

# CHOKED FLOW EXPERIMENT

ver 6.05

## Startup:



- Turn the up stream pressure regulator all the way counter-clockwise.
- Open the down-stream needle valve all the way counter-clockwise.
- Turn on the main power and you should see a number show up on the mass flow meter. (Allow 10 minutes of warm-up before starting.)

- Now we are ready to select an upstream pressure for the first run. We will start with 30 psig.
  - The air will start flowing. We have a maximum flow rate at this setting.
- The mass flow, upstream and downstream pressure and temperature are all recorded on Labview. (Click [here](#) to see the VI) There is nothing to control but you can read all the variables and record them.
  - After 10 minutes of warm-up time, you can now adjust your downstream pressure.
  - You will probably want to start a data acquisition on Labview (you can specify how many point to collect and how much time between points (in seconds). The files can be exported into an Excel file.



- Now you can turn your needle valve in, which increases the downstream pressure. The more you turn the valve, the more you increase your pressure. You can also reduce your downstream pressure which affects the downstream flow. Leave the valve open long enough to get a steady reading.
- Now select a higher upstream pressure. Go ahead and do the same thing that was done with the downstream pressure. You can collect data going back down as well. By collecting data as you increase and decrease the pressure you reduce any miscalculations.

## Shutdown:

- Turn the down-stream needle valve all the way counter-clockwise.
- Turn the pressure regulator to 0 by turning it all the way counter-clockwise. Don't leave it closed all the way or it might jam.
- Turn off the power so that the mass flow meter doesn't remain on.

# Choked Flow

Air Flowrate 0.00 SLM	Upstream Temperature 20.3 C	Specify Time between Data Points (sec) 1	Specify number of data points 1
Upstream Pressure (gage) -0.1 psi		<b>Push to Record</b>	Data Point Count 0
Downstream Pressure (gage) -0.1 psi		Cancel Data Collection Cancel	