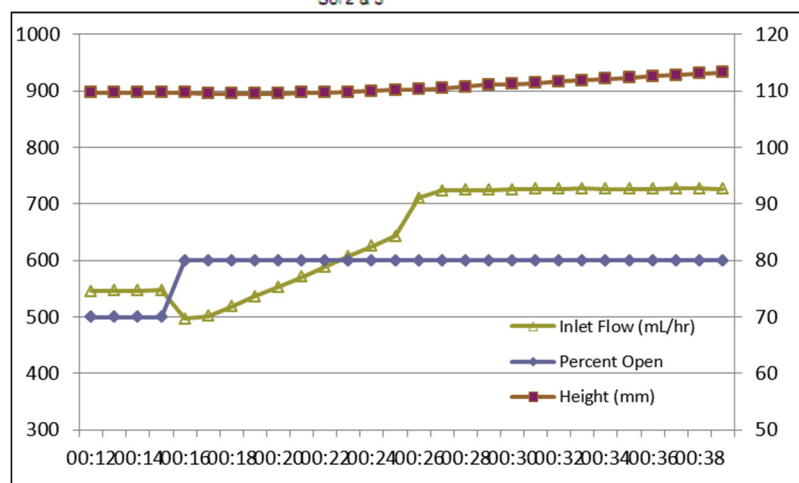
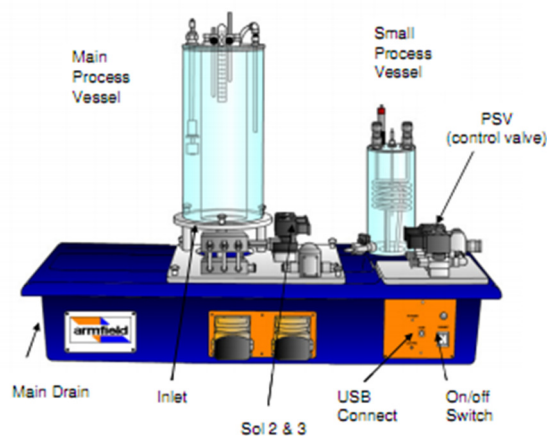


## ChE436 - Process Control

### Gravity Drained Tank Exercise

The gravity drained tank in the BYU Unit Operations Lab is a demonstration of closed loop control. In this exercise, you are requested to derive a model for a model predictive control application.

Part a) The gravity drained tank height (mm) is maintained by adjusting the % open on an inlet line to a cylindrical tank. Inlet flow (mL/min) is measured as well as the height (mm). You are requested to derive the material balance.



Part b) Identify the parameters that can be determined without process measurements. How can they be specified?

Part c) Identify the parameters that need to be adjusted to fit the data (inlet flow and height). How can they be determined through optimization?

Part d) Write the model in differential and algebraic equation form (differential =  $\dot{x}$ ).

**Model**

*Parameters*

*End Parameters*

*Variables*

*End Variables*

Equations

End Equations

**End Model**