

Operation Manual

Back Pressure Regulators

(Model BP1000)

A. General information

AP Tech back pressure regulators are used in gas delivery systems to maintain a specified inlet (upstream) pressure. A back pressure regulator is similar to a precision pressure relief device. Many models are available with different operating characteristics (pressure ratings, flow capabilities, etc.) and porting configurations.

Refer to the appropriate catalog data sheet for specific product information.

B. Installation

1. Prior to installation, verify that the operating characteristics of the back pressure regulator as described below are appropriate for the system in which it will be installed.
 - a. Verify the materials of construction are compatible with the intended process gas.
 - b. Verify the pressure and temperature ratings are acceptable for the intended application.
 - c. If the back pressure regulator is equipped with either a supply or delivery pressure gauge, verify that the pressure gauge range is suitable for application.
 - d. Verify that the flow capability of the back pressure regulator is appropriate for the application.
2. Inspect the back pressure regulator to determine the flow path through the regulator and how the regulator will need to be installed in the system.
 - a. The inlet (high pressure) port(s) is labeled with an “IN” marked into the body near the port. Arrows are sometimes used next to the IN to point toward an inlet port.
 - b. The outlet (low pressure) port(s) is labeled with an “OUT” marked into the body near the port. Arrows are sometimes used next to the OUT to point toward an outlet port.
 - c. Always connect the gas source to the inlet port. Never connect the gas source to the outlet port.
3. Install the regulator using the appropriate method described below. A large variety of porting options and connections are available.
 - a. For tube stub connections, weld connectors or other components to the tube stubs per standard industry practice (reference SEMI standard F78).
 - b. For metal face seal connectors, assemble connections per standard practice described by fitting supplier (typically 1/8 turn past fingertight).
 - c. For NPT connections, apply PTFE (e.g. Teflon) tape to connector threads and install connector in regulator body wrench tight.

- d. For compression tube fittings, insert the tubing until it bottoms out in the fitting. Assemble nut fingertight. Then tighten the nut 1-1/4 turns past fingertight for 1/4 inch to 1 inch tube connections. For remaking connections, only tighten the nut slightly past fingertight until a rise in torque is detected—this is typically 1/10 turn.
4. After installation, perform a leak test. A helium leak test, a pressure decay leak test, or a bubble leak test may be used depending on the application. A helium leak test is recommended for all face seal connections and welds per standard industry practice (reference SEMI standard F1).

C. Operation

Note: A back pressure regulator should not be used as a positive shut-off device.

Note: Back pressure regulators operate best under constant flow conditions. A change in flow will change the inlet pressure.

1. Perform the following to increase the regulator inlet pressure.
 - a. Before opening the source valve, verify that the regulator adjustment wheel is turned fully counterclockwise (fully open position).
 - b. Partially open the source valve to introduce flow through the regulator.
 - c. Rotate the wheel clockwise to increase the inlet pressure to the desired set point.
 - d. Continue to open the source valve while monitoring the inlet pressure. If the inlet pressure exceeds the desired set point, then rotate the wheel counterclockwise until the desired set point is again reached.
 - e. When the source valve is fully open, verify the inlet pressure is at the desired set point.
2. Perform the following to decrease the regulator set point.
 - a. Open a downstream valve to initiate a flowing condition.
 - b. Slowly rotate the wheel counterclockwise to reduce the inlet pressure until the desired set point is reached.

Please contact the factory or your local representative to answer questions or for further information.