

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

The A. O. Smith AHPM-540 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](http://hotwater.com)



**MODEL AHPM-540**





# COMMERCIAL

## HEAT PUMP WATER HEATERS

### SPECIFICATIONS

<b>Operating Conditions</b>	<b>Model Number</b>			<b>AHPM-540</b>	
	Recovery Rate †			646 Gal/hr	
	Compressor Type			Scroll	
	Refrigerant			R134a	
	Max Water Temperature			160° F	
	Source Water Range			40° F - 100° F	
	Max Working Water Pressure			100 psig	
<b>Multi-Pass Unit Sizing</b>	Water Connections			2" FPT Copper	
	Condenser Water Flow Rate			150 GPM	
	Condenser Pressure Drop			10.76 ft Head*	
	Evaporator Water Flow Rate			100 GPM	
	Evaporator Pressure Drop			11.19 ft Head*	
	External Head Pressure Allowed by Unit			3.08 ft Head / 50 ft run of 2" pipe	
<b>Single-Pass Unit Sizing</b>	Heated Water Connections			1 1/2" FPT Copper	
	Source Water Connections			2" FPT Copper	
	Average Condenser Water Flow Rate			50 GPM	
	Condenser Pressure Drop			1.92 ft Head*	
	Evaporator Water Flow Rate			100 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	
<b>Unit Specifications</b>	Dry Weight			2,300 lbs	
	Operating Weight			2,600 lbs	
	Standard Sound Rating			81 dB	
	Dimensions (L x W x H)			67 1/4" x 36 1/4" x 67 1/4"	
<b>Power Requirements</b>	<b>Voltage</b>	<b>Compressor LRA</b>	<b>RLA Per Compressor</b>	<b>Wire and Disconnect Sizing ††</b>	
				<b>MCA</b>	<b>MOCP / MFS</b>
	208-230/3/60	560	92.9	173	175
	440-480/3/60	270	49.3	84	90
	575/3/60	198	28.2	67	70

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

†† 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-540	42°F	36	302600	50	57.7	386400	24.56
		36.2	293500	60	67.7	384600	26.66
		36.4	283900	70	77.7	382800	28.92
		36.6	273800	80	87.6	380800	31.34
		36.8	263700	90	97.6	379400	33.9
		37	252900	100	107.6	377800	36.64
		37.2	241600	110	117.6	376800	39.6
		37.4	229400	120	127.6	375400	42.74
		37.7	217600	130	137.6	375000	46.14
		37.7	215500	140	147.6	374400	47.38
	50°F	42.7	356000	50	58.8	441200	24.9
		43.1	345400	60	68.8	437600	27.34
		43.4	335000	70	78.7	435200	29.34
		43.6	323600	80	88.6	432000	31.82
		43.9	307200	90	98.6	429000	34.44
		44.1	295200	100	108.6	426000	37.24
		44.3	285600	110	118.6	423200	40.16
		44.6	270400	120	128.5	420400	43.44
		44.9	255200	130	138.5	418600	46.94
		45.1	243600	140	148.5	416600	50.4
	60°F	52	398800	50	59.7	484600	25.1
		52.3	387100	60	69.6	480200	27.28
		52.5	375600	70	79.6	476600	29.6
		52.8	362400	80	89.5	472000	32.12
		53	349600	90	99.4	468200	34.76
		53.3	336000	100	109.4	464400	37.64
		53.6	321800	110	119.3	460200	40.58
		53.9	304800	120	129.3	455400	44.14
		54.2	290600	130	139.2	452600	47.44
		54.5	274500	140	149.1	449400	50.62
	70°F	61.1	445600	50	60.6	532000	25.3
		61.2	439200	60	70.5	526600	27.5
		61.6	420000	70	80.5	521800	29.86
		61.9	405300	80	90.4	516000	32.4
		62.2	391200	90	100.4	511000	35.1
		62.5	376300	100	110.3	505800	37.98
62.7		360200	110	120.1	501000	41.08	
63.1		342000	120	130	494400	44.7	
63.5		326600	130	139.9	490000	47.92	
63.8		308800	140	149.9	485400	51.74	



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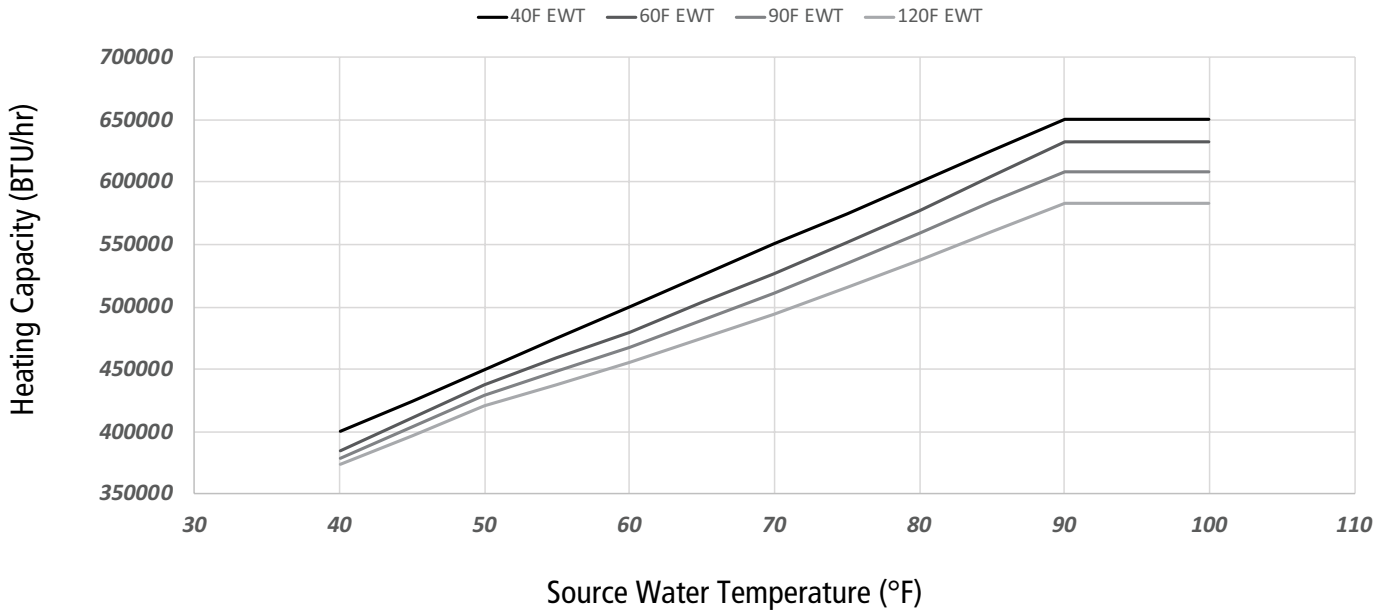
## HEAT PUMP WATER HEATERS

### PERFORMANCE DATA

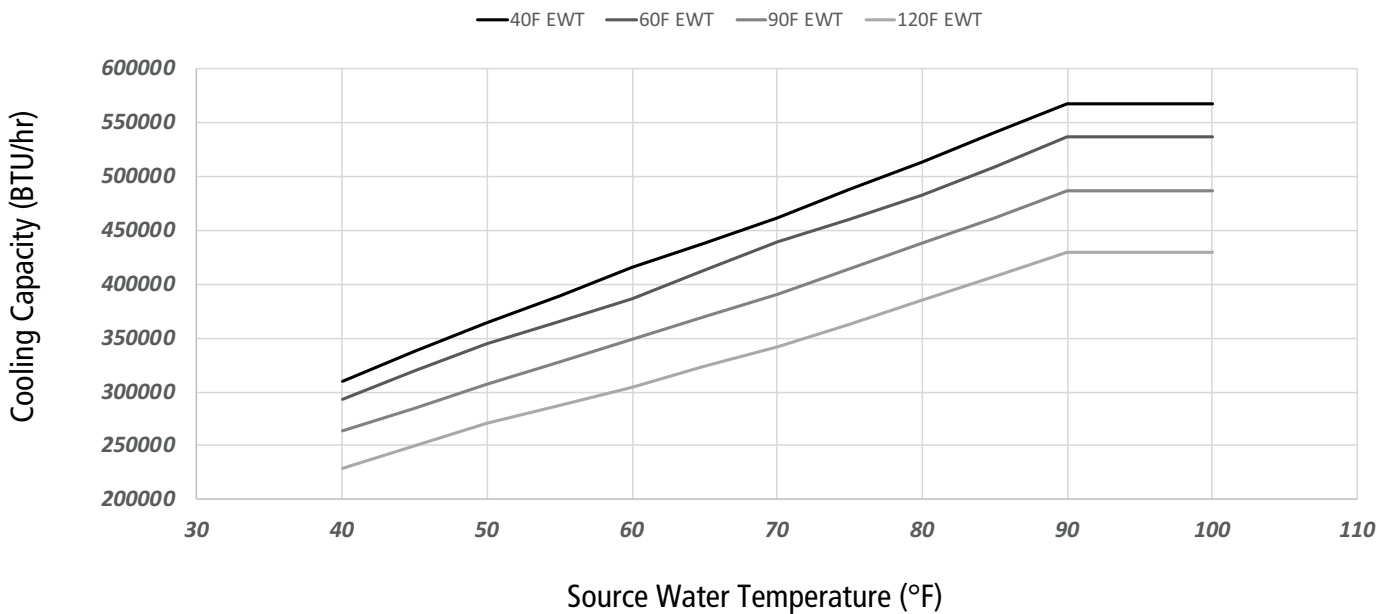
Model	Entering Source Water Temp(F°)	Leaving Source Water Temp(F°)	Source Cooling Capacity (Btu/hr)	Entering Heated Water Temp(F°)	Leaving Heated Water Temp(F°)	Supply Heating Capacity (Btu/hr)	Power Input (kW)
AHPM-540	80°F	70	496800	50	61.7	583600	25.48
		70.3	482400	60	71.5	577000	27.72
		70.6	468400	70	81.4	571200	30.12
		70.9	453100	80	91.3	564600	32.66
		71.2	438400	90	101.2	558800	35.2
		71.7	419700	100	111.1	550600	38.3
		72	402900	110	121	544200	41.42
		72.4	384900	120	131	537800	44.78
		72.8	366000	130	140.9	531000	48.34
	73.1	346500	140	150.7	524800	52.22	
	90°F	78.9	552200	50	62.8	639800	25.66
		79.35	536600	60	72.7	631800	27.92
		79.8	521200	70	82.5	624800	31.22
		80.25	503700	80	92.3	616000	32.92
		80.7	486900	90	102.1	608600	35.6
		81.15	468000	100	111.9	599800	38.6
		81.6	449800	110	121.5	592400	41.66
		82.05	429300	120	131.1	583400	45.1
		82.5	409200	130	140.9	575400	48.6
83		387800	140	150.7	566600	52.66	

### PERFORMANCE CHARTS

#### Heating Capacity vs. Source Water Temperature

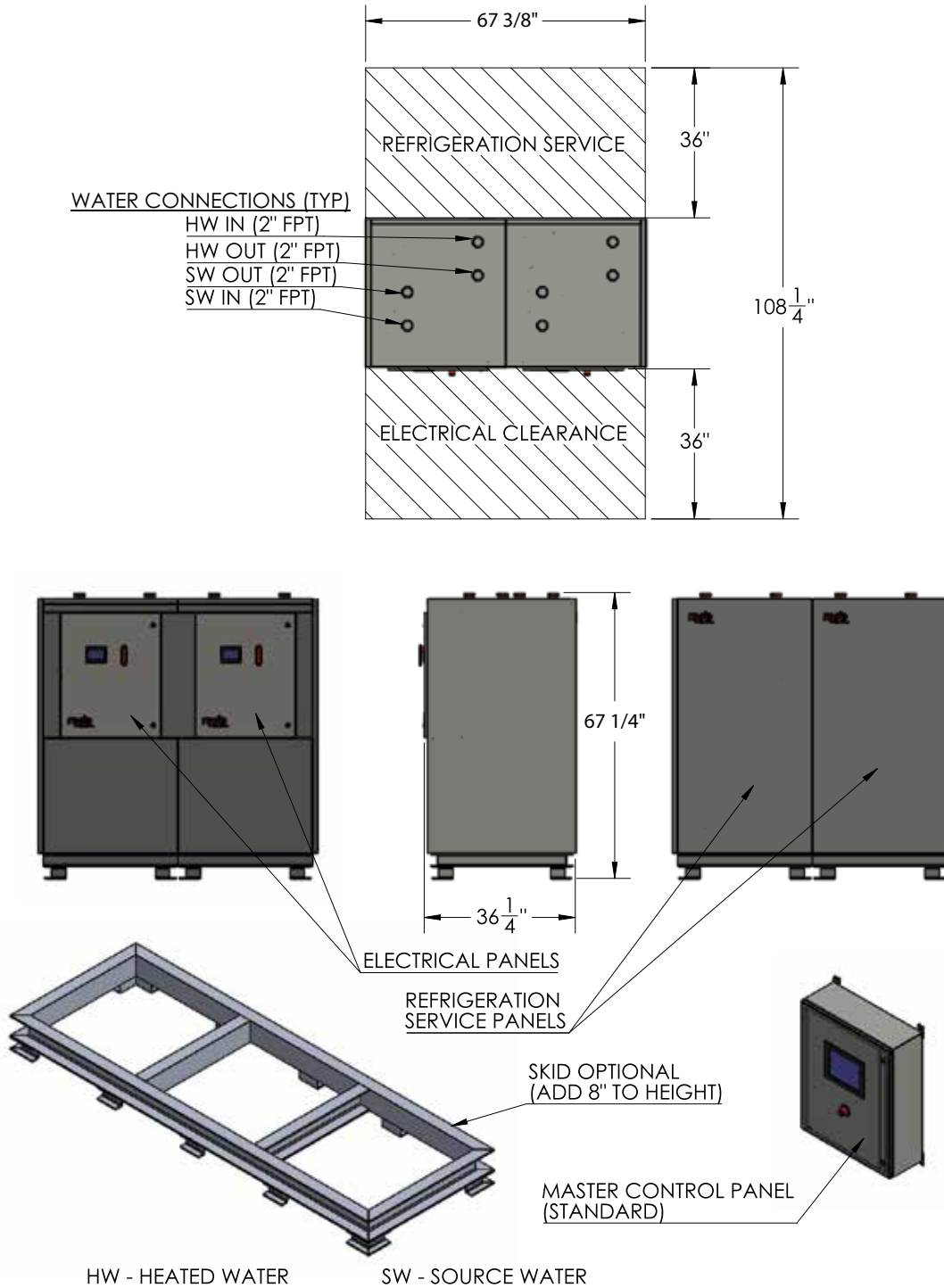


#### Cooling Capacity vs. Source Water Temperature



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

## DIMENSIONS



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



# COMMERCIAL HEAT PUMP WATER HEATERS

## SUGGESTED SPECIFICATION

The HEAT PUMP shall be A. O. Smith Model AHPM-540 having a heating capacity capable of 554,200 BTU/h and cooling capacity of 414,450 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.**