

Boiler Cheat Sheet

Boiler feedwater pump sizing

When it comes time to select the boiler feedwater pumps, it is important to know the pressure at which the safety valves are set.

As a general rule for a safe boiler operation, it is essential that the pump can fill the boiler in the event of an activated safety valve. This requires that the pump must be able to reach the safety valve pressure set point.

In addition, in order to adequately supply the boiler with water even at maximum pressure, another generally established rule is to provide a flow greater than the maximum rated boiler capacity in order to rise the water level even when the boiler works at full capacity.

The required pump flow is different depending on whether the boiler has a modulating level control or an interruptible type of control (on / off). We use the two following rules regarding the pump flow:

- Case with a modulating water flow valve, the pump flow rate = $1.25 \times$ the boiler capacity.
- Case without a modulating water flow valve, the pump flow rate = $2 \times$ the boiler capacity.

For a complete pump selection, the total head calculations are required by taking into account the pressure losses in the pipes upstream and downstream in addition to considering the water level heights. Since the feedwater temperature is high and close to the saturated temperature, it is also very important to calculate the available NPSH of your system.