



APV Shell & Tube Hot Water Sets For Sanitary & Industrial Applications

Many processes in food, dairy, beverage, pharmaceutical, chemical, and industrial facilities require a constant, controlled supply of hot water. Typical uses include heat sources for plate and tubular heat exchangers, process vessels, water ingredient supply for blend processes, and CIP systems. Hot water is often preferred over steam because it provides a closer and more controllable temperature approach to the final desired product temperature. This is often critical when processing heat sensitive products that risk burn on or coagulation. Production run times can also be extended when hot water is used to heat products containing proteins, or other constituents, which have a tendency to fall out of solution when heated.

The APV Solution

Fourteen sizes of APV **standard** hot water sets are available covering a wide range of applications. These units are pre-engineered using proven shell and tube heat exchanger designs. Components are assembled on a 304 stainless steel base frame. Steam piping is welded, utilizing flanged components, which eliminates steam leaks common to threaded steam piping. Advantages include immediate documentation availability, proven design, quick shipments, and cost savings.

Custom hot water sets are engineered and manufactured to a specific set of application parameters. Custom units are fabricated using designs and components similar to the standard units, but specially selected to meet particular requirements. Custom units can also include an expansion tank for high-pressure steam, a condensate return pump, or electric heating technology.

A typical APV Stainless Steel Shell and Tube Hot Water Set will comprise the following standard components:

- Shell & tube heat exchanger: All 316 stainless steel
- Hot water re-circulation pump: Stainless steel pump with 3PH/60HZ/230-460V motor
- Automatic steam control valve: Automatic valve with flanged connections
- Base: Stainless steel with ball feet
- Standard components: manual steam isolation valve, steam strainer, steam trap, vacuum breaker, water make-up and relief valves, ASME steam pressure relief valve, manual water shutoff valve, mild steel steam piping (welded as much as possible), stainless steel water piping, thermometers, pressure gauges

A typical APV Carbon Steel Shell and Tube Hot Water Set will comprise the following standard components:

- Shell & tube heat exchanger: Cast iron head, carbon steel shell, copper tubes
- Hot water recirculation pump: Stainless steel pump with 3PH/60HZ/230-460V motor
- Automatic steam control valve: Automatic valve with flanged connections
- Base: Stainless steel with ball feet
- Standard components: Manual steam isolation valve, steam strainer, steam trap, vacuum breaker, water make-up and relief valves, ASME steam pressure relief valve, manual water shutoff valve, mild steel steam piping (welded as much as possible), mild steel water piping, thermometers, pressure gauges



Options available with the standard HWS:

- Control Panel for Pump and Temperature Control
- Hot Water RTD (Residence Temperature Detector)
- Pneumatic Steam Shut-off Valve
- Positioner for Steam Valve
- Steam Pressure Reducing Valve

Benefits Of Hot Water Sets

- Closer temperature approach improves product quality
- Longer product run times by reducing fouling
- More controllable heating source (no superheat issues)
- More even energy distribution along heat transfer surface
- Prolongs life of heat transfer surface and gaskets
- Less risk of steam leaks provides safer operation
- Energy savings possible through condensate return to boiler

Selecting The Correct Hot Water Set

- To select the proper hot water set, identify water flowrate in GPM and heating range in °F.
- Selections are based on 90 PSIG steam pressure and 20 PSIG water pressure.
- Steam pressure regulator required for steam supply pressure greater than 90 PSIG.
- When selecting a system, it is important to size it for start-up and peak loads.
- Consult APV if hot water temperatures are required above 220 °F

APV Standard Shell & Tube Hot Water Sets Model Numbers				
Maximum Hot Water Flowrate	Maximum Hot Water Heating Range and Temperature			
	ΔT 5°F	ΔT 15°F	ΔT 30°F	ΔT 50°F
	220°F Maximum Water Temp.	220°F Maximum Water Temp.	220°F Maximum Water Temp.	220°F Maximum Water Temp.
25			CS2530 SS2530	
75		CS7515 SS7515	CS7530 SS7530	CS7550 SS7550
150	CS15005 SS15005	CS15015 SS15015	CS15030 SS15030	CS15050 SS15050
250		CS25015 SS25015	CS25030 SS25030	CS25050 SS25050
400		CS40015 SS40015	CS40030 SS40030	CS40050 SS40050

APV Standard HWS Dimensions

Width : 2 ft.
Height: 5 ft 6 in. to 9 ft.
Length: 7 ft. to 10 ft.

APV Hot Water Set Operation

To activate the system, make-up water is supplied to the pressure-reducing valve. Air is vented through an APV supplied valve which is shipped loose and installed by the customer at the highest point of the system. Water will continue to fill the system to the pressure set on the pressure reducing valve. This pressure should be checked on gauge and adjusted if necessary to about 20 PSIG before the system is operated. For applications where the water is heated above 220°F, the pressure set on the pressure reducing valve must be increased accordingly in order to provide adequate safety margin to avoid flashing. Start water pump.

The steam isolation valve is then opened, together with the blowdown valve, until all condensate is removed from the steam line. The optional steam pressure reducing valve is adjusted to give sufficient pressure at the gauge to allow the steam control valve to function correctly. The blowdown valve is then closed. The optional automatic shutoff valve is opened. The safety relief valve vent must be piped to a safe area. The steam trap should have no piping at its discharge that can create back pressure.

During operation of the system, pressure will increase due to expansion of the heated water. If the system pressure increases beyond the relief valve set point of 30 PSIG, water will be discharged from the system. For water temperatures of 220 °F and above, higher set relief valves are used. This relief valve discharge line should be piped to drain with no back pressure. If the system pressure is reduced to less than 20 PSIG due to loss of water through the pump seal or because of leaks in the piping, the water reducing valve will refill the system to 20 PSIG.

It is important that the water supply be maintained at a minimum of 20 PSIG at the reducing valve while the system is being operated. The water can be shut off only for servicing the pump.

