

## Plug & Play Flexibility with Zero Emissions! A Revolution in Valve Pressure Controllers for the Natural Gas Industry!

### VPC Valve Pilot Controllers

The VPC Valve Pressure Controller represents a breakthrough in Valve Control technology. The VPC provides a modular, plug & play pressure control system for use in conjunction with pneumatically actuated control valves for natural gas pipelines. The VPC features a simplified 5-in-1 configuration system that provides compatibility with double acting and single acting (spring return) control valves in a single platform. The VPC may be easily reconfigured in the field to provide compatibility with almost any pneumatic control valve on the market. The high accuracy performance and ZERO emissions capabilities of the VPC provide the desired features to meet natural gas industry needs. The VPC was designed by the inventor of the original "Valve Regulator Pilot" and features patented technological advances that provide reliability, convenience, and performance above and beyond previous technologies. VPC Valve Pilot Controllers represent the future of natural gas control valve pressure control technology and are backed up by the industries' most experienced team.

**Applications:** The VPC Controller is designed to provide self-contained pressure control when incorporated with pneumatic control valves in natural gas pipeline installations. The system utilizes pressurized natural gas from the pipeline to operate and can address a number of common pipeline pressure control applications. Contact VRG Controls for assistance with your application.

- Primary Pressure Control (Active)
- Overpressure Protection (Monitor)
- Overpressure Protection (Relief)
- Underpressure Protection (Standby)
- Backpressure Control
- Tandem Pressure Control
- Two-Stage Pressure Control
- Split Range Pressure Control
- Power Plant Fuel Gas Feed



"5-in-1"  
Plug & Play  
Design

PATENT PENDING

**Figure 1 – VPC Control System**

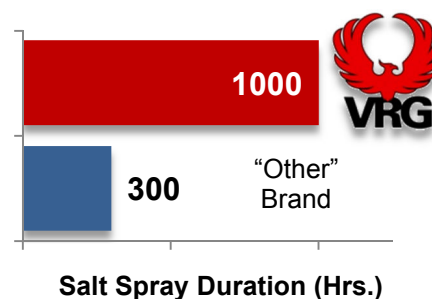
The VPC System represents a breakthrough in Valve Control Technology for use with pneumatically actuated natural gas control valves. The VPC is designed and supported by the inventor of the industry's original "Pilot Controller" technology and provides ZERO emissions capabilities with a plug & play platform with superior performance and reduction in tubing complexity via a modular format design.

**Exceeds EPA Ruling, EPA-HQ-OAR-2010-0505, requiring  
"constant bleed controllers" in the Oil and Natural gas  
industry must meet <6 SCFH bleed rate by October 2013.**

## VPC Features & Benefits:

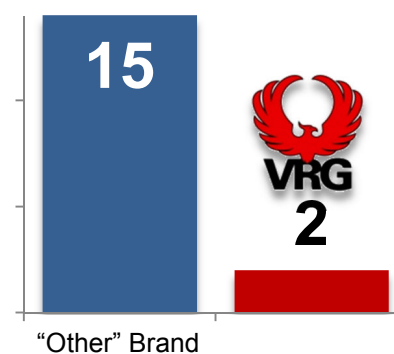
- **Exceeds EPA Ruling, EPA-HQ-OAR-2010-0505, requiring “constant bleed controllers” in the Oil and Natural gas industry must meet <6 SCFH bleed rate by October 2013.**
- Modular “Plug & Play” Format Provides Five (5) Valve Pilot Controllers in a Single Platform
- Ultimate Flexibility Enables Conversion From One Model to Another with Ease.
- “Logic Xchange” Feature Enables Usage of NC Balanced Valves or NO Seat & Nozzle Internal Porting
- Setpoint Adjustment Screw Incorporates High Strength Design and Includes Protective Cover
- High Performance Pressure Control From a Single Device
- Pressure Setpoint Control Ranges from 1.25 psig to 1500 psig
- Environmentally Friendly Design Exhibits ZERO Steady State Emissions
- Vent to Pressure System Enable Complete Elimination of Atmospheric Emissions
- Military Grade Aluminum Alloy with “Stealth System” Corrosion Protection Stands Up to the Harshest Environments and Resist Corrosion
- Revolutionary VPC Design Optimizes Performance While Reducing Number of Parts by over 40% as Compared with the Similar Technologies Currently on the Market
- Generous Body Dimensions Provide Heavy Wall Construction For Better Corrosion Resistance at Bolted Connections
- Large diameter diaphragms provide an 18% increase in area as compared to similar technologies, making the VPC design more sensitive to changing conditions.
- Incorporate with New Control Valve Installations for Superior Performance and Better Reliability
- Replace Existing Control Instrumentation to Optimize Performance and Eliminate Emissions
- Compatible with Wide Array of Control Valves, Actuators and Control Instrumentation
- VPC Incorporates Six (6) Common Control Springs Across All VPC Ranges

## VPC Outlasts The Competition in Corrosive Environments



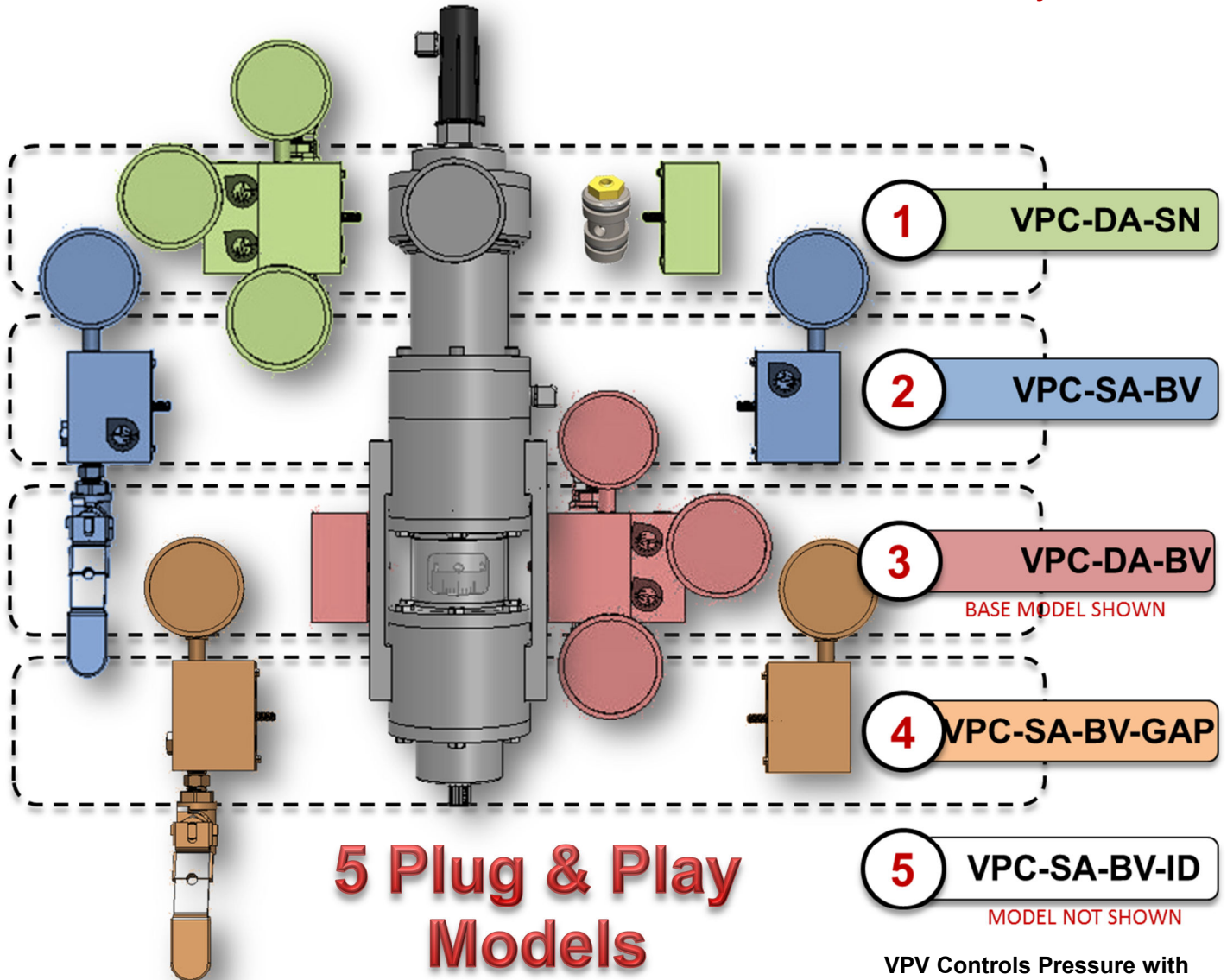
**Figure 2 - Salt Spray Test Performance**  
VPC Controllers incorporate Military Grade Aluminum Alloy with “Stealth System” Corrosion Protection to outlast the competitions 3X longer than competitor’s standard issue construction.

## Stock Fewer Repair Kits with VPC

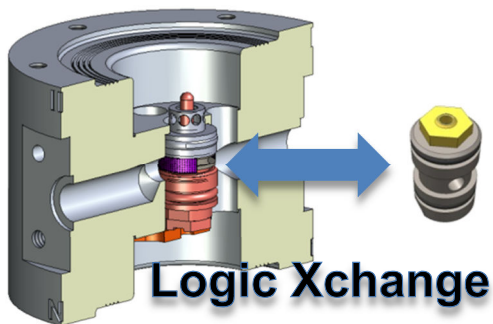


**Figure 3 – Number of Repair Kits**  
VPC Controllers are designed from a single platform, significantly reducing parts. The VPC series has only two (2) different repair kits, far fewer than the competition.

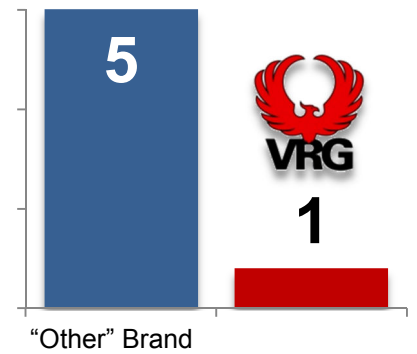
**Plug & Play Flexibility with Zero Emissions!  
A Revolution in Valve Pressure Controllers for the Natural Gas Industry!**



**5 Plug & Play  
Models  
From  
1 Platform!**



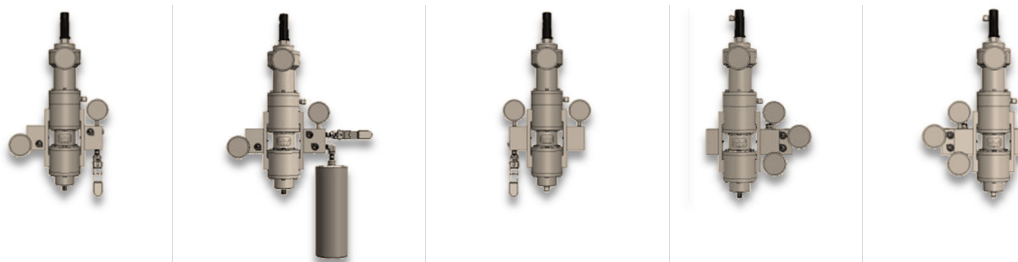
VPV Controls Pressure with Fewer Platforms!



**Figure 4 – Number of Platforms**  
VPC Controllers plug & play design and high performance materials drastically reduce the number of platforms necessary to provide high performance pressure control.

**Table. 1.0 – VPC Valve Pilot Controller Technical Specifications**

**PATENT PENDING**



VPC Model	VPC-SA-BV	VPC-SA-BV-ID	VPC-SA-BV-GAP	VPC-DA-BV	VPC-DA-SN
Type	Variable	Variable	Discrete (On-Off)	Variable	Variable
Outputs	Single Acting (1)			Double Acting (2)	
Internal Valve Logic	NC Balanced Valve <sup>1</sup>				NO Seat & Nozzle <sup>1</sup>
Setpoint Range	1.25 - 1500 psig (9.0 - 10,342 kPa)				
Temperature Range	-20°F to +160°F (-29°C to +71°C)				
<b>Consumption</b>					
Steady State Control	ZERO <sup>2</sup>			<10 scfh <sup>3</sup>	≈100 scfh <sup>3</sup>
Full Open	ZERO			ZERO <sup>4</sup>	
Full Closed	ZERO			ZERO <sup>4</sup>	
ZERO Emissions	ZERO Atmospheric Emissions May Be Achieved When “Vent to Pressure System” Feature Utilized				
EPA Specifications	Exceeds EPA Ruling, EPA-HQ-OAR-2010-0505, requiring <6 SCFH bleed rate by October 2013.				
<b>Pneumatic</b>					
Supply Gas Quality	Dry, Filtered @ 10μ Natural Gas or Air				
Max Supply Gas Pressure	400 psig (2758 kPa)				
Min Supply Gas Pressure	20 psig				
Max Discharge ΔP	150 psig (1034 kPa)				
Min Discharge ΔP	20 psig (138 kPa)				
Connections	All Ports ¼ FNPT				
<b>Construction</b>					
External Parts	VRG Military Grade Aluminum Alloy with “Stealth System” Corrosion Protection 304 SS – Optional Construction				
Internal Parts	316 SS				
Diaphragms	Nylon Reinforced Buna-N				
O-Rings	Buna-N				
Control Springs	Painted Alloy Steel				
Gauges	2.5 in. Liquid-Filled SS Case & Body				
Weight	20 lbs. (9.0 kg)				
Approx. Dimensions	22 in 12 in X 7 in (559 mm X 305 mm X 178 mm)				
<b>Compatible Actuators &amp; Control Valves</b>					
SA Spring & Diaphragm Act.	■	■	■		
SA Spring & Piston Act.	■	■	■		
Double Acting Piston Act.	■ <sup>5</sup>	■ <sup>5</sup>	■ <sup>5</sup>	■	■
"Jet" Regulator	■	■	■		
Pneumatic Positioner		■			
Volume Booster	■	■			■

**Notes:**

1. NC Balanced Valves and NO Seat & Nozzle internal components may be exchange/converted to meet application requirements
2. ZERO Steady State emissions achieved when VPC properly adjusted to exhibit factory advised deadband setting
3. Consumption is approximate and based upon 100 psig Supply Gas. Atmosphere emissions may be completely eliminated when Discharge to Pressure System incorporated.
4. Double acting VPC's require addition of No-Vent Device to achieve ZERO emissions at full open and full closed
5. Double Acting Piston Actuators Equipped with Single Acting VPC requires additional interface instrumentation such as pneumatic positioner or pilot-operated trigger valve (GAP).

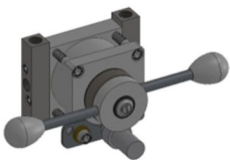
**Table. 2.0 – VPC Controller Spring Ranges and Performance Specifications**

VPC Pressure Series	Control Range	Spring Color	Setpoint Change Per Rev.	Setpoint Accuracy <sup>1</sup>	Maximum “GAP” Setpoint Range <sup>2</sup>	Control Spring Part No.
<b>VPC-225 Pressure Series</b>	1.25 - 14 psig (9 - 97 kPa)	Black	0.5 psig (3.2 kPa)	±0.1 psig (±0.7 kPa)	0.1 – 0.5 psig (0.7 – 3.4 kPa)	CS-0100
	8 - 53 psig (55 - 365 kPa)	Brown	2.1 psig (14 kPa)	±0.1 psig (±0.7 kPa)	0.2 – 2 psig (1.4 - 14 kPa)	CS-0110
	16 - 100 psig (110 - 689 kPa)	Grey	5 psig (34 kPa)	±0.2 psig (1.0 kPa)	0.5 - 5 psig (3.4 - 35 kPa)	CS-0120
	40 - 170 psig (276 - 1172 kPa)	Orange	12 psig (83 kPa)	±0.4 psig (±2.6 kPa)	1 - 12 psig (6.9 - 83 kPa)	CS-0130
	65 - 205 psig (448 - 1413 kPa)	White	19.5 psig (134 kPa)	±0.6 psig (±4.2 kPa)	2 - 19 psig (14 - 131 kPa)	CS-0135
	100 - 225 psig (689 - 1551 kPa)	Purple	26.5 psig (181 kPa)	±0.8 psig (±5.6 kPa)	3 - 26 psig (21 - 179 kPa)	CS-0400
<b>VPC-700 Pressure Series</b>	6 - 45 psig (41 - 310 kPa)	Black	2.4 psig (17 kPa)	±0.5 psig (±3.4 kPa)	0.5 - 2.4 psig (3.4 – 17 kPa)	CS-0100
	35 - 160 psig (241 - 1103 kPa)	Brown	10.6 psig (73 kPa)	±0.7 psig (±4.5 kPa)	1.5 - 10 psig (10 - 69 kPa)	CS-0110
	75 - 310 psig (517 - 2137 kPa)	Grey	25.4 psig (175 kPa)	±1.6 psig (±10 kPa)	3 - 25 psig (21 - 172 kPa)	CS-0120
	150 - 520 psig (1034 - 3585 kPa)	Orange	61.4 psig (423 kPa)	±3.8 psig (±26 kPa)	5 - 61 psig (35 - 421 kPa)	CS-0130
	240 - 635 psig (1655 - 4378 kPa)	White	100 psig (687 kPa)	±6.2 psig (±43 kPa)	6 - 100 psig (41 - 690 kPa)	CS-0135
	350 - 700 psig (2413 - 4826 kPa)	Purple	134 psig (926 kPa)	±8.3 psig (±57 kPa)	8 - 134 psig (69 - 345 kPa)	CS-0400
<b>VPC-1500 Pressure Series</b>	30 - 90 psig (207 - 620 kPa)	Black	4.9 psig (34 kPa)	±5.0 psig (±34 kPa)	N/A <sup>3</sup>	CS-0100
	50 - 335 psig (345 - 2309 kPa)	Brown	21.7 psig (149 kPa)	±5.0 psig (±34 kPa)	N/A <sup>3</sup>	CS-0110
	100 - 640 psig (689 - 4412 kPa)	Grey	52.3 psig (361 kPa)	±5.0 psig (±34 kPa)	10 - 50 psig (69 - 345 kPa)	CS-0120
	265 - 1070 psig (1827 - 7377 kPa)	Orange	126 psig (870 kPa)	±7.8 psig (±54 kPa)	10 - 125 psig (69 - 862 kPa)	CS-0130
	400 - 1300 psig (2758 - 8962 kPa)	White	204 psig (870 kPa)	±13 psig (±88 kPa)	15 - 204 psig (103 - 1407 kPa)	CS-0135
	625 - 1500 psig (4309 - 10341 kPa)	Purple	276 psig (1904 kPa)	±17 psig (±118 kPa)	20 - 276 psig (138 - 1903 kPa)	CS-0400

**Notes:**

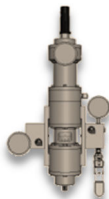
1. Setpoint Accuracy based upon proper maintenance of VPC Controller and adjustment to specification following VPC Controller Technical Manual.
2. Maximum “GAP” Setpoint Range applicable only to VPC-GAP Controller Configurations. The “GAP” relates to bracketed high-low trigger points for discrete on-off control logic.
3. Control Spring and VPC Series Combination not recommended for GAP control applications.

## Maximize Performance of Your VPC Controller with These Convenient Options and Accessories



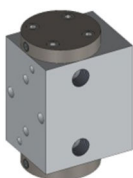
### **Manual Valve Override (MVO):**

The MVO allows the user to override the control instrumentation and manually position the control valve. The MVO is a convenient option that facilitates control valve maintenance and operation. The MVO is equipped with “lock out” feature to prevent unauthorized operation.



### **Stainless Steel Construction:**

Standard construction for VPC features Military Grade Aluminum Alloy with “Stealth System” Corrosion Protection to withstand harsh environments. For the most aggressive operating environments, the VPC is available in an optional Stainless Steel construction.



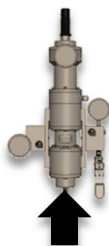
### **No-Vent Device (NVD):**

Double Acting VPC’s will discharge gas when the control valve is in the full open and full closed positions. The NVD shuts off VPC discharge for ZERO consumption when the control valve is in full open or full closed positions. The VRG No-Vent Device incorporates higher sensitivity components for higher performance as compared with “other” similar technologies.



### **Electronic Setpoint Control (ESC):**

Remote Setpoint Control is achievable with the addition of Electronic Setpoint Control motor system. The system features the ability to adjust setpoint via an electronic signal from the RTU or Gas Control. Electronic Setpoint Control can accept discrete signal or analog signals ( $\pm 12$  VDC,  $\pm 24$  VDC, 110 VAC, or 4-20 mA). Loss of signal to the system will cause the VPC to maintain control at the “last setpoint.”



### **Remote Loading Module (RLM):**

VPC Setpoints may be remotely adjusted via a pneumatic loading signal from an I/P Transducer. The RLM system allows remote adjustment of multiple VPC setpoints simultaneously. A variety of logic configurations and command signal inputs are available.



### **Integrated Systems (IS):**

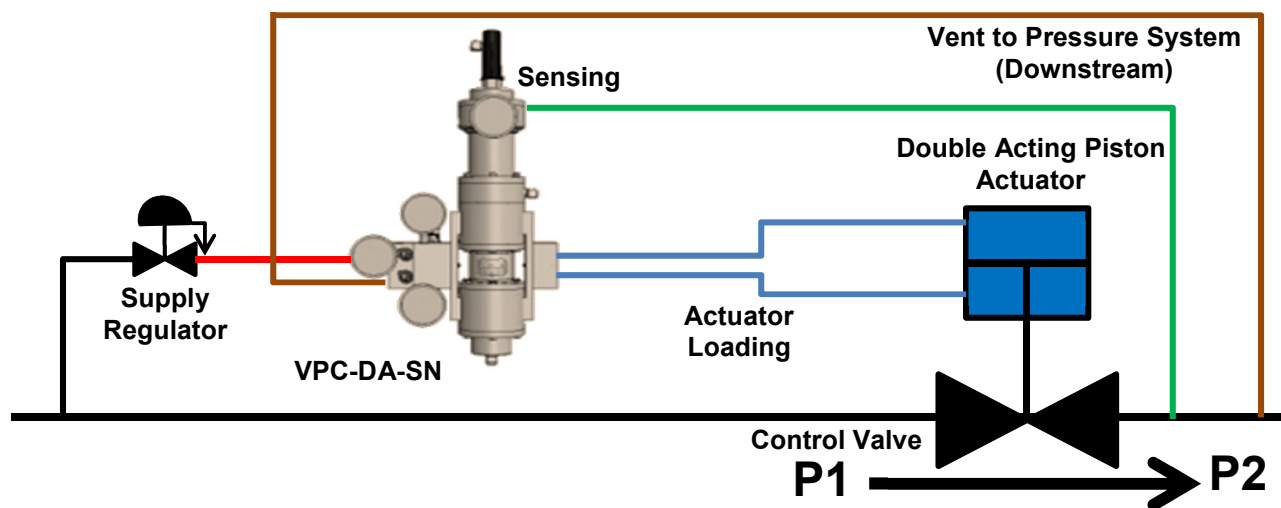
VRG can provide complete solutions to meet a variety of needs. The Integrated System features VPC Controllers packaged with a variety of complementary components to ensure a compatible “plug & play” solution with guaranteed performance. The Integrated System may be packaged in a secure, lockable cabinet of stainless steel, reinforced fiberglass or painted carbon steel construction.



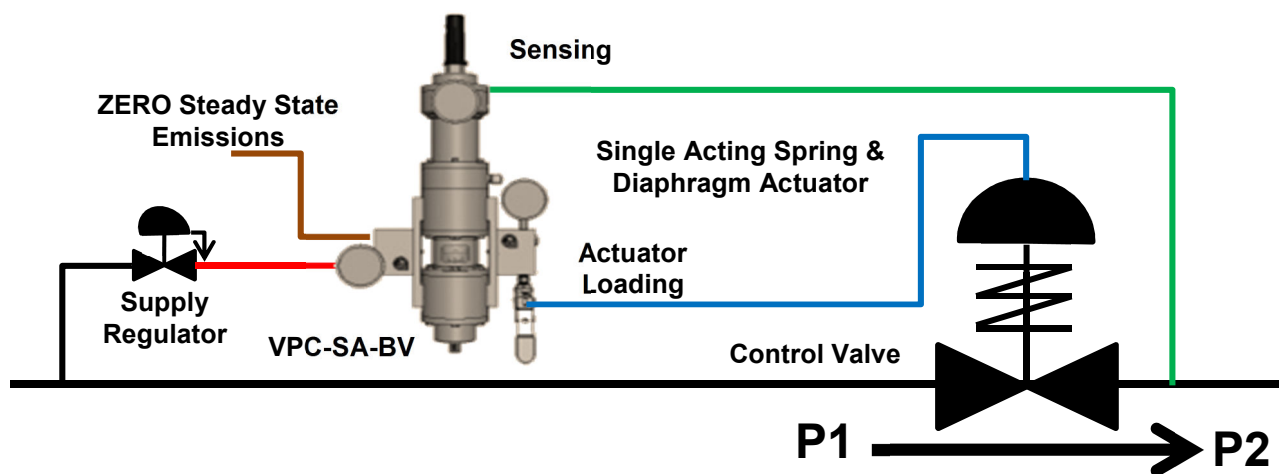
### **4500 Volume Booster**

Model 4500 Pneumatic Volume Boosters provide high capacity output when paired with VPC Controllers. The Volume Boosters may be utilized in conjunction with double acting and single acting VPC’s to provide accelerated speed in open and closing directions. The Volume Booster is typically a necessary accessory with large bore control valves where high volume displacement actuators are incorporated.

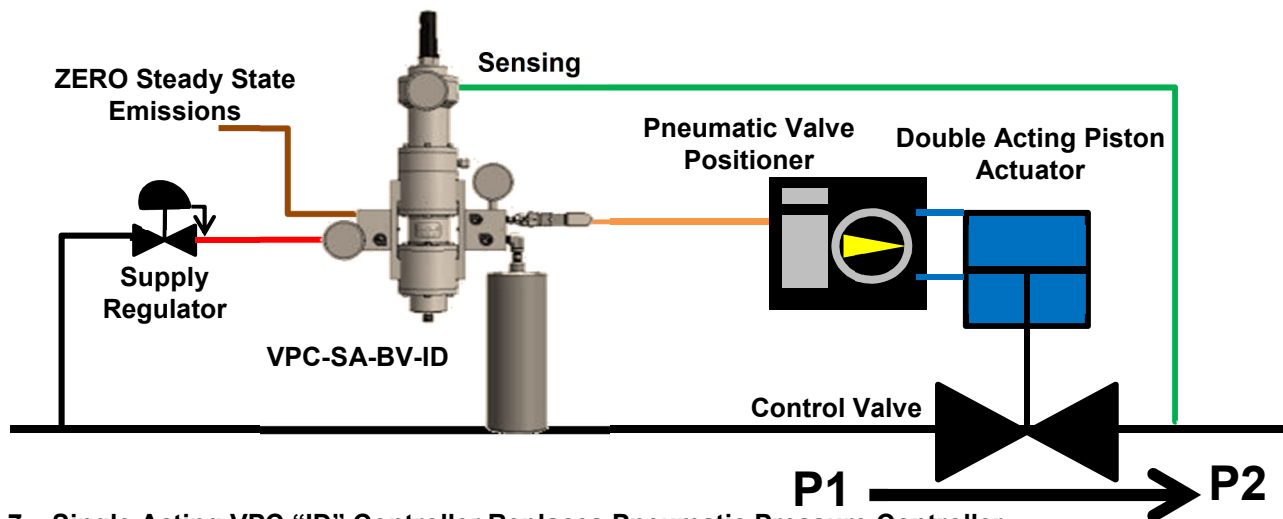
VPC Controller Typical Application Schematics



**Figure 5 – Double Acting VPC Controller Equipped to Vent to Downstream System**  
System shows double acting high pressure piston actuated control valve configured for active pressure control. All emissions are eliminated by discharge of vent gas to downstream piping



**Figure 6 – Single Acting VPC Controller Exhibits ZERO Steady State Emissions**  
System shows single acting spring & diaphragm actuated control valve configured for active pressure control. Retrofit to existing control valves is simple and eliminates steady state emissions.



**Figure 7 – Single Acting VPC “ID” Controller Replaces Pneumatic Pressure Controller**  
VPC “ID” Controllers can replace “bleeding” pneumatic pressure controllers and eliminate venting gas emissions. Shown with double acting actuated control valve. Compatible with almost any pneumatic positioner driven system.



**Figure 8 – VPC Replaces Existing Becker VRP**  
VRG Controls shown above replaced Dresser VRP Controller to provide improved control and greater durability in aggressive environments.



**Figure 9 – VPC Replaces Bristol 624**  
VRG Controls shown above replaced Bristol 624-II Pressure Controller to provide improved pressure control performance in critical power plant fuel gas feed application. The VPC demonstrated more accurate control downstream pressure and eliminated sensitivity to vibration. VPC shown installed on Fisher 470 Series actuator with EWT Control Valve and 3610 Pneumatic Positioner.

### Compatible Control Valves/Actuators/Instruments:

VPC Controllers are compatible with a wide array of control valves, actuators and control instrumentation. The unique features of the VPC ensures easy installation, excellent performance and unparalleled reliability. Contact VRG Controls for assistance with your next natural gas control valve application.

- Becker (GE)
- CCI
- Fisher Controls (Emerson)
- Masoneilan (GE)
- Metso (Neles)
- Mogas
- Mokveld
- PMV Positioners
- Valtek (Flowserve)
- Welker
- Bettis
- Others... Contact VRG for assistance.

### About VRG Controls:

VRG Controls manufactures innovative natural gas control instrumentation designed to provide enhanced performance, optimum reliability and environmentally friendly features that can eliminate emissions. Our heritage is borne from the natural gas industry and ensures that our focus is aligned with yours. VRG doesn't sell commodity components. We provide complete control solutions that consider the entirety of your natural gas regulation facility.



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