Becker

a Baker Hughes business

Volume Booster (VB) Series

Increased Stroking Speed of Control Instrumentation on Large Actuators

VB Series Volume Boosters are utilized in conjunction with **Becker™** control instrumentation to provide adequate instrumentation flow volume for larger volume piston actuators. VB Series volume boosters are typically only required for ball valve regulators using a model 12L or larger actuator. Additionally, VB Series volume boosters may be utilized to provide increased actuator stroking speed when applications demand them, such as power plant and other short system applications. Quick stroking applications require the VB Series Volume Booster on ball valve regulators 4" bore and larger. As with most Baker Hughes instrumentation, VB Series volume boosters may be discharged into a lower pressure system to eliminate atmospheric bleed.

The VB Volume Boosters may be configured with Becker pilots and positioners to increase stroking speed of large actuators or to increase speed of response in demanding applications such as pressure control to power plant.

Features

- 1:1 pressure ratio—the output pressure from the booster changes 1 psi for each 1 psi signal change
- Two piece body construction allows for easy maintenance
- Outlet pressure up to 250 psig
- Supply pressure up to 400 psig repeated testing

Benefits

- Provides quick stroking of control valves for high speed applications
- Allows implementation of Becker's instrumentation on large control valve actuators
- May be discharged into a lower pressure system to eliminate atmospheric bleed
- ZERO steady state bleed
- Simple construction without any adjustment

Applications

- Increase stroking speed of control valves for high speed applications
- Increase volume output of Becker's control instrumentation
- May be necessary for ball valve regulators 16" bore and larger
- Always consult Baker Hughes regarding application of VB Series Volume Boosters

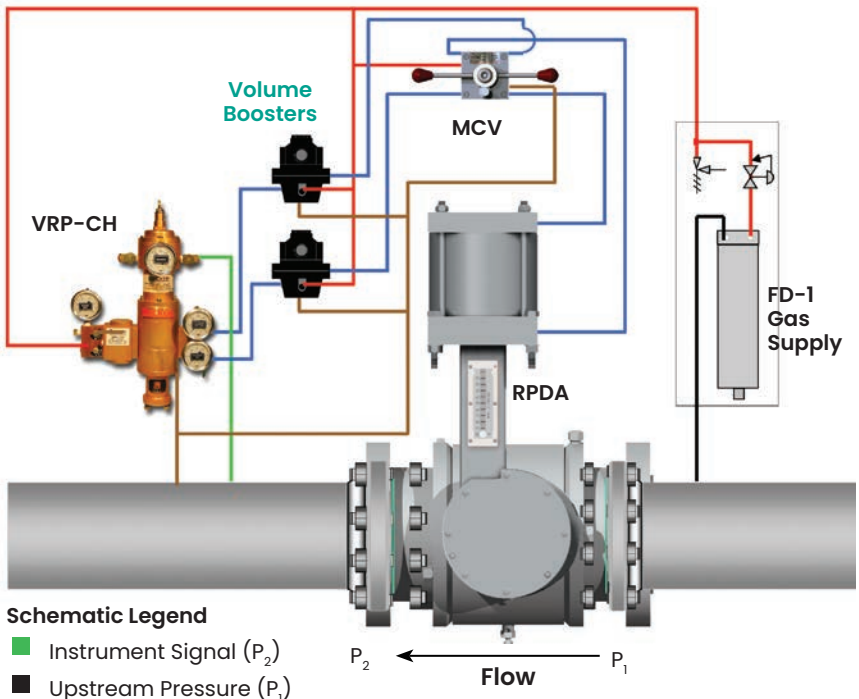

Figure 1 - VB Volume Boosters installed on VRP-CH Series pilot to increase stroking speed.

Technical Specifications	
Maximum Outlet Pressure	250 psig
Inlet Pressure Range	10-400 psig (0.7-27.6)
Steady State Consumption	ZERO
Ambient Temperature Range	32°F to + 175°F (0°C to +79°C)
Supply and Outlet Port Size	1/2" FNPT
Single Port Size	1/4" FNPT
Exhaust Port Size	3/4" FNPT
Approximate Weight	3 lbs (1.36 kg)
Materials of Construction	
Body and Bonnet	Zinc
Bottom Plug	Acetal
Valve	Brass
Seals	Buna-n

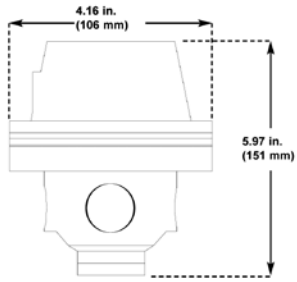

Figure 2 – Overall Dimensions of VB

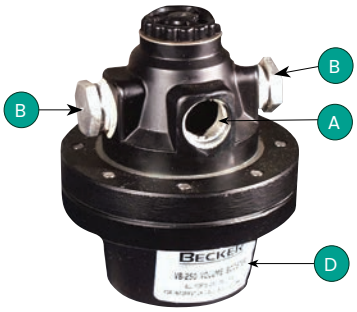

Figure 3 – Volume Booster Ports

VB Volume Booster Port Definitions	Port Size	Item
Input	1/2" FNPT	A
Output	1/2" FNPT	B
Signal	1/2"FNPT	C
Exhaust	3/4" FNPT	D

Repair or Rebuild?

Becker's Instrumentation rebuild kits are available from stock for regular maintenance or emergency needs. To order repair kits please contact your local Baker Hughes sales representative.

VB-250 Rebuild Kit Becker Part Number 01-7263

How It Works

The VB Series Volume Booster is a high capacity device that reacts to a pressure signal from control instrumentation. The booster has an independent pressure supply source to feed the actuator. The VB volume booster receives signal pressure from the control instrumentation which acts on the upper side of a diaphragm inside the booster. The actuator pressure or output pressure of the booster acts on the lower side of the diaphragm. When the signal pressure and output pressure are equal the booster remains in an equalized steady state position (Figure 4.0) keeping the actuator stationary. As the signal increases from the control instrumentation, the signal pressure rises above the output pressure opening the supply valve loading the actuator cylinder with high volume pressure (Figure 4.2). When the output pressure under the diaphragm is approximately equal to the signal pressure above the diaphragm, the supply valve closes and a steady state position is achieved. As the signal decreases from the control instrumentation, the supply valve remains closed.

The output pressure rises above the signal pressure causing the diaphragm to open the exhaust valve (Figure 4.1). Output pressure is exhausted until the pressure on both sides of the diaphragm are again equalized at which point the exhaust valve closes and steady state is again achieved.

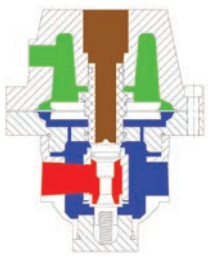

Figure 4.0 – VB Series at steady state condition

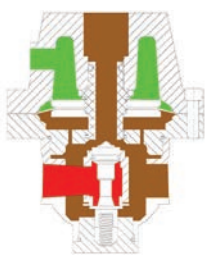

Figure 4.1 – VB Series with exhaust valve open

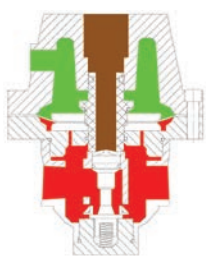

Figure 4.2 – VB Series with supply valve open loading actuator

Schematic Legend

- Atmospheric Pressure
- High Pressure Gas (Regulated)
- Instrument Sensing
- Actuator Pressure (Output pressure)

Application Guidelines for AB Series Atmospheric Bleed Control

	VRP-CH Pilot	VRP-B-CH Pilot	VRP-SB-CH Pilot	VRP-SB-PID Pilot	HPP-4 Positioner	HPP-5 Positioner	HPP-SB Positioner	DNGP Postioner	Notes
Instrument Options									
Bleed to Pressure Systems (BPS)	•	•	•	•	•	•	•	•	1
AB Series Atmospheric Bleed Control	•	•	•	•	•	•	•	•	
NBV Series No-Bleed Valve	•	•			•	•			2
DPS-2 Series Non-Bleed Sensor	•	•			•	•			3
PS-2 Series Non -Bleed Sensor	•				•				3
SP Series Setpoint Pump	•	•	•	•					
RSM Series Remote Setpoint Module	•	•	•	•					
Panel Mounting	•	•	•	•				•	
Stainless Steel Option	•	•	•	•	•	•	•		
VB Series Volume Booster	•		•	•	•		•		4
QEV Series Quick Exhaust Valve							•		
I/P Transducer					•	•	•		
SLV Series Signal Lock Valve					•	•	•		

1. BPS is limited to pressure systems below 300 psig. Consult Baker Hughes for assistance.
2. NBV may only be utilized when $P_{Discharge}$ ≤ 60 psig (414 kPa) and/or P_{Supply} ≤ 150 psig (1034 kPa).
3. PS-2 and DPS-2 Non-Bleed Sensors must be utilized when $P_{Discharge}$ >60 psig (414 kPa) and/or P_{Supply} >150 psig (1034 kPa).
4. Volume Boosters are necessary for power plant regulator, surge control applications, or when Large Model RPDA and LPDA Series Actuators are utilized.

⚠ CAUTION

This information is intended as a guideline for application of Becker Control Valve products. Baker Hughes strongly recommends consulting Becker Engineering prior to application of any product.

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