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Hubbell OMNI HHP System

Training 04/26/2023

The Nudyne Group

- Who is The Nudyne Group?
- Our mission
- How it benefits the customer
- Hubbell founding member of ASPE Boston Chapter

Value Proposition

The Nudyne Group leverages the knowledge, capabilities, and innovation of each company in a collaborative manner to provide water heating and storage solutions to the commercial, industrial, and residential markets.

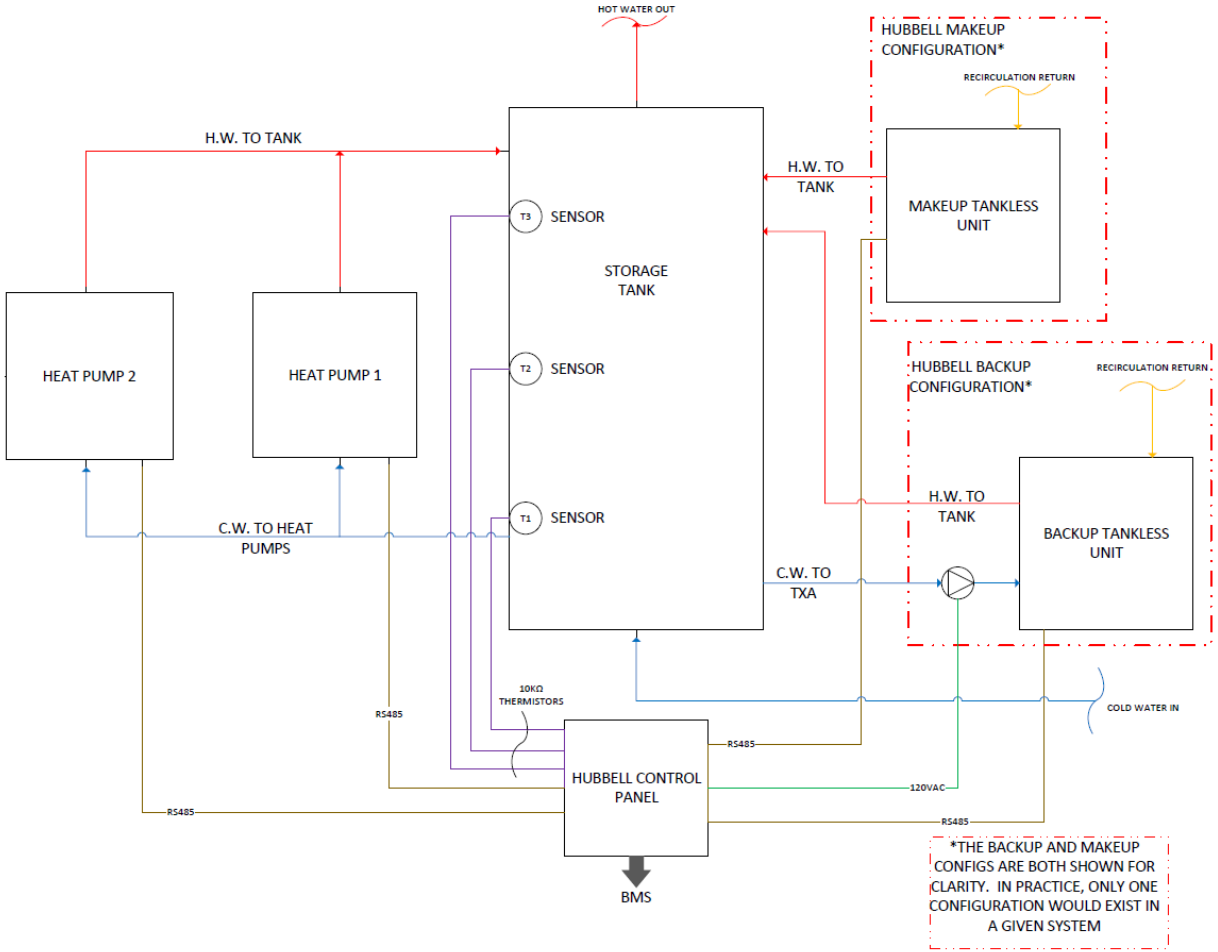
Takeaways

By attending this meeting, you will leave with:

- A better understanding of heat pump technology
- The benefits and draw-backs
- Why cement lining is the best choice for a lined potable water tank
- A comprehensive understanding of how the TXA eliminates the need for a swing tank, saves space, and saves money
- A deeper understanding of the philosophy and nuances of heat pump sizing
- How to control it all
- A broad understanding of the Hubbell product line

The OMNI HHP System

The OMNI HHP System Diagram

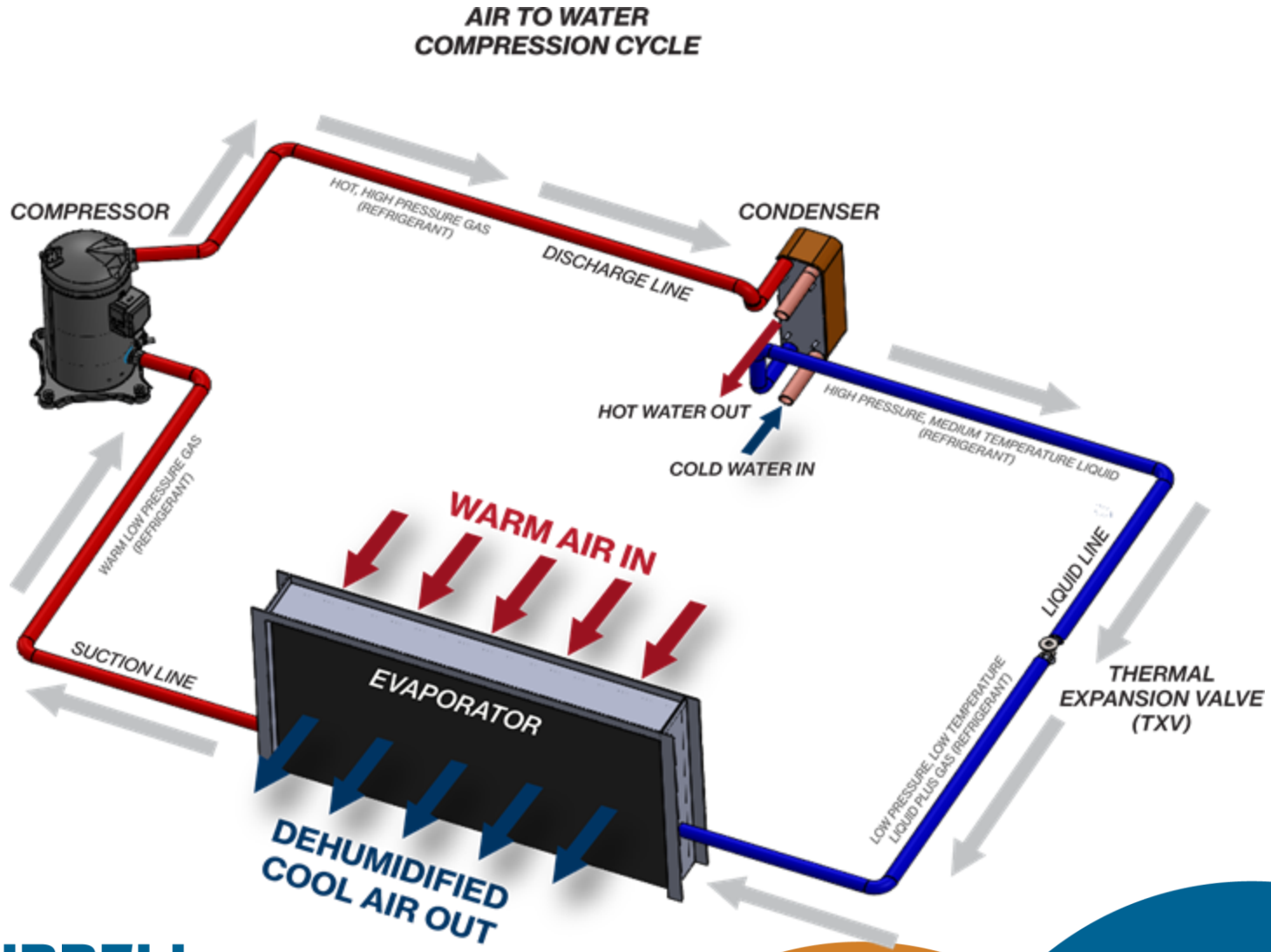


The Hubbell OMNI Heat Pump

- Using R-134a refrigerant
  - 513 end of summer
- Water source models compatible with source water 40-100°F
- Air source models compatible with source air 40-100°F
- Outlet water heating capacity up to 150°F

AIR SOURCE			WATER SOURCE		
MODEL	CAPACITY @ 75°F SOURCE	C.O.P @ 75°F SOURCE	MODEL	CAPACITY @ 75°F SOURCE	C.O.P @ 75°F SOURCE
HHP90A	109,000 BTH	5.8	**HHP125W**	145,000 BTH	5.2
HHP185A	224,100 BTH	5.7	**HHP185W**	224,100 BTH	5.0
HHP250A	282,000 BTH	4.5	**HHP270M**	269,000 BTH	4.8
			HHP540M	538,000 BTH	4.8
			HHP810M	804,000 BTH	4.9
			HHP1080M	1,080,000 BTH	3.8
			HHP1350M	1,350,000 BTH	3.8
			HHP1620M	1,620,000 BTH	3.8

Hubbell Heat Pump Technology – How Does it Work?



Air Source vs. Water Source

- Cold weather package
  - Used to bring below 40°F air up to temperature
  - Required on all air-source units installed in areas that face sub-optimal conditions
  - With defrost mode and shutdown faults when facing sub-optimal conditions
- Outdoor vs. Indoor coating
  - Indoor coating standard on all water source units
    - Macropoxy 646 Base
      - Rated for 6,500 Hrs. salt spray / fog
  - Outdoor coating standard on all air source units
    - Macropoxy 646 Base, Arcolon Ultra Polyurethane Finish
      - 9,000 Hrs. salt spray / fog
- Air source units in sub-optimal areas should be equipped w full electric backup

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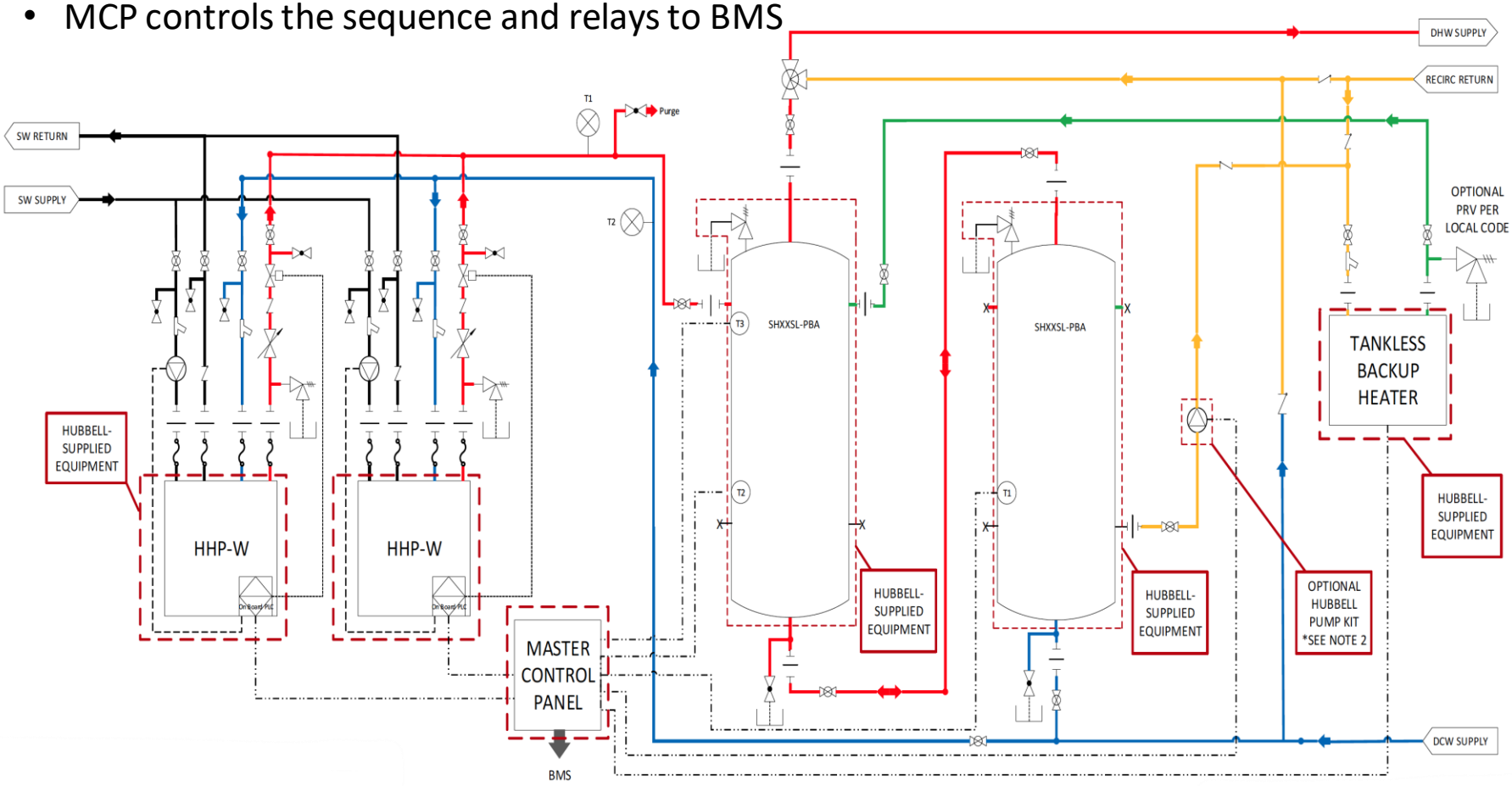
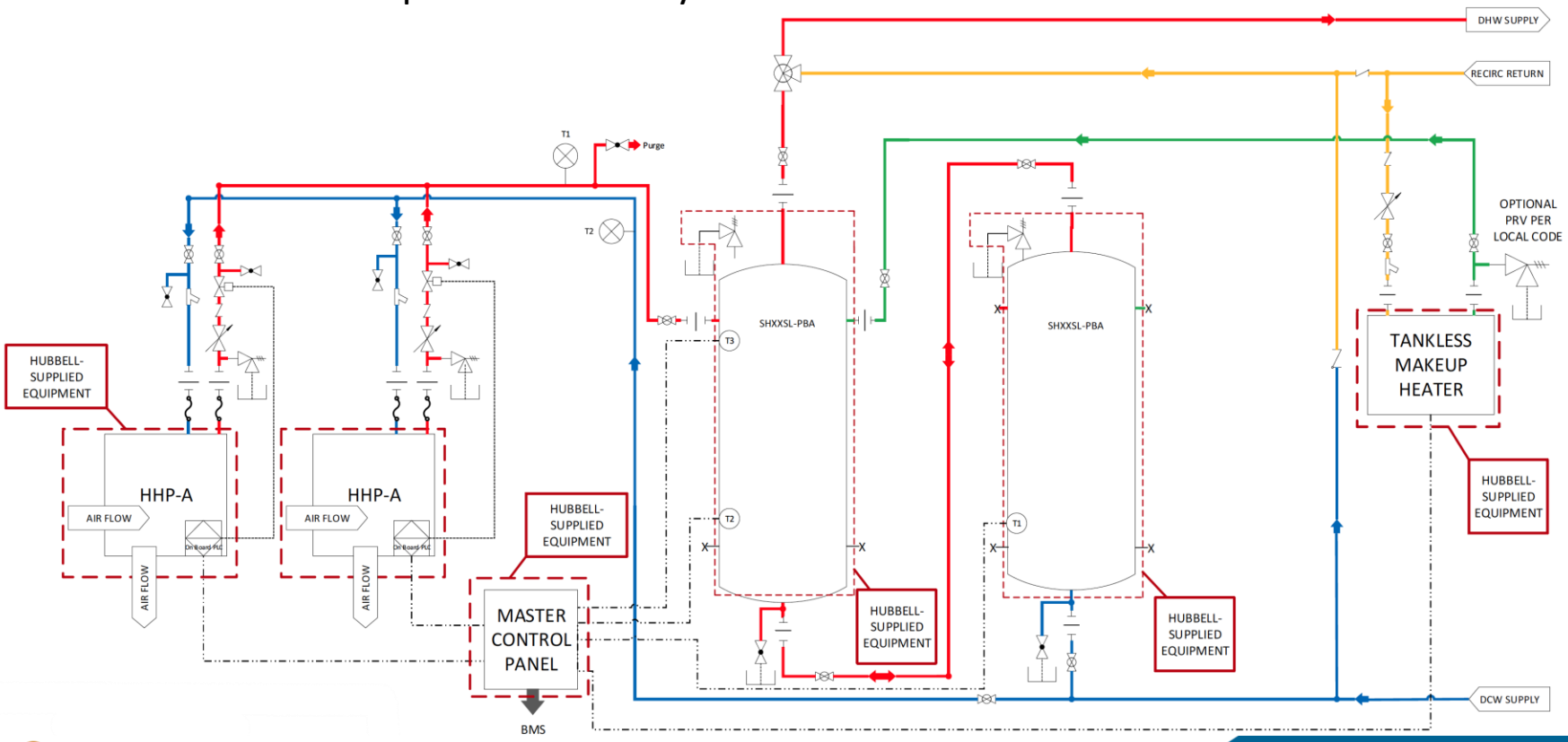
The OMNI System (TXA BACKUP)

- Heated potable water flows from HP to ST
- When HP alone is unable to meet demand, TXA kicks-on to fill ST
- MCP controls the sequence and relays to BMS



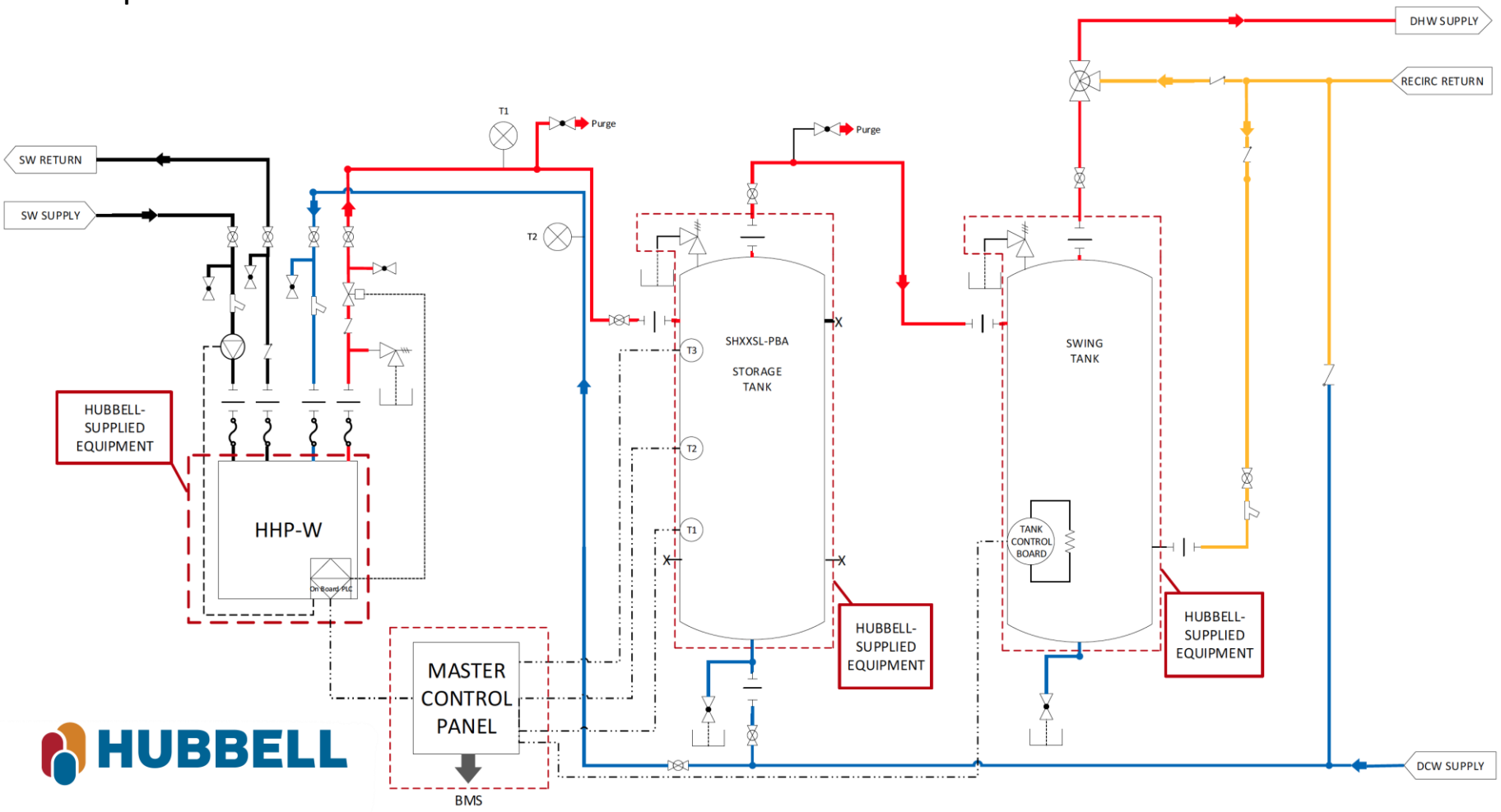
The OMNI System (TXA MAKEUP)

- Heated potable water flows from HP to ST
- When recirc return endangers the storage temp, TXA kicks-on to increase recirc temp to setpoint
- MCP controls the sequence and relays to BMS



The OMNI System (Swing Tank)

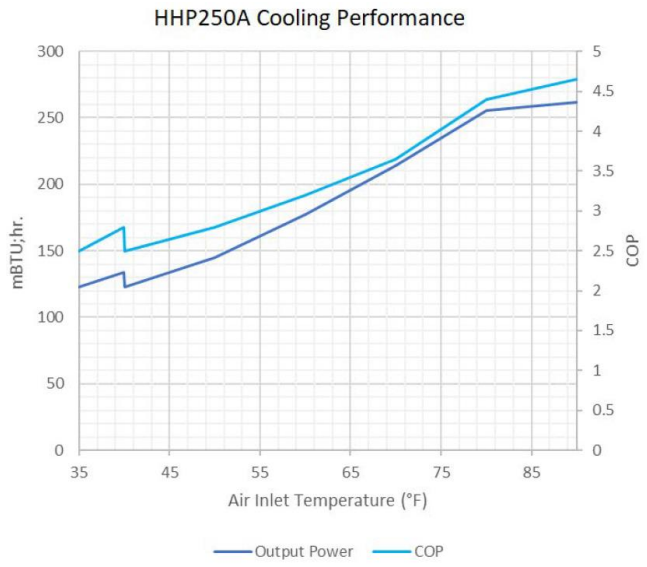
- Heated potable water flows from HP to ST
- ST outlets to swing tank for building use
- When recirc return endangers storage temp, heating elements kick-on to increase to setpoint

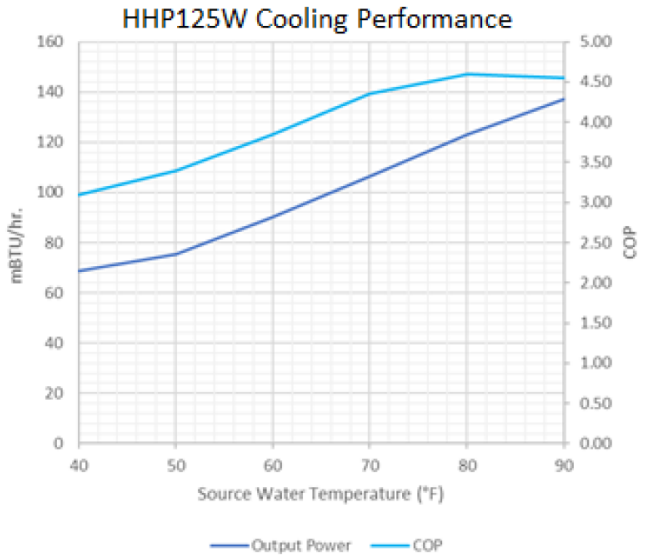


Hubbell Heat Pump Cooling Technology

An additional benefit to heat pump installation

- **Air source –** cooling applied to the mechanical room or to other parts of the building if the air intake & discharge are ducted
- **Water source –** added cooling capacity to a chiller loop or cooling tower

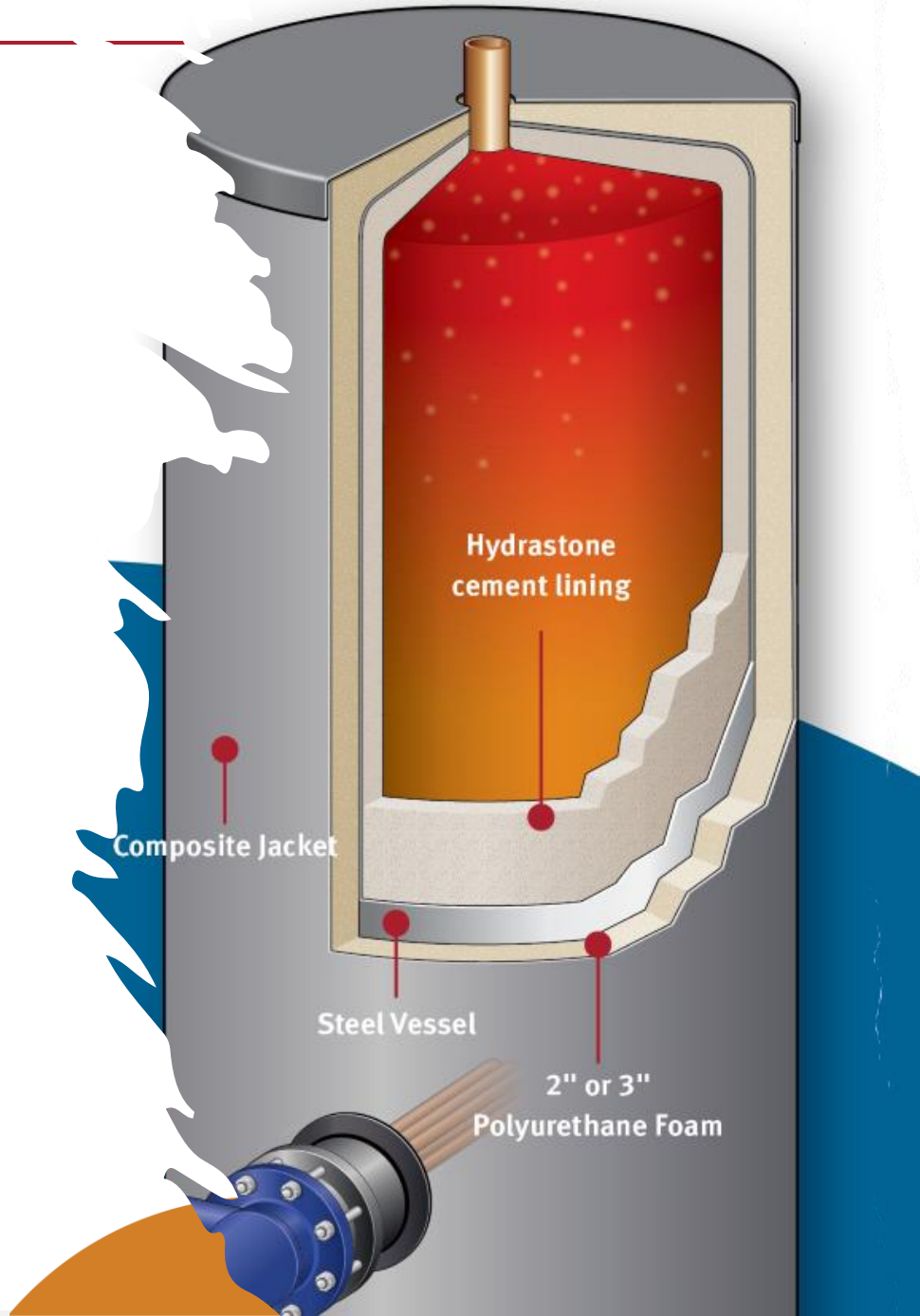




Hubbell Cement-Lined Tank

Why a lining

- Thickness
- Coverage
- Corrosion Resistance
- Non-Ferrous Tappings
- Other Benefits
- Available in Sizes 6-5000 Gallons



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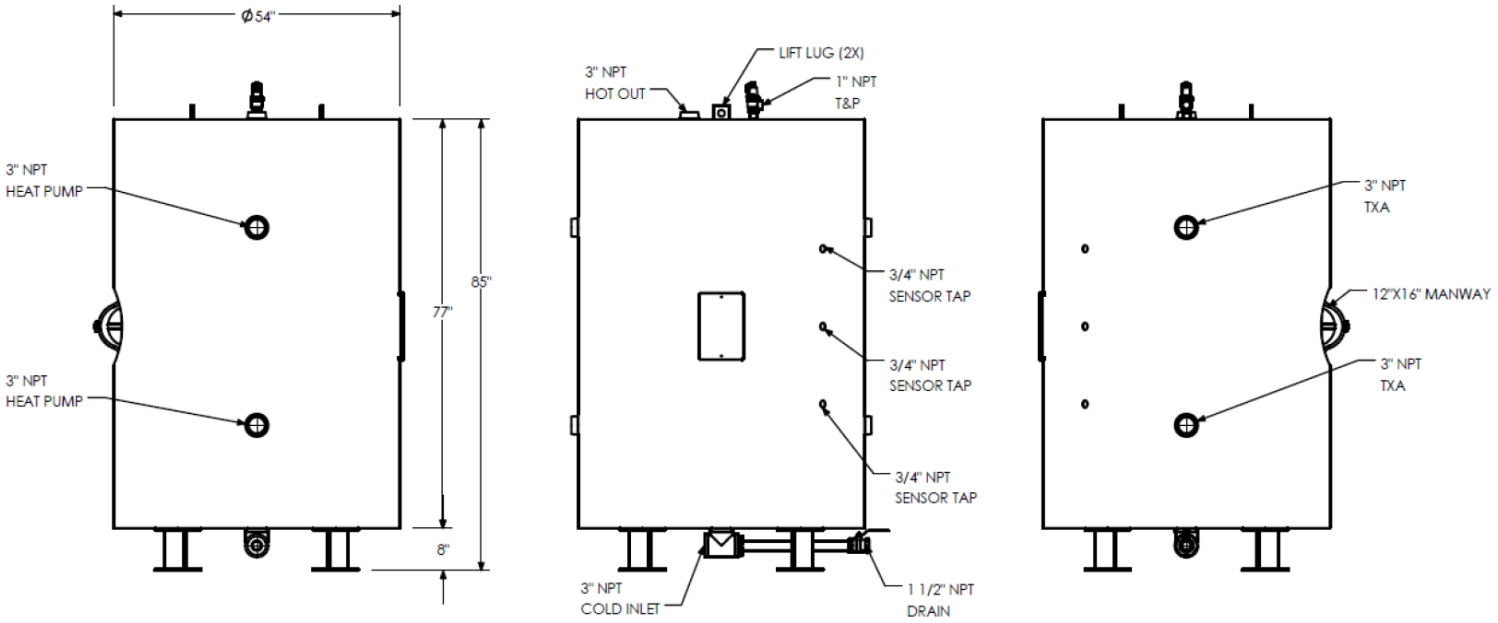
-PBA Tanks

- 3 Sensors to control the system
- 3” Polyurethane foam insulation
  - R Value: 21 on all standard sizes
- Standard sizes eliminate pre-production, lowering lead times
  - 120, 150, 200, 300, 400, 500, 600, 750, & 900 Gallons



TXA (Electric Backup/Makeup)

- Fully modulating
- 1°F setpoint temp. increments
- Available in 3, 6, 12, & 18-element designs, kW ratings 5-162
- Max. Footprint 59” X 43” X 33”
- BACnet communications via Hubbell T1000 controller, compatible with Hubbell connect controller MCP
- Used to boost recirc flow re-entering storage tank OR to provide full recovery when HP cannot meet demand

The Hubbell Connect Controller

- The Master Control Panel or Hubbell Connect Controller ties the OMNI System together
- BMS BACnet MS/TP Communications
- Monitors and relays temperature setpoint, HP status, among others
- Monitors the tank temperature sensors and the condition of the heat pump
- Controls alternate heat source and recirc pump if necessary
- Specially designed for each type of system
  - HCC-B, HCC-M, HCC-S, HCC-T, HCC-H, HCC-X

Sizing

Unlike traditional potable water heating, a Hubbell heat pump system consists of multiple major components and user inputs which have significant impact on its design and operation

Key factors include:

- Building type
- Number of occupants
- Projected hot water usage curve
- Available storage
- Source air or water temperature
- Desired outlet temperature and flow rate

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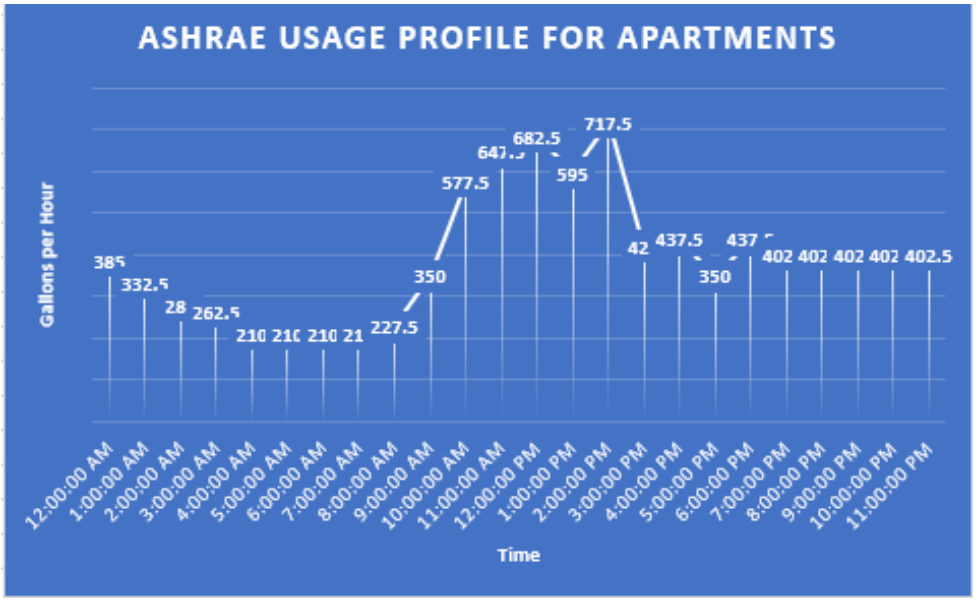
The Hubbell Heat Pump Sizing Tool

Hubbell engineers have created a powerful and intuitive tool for sizing heat pump systems, based around the philosophy of run-time, the longer it runs, the more efficient it becomes

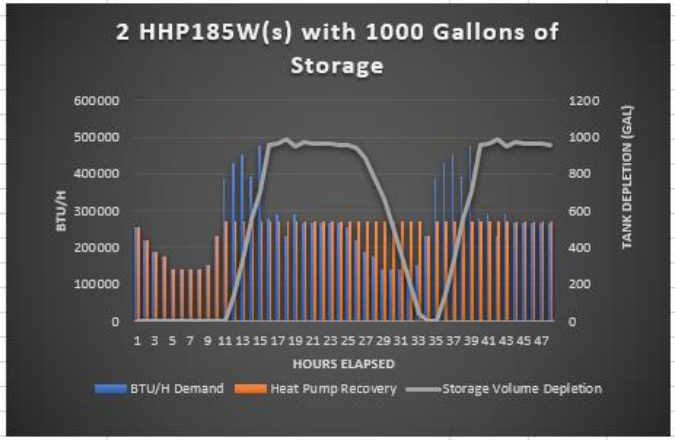
Using installation inputs and ASHRAE data

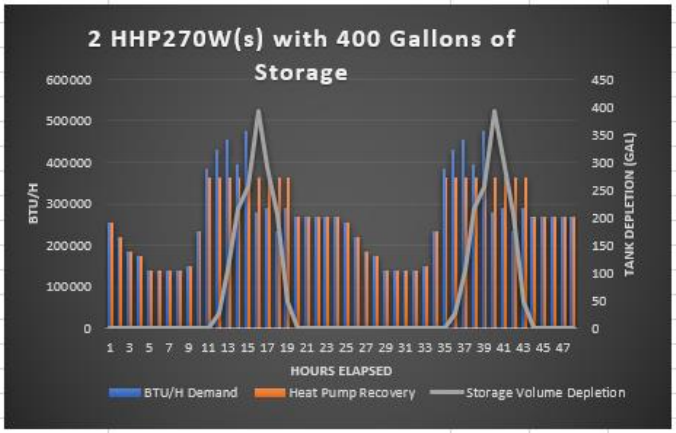
Storage Temp	140°F
Cold Water Supply Temp	40°F
Building Type	Apartments
# of Apartments	175
Recirculation Loop Temp (Supply)	120°F
Loop ▲T	10°F
Recirculation Loop Flow Rate	3 GPM
Source Temp	40°F
Source Type	Water
Min # of Heat Pumps	2
Alternate Heat Source Voltage	T4
Alternate Heat Source	Makeup
Max Storage Capacity (Default 900 Gal)	1000
Peak Demand	**717.5 GPH**
Gallons per Day	**9,555 Gal**
Avg Energy Demand	**634,4520**

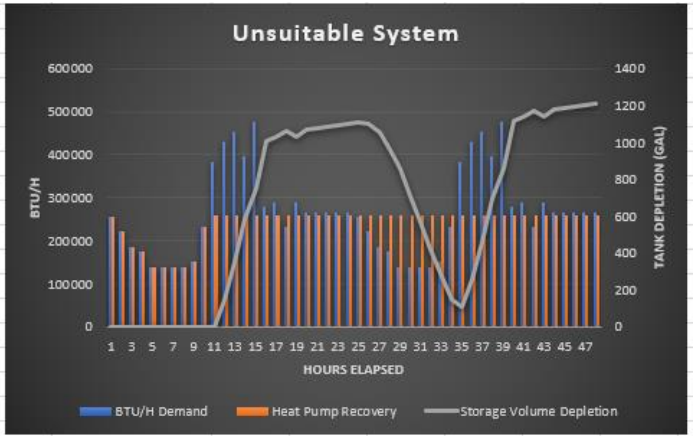


Sizing (Cont.)

Creating demand and supply curves help you size and select the optimal heat pump system







Sizing (Cont.)

Complete with dynamic model numbering to complete the system

Select This

Source Type	Water
Min # of Heat Pumps	2
Alternate Heat Source Voltage	T4
Alternate Heat Source	Makeup
Max Storage Capacity (Default 900 Gal)	1000

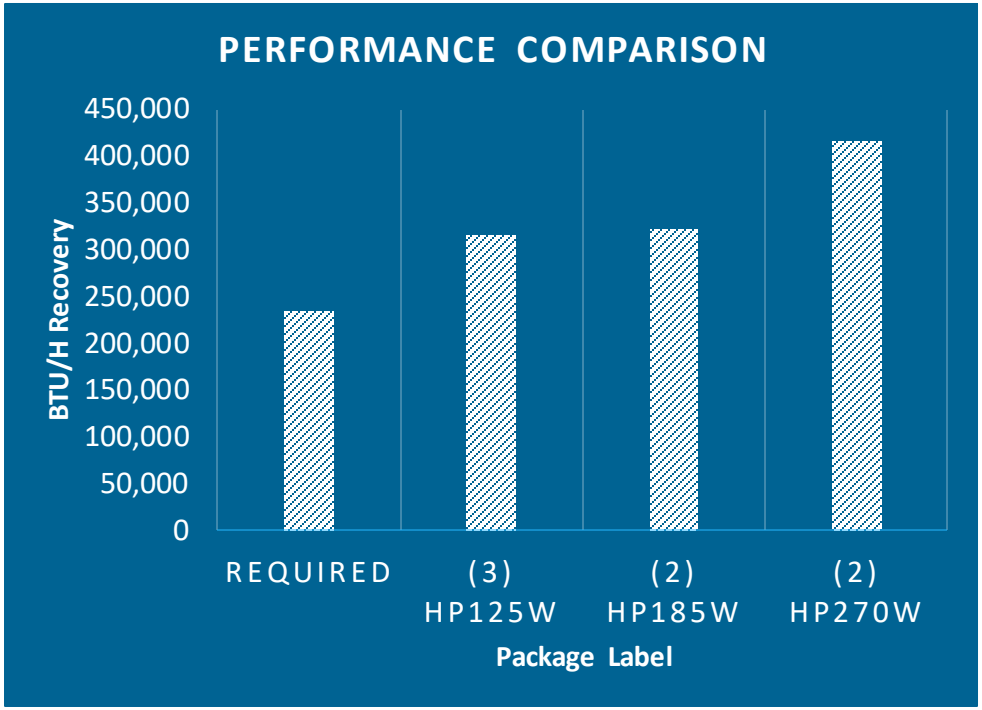
Get This

RECOMMENDED HP/TANK	Alternate Heat Source	Controller	Avg Recovery
Unsuitable System	N/A	HCC-M	N/A
2 HHP185W(s) with 1000 Gallons of Storage	(1) TXA18-3T4	HCC-M	301 GPH
2 HHP270W(s) with 400 Gallons of Storage	(1) TXA18-3T4	HCC-M	321 GPH

Sizing (Cont.)

Including a comparison tool for providing Hubbell “equal-to’s”

Storage Temp	140°F
Cold Water Supply Temp	120°F
Required BTU/H	235,000BTU/H
Storage Capacity	400 GAL
Recirc Loop Temp (Supply)	120°F
Loop ▲T	10°F
Recirculation Loop Flow Rate	3 GPM
Source Temp	50°F
Source Type	Water
Alternate Heat Source	Makeup
AHS Voltage	R
Gallons per Day	**33,976**



Option	RECOMMENDED HP	Alternate Heat Source	Controller	Avg HP Recovery
Option A	3 HP125W Recommended	(1) TXA16-3R	HCC-M	1903 GPH
Option B	2 HP185W Recommended	(1) TXA16-3R	HCC-M	1935 GPH
Option C	2 HP270W Recommended	(1) TXA16-3R	HCC-M	2505 GPH

The Hubbell Line

- Our OMNI System spotlights the “Uniques” which set Hubbell apart in the industry
- Cement-Lined Tanks
  - Hubbell E & SE, EMV, ER, SH, ST, & BW
- Infinity Series
  - TX, HX, TXA, ETX, STX, BWXP, & CR
- Controls & Components
  - HCC, T1000, Steam & Boiler Coils, Elements, Etc.

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In Review

- The Hubbell Heat Pump system is available in air and water source styles and at variety of different heating and cooling capacities
- Heat pump systems are some of the most efficient heating systems in the world today
- Hubbell's cement-lined tanks set the industry standard for corrosion resistance and lifelong performance
- The Hubbell TXA eliminates the need for a swing tank, saving space and money
- The philosophy of run-time helps Hubbell size and specify the optimal heat pump system for your application
- The Hubbell Connect Controller ties the system together with BACnet MS/TP
- Hubbell offers a vast array of water heating products to fit near every application or need