacket assembly and painted on both sides.

The HEAT PUMP shall utilize a 24 VDC control circuit and components. The control system shall have a display (PLC Option) for HEAT PUMP set-up, HEAT PUMP status and HEAT PUMP diagnostics. All components shall be easily accessed and serviceable. The HEAT PUMP shall be equipped with low and high refrigerant pressure switches short-cycle control outlet water temperature sensor and return water temperature sensor.

The HEAT PUMP shall have an optional control for "Cascade" to sequence and rotate while maintaining operation of up to eight HEAT PUMPs of same BTU inputs. The HEAT PUMP shall be capable of controlling a valve (single pass option) that maintains constant delivery temperature to the storage tank. The HEAT PUMP shall have an optional gateway device which will allow integration with BACnet.

The HEAT PUMP shall be equipped with terminal strips for electrical connections. A low voltage connection board shall have connection points for safety and operating controls, i.e., alarm contacts, runtime contacts and tank thermostat. A high voltage terminal strip shall be provided for supply voltage connection. Supply voltage shall be 208-230V/3PH/60Hz, 440-480V/3PH/60Hz, or 575V/3PH/60Hz.

The HEAT PUMP shall be suitable for use with polypropylene glycol, up to 50% concentration. The de-rate associated with the glycol will vary per glycol manufacturer.

STANDARD CONSTRUCTION

The HEAT PUMP shall be constructed in accordance with the code requirements as standard equipment.

**For technical information, call 800-527-1953. A. O. Smith Corporation reserves the right to make product changes or improvements without prior notice.**



**hotwater.com | 800-527-1953 Toll-Free USA | A. O. Smith Corporation | 500 Tennessee Waltz Parkway | Ashland City, TN 37015**