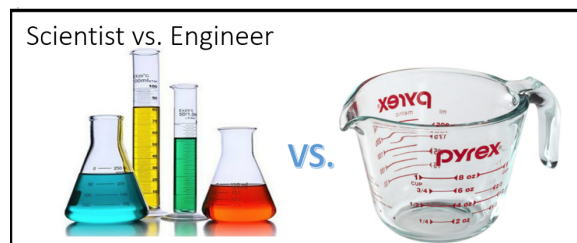


Monday, May 9, 2022

Circulator Pump Curves & Step Sized Selections. A Domestic Water Recirculation Example

Monday Morning Minutes | by Norm Hall, May 9, 2022

Circulator series pumps are those small inline pumps that have fixed impeller choices with no impeller trimming available. When these pumps have ECM technology, the speed selections are also available in steps. What happens if the selection you want is just over the curve and the next selection is much larger? This is a perfect example of the difference between the engineer and the scientist.

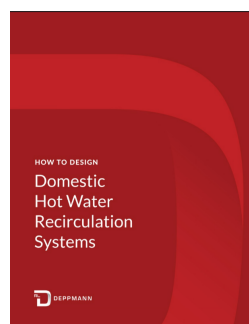


Are Close Curve Selections Close Enough?

The R. L. Deppmann customer service department fields hundreds of inquiries every day. Many of these calls involve a pump that is down and the service contractor or wholesaler needs an in-stock solution now. Our team will ask many questions about the system. The goal is to identify whether the available pump choice, out of the thousands in inventory, is close enough. Close is usually OK in HVAC and plumbing. Today we look at an example.

Domestic Water Recirculation eBook Inquiry

[CLICK HERE TO DOWNLOAD THE EBOOK](#)

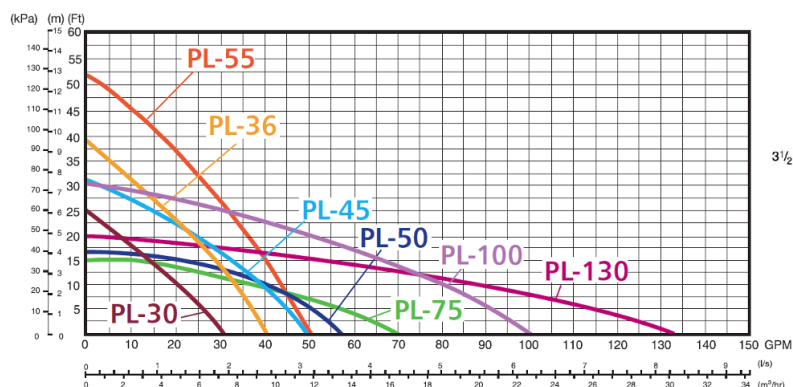


Hard to believe all the feedback we have received since we announced our free eBook just a few weeks ago. One of the questions we received sparked a longer response and the basis of this R. L. Deppmann Monday Morning Minutes.

Cathy Fan, a plumbing engineer with [Jordan & Skala Engineers](#) in Norcross, GA wrote with the following observation.

The question concerned our selection of a Bell & Gossett model 20-18SS inline circulating pump for the domestic water recirculation capacity of 5 GPM at 16 feet. When looking at the curves, none of the choices hit exactly at 5 GPM at 16 feet. The answer to this inquiry is worth spending some time on and sharing with others.

What is a Circulator?



Bell & Gossett series PL circulator pumps

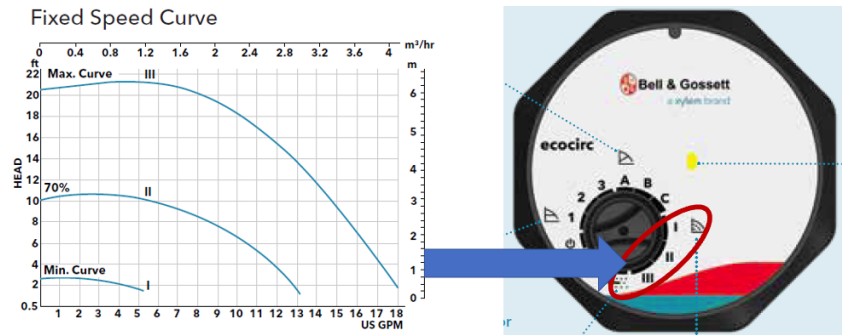
A [circulator pump](#) is the formal name for a group of small inline pumps with fixed impeller sizes. They normally are fractional horsepower. The pumps are used in residential applications for hydronic heating. They may be used in commercial applications when there is a small flow and head.

These pumps tend to be lower price since there is no impeller trim and little, if any, options, or material choices.

B&G 20-18SS Circulator Fixed Curve Operation Choices.

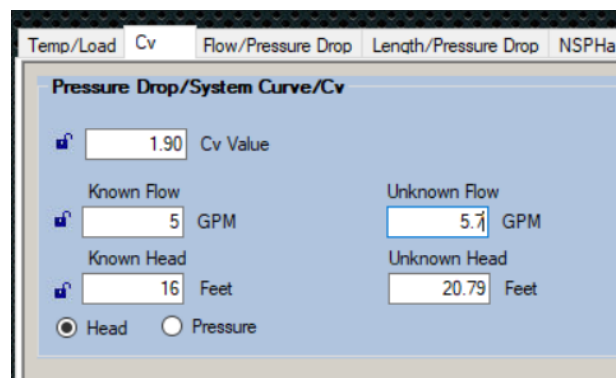
The B&G 20-18 circulator pump is a [small ECM pump](#) with options for curve types. The 20-18 can be a real value for the wire to water efficiency.

The pump has several operational choices. Here is the fixed speed curve.



When the ecocirc operational dial is set at the roman numerals I, II, III the speed changes to match the curve. The fixed speed curve works well with manual or automatic flow balance valves out in the system. At 5 GPM at 16 feet, the operating point would be between curve III and curve II. In this case the curve II is too far below the design point, and I would select curve III. How will this affect the operation?

The pump will be oversized a small amount. I can use the Cv tab on the Bell & Gossett electronic system syzer to determine how much extra flow we will have.

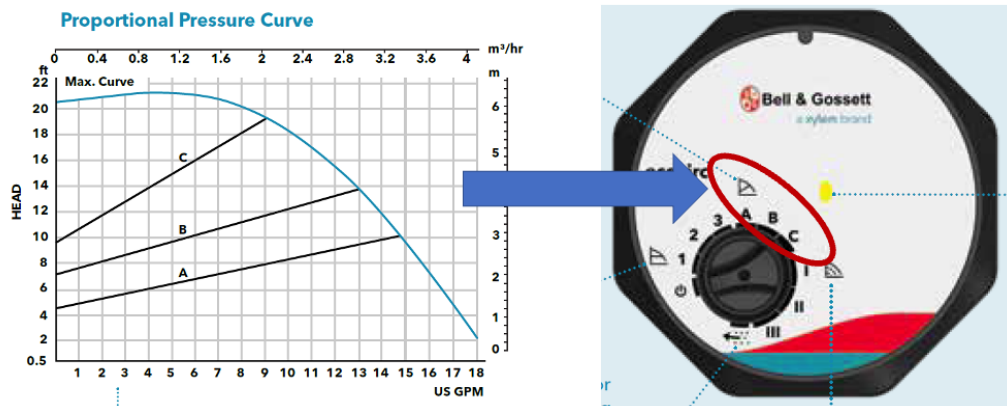


We see that the point where the system and the pump curve match is at 5.7 GPM. This extra 0.7 GPM is within most balance standards. The engineer could specify 5.7 GPM at 21 feet or 5 GPM at 16 feet. The pump supplier would select the same pump.

If the application were more critical, the engineer may choose the **ecocirc+ 20-18SS** which would accept a 0-10Vdc signal from the building management system. The exact speed to achieve the exact flow rate could happen. For this application, this might be considered a bit overkill.

B&G 20-18SS Circulator Proportional Flow Operation Choices.

The other option the engineer might choose is proportional flow. This could be a nice option if the engineer chooses the B&G Temp Setter modulating balance valves on the branches.



The design point of 5 GPM at 16 feet is above the “C” selection. We could use the **ecocirc+** model with external sensors but, again, that is overkill for the value. What happens if we select the “C” setting? We use the B&G system syzer again and instead of 5 GPM at 16’, we will get about 4.8 GPM. The engineer could specify 4.8 GPM at 15 feet or just keep the capacity shown and select this pump. The result flow rate is within balance tolerances.

Once again, I thank the plumbing engineer for the question that sparked this response and R. L. Deppmann Monday Morning Minutes.