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## Modeling a Centrifugal Fan, Compressor, or Blower in PIPE-FLO Professional

When you are modeling a compressible system in PIPE-FLO Professional, it is often necessary to simulate the effects of a fan, compressor, or blower. The way to model this is to install a pump, and enter the device's characteristic curve data in the "Pump Data" window. The following example details this procedure:

Let's say you have the system as shown in Figure 1. There is a centrifugal fan supplying air to 5 user points. Let's assume, for this model, that you want to see flow rates in pounds per hour and pressure in psi g.

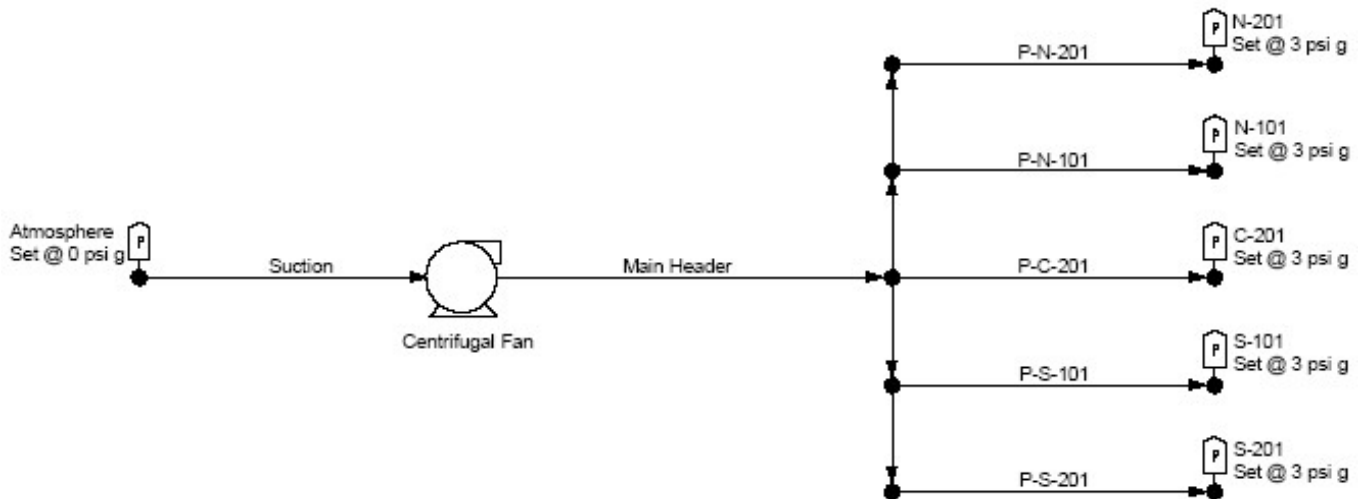


Figure 1: Air Supply System

To model the fan's performance data, you need to use a pump. Now, let's say the manufacturer has published the performance curve for this particular fan as shown in Figure 2.

## Centrifugal Fan Curve

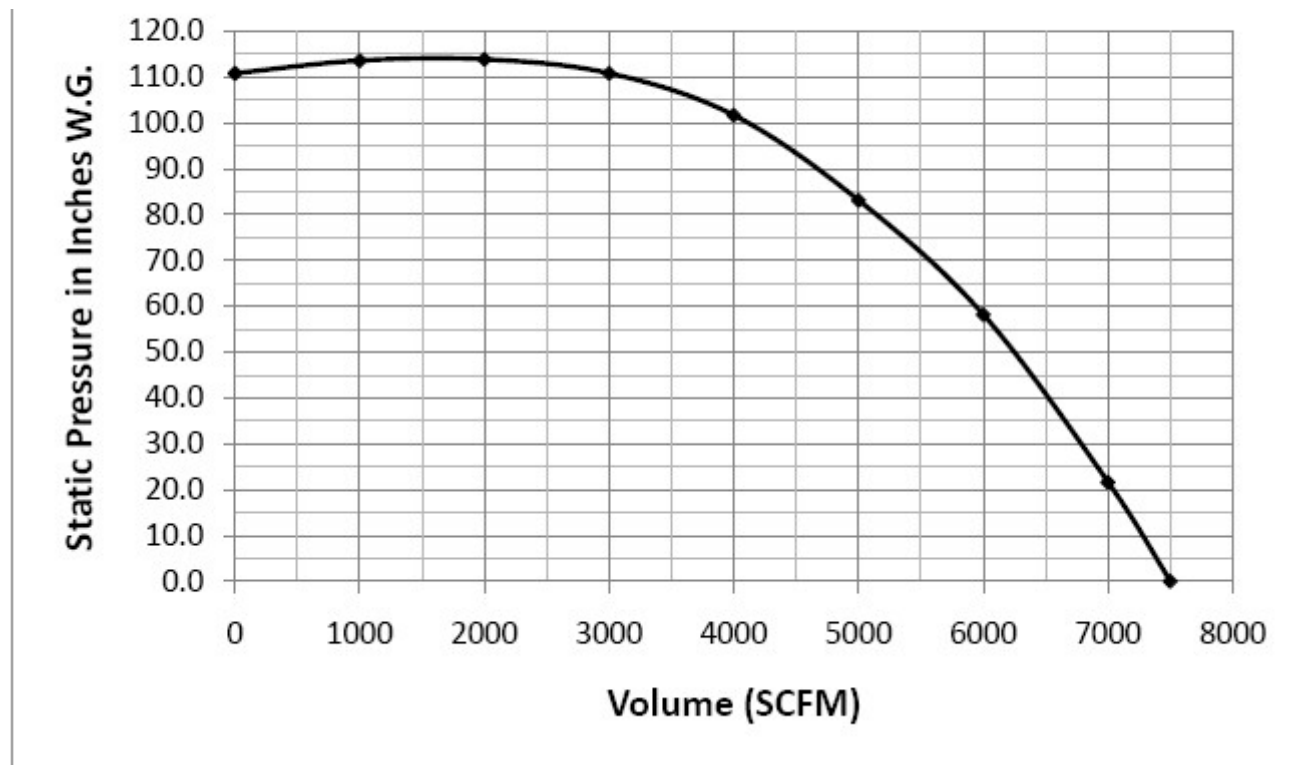
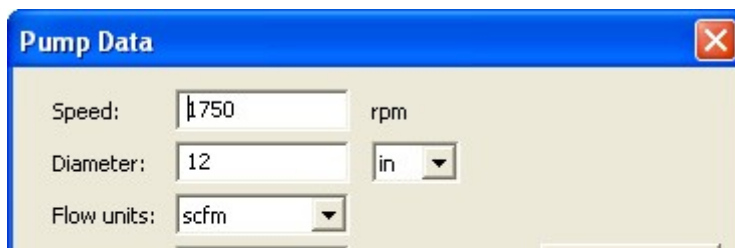


Figure 2: Centrifugal Fan Performance Curve Data

From this curve, you can pick off data points with flow units of SCFM, and head units of Inches of Water. In PIPE-FLO Professional, the data points that you specify for your pump/fan curve can be entered in whatever units you choose, and they do not necessarily have to match your System units (lb/hr and psi as selected on the Units tab in the System Settings and Properties dialog box). So when you enter the pump dialog box, and click on the "Enter Curve" button, you will see the "Pump Data" dialog box open up. Here, you can set your Flow units to scfm and Head units to in H2O, and enter the manufacturer's fan curve data as shown in Figure 3.



Head units: in H2O Advanced

Flow (scfm)	Head (in H2O)	Efficiency (%)	NPSHr (ft)
0	110.8	0	
1000	113.6		
2000	113.9		
3000	110.8		
4000	101.7		
5000	83.1		
6000	58.2		
7000	21.6		
7500	0.001		

OK Cancel Help

Figure 3: Fan Curve Data entered into PIPE-FLO

**Important Note: Do not enter efficiency data when you are modeling a fan, compressor or blower. Efficiency data entered for a pump device is used for various calculations that are valid only for liquids, including viscosity corrections and life cycle cost calculations.**

When the OK button is clicked, notice that the data on the "Curve" tab of the pump dialog box gets converted to your system units (lb/hr and psi) as shown in Figure 4. Do not worry about this because your entered data is still intact in the units you entered it in. You can always access your entered data from the "Enter Curve" button or the "Edit Curve" button.

**Pump** ✖

Pump Curve Symbol Notes Links

Catalog:

Manufacturer:

Type:   rpm

Size:  Stages:

Size:  12 in  1750

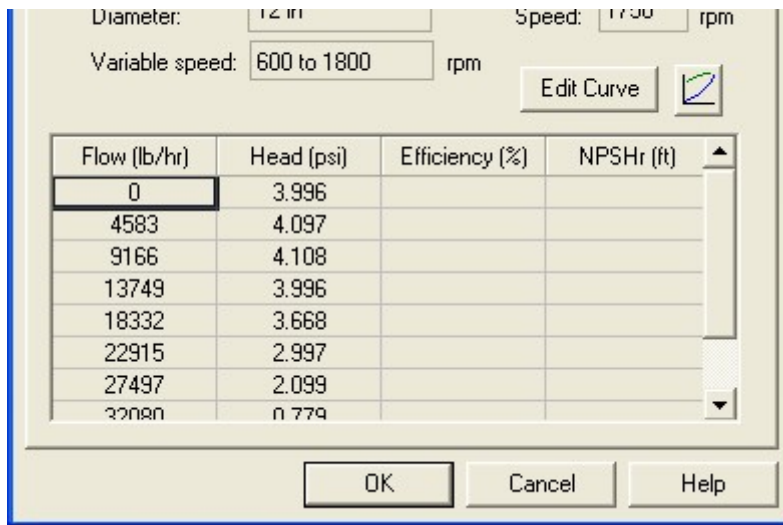


Figure 4: Curve Tab from the Pump Dialog Box

Now, you can calculate your system with the fan curve, and see the calculated flows and pressures in the system units you originally specified, even though you entered more conventional units for your fan curve data. The calculated system is shown in Figure 5.

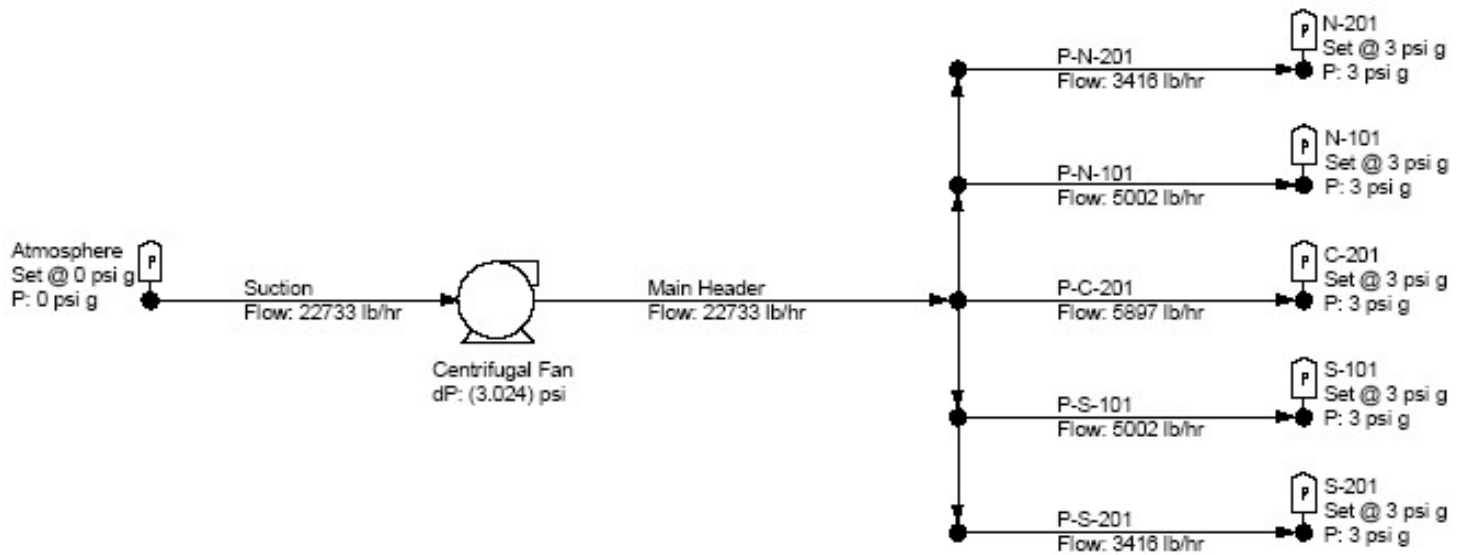


Figure 5: Calculated PIPE-FLO System with Fan Curve