

SHPM SERIES

MODULAR WATER SOURCE HEAT PUMP HEAT PUMP WATER HEATER

The State SHPM-2160 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:

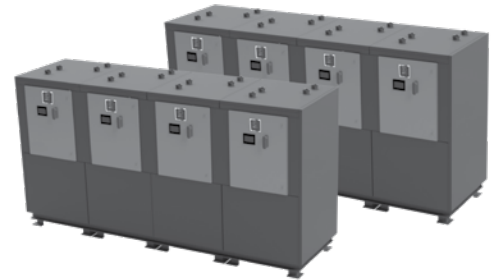
- Up to 160°F maximum water temperature
- Ambient operating range of 40-120°F
- Absorbs heat from water sources, including return chiller water, process and groundwater
- Environmentally-friendly R134a refrigerant
- Double wall condenser for potable water heating
- Suitable for indoor and outdoor applications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



MODEL SHPM-2160



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COMMERCIAL

HEAT PUMP WATER HEATERS

SPECIFICATIONS

Operating Conditions	Model Number		SHPM-2160		
	Recovery Rate †		2,584 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		400 GPM		
	Condenser Pressure Drop		10.76 ft Head*		
	Evaporator Water Flow Rate		400 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		200 GPM		
	Condenser Pressure Drop		1.92 ft Head*		
	Evaporator Water Flow Rate		400 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		9,200 lbs		
	Operating Weight		10,400 lbs		
	Standard Sound Rating		87 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)



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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)
SHPM-2160	42°F	36	1210400	50	57.7	1545600	98.24
		36.2	1173600	60	67.7	1538400	106.64
		36.4	1135200	70	77.7	1531200	115.68
		36.6	1095200	80	87.6	1523200	125.36
		36.8	1054400	90	97.6	1517600	135.6
		37	1011200	100	107.6	1511200	146.56
		37.2	966400	110	117.6	1507200	158.4
		37.4	917600	120	127.6	1501600	170.96
		37.7	870400	130	137.6	1500000	184.56
		37.7	861600	140	147.6	1497600	189.52
	50°F	42.7	1424000	50	58.8	1764800	99.6
		43.1	1381600	60	68.8	1750400	109.36
		43.4	1340000	70	78.7	1740800	117.36
		43.6	1294400	80	88.6	1728000	127.28
		43.9	1228800	90	98.6	1716000	137.76
		44.1	1180800	100	108.6	1704000	148.96
		44.3	1142400	110	118.6	1692800	160.64
		44.6	1081600	120	128.5	1681600	173.76
		44.9	1020800	130	138.5	1674400	187.76
		45.1	974400	140	148.5	1666400	201.6
	60°F	52	1595200	50	59.7	1938400	100.4
		52.3	1548000	60	69.6	1920800	109.12
		52.5	1502400	70	79.6	1906400	118.4
		52.8	1449600	80	89.5	1888000	128.48
		53	1398400	90	99.4	1872800	139.04
		53.3	1344000	100	109.4	1857600	150.56
		53.6	1287200	110	119.3	1840800	162.32
		53.9	1219200	120	129.3	1821600	176.56
		54.2	1162400	130	139.2	1810400	189.76
		54.5	1097600	140	149.1	1797600	202.48
	70°F	61.1	1782400	50	60.6	2128000	101.2
		61.2	1756800	60	70.5	2106400	110
		61.6	1680000	70	80.5	2087200	119.44
		61.9	1620800	80	90.4	2064000	129.6
		62.2	1564800	90	100.4	2044000	140.4
		62.5	1504800	100	110.3	2023200	151.92
		62.7	1440800	110	120.1	2004000	164.32
		63.1	1368000	120	130	1977600	178.8
		63.5	1306400	130	139.9	1960000	191.68
		63.8	1235200	140	149.9	1941600	206.96

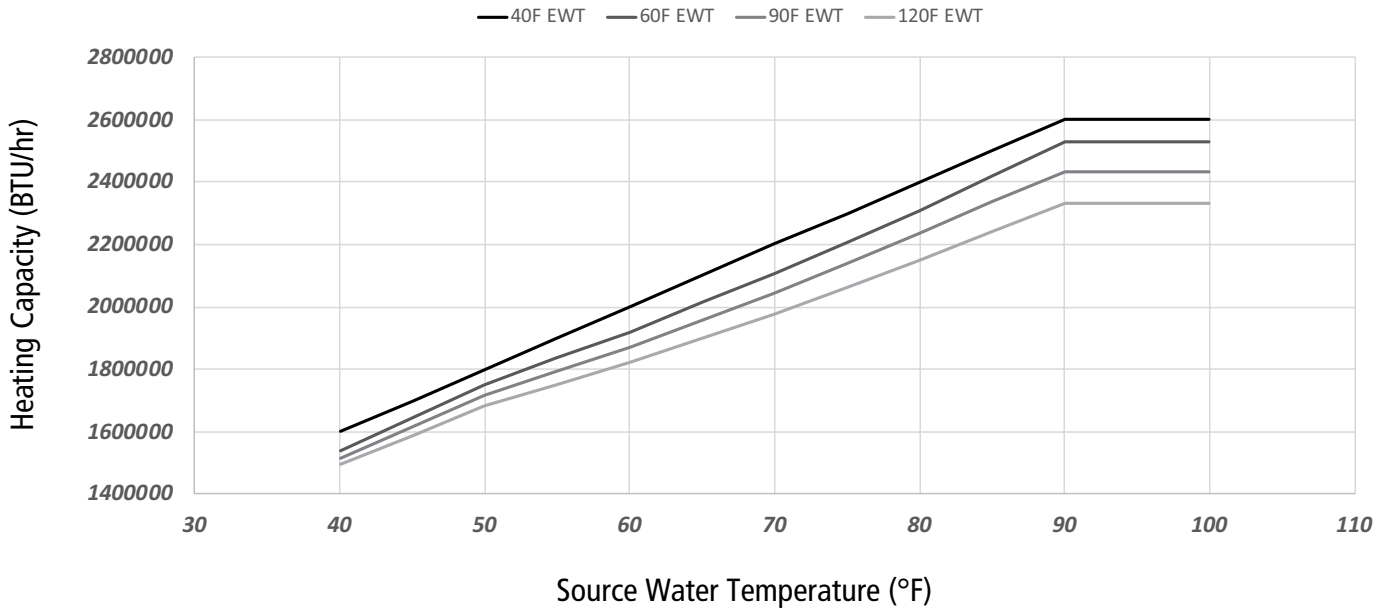


PERFORMANCE DATA

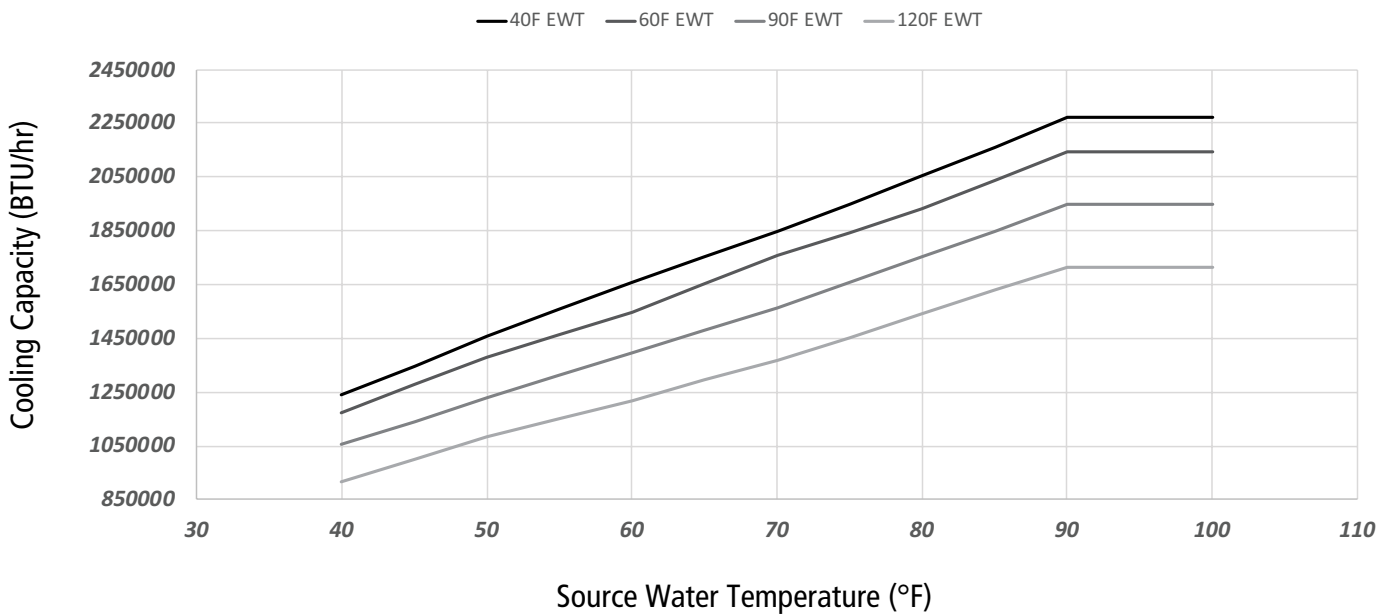
Model	Entering Source Water Temp(°F)	Leaving Source Water Temp(°F)	Source Cooling Capacity (Btu/hr)	Entering Heated Water Temp(°F)	Leaving Heated Water Temp(°F)	Supply Heating Capacity (Btu/hr)	Power Input (kW)
SHPM-2160	80°F	70	1987200	50	61.7	2334400	101.92
		70.3	1929600	60	71.5	2308000	110.88
		70.6	1873600	70	81.4	2284800	120.48
		70.9	1812000	80	91.3	2258400	130.64
		71.2	1753600	90	101.2	2235200	140.8
		71.7	1678400	100	111.1	2202400	153.2
		72	1611200	110	121	2176800	165.68
		72.4	1539200	120	131	2151200	179.12
		72.8	1464000	130	140.9	2124000	193.36
	73.1	1385600	140	150.7	2099200	208.88	
	90°F	78.9	2208800	50	62.8	2559200	102.64
		79.35	2146400	60	72.7	2527200	111.68
		79.8	2084800	70	82.5	2499200	124.88
		80.25	2014400	80	92.3	2464000	131.68
		80.7	1947200	90	102.1	2434400	142.4
		81.15	1872000	100	111.9	2399200	154.4
		81.6	1799200	110	121.5	2369600	166.64
		82.05	1716800	120	131.1	2333600	180.4
		82.5	1636800	130	140.9	2301600	194.4
83		1551200	140	150.7	2266400	210.64	

PERFORMANCE CHARTS

Heating Capacity vs. Source Water Temperature



Cooling Capacity vs. Source Water Temperature

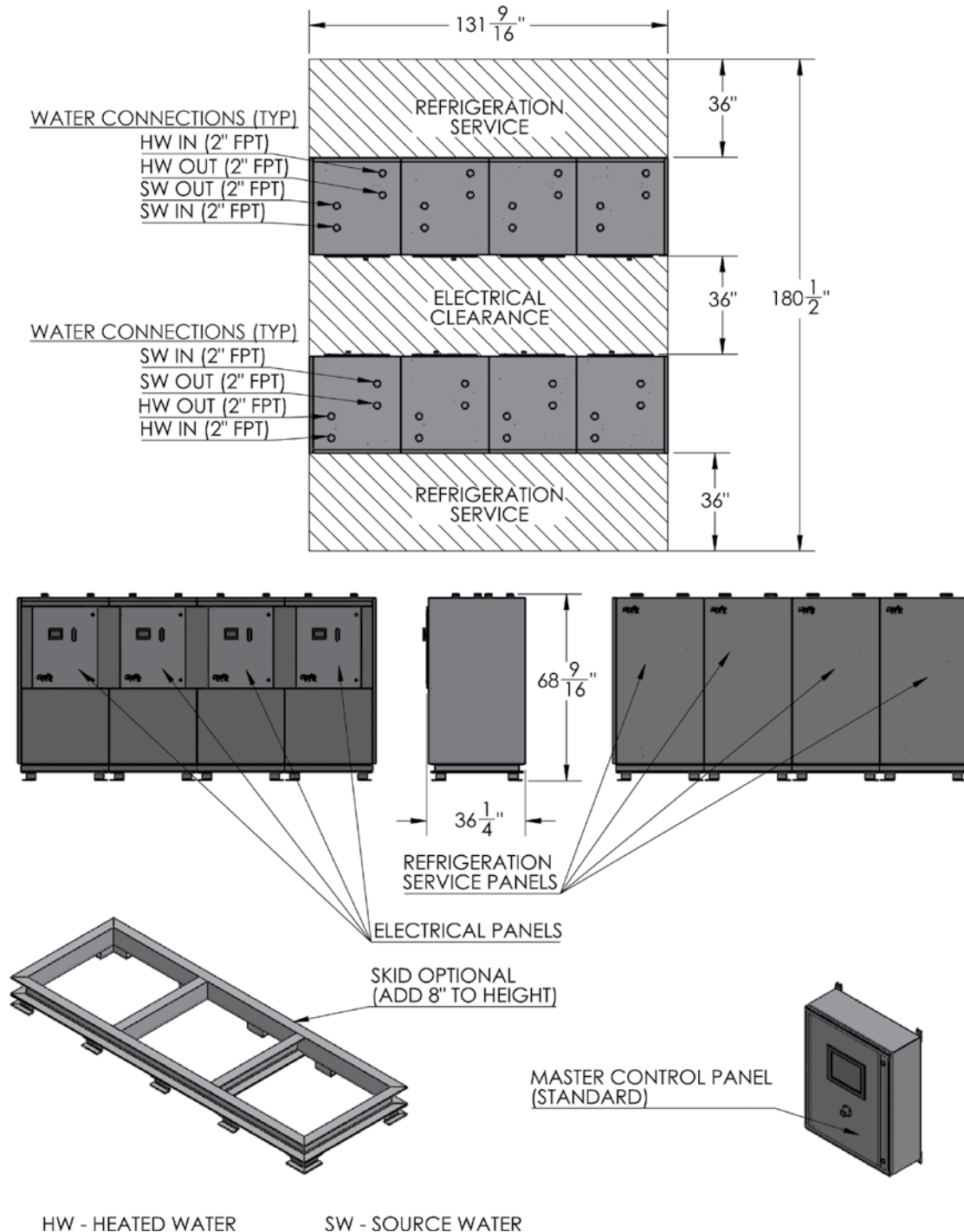


Water heated from 50°F to 150°F with 75°F entering source water temperature

DIMENSIONS

Customer specific layout available utilizing a combination of eight (8) 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-2160 having a heating capacity capable of 2,216,800 BTU/h and cooling capacity of 1,725,600 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.