

Liquid Dosing Control in Bio Pharmaceutical Processes

Many BioPharma processes require precise dosing and blending of Water-For-Injection (WFI), nutrients, and other buffer solutions as input to a reactor, fermenter, or chromatography column. These dosing or blending systems must often be able to control over a wide range of flow rate to hold the desired conditions in the downstream process.

Traditional dosing systems in BioPharma utilize flow control valves such as a diaphragm weir style or a globe or needle style body with sanitary fittings. These valves typically provide stable control through only a 15:1 flow rate range, and process engineers must often install multiple flow control valves in parallel to achieve the needed wide dosing range.

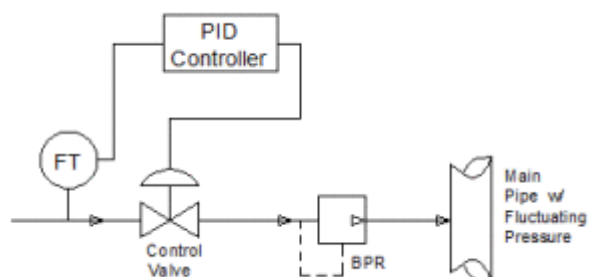
The Equilibar® Sanitary Back Pressure Regulator works across a very wide range of flow rate, and can be used to enhance dosing flow rate control in BioPharm processes in several ways:



Sanitary back pressure regulator

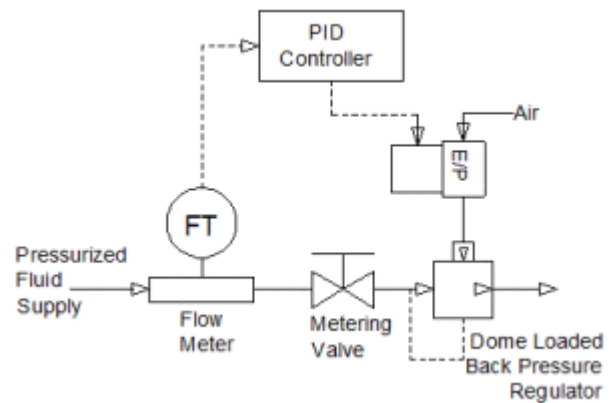
Stabilize Downstream Pressure of Dosing Valve

Dosing valves often suffer from unexpected pressure changes downstream, which take time for the PID controller to adjust to. In other situations, dosing control valves are not able to function through the required flow rate range because of undesired pressure changes downstream. This application page explains how the Equilibar back pressure regulator has been used to address these problems to allow the flow metering valve to perform as required.



Function as 100:1 Flow Metering Valve

The Equilibar back pressure regulator can often function in place of a traditional flow control valve, and in many applications control flow rate through a 100:1 turndown range. While pressure changes downstream of the BPR are generally isolated and have no impact, it should be noted that this approach does require a stable upstream fluid pressure source. See [video and application notes](#).



Precisely Control Pump Discharge Pressure

Regardless of the type of pump used, a precision back pressure regulator can be used to control its discharge pressure when a circulating loop is installed. A manually controlled back pressure regulator could be used to maintain the desired stable pressure to enhance the control valve performance. In addition, an electronic back pressure regulator can be used to actually control the flow rate of the dosing process (for example, across a fixed orifice or a spray nozzle).

