

# GENERAL SERVICE (GS) CONTROL VALVES

COPEX VULCAN®



The Copes-Vulcan brand from Celeros Flow Technology has been providing control valves and desuperheaters for the power, process and nuclear industries since 1903. Copes-Vulcan provides a wide range of valves for the control of pressure, temperature and flow-induced noise in all types of power plants. Products include severe service and general service control valves, variable orifice desuperheaters, Raven™, trim and steam-conditioning valves and nuclear control valves, as well as custom designed specialty valves. Copes-Vulcan is recognized worldwide as a leader in valves for severe and critical service applications. Our strength lies in our ability to provide innovative valve solutions for our customers' application needs.

## GS-GENERAL SERVICE VALVES

The GS-General Service Valves continues Copes-Vulcan's tradition of designing and manufacturing control valves that provide both exceptional service and great value. Representing significant refinement in design and performance for general service globe style control valves, the GS-General Service Valves combine the most advanced levels of body configuration, trims and, actuation to produce a valve assembly capable of premium performance at a competitive price.

Suitable for controlling water, steam, gas and most other fluids, GS-General Service Valves deliver a new standard of versatility, rugged dependability and, cost effectiveness that will serve the power and process industries well into the 21st century.

Copes-Vulcan GS-General Service Valves are ideally suited for non-severe flow control of most liquids, steam and gases. They provide reliable, economical performance in heater drains, gas and fuel oil control, feedwater control, steam/gas pressure reduction and, many other power and process flow control operations.

For applications involving extreme environments, especially hostile fluids, or pressure classes greater than ANSI 600, specify Copes-Vulcan SD-Severe Duty Control Valves.



### DESCRIPTION AND PRINCIPLE OF OPERATION

GS-General Service Valve assemblies feature a straight-through globe style body design with streamlined precision cast bodies to provide smooth contours and transition areas. The result is minimized flow restriction and maximized capacity. Computer calculated cross sections and wall thicknesses assure high structural integrity while maintaining a very favorable strength-to-weight ratio. The GS-General Service Valves are available in .75-8" (20-200mm) sizes as standard, ANSI pressure classes of 125-600, and most standard castable material choices, with either flanged, welded or threaded end connections.

GS-General Service Valves can be equipped with an extensive array of standardized trims to meet virtually any general service requirement. A number of high performance trims, such as RAVEN™, HUSH®, TANDEM, and GAD™ are also available and can be used to control occurrences of cavitation, flashing or noise. All trims are quick to change to assure ease of maintenance. All trims are fully interchangeable between like sizes to ensure maximum flexibility and reduced inventory requirements.

A complete range of 700 series pneumatic diaphragm actuators that can handle supply air pressure as high as 80 psig (550 kPag) provides performance usually associated with much more expensive actuation systems. Copes-Vulcan pneumatic actuators are known worldwide for high performance and reliability.

The design is in accordance with ANSI B16.1, B16.5, B16.11, B16.25, B16.34. Copes-Vulcan also holds the following certifications that can be applied to the GS-Style Globe valve: ASME Section I, ASME Section III 'N' & 'NPT', 97/23/EC-PED-CE and is also ISO-9001 certified.



## TYPICAL PRODUCT APPLICATIONS

Suitable for controlling liquid, steam, gas and, most other fluids, General Service Valves deliver a new standard of versatility, rugged dependability and cost effectiveness.

### Traditional Coal-Fired Power

- Deaerator Level Control
- Heater Drain Valve
- Aux Steam to Deaerator
- Condensate Water to Condenser
- Condensate Water Recycle
- Cold Reheat to Aux Steam
- Main Steam Letdown Spray water
- LP Feedwater Recirculation
- Flash Tank Drain
- Reheater Spray Control



### Nuclear Power

- Isolation Valves
- Level Control Valves
- Feedwater Valves
- LP Drain Pump Recirc
- Blowdown Cooling Water
- Steam Transformer Blowdown
- Drain Cooler to Condenser



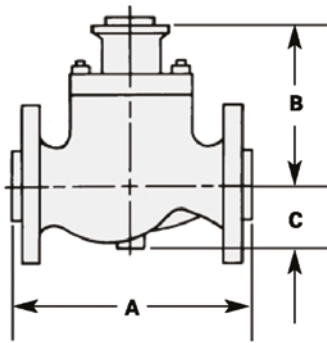
### Oil & Gas

- Propane Pressure Reducing
- Ethylene Control
- Nitrogen to Mill Shut-Off
- Gas to Burner
- Oil Quick Shutoff
- Heavy Oil Control



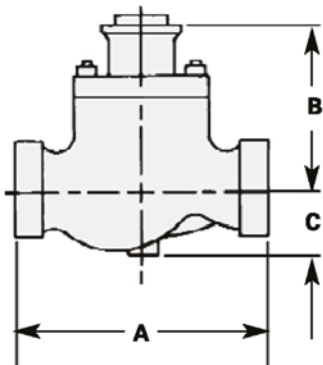
# GS Valve Body/Bonnet Assembly

## FLANGED ENDS



VALVE SIZE	CLASS 150			CLASS 300			CLASS 400			CLASS 600		
	A	B	C	A	B	C	A	B	C	A	B	C
.75 20	7.25 184	7.00 178	1.69 43	7.62 194	7.00 178	1.69 43	8.12 206	7.00 178	1.69 43	8.12 206	7.00 178	1.69 43
1 25	7.25 184	7.00 182	1.69 43	7.75 197	7.00 178	1.69 43	8.25 210	7.00 178	1.69 43	8.25 210	7.00 178	1.69 43
1.5 40	8.75 222	7.15 182	1.94 49	9.25 235	7.15 182	1.94 49	9.88 251	7.15 182	1.94 49	9.88 251	7.15 182	1.94 49
2 50	10.00 254	7.15 182	2.50 64	10.50 267	7.15 182	2.50 64	11.25 286	7.15 182	2.50 64	11.25 286	7.15 182	2.50 64
3 75	11.75 298	9.47 241	3.31 84	12.50 318	9.47 241	3.31 84	13.25 337	9.47 241	3.31 84	13.25 337	9.47 241	3.31 84
4 100	13.88 353	10.56 268	4.00 102	14.50 368	10.56 268	4.00 102	15.25 387	10.56 268	4.00 102	15.50 394	10.56 268	4.00 102
6 150	17.75 451	11.81 300	5.50 140	18.62 473	11.81 300	5.50 140	19.50 495	11.81 300	5.59 142	20.00 508	11.81 300	5.50 140
8 200	21.38 543	13.06 332	6.88 175	22.38 568	13.06 332	6.88 175	23.38 594	13.06 332	6.88 175	24.00 610	13.06 332	6.88 175

## WELD ENDS AND THREADED ENDS (FOR 2" (50MM) AND SMALLER)


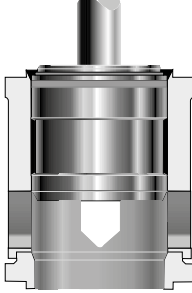


VALVE SIZE	CLASS 150			CLASS 300			CLASS 400			CLASS 600		
	A	B	C	A	B	C	A	B	C	A	B	C
.75 20	7.75 197	7.00 178	1.69 43	7.75 197	7.00 178	1.69 43	7.75 197	7.00 178	1.69 43	7.75 197	7.00 178	1.69 43
1 25	7.75 197	7.00 182	1.69 43	7.75 197	7.00 178	1.69 43	7.75 197	7.00 178	1.69 43	7.75 197	7.00 178	1.69 43
1.5 40	9.25 235	7.15 182	1.94 49	9.25 235	7.15 182	1.94 49	9.25 235	7.15 182	1.94 49	9.25 235	7.15 182	1.94 49
2 50	10.50 267	7.15 182	2.50 64	10.50 267	7.15 182	2.50 64	10.50 267	7.15 182	2.50 64	10.50 267	7.15 182	2.50 64
3 75	12.50 318	9.47 241	3.31 84	12.50 318	9.47 241	3.31 84	12.50 318	9.47 241	3.31 84	12.50 318	9.47 241	3.31 84
4 100	14.50 368	10.56 268	4.00 102	14.50 368	10.56 268	4.00 102	14.50 368	10.56 268	4.00 102	14.50 368	10.56 268	4.00 102
6 150	20.00 508	11.81 300	5.50 140	20.00 508	11.81 300	5.50 140	20.00 508	11.81 300	5.59 142	20.00 508	11.81 300	5.50 140
8 200	24.00 610	13.06 332	6.88 175	24.00 610	13.06 332	6.88 175	24.00 610	13.06 332	6.88 175	24.00 610	13.06 332	6.88 175



## TRIM TYPES

A broad variety of trims are available for the GS-General Service control valves. They are designed to match virtually any general service operational requirement. All GS trims feature a quick-change design to reduce downtime for inspection, maintenance or change out, and most are cage guided, further ensuring smooth, accurate operation. The entire trim line is interchangeable between like sizes, and many reduced trims are also available as standard offerings. The trims shown in this brochure are a partial representation of the standard trim selection. Additional standard, special and custom trims are available as required. Standard stocked trim materials are 300 series and 400 series stainless steel. Other materials are available as required.

TRIM TYPES	UNBALANCED SINGLE SEAT PLUG THROTTLING	UNBALANCED SINGLE SEAT PORT THROTTLING	BALANCED SINGLE SEAT PORT THROTTLING	BALANCED SINGLE SEAT PORT THROTTLING (HI-TEMP)
				
<b>DESCRIPTION/ APPLICATION</b>	This trim style is a general purpose cage guided trim for on/off or modulating control. It is designed for low to moderate pressure drop applications. The solid plug has a contour on its lower end that provides varying flow area with lift, thus regulating the flow. It can be used with a wide variety of non-abrasive/non-adhesive compressible and noncompressible fluids. Standard trim for valve sizes 1.5" (40mm) and smaller.	This trim style is a general service cage guided trim for on/ off or modulating control where moderate flow rates exist along with low differential pressures. The unbalanced single seat plug modulates flow by uncovering ports in the cage. The cage porting produces the pressure drop or flow control. This trim can be used in most non-abrasive/non-adhesive compressible and noncompressible fluids.	This trim style is a general purpose cage guided trim for on/off or modulating control suitable for use in most non-abrasive/non-adhesive compressible and noncompressible fluid services. The balanced plug design reduces actuator force requirements thus permitting the use of smaller, less expensive actuators while maintaining tight shutoff capability. It is designed for valves 2" (50mm) and larger and is a standard offering when the service temperature does not exceed the 400°–500°F (204°– 260°C) range, relative to pressure.	This general purpose cage guided trim is virtually identical in all respects to the balanced single seat port throttling trim except that piston rings are used in lieu of the elastomeric seal on the trim's plug. While the piston rings do limit the leakage rate to ANSI Class III, this trim is a viable option when a balanced plug is desirable and when temperatures of the fluid exceed 500°F (260°C). It is for valve sizes 2" (50mm) and larger.
<b>STANDARD FCI 70-2/ANSI RATED SEAT LEAKAGE</b>	Class IV standard Class V optional	Class IV standard Class V optional	Class IV standard Class V optional *Class VI optional	Class IV standard
<b>STANDARD TRIM CHARACTERISTIC</b>	Modified parabolic, linear, equal percent- age.	Modified parabolic, linear, equal percentage	Modified parabolic, linear, equal percentage	Modified parabolic, linear, equal percentage
<b>TYPICAL FLOW DIRECTION</b>	Under the seat	Under the seat	Over the seat	Over the seat
<b>MAXIMUM RANGEABILITY</b>	50:1	35-50:1	35-50:1	35-50:1

\* Class VI requires use of soft seat.

## ACTUATORS

### SERIES 700 ACTUATORS

Series 700 actuators are pneumatic diaphragm operators that have spring return in both direct and reverse acting styles, offering fail open and fail closed models respectively. The pressed steel diaphragm case construction along with the nylon reinforced Buna-N rubber diaphragm permits a maximum allowable air supply pressure of 80 psig (550 kPag).

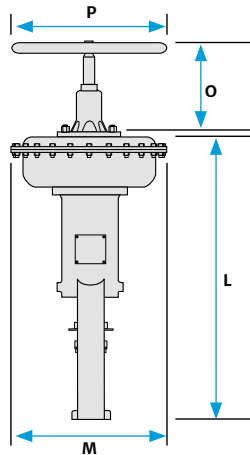
This pre-formed diaphragm provides a constant effective area throughout the full extent of travel.

With effective diaphragm areas ranging from 60–160 in<sup>2</sup> (385–1030 cm<sup>2</sup>). Series 700 actuators can provide the necessary stem force to meet virtually any operating requirement.

### SERIES 700 ACTUATOR (SHOWN WITH OPTIONAL TOP-MOUNTED HANDWHEEL)

#### Reverse Acting (Spring-to-Close)

ACTUATOR SIZE	60 in mm	100 in mm	160 in mm	160L in mm
L	21.06 536	28.06 713	32.38 822	40.81 1037
M	11.50 292	15.12 384	18.00 457	18.00 457
N	6.50 165	6.50 165	6.25 159	6.38 162
O	6.72 171	11.38 289	11.56 294	17.19 437
P	10.00 254	18.00 457	18.00 457	18.00 457



#### Direct Acting (Spring-to-Open)

ACTUATOR SIZE	60 in mm	100 in mm	160 in mm	160L in mm
L	20.50 521	28.12 714	32.31 821	39.75 1010
M	11.50 292	15.12 384	18.00 457	18.00 457
N	7.56 192	9.38 238	9.31 236	11.81 300
O	5.81 148	9.44 240	9.50 241	15.19 386
P	10.00 254	18.00 457	18.00 457	18.00 457

An optional top mounted handwheel is available on both direct and reverse acting actuators, permitting manual operation of the valve should a loss in supply air pressure occur. Force is exerted directly on the actuator stem, making manual positioning smooth, easy and precise.

The top mounted handwheel will operate the valve in one direction. For direct acting units, the handwheel will extend the actuator stem; and for reverse acting units, the stem will be retracted. Side mounted handwheels are also available for Series 700 actuators.



Copes-Vulcan offers handwheel operated actuators for applications where an automated valve is not required or where compressed air service is unavailable. Series 800 actuators are suitable for both on/off and modulating service. Since they are attached to the valve bonnet and stem using the same arrangement as the Series 700, future conversion to an automated actuator can be accomplished.







- | SPEED
- | EXCELLENCE
- | PARTNERSHIP

# GENERAL SERVICE (GS) CONTROL VALVES



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