Shippensburg Pump Company, Inc.

BOILER FEED ● CONDENSATE ● DEAERATOR ● VACUUM

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Re: What is a Surge Tank? How Does it Work?

A surge tank is any tank made of steel, stainless steel or cast iron that holds ten minutes of *Net Storage.* The tank functions similar to a boiler feed unit in that the city make-up water should be entered into the system at this point. It differs from a boiler feed unit in that it provides feed water into deaerator instead of a boiler. The blending of the city make-up water with the returning condensate minimizes **thermal shock** to the deaerator.

The physical characteristics on this unit can vary from being floor-mounted to elevated and from vertical to horizontal. Generally, the surge tank since is vented and subject to corrosion, which is why, it is lined or is made out of 304 L stainless steel material. The surge tank is generally elevated for aesthetics only. The NPSH of the pump is NOT a concern since the water temperature of 150°F to 180°F ensures sufficient NPSH is available to the pump; therefore, make the surge tank floor mounted. It **saves money** and limits competition!

In addition, a surge tank must have continuously running pumps. These pumps must pump through the modulating level-controller on the deaerator. Failure to operate the pumps continuously negates the purpose of the modulating valve. For example, let's suppose the pumps ran on-off from a level-controller in the tank like a condensate pump. Every time the pump would turn on it would send 180°F water at around 50% of the load into the deaerator. Do the math-- the water temperature inside the deaerator is now around 204°F-- that is not a good boiler feed unit temperature! The oxygen content is about 200 parts per billion or about 1 cc per liter. 1 cc per liter is a lot greater than .005 cc per liter like unit was rated for.

The pump must feed into the modulating transfer (make-up) valve on the deaerator. The modulating level controller inside the deaerator controls this valve to allow water to enter the tank. The valve is modulating to control the flow into the deaerator so as to not shock it with cooler temperatures. The regulator responds to this gradual change instead of a larger more abrupt one.

Finally, surge tanks are used when your condensate returns are greater than 20% of the load. Loads with 80% or more make-up only need a single tank unit since the mood swings are not as great.

Sincerely,

Shipco® Marketing and Sales Department
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