

## Choosing a Circulator Pump for your Hydronic System

Most new hot water boilers ship from the manufacturer with a circulator pump. To help select a properly-sized circulator, for replacement or system expansion, there are simple formulas to help you determine which circulator would work for your particular application.

The first step is to determine the water flow, measured as Gallons Per Minute (GPM), that your system will need to operate efficiently. To determine that rate of flow you would calculate the boiler's output, rated in BTU (British Thermal Units) and divide that amount by 500 times the temperature drop of the water from the supply to return side of the boiler (usually 20°F), using this formula:

$$\text{GPM} = \text{BTU Output} / (500 \times \text{Temp. Drop})$$

Simply stated, if your boiler had an output of 100,000 BTU and a normal design temperature drop of 20°:

$$100,000 / (500 \times 20) = 100,000 / 10,000 = 10 \text{ GPM}$$

Your water flow would be 10 GPM.

The next step would be to calculate the resistance to flow in your system, referred to as "Feet of Head". This is determined by taking the longest run of piping, on the longest circuit, flowing away from and back to your boiler. Once you know the longest run, multiply that length (in feet) by .06 to determine feet of head (Ft. Hd.) of the system. Using this formula:

$$\text{Ft Hd} = \text{Longest Piping Run} \times .06$$

Simply stated, if your longest run is 150 feet in length:

$$(150 \text{ feet} \times .06) = 9.0 \text{ Ft. Hd.}$$

Thus your resistance to flow is 9.0 Ft. Hd.

Once you have calculated those values use the Performance Charts for the circulator pumps (located under the "Instructions & Brochures" tab of the circulator pump's product page) to identify which model will work best for your system. Select a pump that meets or exceeds your system's requirement (if no performance curve passes through your datapoint exactly, choose one that passes above and to the right of your point.)