



# **G-Series Instruction Manual**

**Back Pressure Valves  
Pressure Relief Valves**

Made in the USA

INSG-1003-2021

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Call: 1 - 800 - GRIFFCO

Website: [www.griffcovalve.com](http://www.griffcovalve.com)

**PLEASE READ THE FOLLOWING INFORMATION PRIOR TO INSTALLING GRIFFCO VALVE PRODUCTS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN INJURY**

1. *Griffco Valve guarantees its' products against defective material and workmanship only. Griffco Valve assumes no responsibility for damage or injuries resulting from improper installation, misapplication, or abuse of any product.*
2. *Griffco Valve assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. Compatibility charts provided in Griffco Valve literature are based on ambient temperatures of 70°F and are for reference only. Customers should always test to determine application suitability.*
3. *Consult Griffco Valve literature to determine operating pressure, temperature, and flow rate limitations before installing any Griffco Valve product. The maximum recommended fluid velocity through this product is eight feet per second. Higher flow rates can result in possible damage due to the water hammer effect. Also note that maximum operating pressure is dependent upon material selection as well as operating temperature.*
4. *This product is designed primarily for use with non-compressible liquids. It should NEVER be used or tested with compressible fluids such as compressed air or nitrogen.*
5. *Systems should always be depressurized and drained prior to installing or maintaining Griffco Valve products.*
6. *Temperature effect on piping systems should always be considered when the systems are initially designed. Piping systems must be designed and supported to prevent excess mechanical loading on Griffco Valve equipment due to system misalignment, weight, shock, vibration, and the effects of thermal expansion and contraction.*
7. *Because PVC and CPVC plastic products become brittle below 40°F, Griffco Valve recommends caution in their installation and use below this temperature.*
8. *Published operating torque requirements are based upon testing of new valves using clean water at 70°F. Valve torque is affected by many factors including fluid chemistry, viscosity, flow rate, and temperature. These should be considered when sizing electric or pneumatic actuators.*
9. *Due to differential thermal expansion rates between metal and plastic, transmittal of pipe vibration, and pipe loading forces **DIRECT INSTALLATION OF METAL PIPE INTO PLASTIC CONNECTIONS IS NOT RECOMMENDED.** Wherever installation of plastic valves or strainers into metal piping systems is necessary, it is recommended that at least 10 pipe diameter in length of plastic pipe be installed upstream and downstream of the plastic valve to compensate for the factors mentioned above.*

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## LIMITED WARRANTY

Griffco Valve Inc. ("GVI") warrants that its products, produced at its facility, shall be free from defects in material and workmanship for a period of one year under normal use or eighteen (18) months from date of shipment, which first occurs. Defects caused by shipment, improper installation, negligence, misuse or alterations by parties other than GVI are not covered by this limited warranty. This limited warranty is extended only to the original purchaser from GVI.

This warranty does not extend to damage by corrosion or erosion. The materials of construction offered are recommendations subject in all cases to acceptance by the customer. These recommendations, based on previous experience and best available information, do not constitute guarantees against wear or chemical action. No liability for consequential damages or reinstallation labor is accepted. Griffco Valve, Inc. will not assume responsibility for contingent liability for alleged failure of its products.

The purchaser must promptly notify GVI of any claimed defect. Products may only be returned to GVI upon purchaser's receipt of written consent from GVI. Products are to be returned to GVI with freight prepaid. If GVI's inspection shows the products to be defective, GVI's liability in respect of defective products shall be to repair or replace such item(s) in its discretion.

EXCEPT FOR THE EXPRESS LIMITED WARRANTY SET FORTH HERE, NO OTHER IMPLIED WARRANTIES OF ANY KIND, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, ARE HEREBY DISCLAIMED. GVI SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES.

**GVI'S MAXIMUM LIABILITY SHALL NOT IN ANY EVENT EXCEED THE CONTRACT PRICE FOR THE PRODUCT.**

# ***SAFETY PRECAUTIONS***

## **Always follow the safety instruction below:**

- Wear protective clothing and glasses when working with or near chemicals.
- Refer to the MSDS for all chemicals used.
- Use only Genuine Griffco parts. Use of other parts may result in damage to equipment or injury and invalidate warranty.
- Flush all components that are in contact with chemicals prior to servicing.
- Secure all chemicals and equipment making them inaccessible to children and pets.
- Dispose all chemicals and waste according to all local, state and federal regulations.
- Stop the flow of chemical through the system prior to working on the valve.
- **Do Not** exceed the maximum operating pressure.

# ***INTRODUCTION***

**GRIFFCO** diaphragm back pressure valves are used to enhance the performance of chemical feed pumps and systems by providing a constant discharge head pressure. These valves also function as an anti-siphon valve. The diaphragm is held against the seat by the internal spring. Back pressure is adjustable from 10 - 150 psi via the adjustment screw. When the inlet pressure exceeds the preset pressure the diaphragm lifts off the seat and the chemical flows to the injection point. After each discharge stroke of the pump, as the pressure drops, the diaphragm reseats itself.

**GRIFFCO** diaphragm pressure relief valves are designed to protect chemical feed pumps and systems from overpressure caused by defective equipment or blockages in the chemical line. The 3 port design allows chemical to flow through the valve via an internal chamber. When the pressure in the chemical line exceeds the preset pressure of the valve the diaphragm lifts off the seat and the chemical then flows out the bottom port back to the chemical tank. Relief pressure is adjustable via the adjustment screw in the top of the valve.

## **Product Coding for Valves:**

**BPG/PRG**



1                    2                    3                    4

**1 = Size**

**2 = Material**

**3 = Spring**

**4 = Options**

050 - 1/2"

P - PVC

1 - 0 - 50 psi

V - Viton Diaphragm

075 - 3/4"

CP - CPVC

2 - 10 - 250 psi

S - Socket Connection

100 - 1"

PP - Polypro

F - Flange Connection

155 - 1 1/2"

T - PTFE

U - Union Connection

200 - 2"

K - PVDF

B - BSP Connections

300 - 3"

H - Halar

OSS - 316 SS Top

400 - 4"

S - 316 SS

MSS - 50 - 350 psi

A - Alloy 20

AR - Priming Valve

C - Hastalloy C

90 - 90° Configuration

# ***INSTALLATION***

## **Unpacking:**

Units are shipped FOB factory and the title passes to the customer when the carrier signs for the receipt of the unit. In the event damages occur during shipment, it is the responsibility of the customer to notify the carrier immediately and to file a damage claim.

Check all orders for completeness against the packing list. Notify Griffco Valve Inc. immediately if any deficiencies are found.

The carton should contain:

1 Backpressure valve or Pressure Relief valve

1 Instruction Manual

Accessories as ordered

## **Installation:**

**As a general rule, installation should follow the layout as outlined in the “TYPICAL INSTALLATION” drawing.**

## **Back Pressure Valve:**

Generally, the back pressure valve can be installed anywhere in the discharge line, provided there is some downstream pressure at the dosage point. If there is no downstream pressure the back pressure valve should be installed at the dosage point to prevent siphoning and drainage of the chemical line. The valve can be installed either vertically or horizontally. The flow must be across the valve in the direction of the arrow. All **GRIFFCO** valves are factory set at 50 psi, unless

otherwise specified. Field adjustment is possible with the adjustment screw.

Back pressure valve performance will be enhanced with the installation of a pulsation dampener to smooth out the discharge / suction cycles of the pump. Thus, the diaphragm is free to float inside the valve chamber, minimizing the wear on the stress points of the diaphragm. Pulsation dampeners will also reduce the pressure drop across the valve by reducing peak flows. Backpressure valves should be installed downstream of the dampener. For most applications diaphragm type dampeners are required. Generally speaking 5 to 10% dampening is sufficient. Consult with your pump manufacturer to get his recommendations.

### **Pressure Relief Valve:**

#### **3 Port Valves:**

Installation should be made as close to the chemical pump discharge valve as possible, without any equipment, especially shut-off valves, between the valve and the pump. Direction of flow must be across the valve; however the side of entry is not important. The valve can be installed either vertically or horizontally. The relief port is on the bottom of the valve.

#### **2 Port 180° Valves:**

Installation of a tee should be made as close to the chemical pump discharge valve as possible, without any equipment, especially shut-off valves, between the valve and the pump. The flow can travel at 90° or 180° through the tee, with the relief valve connected to the 3<sup>rd</sup> port of the tee. Direction of relief flow must be in the direction of the arrow on the valve.



## 2 Port 90° Valves:

Installation of a tee should be made as close to the chemical pump discharge valve as possible, without any equipment, especially shut-off valves, between the valve and the pump. The flow can travel at 90° or 180° through the tee, with the relief valve connected to the 3<sup>rd</sup> port of the tee. Direction of relief flow must be in the side of the valve with the relief port being on the bottom.

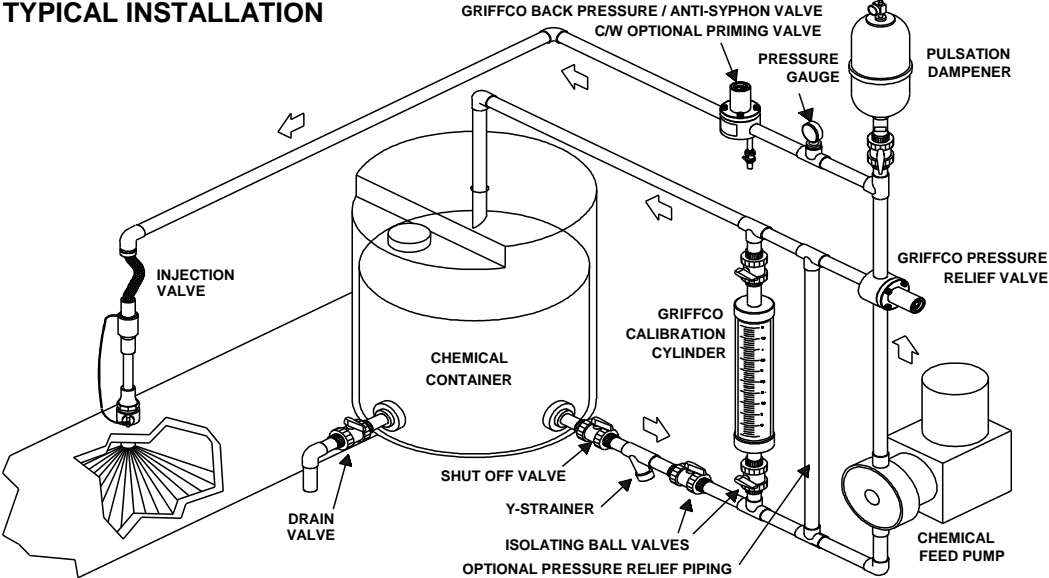
The optimum installation for any relief valve is to vent the relief port back to the chemical tank, or directly to a containment area. However if this is not possible, the relief port can be piped back into the suction side of the pump. This will apply the suction head to the relief port. To compensate, divide the NPSH by 4 and add this pressure to the relief valve setting. Do not put a shut off valve in the relief line.

All **GRIFFCO** valves are factory set at 50 psi, however field adjustment is possible with the adjustment screw.

## Important Precautions:

- Do not over tighten the connection piping.
- It is not recommended threading metal pipe or pipe fittings into plastic valves.
- Care should be taken when applying thread sealant to pipe threads not to use excessive amounts as the sealant could break free and get lodged between the valve seat and the diaphragm causing the valve to weep.
- Check to ensure that the valve bolts are tight.
- Do not bottom out the adjustment screw.

# TYPICAL INSTALLATION



# ***OPERATION***

## **Start-up:**

Before starting the chemical feed system make sure the backpressure and safety valves are installed correctly and the proper pressures are set for the application. The valves are factory set at 50 psi unless otherwise specified. Valves can be field adjusted.

## **Adjusting Set Pressure:**

The set pressure of the valves can be adjusted to any pressure value between the maximum and minimum value as stated on the valve ID tag. This is done via the adjustment screw located under the black cap on the top of the valve. To increase the pressure, turn the screw clockwise. This should be done with the pump operating and a pressure gauge installed between the pump and the back pressure valve. If no gauge is installed the pressure can be estimated to change approximately 8 psi per revolution with the standard 150 psi spring.

## **Caution:**

Pressure setting changes should be made only after careful consideration of the effect of the change on the entire hydraulic system, including the chemical feed pump. Never attempt to adjust the valve outside the pressure limit as improper operation and/or damage to the valve and/or system components may occur.

# ***MAINTENANCE***

## **General:**

Griffco valves were designed with a minimum amount of maintenance required to keep the valves in operation. However, periodic replacement of the diaphragm is required. The Griffco design permits routine inspection and repair without removing the valve from the pump line.

## **Caution:**

**Ensure that the chemical feed system is not under pressure and that the chemical lines have been flushed with water before starting disassembly.**

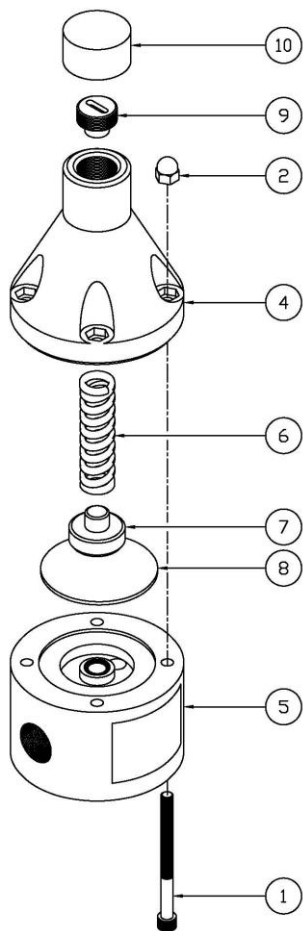
Unscrew the pressure adjustment screw to remove the pressure from the diaphragm. Remove the 4 bolts and lift off the valve top.

After the diaphragm and the valve seat have been inspected and replaced if necessary, (White PTFE side down), check the adjustment spring. Make sure there is no rust or corrosion. Place the support disc and the spring onto the valve body and slide the top back over the four bolts.

Tighten the 4 bolts, and then replace the adjustment screw. Turn the adjustment screw clockwise to approximately the same position as it was prior to disassembly. If an exact pressure setting is required or a different pressure is desired a pressure gauge should be used to verify the setting. Turning the adjustment screw clockwise will increase pressure.

**Use only genuine Griffco Valve parts in your Griffco Valves.**

# SPARE PARTS



# COMMON VALVE PARTS:

ITEM	DESCRIPTION	PART #
1	1/4 - 20 X 2 3/4" Bolt - 1/2 - 1" Plastic Valves 5/16 - 18 X 1 1/2" Bolt - 1 1/2" - 2" Metal Valves 1/4 - 20 X 4.5" - 1 1/2" Plastic Valves (5" OD Body) 1/4 - 20 X 5" Bolt - 1 1/2" (OBS 4.5" OD); & 2" Plastic Valves (5" OD) 1/4 - 20 X 1 1/4" Bolt - 1/2 - 1" Metal Valves	PV-00101 PV-00102 PV-00104 PV-00105 PV-00108
2	1/4 - 20 Cap hex nut	PV-00202
3	1/4 Flat Washer (Required with 316 SS Top) 5/16 Flat washer (Required with 316 SS Top)	PV-00302 PV-00303
4	1/2" - 1" Valve Top – Noryl, Black 1/2" - 1" Valve Top – Noryl, Orange 1/2" - 1" Valve Top – Noryl, Yellow 1/2" - 1" Valve Top – Noryl, Green 1/2" - 1" Valve Top – Noryl, Grey 1/2" - 1" Valve Top - 316 SS 1 1/2" Valve Top; 4 1/2" Valves, PVC 1 1/2" Valve Top; 4 1/2" Valves, 316 SS 2" Valve Top; 5" Valves, Noryl 2" Valve Top; 5" Valves, 316 SS	PV-004451 PV-004452 PV-004053 PV-004054 PV-004450 PV-00407 PV-00411 PV-00413 PV-00414 PV-00416
6	Pressure Spring - 1/2" - 1" Valve; 150 psi Pressure Spring - 1/2" - 1" Valve; 50 psi Pressure Spring - 1/2" - 1" Valve; 250 psi Pressure Spring - 1/2" - 1" Valve; 350 psi Pressure Spring - 1/2" - 1" Valve; 100 psi, 316 SS Pressure Spring - 1 1/2" - 2" Valve; 150 psi Pressure Spring - 1 1/2" - 2" Valve; 50 psi	PV-00602 PV-006021 PV-006023 PV-006122 PV-00602S PV-00603 PV006033
7	Support Disc - 1/2 - 1" Valve, PVC Support Disc - 1/2 - 1" Valve, 316 SS Support Disc - 1 1/2" - 2" Valve, PVC Support Disc - 1 1/2" - 2" Valve, 316 SS	PV-00705 PV-00706 PV-00708 PV-00709
8	Diaphragm - 1/2" - 1" Valve - PTFE / EPDM Diaphragm - 1/2" - 1" Valve – Viton Diaphragm - 1/2" - 1" Valve - PTFE / Viton (High Temperature) Diaphragm - 1 1/2" Valve - PTFE / EPDM (OBS 4.5" OD Body) Diaphragm - 1 1/2" Valve – Viton (OBS 4.5" OD Body) Diaphragm - 1 1/2" Valve – PTFE/Viton (OBS 4.5" OD Body) Diaphragm - 1 1/2" - 2" Valve – PTFE/EPDM (5" OD Body) Diaphragm - 1 1/2" - 2" Valve – Viton ( 5" OD Body)	PV-00810 PV-00812 PV-00813 PV-00820 PV-00821 PV-00822 PV-00830 PV-00831
9	Adjustment Screw - 1/2" - 1" Valve PET (white) Adjustment Screw - 1/2" - 1" Valve Coated Steel Adjustment Screw - 1 1/2" - 2" Valve PVC Adjustment Screw - 1 1/2" - 2" Valve Coated Steel	PV-00906 PV-00903 PV-00926 PV-00921
10	Protective Vinyl Cap- 1/4" – 1" Valves Protective Vinyl Cap- 1 1/2" – 2" Valves	PV-01001 PV-01002

# BACKPRESSURE VALVE PARTS

ITEM	DESCRIPTION	PART #
5	1/2" Valve Body PVC 1/2" Valve Body PP 1/2" Valve Body PTFE 1/2" Valve Body PVDF 1/2" Valve Body 316 SS 1/2" Valve Body Alloy 20 1/2" Valve Body Hast C 1/2" Valve Body CPVC 3/4" Valve Body PVC 3/4" Valve Body PP 3/4" Valve Body PTFE 3/4" Valve Body PVDF 3/4" Valve Body 316 SS 3/4" Valve Body Alloy 20 3/4" Valve Body Hast C 3/4" Valve Body CPVC 1" Valve Body PVC 1" Valve Body PP 1" Valve Body PTFE 1" Valve Body PVDF 1" Valve Body 316 SS 1" Valve Body Alloy 20 1" Valve Body Hast C 1" Valve Body CPVC 1 1/2" Valve Body PVC (5" OD) 1 1/2" Valve Body PP (5" OD) 1 1/2" Valve Body PTFE (5" OD) 1 1/2" Valve Body PVDF (5" OD) 1 1/2" Valve Body 316 SS (5" OD) 1 1/2" Valve Body Alloy 20 (5" OD) 1 1/2" Valve Body Hast C (5" OD) 1 1/2" Valve Body CPVC (5" OD) 2" Valve Body PVC 2" Valve Body PP 2" Valve Body PTFE 2" Valve Body PVDF 2" Valve Body 316 SS 2" Valve Body Alloy 20 2" Valve Body Hast C 2" Valve Body CPVC	BPV-00511 BPV-00512 BPV-00513 BPV-00514 BPV-00515 BPV-00516 BPV-00517 BPV-00518 BPV-00521 BPV-00522 BPV-00523 BPV-00524 BPV-00525 BPV-00526 BPV-00527 BPV-00528 BPV-00531 BPV-00532 BPV-00533 BPV-00534 BPV-00535 BPV-00536 BPV-00537 BPV-00538 BPV-50541 BPV-50542 BPV-50543 BPV-50544 BPV-50545 BPV-50546 BPV-50547 BPV-50548 BPV-00551 BPV-00552 BPV-00553 BPV-00554 BPV-00555 BPV-00556 BPV-00557 BPV-00558

# PRESSURE RELIEF VALVE PARTS

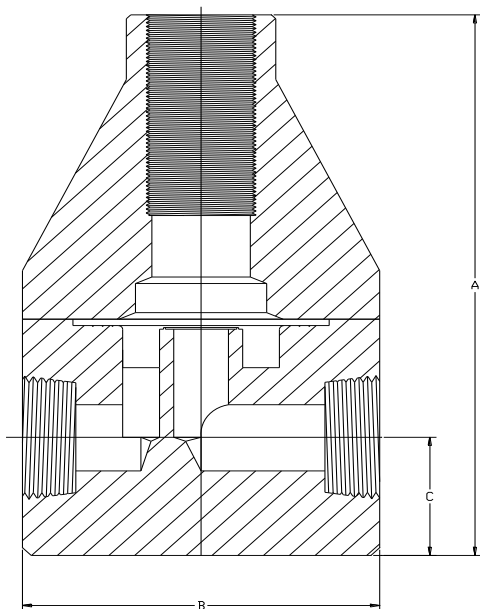
ITEM	DESCRIPTION	PART #
5	1/2" Valve Body PVC 1/2" Valve Body PP 1/2" Valve Body PTFE 1/2" Valve Body PVDF 1/2" Valve Body 316 SS 1/2" Valve Body Alloy 20 1/2" Valve Body Hast C 1/2" Valve Body CPVC 3/4" Valve Body PVC 3/4" Valve Body PP 3/4" Valve Body PTFE 3/4" Valve Body PVDF 3/4" Valve Body 316 SS 3/4" Valve Body Alloy 20 3/4" Valve Body Hast C 3/4" Valve Body CPVC 1" Valve Body PVC 1" Valve Body PP 1" Valve Body PTFE 1" Valve Body PVDF 1" Valve Body 316 SS 1" Valve Body Alloy 20 1" Valve Body Hast C 1" Valve Body CPVC 1 1/2" Valve Body PVC (5" OD) 1 1/2" Valve Body PP (5" OD) 1 1/2" Valve Body PTFE (5" OD) 1 1/2" Valve Body PVDF (5" OD) 1 1/2" Valve Body 316 SS (5" OD) 1 1/2" Valve Body Alloy 20 (5" OD) 1 1/2" Valve Body Hast C (5" OD) 1 1/2" Valve Body CPVC (5" OD) 2" Valve Body PVC 2" Valve Body PP 2" Valve Body PTFE 2" Valve Body PVDF 2" Valve Body 316 SS 2" Valve Body Alloy 20 2" Valve Body Hast C 2" Valve Body CPVC	PRV-00511 PRV-00512 PRV-00513 PRV-00514 PRV-00515 PRV-00516 PRV-00517 PRV-00518 PRV-00521 PRV-00522 PRV-00523 PRV-00524 PRV-00525 PRV-00526 PRV-00527 PRV-00528 PRV-00531 PRV-00532 PRV-00533 PRV-00534 PRV-00535 PRV-00536 PRV-00537 PRV-00538 PRV-50541 PRV-50542 PRV-50543 PRV-50544 PRV-50545 PRV-50546 PRV-50547 PRV-50548 PRV-00551 PRV-00552 PRV-00553 PRV-00554 PRV-00555 PRV-00556 PRV-00557 PRV-00558



# SPECIFICATIONS

<b>G-Series Sizes:</b>	1/2", 3/4", 1", 1 1/2", 2", 3", 4"	
<b>Flow Rates @ 150 psi</b>		
<b>Size</b>	<b>Pulsating</b>	<b>Continuous</b>
1/2"	300 USgph	21 USgpm
3/4"	300 USgph	21 USgpm
1"	500 USgph	26 USgpm
1 1/2"	1200 USgph	63 USgpm
2"	2350 USgph	120 USgpm
3"	5200 USgph	270 USgpm
4"	5200 USgph	270 USgpm
<b>Max Temp: (°F)</b>	PVC: 140° ; CPVC & PP: 195°; PTFE, PVDF & Metal: 300°, (Peak 390°)	
<b>Max Operating Pressure(psi) @ 70°F</b>	Plastic/Noryl: 375 psi Metal/Metal: 2000 psi	
<b>Pressure Adjustment</b>	Standard: 10 - 150 psi; Optional: 0 – 50 psi, 10 – 250 psi, 50 - 350 psi  *Note: Size 1 1/2" and Larger BPG valves 10 – 250 psi Max range ONLY.	
<b>Materials of Construction:</b>		
<b>Diaphragm</b>	PTFE / EPDM, Optional: Viton, Hypalon, & PTFE / Viton	
<b>Valve Body</b>	PVC, CPVC, PP, PTFE, PVDF, Halar, 316 SS, A 20, Hast. C	

## Dimensions:



### DIMENSIONS: BPG-SERIES

All Materials

Size	A(in)	B(in)	C(in)
1/2"	5.560	3.500	1.125
3/4"	5.560	3.500	1.125
1"	5.860	3.500	1.250
1 1/2"	8.350	4.900	1.825
2"	8.900	4.900	2.150

# ***NOTES***



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