EQUILIBAR®
PRECISION FLUID CONTROL

SD Series

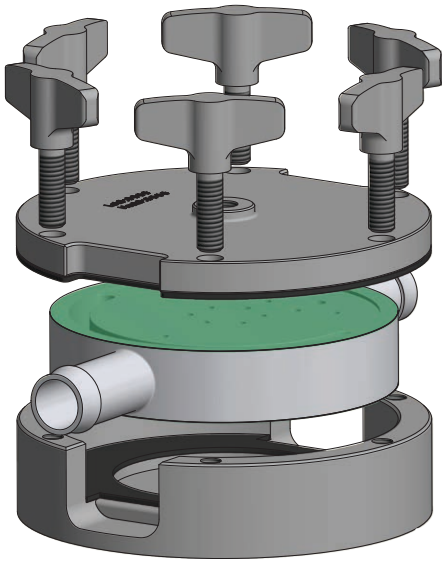
Single Use Control Valves for BioPharma

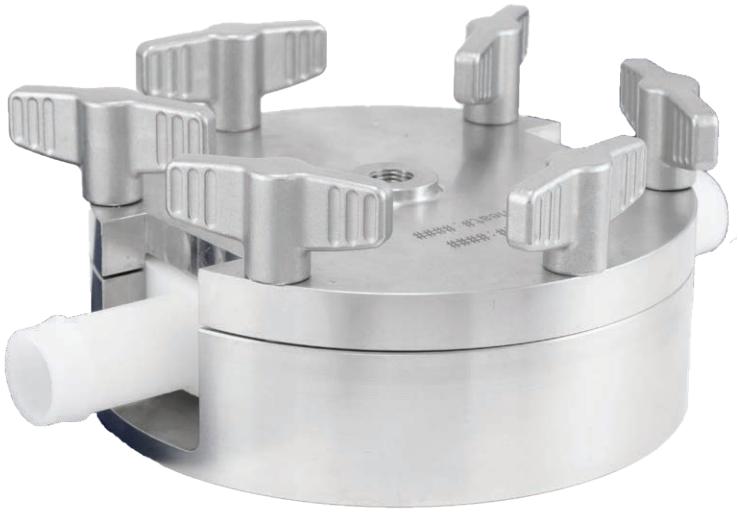
FOR SINGLE USE AND HYBRID SYSTEMS

Back Pressure Regulators and Flow Control Valves Used in Upstream and Downstream Processing For Single Use and Hybrid Systems

The Equilibar® single use back pressure regulator and flow control valve is designed for the rapidly expanding field of single use technology for biopharmaceutical processing.

The patent pending SD Series is manufactured using USP Class VI polymers and 316 stainless steel. The polymer body and diaphragms are disposable and are inserted into a reusable stainless steel support housing with wing nut closure for quick and easy assembly.

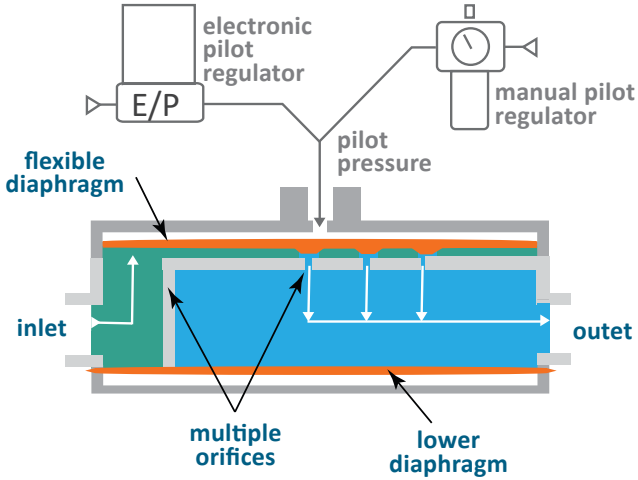




- Flow or Pressure control: The Equilibar valve is engineered to control either pressure or flow to meet your system requires.
- Precision control: Unique dome-loaded multi-orifice design delivers superior process control for single use systems.
- Smooth action: Novel valve technology eliminates hysteresis and lag in response time that may occur in other valve designs.
- Fast transient response: The flexible diaphragm adjusts instantaneously in response to upstream or downstream process disruptions.
- Easy automation: Pilot operation with an electronic controller makes computer automation easy.
- Pulsation dampening: Top and bottom diaphragms dampen upstream and downstream pulsations caused by other system components.

HOW IT WORKS

The Equilibar SD is a dome-loaded valve with pilot operation. This means that gas or air is fed into the top (dome) of the valve to provide the pressure setpoint for the process in a 1:1 ratio. The pressure of the gas in the dome is set by a secondary standard regulator called a pilot regulator. The pilot regulator can be manual or electronic, depending on the application's requirements.



The top of the polymer body has multiple parallel orifices sealed by a flexible diaphragm. The pilot pressure on the dome forces the diaphragm down onto the orifices. A rise in inlet pressure lifts the diaphragm up to allow excess fluid to be relieved through the outlet orifices. Likewise, a loss of pressure at the inlet causes the diaphragm to be pushed closer to the orifices, restricting flow and rebuilding pressure upstream.

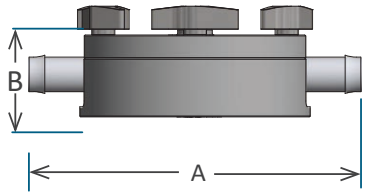
The result is instantaneous and precise control.

Specifications

- Pilot port on the dome is 1/8" NPT
- Single use body & diaphragm material is USP Class VI HDPE - BPE and TSE free
- Cradle material is 316L stainless steel
- Max pressure rating is 60 psig / 4 bar(g)

Available for tubing sizes ¼" through ¾"

MODEL	INLET / OUTLET PORT	CV RANGE (PRECISION) MIN	MAX	DIMENSION IN (MM) A	B
SDO2	1/4" (6.4mm)	1E-04	0.4	3.6 (91)	1.2 (30)
SDO3	3/8" (9.5mm)	1E-04	0.9	4.2 (107)	1.4 (36)
SDO4	1/2" (12.5mm)	1E-03	1.6	5.5 (140)	1.6 (41)
SDO6	3/4" (19mm)	1E-03	4.0	7.2 (183)	1.8 (46)



SDO Dimensions

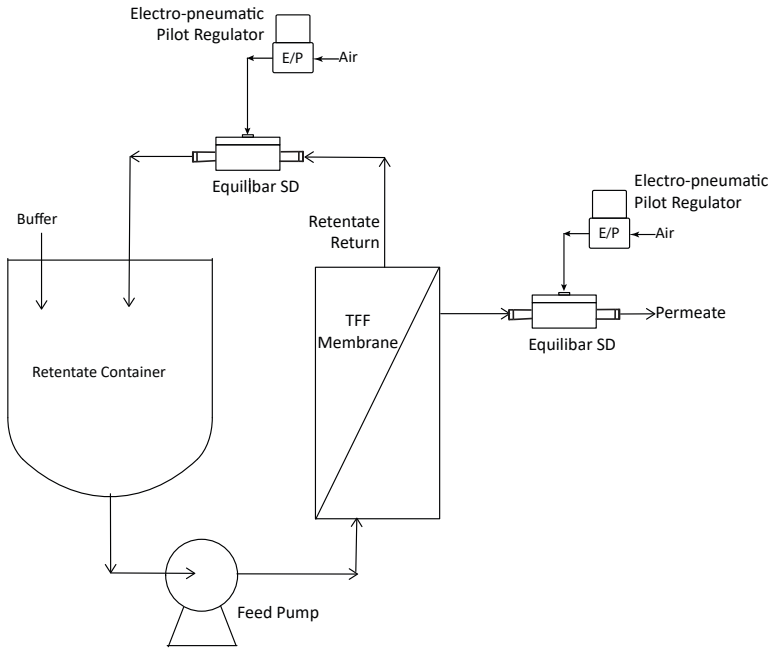
FILTRATION SYSTEM CONTROL

Tangential flow filtration (TFF) and virus filtration (VF) systems

Tangential flow filtration (TFF) and virus filtration (VF) steps in biopharmaceutical processing are both reliant on excellent pressure control. Specifically, the differential pressure (dP) across the membrane must be maintained within a narrow range for peak filter performance. Automated accurate pressure control of the retentate and permeate fluids are critical to the system design.

Using an Equilibar SD for filtration pressure control

The Equilibar SD delivers precise pressure control to maintain the dP across the filter within a tight operational window. Its smooth adjustment to setpoint changes avoids pressure spikes that can damage sensitive filters. With its wide range of flow rates, the SD valve can fully open to facilitate flushing or rinsing the filter when needed.



TFF system with Equilibar SDO back pressure regulator controlling dP

PUMP CONTROL

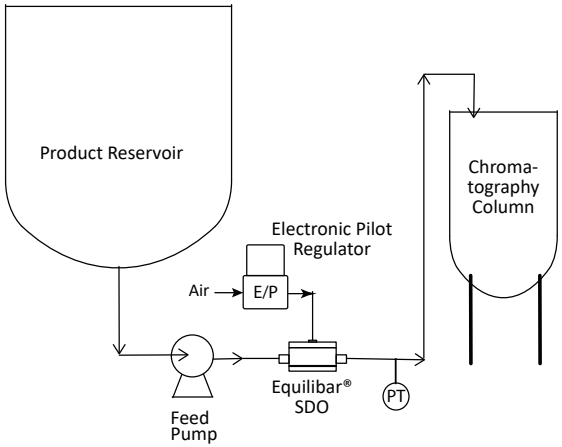
Pulsation dampening using pressure control

Biopharmaceutical processing oftentimes involves pumping fluid from one process to the next. In cases where positive displacement pumps are used, such as peristaltic, lobe or diaphragm pumps, downstream pulsation may occur, introducing disruptions for the next process.

Chromatography and filtration steps are particularly vulnerable to pulsations. The sensitive resins in the chromatography column can be disturbed by pulsations, which can be damaging to the final product. Pulsations can also cause channeling in the packed bed, reducing efficiency of the chromatography process.

How an Equilibar SD helps pump pulsation control

Upstream pulsation dampening is a natural behavior of the Equilibar valve; the upper diaphragm responds to slugs of fluid moving through the valve, keeping upstream pressure constant. The ultra-wide Cv range of the Equilibar valve allows it to keep up with positive displacement pumps to maintain constant pressure as it is delivered to the chromatography column or filtration step. Downstream pulsation is mitigated through the lower diaphragm, which can act as a pulsation dampener and absorb downstream pulsations.



SDO prevents pulsations during feed to chromatography column

INLINE CONDITIONING - INLINE DILUTION

Accurate flow control for a wide range of inline mixing

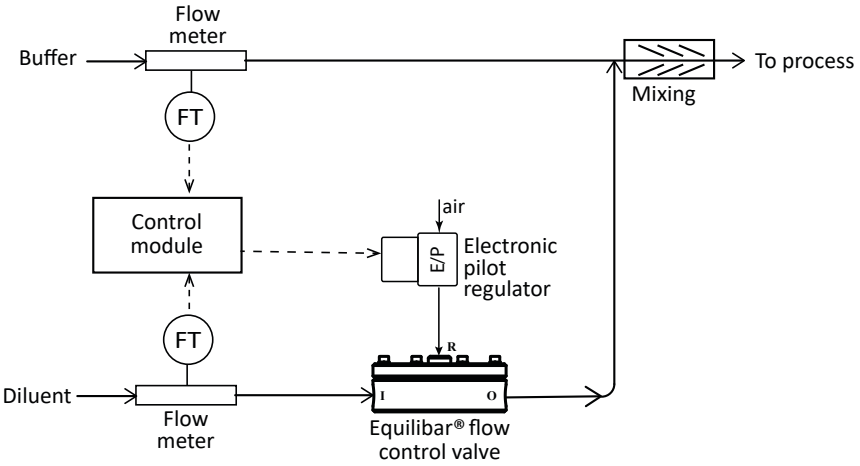
Inline conditioning and inline dilution both involve precision flow control for inline mixing of ingredients. In both scenarios, the process requires accurate flow control across a wide range of flow rates.

Using an Equilibar SD to control flow in mixing or blending

When combined with a high resolution electronic pilot regulator and flow transmitter, the Equilibar SD valve provides precision flow control with instantaneous response to changes in setpoint and process fluctuations.

In a flow control configuration, the Equilibar SD provides accurate control across a wide range of flow rates with 100:1 turndown, offering more rangeability than traditional control valves.

With its wide range of control and instantaneous response, an Equilibar SD valve is an excellent choice for mixing specialized buffers to meet a variety of process requirements.



CONTACT EQUILIBAR

For more information about how an Equilibar SD valve can be used in your single use system, contact Ryan Heffner at

ryanheffner@equilibar.com or **828.650.6590.**

Made in the USA

Equilibar's quality system is **ISO 9001:2015** certified.