

## **SHPM SERIES**

### **MODULAR WATER SOURCE HEAT PUMP HEAT PUMP WATER HEATER**

The State SHPM-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:**

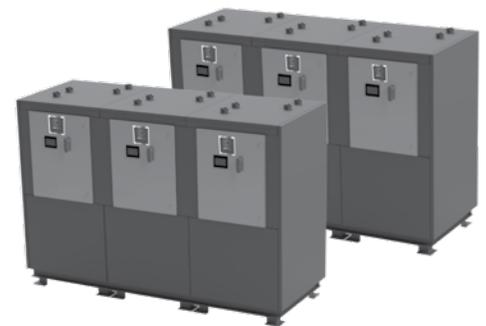
- Up to 160°F maximum water temperature
- Ambient operating range of 40-120°F
- Absorbs heat from water sources, including return chiller water, process and groundwater
- Environmentally friendly R134a refrigerant
- Double wall condenser for potable water heating
- Suitable for indoor and outdoor applications
- 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 [StateWaterHeaters.com](http://StateWaterHeaters.com)



**MODEL SHPM-1620**



# **SOLID. STATE.**



### SPECIFICATIONS

Operating Conditions	Model Number		SHPM-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 State. 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)



# COMMERCIAL

## 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)
SHPM-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

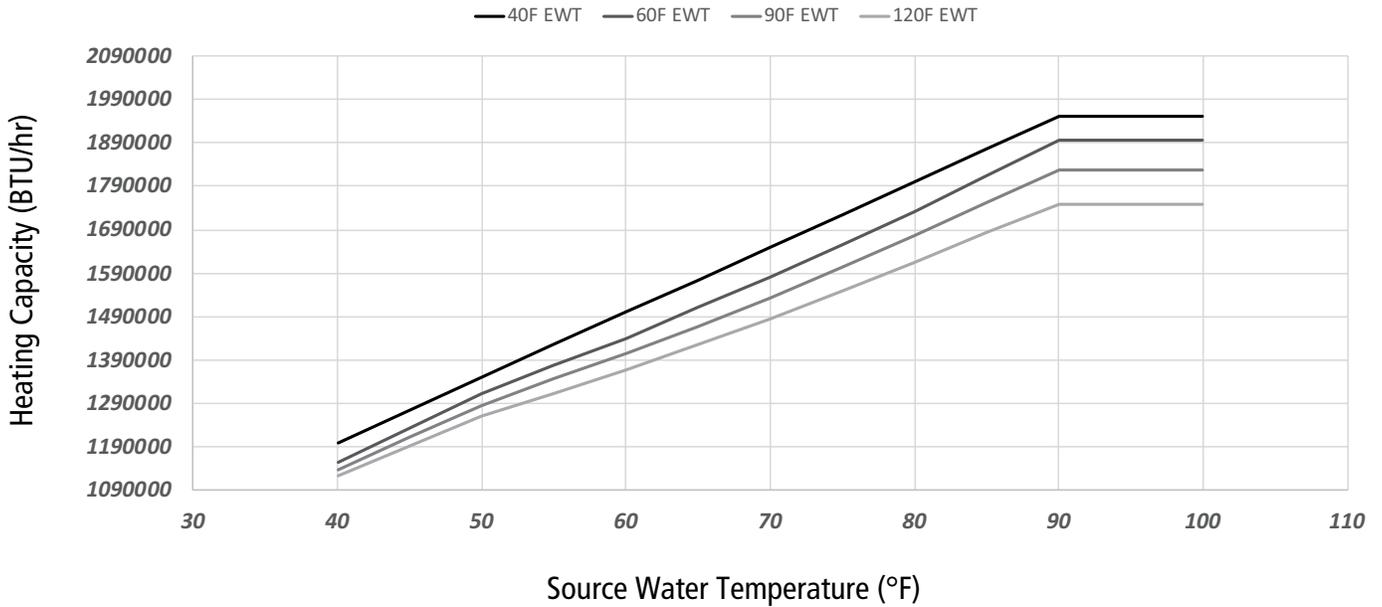


### PERFORMANCE DATA

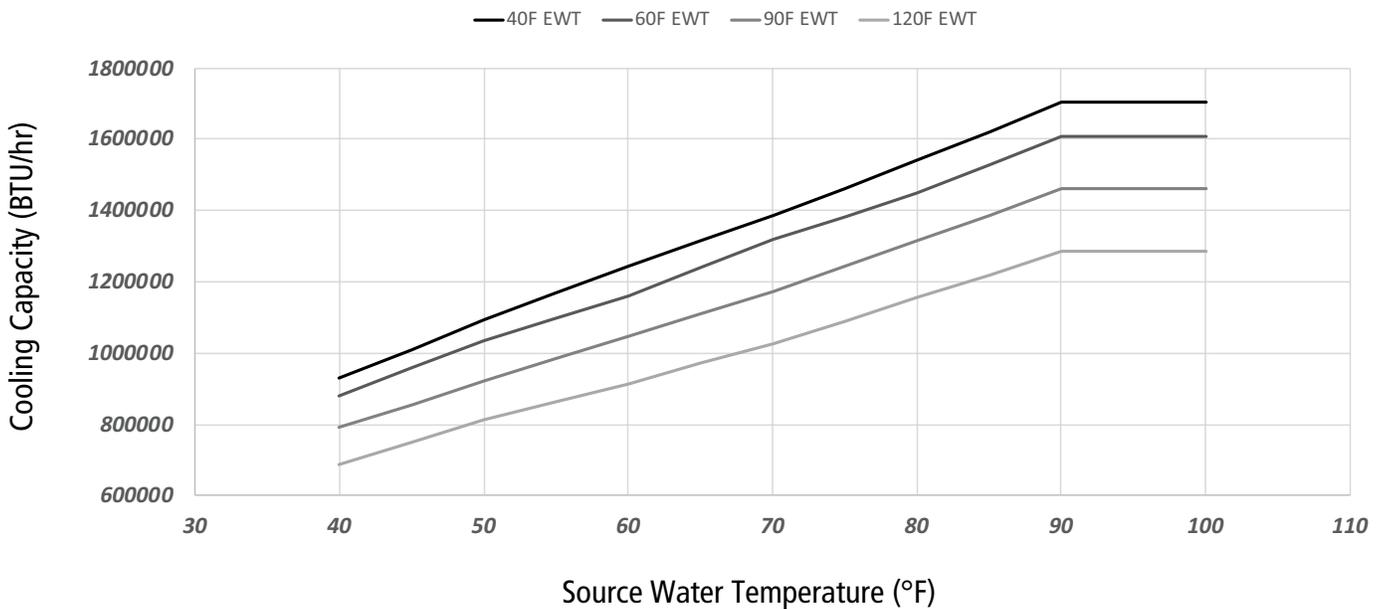
Model	Entering Source Water Temp(°F)	Leaving Source Water Temp(°F)	Source Cooling Capacity (Btu/hr)	Entering Heated Water Temp(°F)	Leaving Heated Water Temp(°F)	Supply Heating Capacity (Btu/hr)	Power Input (kW)
SHPM-1620	80°F	70	1490400	50	61.7	1750800	76.44
		70.3	1447200	60	71.5	1731000	83.16
		70.6	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	1698000	157.98

### PERFORMANCE CHARTS

#### Heating Capacity vs. Source Water Temperature



#### Cooling Capacity vs. Source Water Temperature

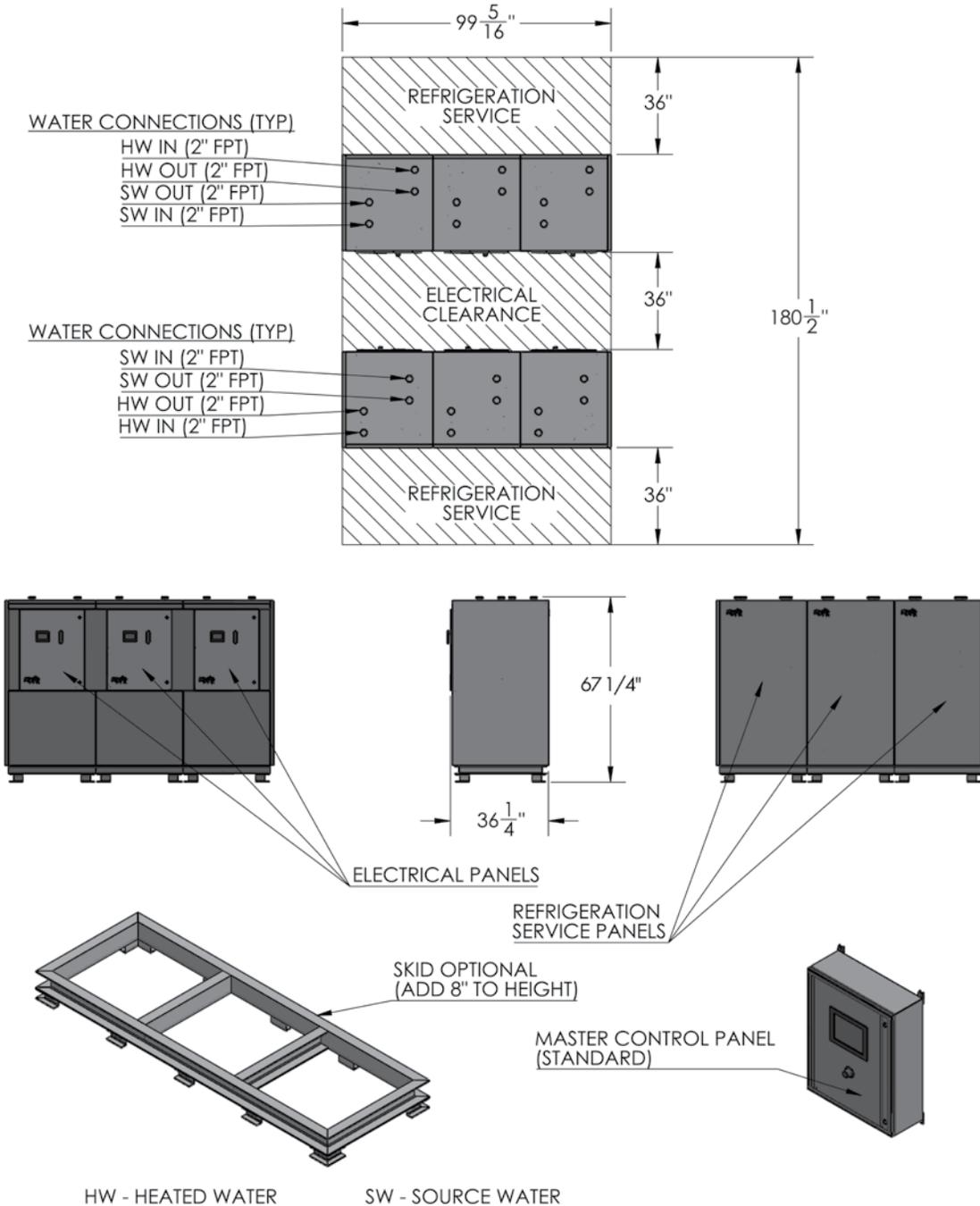


Water heated from 50°F to 150°F with 75°F entering source water temperature

### DIMENSIONS

Customer specific layout available utilizing a combination of six (6) SHPM-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 State Model SHPM-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.