

OpGL

Globe Control Valve



OPTIMUX

OpGL

Control Valve

The OpGL globe control valve provides a superior performance, while permitting easy, fast, inexpensive maintenance. Unlike diaphragm-operated control valves, the spring cylinder-actuated OpGL provides stiffness and maintains high positioning accuracy controlled, and a faithful response. Since it handles up to 150 psi (10.3 Barg) supply air, it also has the thrust necessary to shut off against much higher fluid pressures.

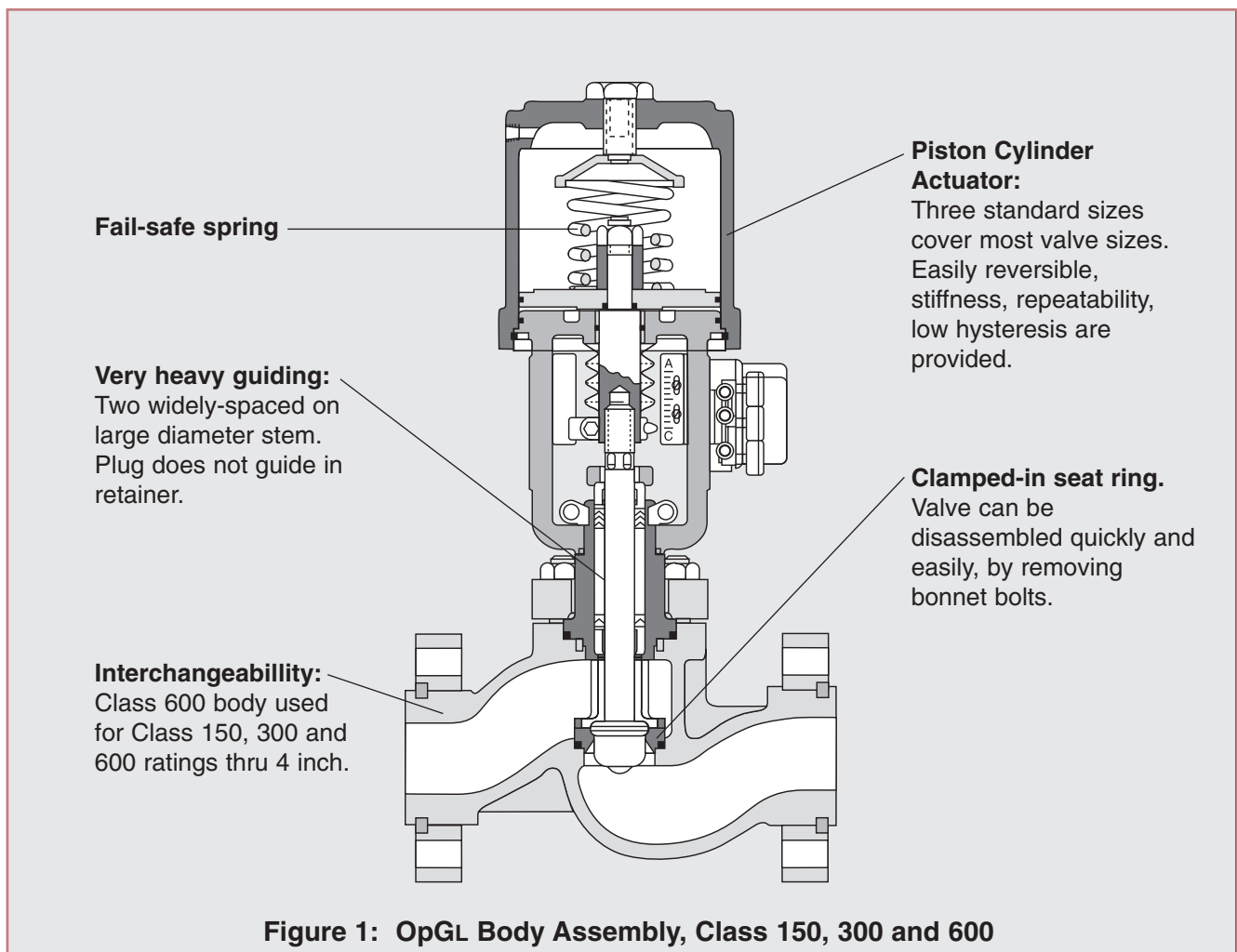
Most diaphragm actuators rely entirely on springs to close the valve. But with the OpGL control valve, the spring force, the supply air pressure and the fluid pressure itself, are combined to produce an exceptionally tight shutoff. Because of its self-aligning seat ring, shutoff is made easier to be achieved in the OpGL control valve.

Most common maintenance problems with globe control valves can be traced to cage-guiding. The close metal-to-

metal contact between the cage and the plug often results in galling and sticking. That is why the OpGL is double-top stem guided thus completely avoiding contact between the plug and the seat retainer.

The clamped-in seat and top entry trim permits easy, quick maintenance. Plus, with OpGL's high degree of parts interchangeability, fewer inventory parts are needed and costs are therefore reduced.

The actuator is also of a compact design, smaller, lighter and easier to handle than comparable diaphragm actuators. With Optimux's quick-and-express manufacturing system, shorter deliveries at no extra costs are possible for the customer. OpGL. The simple, reliable, rugged and economic globe valve.



OpGL Body Styles

Globe Style Body

Globe-style bodies feature smooth, streamlined, constant area internal passages with no pockets, permitting high capacity with minimum turbulence.

They are designed with nearly constant wall thickness, providing lower weight and cost, specially when the body is manufactured in stainless steel or expensive alloy steels.

Angle Style Body

The angle-style OpGL is completely interchangeable with the globe-style. Except for the body, all other valve parts remain the same. For additional protection of the body, a special Venturi seat ring which extends to the outlet flange is available, if required.

Three-way Body

Three-way bodies are used to either combining or diverting services. Due to Optimux's excellent parts interchangeability, a standard globe valve easily converts to three-way service with the addition of a three-way adapter, upper seat ring, two gaskets, and a three-way plug.

Steam Jacketed Body

The steam jacketed OpGL uses a standard globe-style body with oversized, blind flanges for a full jacket or standard flanges for a partial jacket. The jacket is rated for 150 psi (10.3 barg) and is equipped with a 3/4" NPT supply and drain connection.

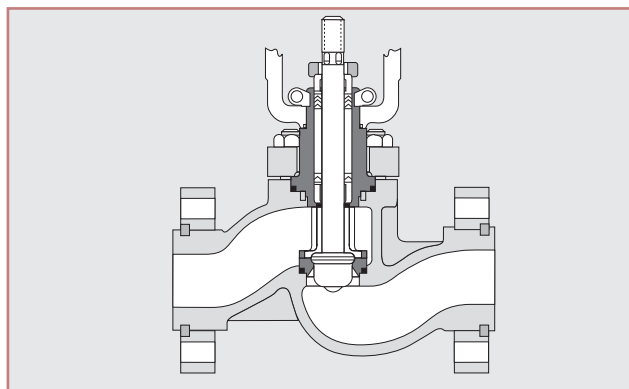


Figure 2: Globe Style body

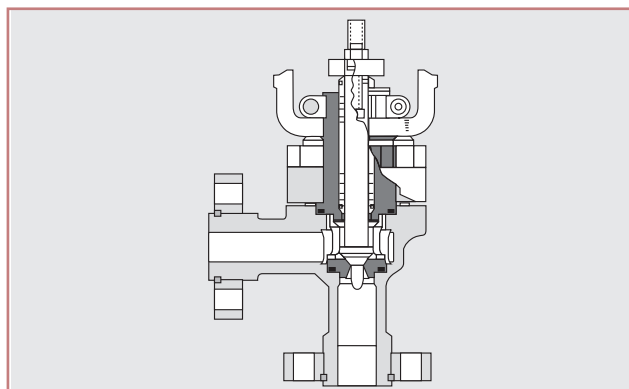


Figure 3: Angle Style body

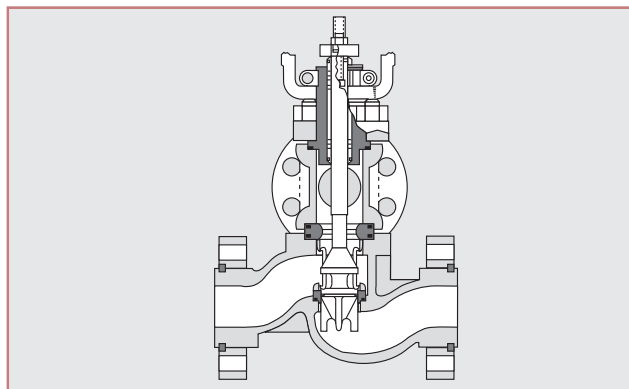


Figure 4: Three-way body

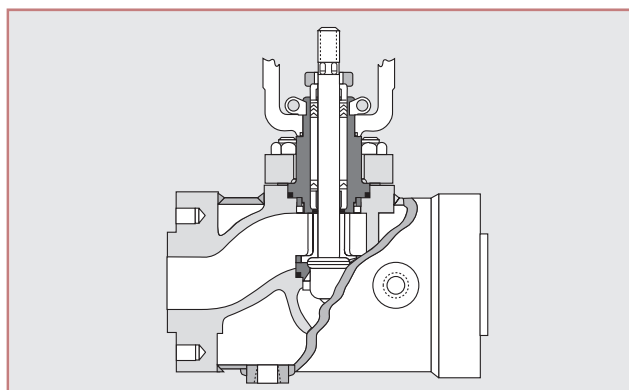


Figure 5: Steam Jacketed Body

Features and Advantages

Performs exactly as required

- High thrust rugged piston cylinder actuator
- Precise throttling
- High repeatability
- Trusty response
- High travel speed controlled

Galling and sticking not possible, prevent process breakdown

- Cage-guiding design not applicable
- Double stem guides positioned away from flowing medium
- Large clearance completely avoids contact between plug head and seat retainer

Easy, fast, inexpensive maintenance

- Top entry, quick maintenance
- Clamped-in seat ring
- Uniformly compressed and controlled packing
- Separable flanges
- High interchangeability of valve parts
- Weight and dimensions reduced

Tight shutoff guaranteed when required to close

- Reinforced spring piston cylinder actuator
- Self-aligning seat ring
- Fluid pressure, actuator spring and cylinder pressure assisted tight shutoff
- If fail safe happens, the spring strokes the valve into the desired position while extra air pressure force is maintained

Toughest services construction

- Corrosion resistant construction
- High seating force
- Special anti-cavitation and noise attenuator cartridges optional
- Heavy duty plug stem available

Compact, easy installation

- The piston cylinder actuator is smaller in size than comparable spring diaphragm actuators
- Lower center of gravity than comparable spring diaphragm actuators
- Valve weight lighter means reduced dynamic and static load on the pipeline
- Separable end flanges allow for multiple installation patterns thus compensating for any flange misalignment

Life time lower cost design

- High interchangeability between sizes and other Optimux products during the valve service life time.
- Valve design allows for a low inventory of parts
- Heavy duty designed parts assure a longer servicing life
- The piston cylinder actuator design permits easy and simple maintenance operations

High performance four-way Positioners

Pneumatic 3-15 psi

Eletropneumatic 4-24 mA

Digital

OpGL

End connections, Flanges and Bolting

OpGL body facings come standard as raised face for either separate and integral flanges. To achieve better sealing with mating piping, the flange face is machined with spiral groove serrations. Other optional facings include smooth face, flat face, ring joint, large and small tongue and large and small groove.

Separable End Flanges

Interchangeable separable flanges are standard for valve bodies through 4 inch in class 150, 300, and 600 ANSI ratings. With separable end flanges, a class 600 body can be adapted for class 150, 300, or 600 service by simply changing the end flanges. Separable flanges are usually furnished in carbon steel for maximum cost savings, although stainless steel can be specified if process atmosphere or extreme temperature requires it.

Bonnet Flanges

The bonnet flange incorporates the same separable design as the end flanges. It is normally manufactured in carbon steel; however, it too can be specified in stainless steel when required.

Bonnet Flange Bolting

Standard bonnet utilizes screwed studs and nuts. Standard material for the studs are ASTM A 193 Gr B7 and nuts ASTM A 194 Gr 2H, suitable for temperatures between -20°F to 800 °F (-29°C to 426°C). Studs and nuts can be also furnished in stainless steel and are suitable for temperatures between -423°F to 1500°F (-253° to 816°C). These temperature limits are for maximum pressure permitted by ASTM B 16.34 - 1988.

Table I: End connections

End Connections	Valve size (inches)	ANSI class	Standard Face-to-face	Optional Face-to-face
Separable Flange	1/2 - 4	150 - 600	ANSI (a)	ISA
Integral Flange Steel & Alloys	1/2 - 48	150	ISA	
	1/2 - 48	300 - 600	ISA	
	1/2 - 24	900 - 2500	ISA (c)	
Screwed	1/2 - 2	150 - 600	ANSI	
	1/2 - 2	900 - 2500	ISA (c)	
Socketweld (SW)	1/2 - 2	150 - 600	ANSI	ISA
	1/2 - 2	900 - 2500	ISA (c)	
Buttweld (BW)	1/2 - 4	150 - 600	ANSI	ISA
	6 - 36	150 - 600	ISA	
	1/2 - 24	900 - 2500	ISA (c)	

(a) ANSI B16 Class 600 Globe valves
 (b) ANSI/ISA S75.03 1983
 (c) See Table XVII

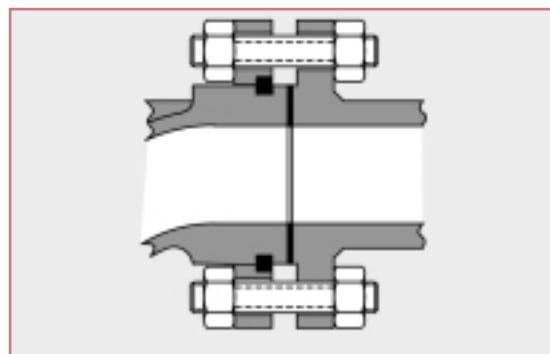


Figure 6: Separable flanges

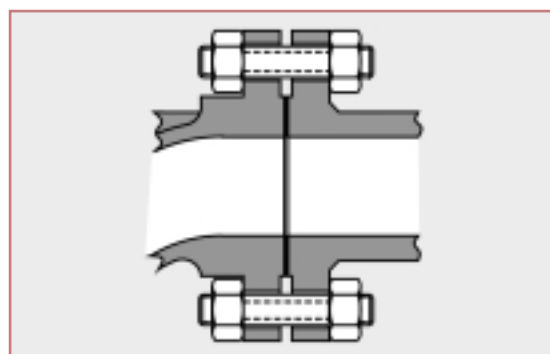


Fig. 7: Integral Flanges

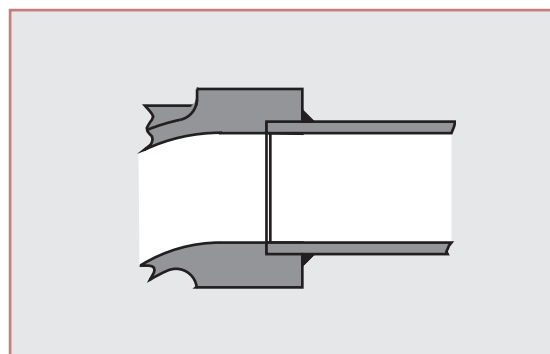


Fig. 8: Socketweld (SW)

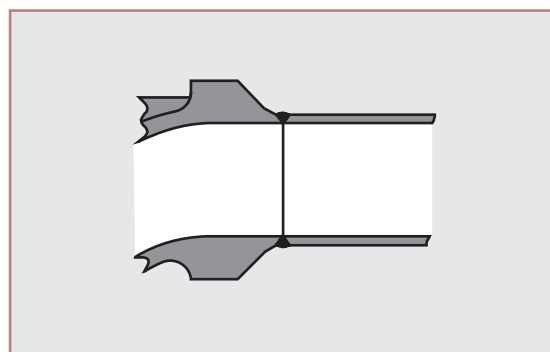


Fig. 9: Buttweld, (BW)

OpGL Gaskets

The OpGL is designed with the bonnet and seat ring gaskets fully retained. Since the bonnet bottoms metal-to-metal in the body, the bonnet gasket compression is determined by the depth of the gasket step on the bonnet which is machined to provide the compression required by the gasket manufacturer.

When the bonnet is fully installed, force is transmitted through the seat retainer to secure the seat ring in position

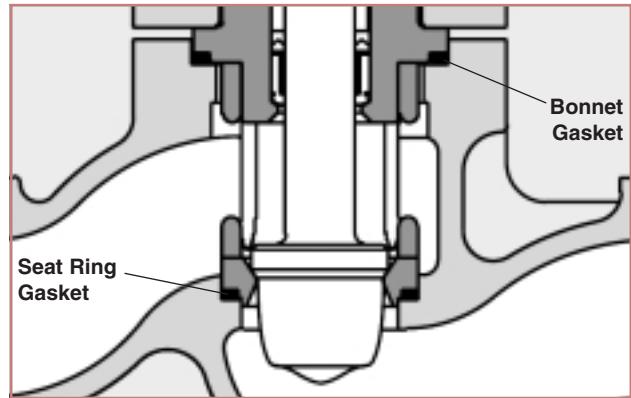


Figure 10: Body Gasket Unbalanced Trim

The body, seat retainer and seat ring are all machined to close tolerances to provide the proper gasket compression. Unlike the bonnet, the seat ring does not bottom in the body, allowing this small clearance to compensate for manufacturing tolerances and thermal expansion.

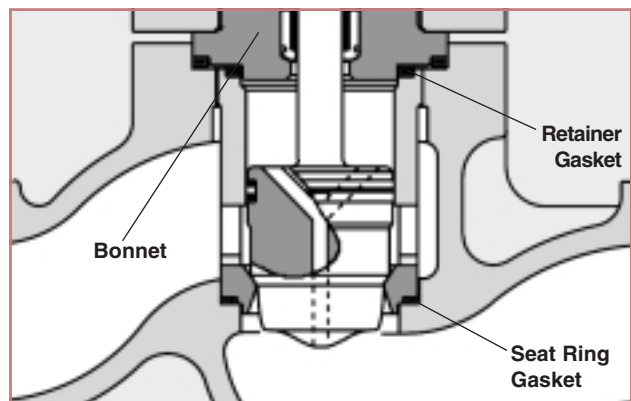


Figure 11: Body Gasket Balance trim

Table II: Gasket Specifications

	Type	Gasket Material	Maximum Gasket Temperature		Minimum Gasket Temperature	
			°F	°C	°F	°C
			Estandard Gaskets	Flat	Teflon (TFE)	350
Gaskets	Spiral Wound	304 SS/ AFG	750	400	-20	-30
	Spiral Wound	316 SS/ AFG	1000	538	-20	-30
Alternate Gaskets	Flat	AFG	600	318	-20	-30
Gaskets	Flat	KEL-F	350	177	-320*	-196*
	Flat	Teflon (FEP)	400	204	-320	-196
	Flat	Grafoil**	1500**	816**	-320	-196
	Spiral Wound	316 SS/ Grafoil**	1500**	816**	-320	-196
	Hollow O-ring	Inconel X-750	1500**	816**	-20*	-30*

* Lower Temperature on request

** Limited to 800°F (427 °C) for oxidizing service

OpGL

Bonnet Types

Standard Bonnet

The OpGL standard bonnet is constructed of the same material as the body, and handles fluid temperatures from -20°F to 750°F (-30°C to 400°C) (See Table on page 8 for packing limitations).

Extended Bonnet

The extended bonnet protects the packing from excessive heat or cold which may inhibit valve performance. It is constructed of carbon steel for temperatures from -20°F to 800°F

(-30°C to 427°C) and of 304 or 316 stainless steel for temperatures from -150°F to 1500°F (-100°C to 816°C).

Cold Box Extended Bonnet

The cold box extended bonnet permits stagnated, moderate temperature gas to form in the bonnet, which protects the packing from the service fluid. It is usually manufactured from 304 or 316 stainless steel to handle fluid temperatures down to -423°F (-253°C).

Standard construction consists of stainless steel bonnet flange and bolting

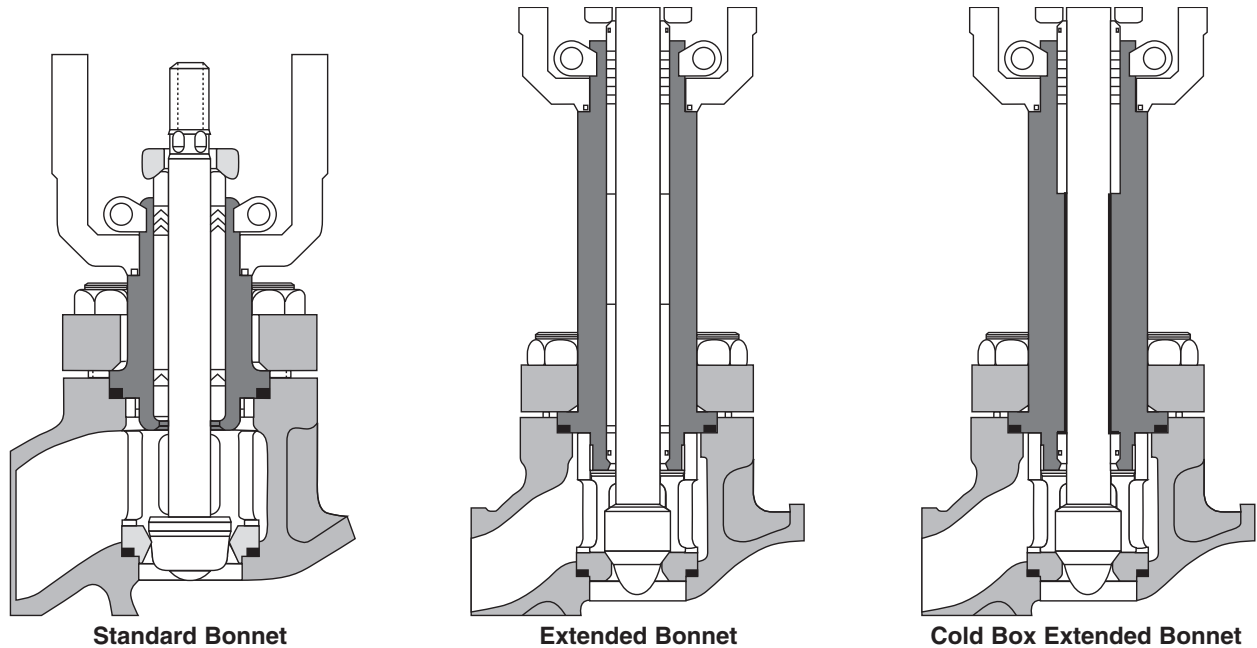


Figure 12: Bonnet Types for OpGL

Table III : Materials: Bonnet Flanges, Screws

Valve size (inches)	Standard Bonnet Flange	Optional Flange	Cap Screws Standard	Cap Screws Optional
1/2 to 3 Class 150-600	Carbon Steel	Stainless Steel (1) Same Body Alloy Material	SAE Grade 5	SS. Series 300 B7-2H Stainless steel (4) 304 and 316 (3,4)
4 Class 150-600 6 and above Class 150-500 All pressure class	Carbon Steel	Stainless Steel (1) Same Body Alloy Material	B-7; 2H (2)	Stainless steel 304 and 316 (3,4)

- (1) When Pressure and temperature exceeds standard limitations for flanges and bolting constructed in carbon steel, and B7-2H, alloy material is required.
- (2) Limit temperature from -20°F to 800°F (-29°C to 427°C). See for body temperature limitations.
- (3) Limit temperature from -428 to 1500°F (-253°C to 816°C). See for body temperature limitations.
- (4) Other materials are dependable on design configurations.

Packing and Guiding

Packing Box

Standard Optimux packing boxes are deeper than most conventional types, providing the following advantages:

1. Wide spacing between the wiper set and the main upper packing set. The upper set is positioned far enough away from the wiper set to avoid contact with any part of the

plug stem which has been exposed to the flowing medium.

2. Two widely spaced stem guides, when used with the large plug stem diameter, provide exceptional guiding. The upper stem guide also acts as a packing follower. The lower guide is situated close to the plug head for additional guiding support.

Table IV: Guides Material

Standard Material	Maximum Temperature		Minimum Temperature		Maximum Pressure
	°F	°C	°F	°C	
Grafoil lined Stainless Steel ⁶	1500	816	-320	-196	1000 psig up to 2 inch. 600 psig 3 and 4 inch. 500 psig 6 inch. and above
Glass-loaded	350	177	-50	-45	150 psig @ 100°F
Teflon-lined SS	350	177	-423	-253	100 psig @ 350°F
Solid Bronze	500	260	-423	-253	Same as the body
Solid Stellite	1500	816	-423	-253	Same as the body

Table V: Packing, Temperature Limitations

ANSI Class	Material	Standard Bonnet (1)		Extended Bonnet (2)	
		°F	°C	°F	°C
150-600	Teflon TFE	-20 to 450	-28 to 232		
	Braided PTFE ³	-20 to 500	-28 to 260	-150 to 600 ²	-28 to 316
	Glass-filled Teflon				
150-600	APFI Asbestos ⁵	-20 to 750 ⁴	-28 to 398	-20 to 1200	-28 to 649
150-600	Grafoil ⁶	-20 to 750 ⁴	-28 to 398	-20 to 1500	-28 to 816
900-2500	Teflon TFE	-20 to 450	-28 to 232		
	Teflon PTFE	-20 to 500	-28 to 260	-150 to 700 ²	-101 to 371
	Glass-filled Teflon				
900-2500	APFI Asbestos ⁵	-20 to 800	-28 to 426	-20 to 1200	-28 to 649
900-2500	Grafoil ⁶	-20 to 800	-28 to 426	-20 to 1500	-28 to 816
150-600	PTG	-20 to 450	-28 to 232	-20 to 600	-28 to 316
150-600	PT	-20 to 450	-28 to 232	-20 to 600	-28 to 316
150-600	PTXT	-20 to 550	-28 to 288	-20 to 700	-28 to 371
900-2500	PTG	-20 to 450	-28 to 232	-20 to 700	-28 to 371
900-2500	PT	-20 to 450	-28 to 232	-20 to 700	-28 to 371
900-2500	PTXT	-20 to 550	-28 to 288	-20 to 800	-28 to 426

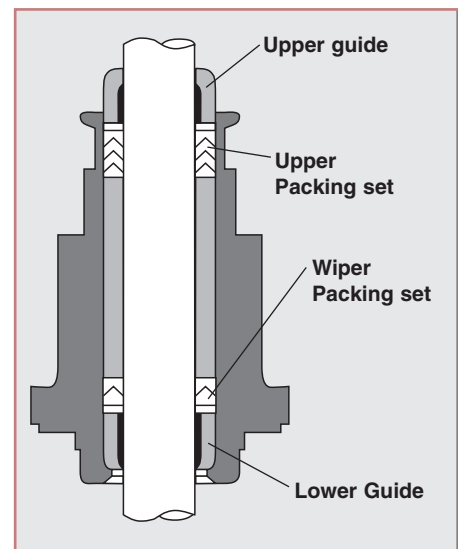


Figure 13: Teflon V-Ring Typical Arrangement

- (1) ANSI B16.34 specifies acceptable pressure temperature limits for pressure retaining materials. Consult Optimux for additional information.
- (2) When used with adequate body and Teflon TFE Bonnet materials.
- (3) PTFE can be used in temperatures down to -423°F (-253°C).
- (4) Sizes from 8 to 12 inches class ANSI 150-600 and 3 to 12 inches, class ANSI 900-2500 can be used in temperatures up to 850°F (455°C).
- (5) Asbestos free packing. High temperature packing.
- (6) Do not use Grafoil above 800°F (427°C) in oxidizing service such as air or oxygen.
- (7) For pressure limitations consult Optimux "Control Valve Selection and Sizing Manual".

OpGL

Fugitive Emission Control

PTG Packing

The Optimux PTG packing complies with the regulations of the EPA (U.S. Environmental Protection Agency) on packing fugitive emissions. Designed as a packing set combination of carbon-filled Teflon backup V-rings, PTG can be installed in all existing Optimux control valves.

Provided with a simple and easy retrofittable system, it permits also monitoring whether maintenance procedures have been performed properly.

In addition, a fire-safe PTG packing set can be furnished on request in case of fire, the packing set is guaranteed against fluid leaks through the stem, even under packing set damage caused by excess of heat.

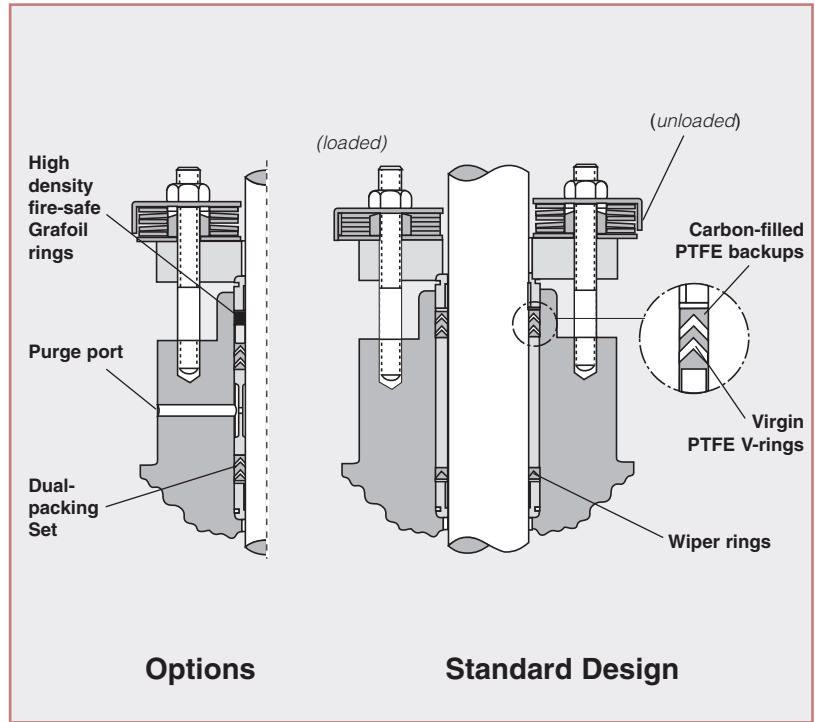


Figure 14: PTG Packing Set

PT Packing

When temperature exceeds that specified for the standard V-rings or when a high temperature are expected, PT packing set is recommended.

As a cost efficient response to the EPA regulations, the PT packing set provides a typical fugitive emission rate lower than 10 ppm, becoming significantly reliable and more economical than metal bellows seal systems.

PT packing can be installed in all Optimux's rotary and globe control valves. It was designed to achieve a long-life expectancy eliminating the needs for packing set retightening.

PT packing set is also provided in a fire-safe version to prevent leaks through the shaft in case of fire, according to the API 607 standards.

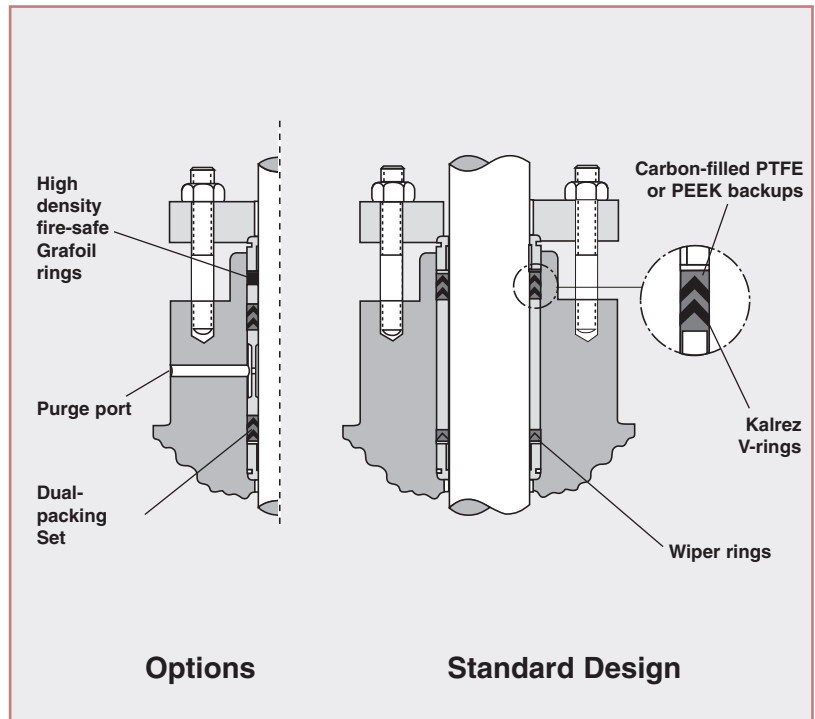
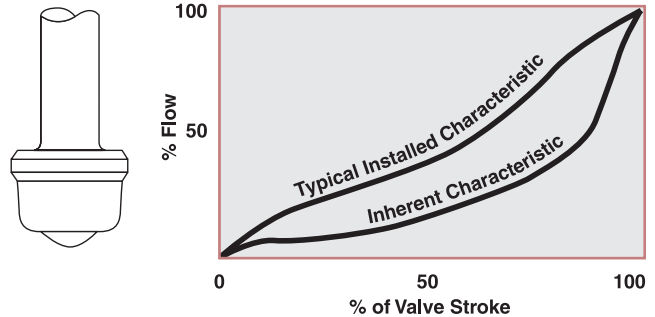


Figure 15: PT Packing Set

Flow Characteristics

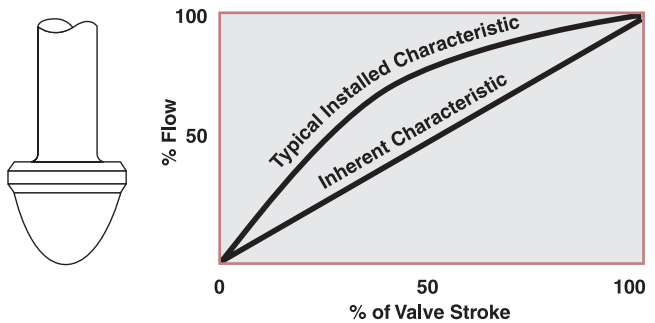
Equal Percentage

Equal percentage is the characteristic most commonly used in process control. The change in flow per unit of valve stroke is directly proportional to the flow occurring just before the change is made. While the flow characteristic of the valve itself may be equal percentage, most common loops will produce an installed characteristic approaching linear when the overall system pressure drop is large relative to that across the valve.



Linear

Linear inherent characteristic produces equal changes in flow per unit of valve stroke regardless of plug position. Linear plugs are used on those systems where the valve pressure drop is a major portion of the total system pressure drop.



Quick Open

Quick open plugs are used for on-off services and are designed to produce maximum flow quickly.

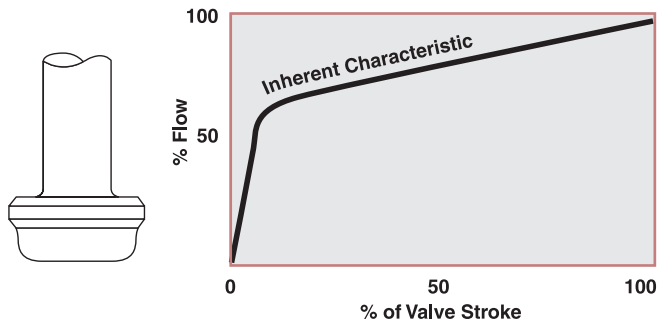


Figure 16: Flow Characteristics

Trim Types

Two different trim types are available: standard full area trim which provides maximum Cv. Reduced trim in a wide variety of sizes when lower Cv's and large bodies are required. In addition integral trim that uses a special seat machined into the body and an oversized plug to provide additional Cv beyond the capabilities of standard trim can be furnished.

OpGL valves can be easily converted from one trim type to another since all seat rings and plugs within a given size and pressure class are completely interchangeable. Integral trim is available by removing the seat ring and by changing the plug.

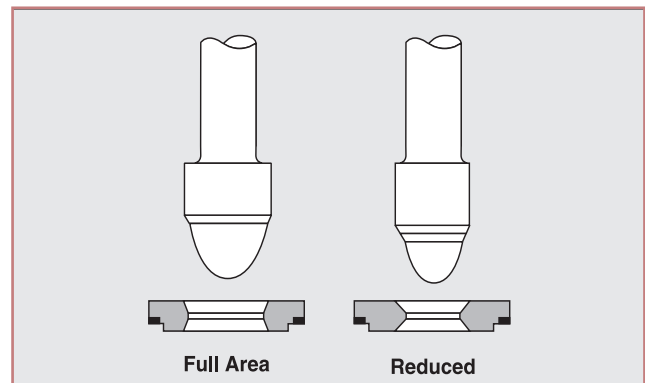


Figure 17: Typical Trim Types

OpGL

Trim, Seats

OpGL trim is designed to avoid the difficulties associated with screwed-in seats and cage-guiding. Since the seat ring is not screwed-in but clamped into the body by the bonnet and seat retainer, removal of the seat is easy even under extremely corrosive conditions.

Unlike cage-guided trims, which easily gall and stick, OpGL plugs are double stem guided, avoiding contact between the seat retainer and plug. Because no contact is made with the plug, the retainer can be constructed of stainless steel rather than costly hard materials. The flow characteristic is determined by the plug contour,

rather than by the opening in the retainer. Optionally gaseous noise attenuation trims can be provided to effectively improve noise level reduction in OpGL valves. For very high pressure drops, pressure-balanced trim is used to reduce the thrust necessary to stroke the plug by reducing the trim off-balance area.

Flow direction is under the plug for fail-closed and over the plug for fail-open.

The seal area less the stem area is designed to be slightly larger than the seat area, thus the plug is off-balance to close for flow under the seat and off-balance to open for flow over the seat.

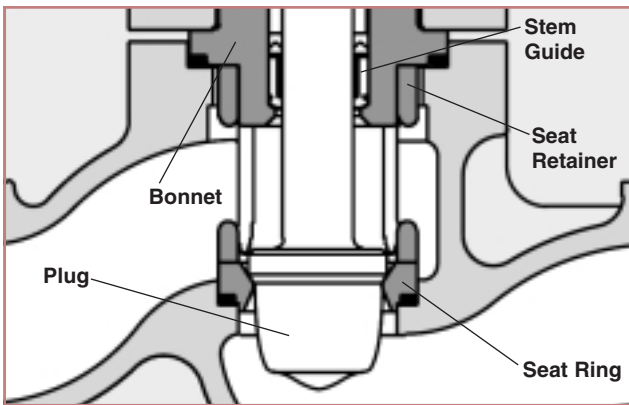


Figure 18: Standard Trim

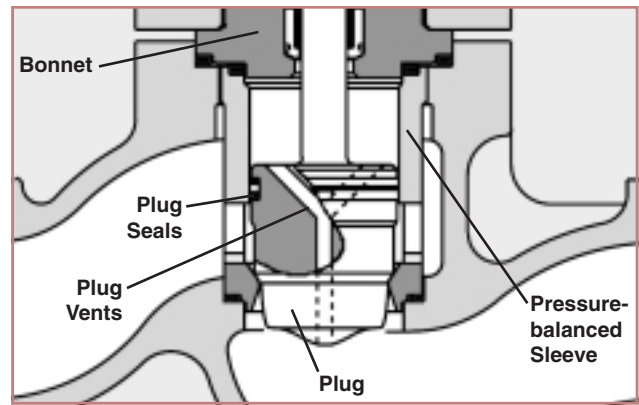


Figure 19: Balanced Trim

Seats

Metal Seats

Metal seated OpGL handless Class IV shutoff (ANSI B16.104; 1976-FCI 70-2). This class calls for maximum permissible seat leakage of 0,01% of rated valve capacity.

This exceptional seat tightness is obtained by aligning the seat ring with the plug during assembly. Additional seat tightness using metal seats is available as an option.

Soft Seats

The OpGL soft seat is used in applications requiring ANSI Class VI "bubble-tight" shutoff.

It's design consists of an elastomer sandwiched between two metal pieces. The assembled soft seat is interchangeable with the hard seat for a given size and pressure rating. Inserts are often constructed of Teflon, therefore, maximum temperature should be below 150°C at 20 Barg.

For temperatures below -65°C, Teflon soft seats can be used in high pressure applications.

Table VI: Plug Seals Temperature Range for Pressure-balance Trim

Teflon Seal	-320°F @ full body rating or 300°F @ 150 psig
Ni-resist Piston Rings	-22°F to 800°F
Buna-N O-rings	-60°F to 250°F
Rene 41	800°F to 1600°F
Spring-reinforced TFE	-365°F to 575°F
Viton	-40°F to 437°F

Table VII: Wear and Galling Resistance of Material Combinations

Standard plug and seat ring material is 316 stainless steel, except in the case of special alloy bodies where trims are sometimes furnished in the same material as the body. A wide variety of fluids are successfully handled by stainless steel trim parts. Nevertheless, as a general rule hard trim must be used for all choked flow conditions or for temperatures above 600°F (316°C). Optimux keeps a large stock of no. 6 Stellite trim parts. This material offers a good combination of relative hardness and corrosion resistance.

Special alloys such as Alloy 20, Hastelloy C and Monel can be furnished on request.

	304 stainless steel	316 stainless steel	Bronze	Inconel 600	Monel 400	Hastelloy B	Hastelloy C	Titanium 75A	Nickel	Alloy 20	416 Hard.	440 Hard.	17-4 PH	Stellite	NDE*	Cr. Plate	Al. Bronze
304 stainless steel	P	G	P	P	P	G	P	P	P	P	G	G	G	G	G	G	G
316 stainless steel	P	G	P	P	P	G	P	P	P	P	G	G	G	G	G	G	G
Bronze	G	E	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G
Inconel 600	P	P	E	P	P	P	G	P	G	G	G	G	G	G	G	G	E
Monel 400	P	P	E	P	P	P	G	G	G	G	G	G	G	E	G	G	E
Hastelloy B	P	P	E	P	P	P	G	G	G	G	G	G	G	E	G	E	E
Hastelloy C	G	G	E	G	G	G	G	G	G	G	G	G	G	E	G	E	E
Titanium 75A	P	P	E	P	G	G	G	P	G	G	G	G	G	E	G	E	E
Nickel	P	P	E	G	G	E	G	G	P	P	G	G	G	E	G	E	E
Alloy 20	P	P	E	G	G	G	G	G	P	P	G	G	G	E	G	E	E
416 Hard.	G	G	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E
440 Hard.	G	G	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E
17-4 PH	G	G	G	G	G	G	G	G	G	G	G	E	P	E	E	E	E
Stellite	G	G	G	G	E	E	E	E	E	E	E	E	E	E	E	E	E
NDE*	G	G	G	G	G	G	G	G	G	G	E	E	E	E	P	E	E
Cr. Plate	G	G	G	G	E	E	E	E	E	E	E	E	E	E	E	P	S
Al. Bronze	G	G	G	E	E	E	E	E	E	E	E	E	E	E	E	E	P

* Electrolytic Nickel Coating

E: Excellent, B: Good, P: Poor

Table VIII : Pressure Differential (psi) Requiring Hardened Seating Surfaces

Valve Size (inches)	Gases (clean)				Steam (superheated)				Steam (saturated)				Water				Process Fluids (general)			
	Control		On-Off		Control		On-Off		Control		On-Off		Control		On-Off		Control		On-Off	
	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar	Psi	Bar
1/2 a 11/2	600	41	900	62	300	21	600	41	100	7	200	14	175	12	250	17	175	12	250	17
2 - 3	350	24	600	41	200	14	300	21	25	2	50	4	150	11	200	14	150	11	200	14
4 - 6	200	14	300	21	100	7	150	11	All applications		25	2	100	7	125	9	75	5	125	9
8 - 12	125	9	175	12	50	4	100	7	All applications				50	4	100	7	50	4	100	7

Table IX: Trim Material Characteristics

Trim Material	Hardness Rockwell C	Impact Strength	Corrosion Resistance	Maximum Temp. Recomm.		Erosion Resistance	Abrasion Resistance
				°F	°C		
316 Stainless steel	8	Excellent	Excellent	600	315	Fair	Fair
n° 6 Stellite	44	Excellent	Excellent	1500	815	Good	Good
416 Stainless steel	40	Good	Fair	800	426	Good	Good
17 - 4 PH H 900	44	Good	Good to Excellent	800	426	Good	Good
440 C Stainless steel	55-60	Fair	Fair	800	426	Excellent	Excellent
K Monel	32	Good	Good to Excellent	600	315	Fair to Good	Good
Tungsten Carbide	72	Fair	Good on bases Poor on acids	1200	648	Excellent	Excellent
Colmonoy n°5	45-50	Good	Fair	1200	648	Good	Good

OpGl

Standard Construction Materials

Table X: Packing

Configurations	Standard: twin seal Vacuum seal
Materials	Teflon V-rings, Teflon, Teflon AFP* AFP/Inconel wire, glass-filled Teflon Grafoil and other materials as required
Lubrication (optional)	Lubricator with integral isolation valve Lubricator and isolation valve

Table XI: Guides

Type	Double-top stem guide
Materials	Glass-filled Teflon, Grafoil, solid Stellite, solid Bronze, other materials as required

Table XII: Gaskets

Types and Materials	Spiral wound: 304 or 316 Stainless steel/ asbestos-free; Teflon, Grafoil, Flat: Teflon, soft metal Metal O-ring: Inconel X750/ silver plated
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Table XIII: Body Materials

Sizes	1/2 - 48 inch; class 150 thru 600 1/2 - 24 inch; class 900 thru 2500 1/2 - 12 inch; class 4500
Forms	Globe, angle, 3 way
ANSI Ratings	Class 150, 300, 600, 900, 1500, 2500
Materials	Carbon steel, Stainless steel, Monel Nickel, Chrome-Moly, Titanium, Alloy 20, Bronze, hastelloy B, Hastelloy C, other castable materials
End connections	Separable flange: 1/2 - 4 inch, class 150 thru 600 Integral flange: all sizes NPT: 1/2 - 4 inch Grayloc: all sizes Socketweld: 1/2 - 4 inch
Separable end Flange material	Carbon steel, 316 Stainless steel, other material as required

Table XIV: Trim

Flow Characteristics	Equal percentage, linear, quick open	
Materials	316 Stainless steel 304 Stainless steel 347 Stainless steel 416 Stainless steel Hastelloy B Hastelloy C	Alloy 20 Nickel Titanium Monel 17-4 PH 440 C
Hardened Seating Surfaces	Materials: n° 6 stellite, Colmonoy n° 5 Types: seat surface, full contour, full bore, lower guide area	
Soft Seat	TFE Teflon, FEP Teflon, KEL-F, polyurethane, PEEK	
Balanced Trim	Sizes: 2 inches and above Seals type: Elastomer, Metal	

Table XV: Bonnet Materials

Types	Standard, extended, special length extended, bellows seal, cryogenic extended
Flanges	Separable
Materials	Bonnet: Same as body Bellows: Stainless steel, other material as required Bellows Housing: carbon steel, 316 stainless steel, other materials as required Bonnet Flange: carbon steel, 316 stain less steel, other materials as required

Name Plate

Valves are equipped with stainless steel name plate, as the example illustrated below.

OPTIMUX S/N _____ OpGl _____ SIZE _____	
CLASS _____	T/N _____ CV _____ CHAR _____
<input type="radio"/> AIR TO _____	<input type="radio"/> SIGNAL _____
<input type="radio"/> BODY _____	<input type="radio"/> TRIM _____
TAG _____	
P.O. _____	

OpGL

Flow Capacity; C_V

Trim: Unbalanced

Body Rating: 150-300-600

Trim Characteristics: Equal Percentage

Flow Direction: Flow Over

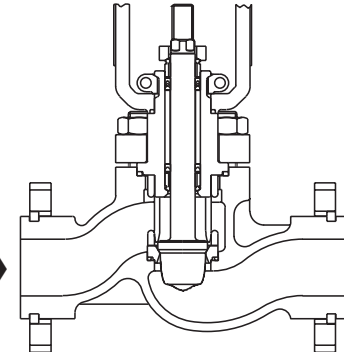


Table XVI: Flow Capacity, C_V

Size (inch)	Trim n ^o	Stroke (inch)	F.L. @ 100%	C_V at Percent Open										
				100	90	80	70	60	50	40	30	20	10	5
1/2	0.50	0.75	0.83	5.1	4.7	3.7	2.6	1.88	1.38	0.91	0.56	0.33	0.25	0.183
	0.38	0.75	0.82	3.8	3.4	2.5	1.66	1.25	0.86	0.50	0.31	0.192	0.129	0.108
	0.31	0.75	0.81	2.9	2.6	1.79	1.24	0.96	0.59	0.34	0.22	0.152	0.097	0.080
	0.25A	0.75	0.81	1.95	1.61	1.09	0.81	0.56	0.37	0.23	0.143	0.090	0.060	0.043
	0.25B	0.75	0.82	1.15	1.12	0.79	0.51	0.36	0.23	0.153	0.105	0.076	0.068	0.051
	0.12A	0.50	0.81	0.46	0.45	0.38	0.27	0.168	0.103	0.072	0.043	0.026	0.015	0.013
3/4	0.72	0.75	0.85	9.5	9.0	7.6	5.6	3.9	3.2	2.3	1.62	1.00	0.63	0.50
	0.62	0.75	0.83	9.1	8.4	6.6	4.6	3.0	2.3	1.58	0.95	0.59	0.32	0.24
	0.50	0.75	0.82	6.4	5.8	4.6	3.0	1.95	1.52	0.97	0.62	0.37	0.24	0.196
	0.38	0.75	0.82	4.3	3.8	2.9	1.77	1.40	0.88	0.47	0.29	0.167	0.107	0.082
	0.31	0.75	0.82	2.9	2.6	1.63	1.21	0.87	0.58	0.31	0.20	0.149	0.092	0.070
	0.25A	0.75	0.81	2.0	1.85	1.23	0.92	0.58	0.35	0.21	0.141	0.088	0.060	0.046
	0.25B	0.75	0.81	1.27	1.25	0.95	0.63	0.37	0.23	0.130	0.086	0.051	0.024	0.017
0.12A	0.50	0.82	0.47	0.48	0.37	0.24	0.151	0.088	0.056	0.036	0.018	0.006	0.005	
1	0.81	0.75	0.87	15.5	14.1	11.2	8.0	4.9	3.3	2.8	2.1	1.60	1.06	0.78
	0.72	0.75	0.85	13.4	11.7	8.9	6.1	3.9	3.1	2.3	1.64	1.11	0.70	0.53
	0.62	0.75	0.83	10.2	8.7	6.5	4.2	2.7	2.3	1.52	0.98	0.61	0.35	0.28
	0.50	0.75	0.82	6.5	5.7	4.4	2.9	1.95	1.53	1.09	0.72	0.46	0.26	0.199
	0.38	0.75	0.82	4.1	3.4	2.3	1.53	1.30	0.84	0.51	0.33	0.22	0.139	0.113
	0.31	0.75	0.81	2.9	2.4	1.63	1.15	0.92	0.61	0.35	0.20	0.137	0.088	0.063
	0.25A	0.75	0.81	1.89	1.55	1.09	0.83	0.56	0.31	0.21	0.133	0.083	0.056	0.040
	0.12A	0.50	0.81	0.47	0.46	0.29	0.22	0.157	0.113	0.085	0.063	0.043	0.026	0.017
1 1/2	1.25	1.00	0.86	27	25	21	15.3	10.1	6.6	4.9	3.5	2.3	1.54	1.22
	1.00	0.75	0.85	19.0	17.2	14.4	10.8	7.1	4.5	3.3	2.4	1.56	1.05	0.82
	0.81	0.75	0.82	12.9	11.4	8.9	6.3	4.0	2.6	1.77	1.06	0.69	0.33	0.27
	0.62	0.75	0.83	9.3	8.0	6.2	4.4	3.0	2.0	1.36	0.76	0.47	0.26	0.20
	0.38	0.75	0.79	3.6	2.8	1.92	1.41	1.23	0.86	0.58	0.30	0.180	0.108	0.084
2	1.62	1.50	0.89	46	41	34	25	16.2	11.3	9.0	5.9	3.8	2.6	2.4
	1.25	1.00	0.87	31	27	22	15.9	10.2	6.6	5.2	3.6	2.3	1.55	1.26
	1.00	0.75	0.83	21	18.6	15.4	11.3	7.5	4.7	3.3	2.5	1.59	1.07	0.85
	0.81	0.75	0.82	14.3	12.8	10.2	7.3	4.6	2.9	2.3	1.52	0.98	0.67	0.53
	0.62	0.75	0.79	8.9	7.9	6.1	4.2	2.6	2.0	1.42	0.88	0.52	0.31	0.25
	0.38	0.75	0.79	3.5	3.2	2.6	1.73	1.15	0.91	0.55	0.34	0.22	0.149	0.123
3	2.62	2.00	0.87	104	95	85	76	60	38	22	16.2	10.2	5.8	3.9
	2.00	1.50	0.83	78	73	66	55	40	24	13.3	8.8	6.3	3.7	2.9
	1.62	1.50	0.81	52	46	36	24	15.8	10.5	8.4	5.7	3.6	2.5	1.99
	1.25	1.00	0.78	31	27	22	15.2	10.1	6.5	4.9	3.4	2.2	1.42	1.17
4	3.50	2.50	0.86	179	169	154	130	96	57	35	26	19.8	12.9	10.2
	2.62	2.00	0.82	133	124	111	89	63	39	24	16.4	11.4	7.4	6.0
	2.25	2.00	0.83	104	96	83	63	40	24	15.0	11.7	7.4	4.6	3.8
	1.62	1.50	0.79	55	48	37	25	16.0	10.5	8.4	5.7	3.6	2.5	2.0
6	5.00	3.00	0.85	355	333	302	264	202	125	59	33	20	13.9	13.4
	3.50	2.50	0.83	230	215	192	152	102	58	35	23	17.4	11.1	8.9
	3.00	2.00	0.81	192	154	121	102	61	38	26	17.0	12.0	8.0	5.0
	2.62	2.00	0.78	141	133	118	95	65	37	22	16.5	11.0	6.9	5.7
8	6.25	4.00	0.86	606	564	499	413	305	181	107	73	55	34	27
	5.00	3.00	0.80	461	428	369	290	202	125	59	33	20	14.0	13.0
	3.50	2.50	0.83	250	233	205	161	110	61	34	21	13.1	7.0	5.1
	2.62	2.00	0.82	144	135	119	95	65	37	22	16.0	11.0	7.0	6.0
10	8.00	4.00	0.85	897	843	762	656	525	371	192	99	60	42	34
	6.25	4.00	0.82	690	635	548	425	305	181	107	73	49	34	27
	5.00	3.00	0.83	495	455	385	290	202	125	59	33	20	14.0	13.0
12	9.50	4.00	0.85	1310	1215	1080	920	697	428	230	153	108	73	55
	7.38	4.00	0.82	960	884	750	585	421	250	149	101	68	46	36
	6.25	4.00	0.83	770	712	589	440	305	181	107	73	49	34	27

OpGL

Flow Capacity; C_v

Trim: Unbalanced

Body Rating: 150-300-600

Trim Characteristics: Equal Percentage

Flow Direction: Flow Under

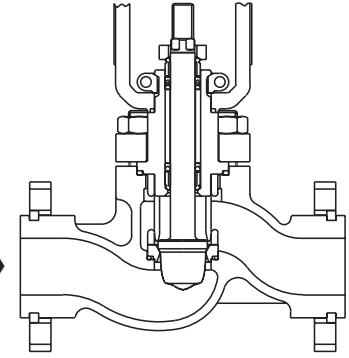


Table XVII: Flow Capacity, C_v

Size (inch)	Trim n ^e	Stroke (inch)	F _L @ 100%	C _v at Percent Open										
				100	90	80	70	60	50	40	30	20	10	5
1/2	0.50	0.75	0.91	4.9	4.7	3.9	2.3	1.64	1.07	0.72	0.45	0.30	0.20	0.165
	0.38	0.75	0.87	3.5	3.1	2.3	1.5	1.00	0.68	0.41	0.27	0.178	0.130	0.11
	0.31	0.75	0.89	2.6	2.3	1.68	1.10	0.72	0.47	0.29	0.21	0.152	0.108	0.086
	0.25A	0.75	0.88	1.78	1.57	1.03	0.67	0.43	0.27	0.178	0.109	0.075	0.049	0.037
	0.25B	0.75	0.88	1.33	1.31	0.91	0.56	0.37	0.22	0.151	0.104	0.077	0.066	0.056
	0.12A	0.50	0.89	0.44	0.43	0.41	0.257	0.160	0.100	0.067	0.0443	0.029	0.017	0.015
3/4	0.72	0.75	0.85	9.5	8.9	7.5	5.5	3.2	2.2	1.39	0.94	0.67	0.43	0.34
	0.62	0.75	0.90	8.6	8.5	6.4	4.4	2.8	1.80	1.24	0.76	0.46	0.27	0.23
	0.50	0.75	0.91	6.0	5.7	4.7	2.9	1.85	1.19	0.76	0.47	0.30	0.181	0.144
	0.38	0.75	0.88	3.8	3.5	2.7	1.75	1.12	0.71	0.43	0.27	0.163	0.098	0.084
	0.31	0.75	0.89	2.7	2.4	1.63	1.09	0.69	0.45	0.26	0.180	0.125	0.080	0.061
	0.25A	0.75	0.89	1.90	1.82	1.28	0.84	0.48	0.31	0.195	0.125	0.080	0.052	0.038
1	0.25B	0.75	0.88	1.23	1.22	0.79	0.52	0.33	0.192	0.117	0.067	0.036	0.014	0.007
	0.12A	0.50	0.88	0.46	0.46	0.45	0.27	0.159	0.092	0.057	0.034	0.015	0.004	0.003
	0.81	0.75	0.89	13.4	12.2	9.2	6.6	4.1	2.8	1.86	1.28	0.94	0.66	0.56
	0.72	0.75	0.90	12.2	11.3	8.0	5.6	3.5	2.3	1.54	1.03	0.69	0.46	0.42
	0.62	0.75	0.91	9.7	9.0	6.1	3.9	2.5	1.68	1.10	0.70	0.45	0.29	0.25
	0.50	0.75	0.89	6.5	5.9	4.5	2.7	1.79	1.18	0.77	0.47	0.29	0.194	0.167
1 1/2	0.38	0.75	0.92	3.9	3.4	2.3	1.50	0.99	0.66	0.43	0.29	0.194	0.130	0.113
	0.31	0.75	0.89	2.8	2.4	1.61	1.06	0.71	0.47	0.26	0.176	0.123	0.079	0.062
	0.25A	0.75	0.91	1.84	1.61	1.16	0.72	0.47	0.30	0.190	0.140	0.084	0.059	0.047
	0.25B	0.75	0.92	1.20	1.06	0.74	0.47	0.32	0.180	0.118	0.084	0.049	0.033	0.023
	0.12A	0.50	0.91	0.51	0.50	0.33	0.196	0.127	0.086	0.062	0.040	0.025	0.014	0.012
	1.25	1.00	0.89	30	28	24	15.9	10.7	6.8	4.4	2.9	1.87	1.27	1.09
2	1.00	0.75	0.92	22	22	16.6	10.8	6.6	4.5	3.0	1.89	1.31	0.90	0.78
	0.81	0.75	0.91	15.9	13.8	9.4	6.1	4.5	2.6	1.59	0.93	0.59	0.33	0.24
	0.62	0.75	0.88	10.1	8.3	6.3	5.3	3.2	1.92	1.09	0.78	0.43	0.27	0.173
	0.38	0.75	0.90	3.7	3.2	1.95	1.31	0.88	0.60	0.36	0.23	0.142	0.088	0.071
	1.62	1.50	0.91	47	45	41	30	16.3	10.5	7.0	4.6	3.1	2.2	1.89
	1.25	1.00	0.89	30	29	24	15.5	10.0	6.4	4.3	2.8	1.85	1.24	1.07
3	1.00	0.75	0.92	23	22	17.9	11.6	6.8	4.7	3.0	1.91	1.29	0.89	0.76
	0.81	0.75	0.91	16.0	15.7	11.5	7.2	4.7	3.0	1.94	1.24	0.85	0.56	0.49
	0.62	0.75	0.90	10.0	9.0	6.7	4.5	2.7	1.79	1.15	0.74	0.44	0.28	0.23
	0.38	0.75	0.90	3.0	2.9	2.6	1.92	1.22	0.80	0.49	0.32	0.21	0.145	0.126
	2.62	2.00	0.89	108	101	92	88	71	36	21	12.8	7.8	4.5	3.2
	2.00	1.50	0.90	82	77	71	63	43	25	13.6	8.7	5.2	3.3	2.6
4	1.62	1.50	0.92	49	47	42	28	17.4	11.4	7.4	4.8	3.2	2.2	1.79
	1.25	1.00	0.88	32	31	25	16.1	10.5	6.9	4.4	2.9	1.88	1.27	1.11
	3.50	2.50	0.91	195	183	168	156	114	57	36	24	15.3	10.6	8.4
	2.62	2.00	0.90	133	123	111	100	67	42	27	17.4	10.4	6.8	5.5
	2.25	2.00	0.89	98	90	81	67	41	26	16.5	10.4	6.3	4.2	3.5
	1.62	1.50	0.90	56	52	42	28	17.4	11.4	7.4	4.8	3.2	2.2	1.8
6	5.00	3.00	0.90	400	374	339	297	249	148	62	35	18.3	13.7	13.2
	3.50	2.50	0.89	224	202	176	152	114	65	41	26	16.4	10.8	8.5
	3.00	2.00	0.91	170	153	134	115	73	37	25	17.0	11.0	7.8	5.0
	2.62	2.00	0.90	130	119	106	93	68	37	23	15.0	8.9	5.6	4.6
	6.25	4.00	0.91	691	643	589	497	334	184	115	76	46	28	24
	5.00	3.00	0.89	457	412	359	298	212	134	65	36	19.0	14.0	13.0
8	3.50	2.50	0.90	245	220	196	161	114	65	41	26	16.0	11.0	9.0
	2.62	2.00	0.90	143	132	117	100	68	37	23	15.0	8.7	6.0	5.0
	8.00	4.00	0.90	1013	921	817	723	603	424	191	112	70	41	32
	6.25	4.00	0.89	672	606	528	456	334	184	115	76	46	28	24
	5.00	3.00	0.91	482	434	378	298	212	134	65	36	19.0s	14.0	13.0
	9.50	4.00	0.90	1410	1290	1140	960	766	534	269	158	99	58	45
12	7.38	4.00	0.89	935	858	756	637	480	267	142	97	65	44	36
	6.25	4.00	0.91	750	683	612	508	334	184	115	76	46	28	24

OpGL

Flow Capacity; C_v

Trim: Unbalanced
Body Rating: 150-300-600
Trim Characteristics: Linear
Flow Direction: Flow Over

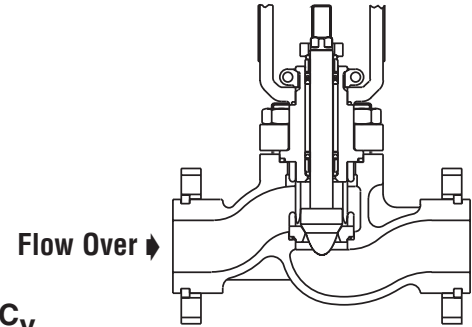


Table XVIII: Flow Capacity, C_v

Size (inch)	Trim n ^e	Stroke (inch)	F _L @ 100%	C_v at Percent Open										
				100	90	80	70	60	50	40	30	20	10	5
1/2	0.50	0.75	0.87	5.6	5.4	5.2	4.8	4.3	3.8	3.2	2.52	1.72	0.84	0.56
	0.38	0.75	0.83	4.1	4.1	3.9	3.5	3.1	2.8	2.2	1.77	1.21	0.63	0.33
	0.31	0.75	0.81	2.9	2.9	2.8	2.5	2.3	2.0	1.6	1.23	0.86	0.46	0.28
	0.25A	0.75	0.82	1.98	1.96	1.88	1.69	1.48	1.25	1.00	0.79	0.42	0.21	0.104
	0.25B	0.75	0.82	1.71	1.31	1.15	1.02	0.92	0.76	0.65	0.51	0.31	0.198	0.115
	0.12A	0.50	0.83	0.46	0.44	0.39	0.33	0.29	0.25	0.193	0.146	0.081	0.028	0.012
3/4	0.72	0.75	0.85	10.1	9.9	9.6	9.2	8.8	8.1	7.2	5.4	3.6	1.54	0.67
	0.62	0.75	0.88	9.1	8.9	8.5	8.2	7.6	6.2	4.9	3.8	2.4	1.30	0.70
	0.50	0.75	0.88	6.9	6.6	6.1	5.5	4.8	4.0	3.3	2.4	1.68	0.74	0.42
	0.38	0.75	0.83	4.3	4.3	4.0	3.5	3.1	2.7	2.1	1.63	1.06	0.49	0.23
	0.31	0.75	0.82	3.0	3.0	2.7	2.4	2.2	1.85	1.44	1.11	0.73	0.37	0.22
	0.25A	0.75	0.82	2.0	2.0	1.92	1.72	1.48	1.25	0.99	0.71	0.45	0.189	0.088
	0.25B	0.75	0.82	1.93	1.39	1.17	1.06	0.91	0.79	0.65	0.48	0.34	0.181	0.111
	0.12A	0.50	0.83	0.47	0.47	0.41	0.36	0.30	0.25	0.199	0.143	0.088	0.027	0.011
1	0.81	0.75	0.87	17.6	17.0	16.3	15.3	13.7	10.9	8.4	6.2	3.7	1.90	0.93
	0.72	0.75	0.85	15.7	15.2	14.3	12.7	10.5	8.5	6.7	5.0	3.2	1.43	0.73
	0.62	0.75	0.83	12.0	11.5	10.6	9.0	7.7	6.2	4.9	3.8	2.4	1.33	0.84
	0.50	0.75	0.84	6.8	6.5	5.9	5.2	4.4	3.7	3.0	2.4	1.63	0.83	0.49
	0.38	0.75	0.83	4.4	4.3	3.8	3.3	2.9	2.5	2.1	1.62	1.12	0.56	0.29
	0.31	0.75	0.81	2.9	2.9	2.6	2.3	2.1	1.79	1.43	1.13	0.75	0.33	0.21
	0.25A	0.75	0.82	1.90	1.90	1.75	1.58	1.43	1.16	0.97	0.80	0.48	0.24	0.110
	0.25B	0.75	0.83	1.58	1.26	1.07	1.00	0.92	0.77	0.71	0.54	0.35	0.21	0.108
	0.12A	0.50	0.83	0.49	0.48	0.41	0.36	0.30	0.26	0.22	0.156	0.102	0.055	0.036
1 1/2	1.25	1.00	0.85	31	30	28	25	23	19.4	16.0	12.2	8.0	3.7	1.93
	1.00	0.75	0.82	21	21	19.6	18.0	16.1	13.8	11.2	8.5	5.5	2.6	1.30
	0.81	0.75	0.80	14.9	14.5	13.9	12.9	11.4	9.6	7.7	5.7	3.7	1.90	1.10
	0.72	0.75	0.81	14.7	14.2	13.4	12.1	10.5	8.5	6.7	5.0	3.2	1.40	0.70
	0.62	0.75	0.79	12.0	11.5	10.6	9.0	7.7	6.2	4.9	3.8	2.4	1.30	0.70
	0.38	0.75	0.80	4.4	4.3	3.8	3.3	2.9	2.6	2.1	1.62	1.12	0.56	0.29
2	1.62	1.50	0.87	56	54	51	48	43	36	29	22	13.9	6.5	4.1
	1.25	1.00	0.83	35	33	31	29	25	22	17.4	13.0	8.4	4.1	2.2
	1.00	0.75	0.82	23	22	21	19.3	17.2	14.6	11.6	8.6	5.5	2.6	1.31
	0.81	0.75	0.84	15.4	14.9	14.1	12.9	11.4	9.6	7.7	5.7	3.7	1.91	1.11
	0.72	0.75	0.81	15.0	14.4	13.5	12.1	10.5	8.5	6.7	5.0	3.2	1.40	0.70
	0.62	0.75	0.79	12.0	11.5	10.6	9.0	7.7	6.2	4.9	3.8	2.4	1.30	0.70
3	0.38	0.75	0.80	4.4	4.3	3.8	3.3	2.9	2.6	2.1	1.62	1.12	0.56	0.29
	2.62	2.00	0.86	116	113	110	105	97	83	71	56	38	17.5	9.7
	2.00	1.50	0.84	79	77	73	69	62	54	44	33	22	12.7	7.5
	1.62	1.50	0.81	57	55	51	47	41	34	27	21	13.7	6.5	3.6
4	1.25	1.00	0.82	37	35	32	29	25	22	17.4	13.0	8.4	4.1	2.2
	3.50	2.50	0.87	193	184	176	170	165	153	132	102	67	30	16.0
	2.62	2.00	0.84	137	133	126	115	103	87	69	50	33	15.9	7.0
	2.25	2.00	0.81	117	108	99	89	78	66	54	41	28	14.0	6.0
6	1.62	1.50	0.82	59	56	53	49	42	35	28	20	13.8	6.9	3.7
	5.00	3.00	0.85	453	437	413	383	346	302	254	199	126	61	34
	3.50	2.50	0.83	247	235	220	202	182	159	133	103	70	36	18.0
	3.00	2.00	0.81	196	183	168	152	134	115	94	72	49	25	12.0
8	2.62	2.00	0.82	162	150	135	121	103	87	69	50	33	16.0	7.0
	6.25	4.00	0.86	713	687	648	600	541	474	397	311	216	112	54
	5.00	3.00	0.83	575	533	488	439	387	330	271	209	143	73	34
	3.50	2.50	0.81	298	274	248	221	193	163	132	102	67	30	16.0
10	2.62	2.00	0.82	173	158	143	126	110	90	69	50	33	16.0	7.0
	8.00	4.00	0.85	1056	1014	963	900	824	732	621	490	340	174	88
	6.25	4.00	0.82	739	711	675	624	562	492	404	305	202	99	53
12	5.00	3.00	0.81	590	545	496	444	388	329	254	192	126	61	30
	9.50	4.00	0.86	1470	1430	1370	1280	1160	1020	850	660	494	259	124
	7.38	4.00	0.81	946	918	877	825	750	654	544	356	212	68	13.9
6.25	4.00	0.83	829	774	713	646	571	489	404	305	202	99	53	

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Flow Capacity; C_V

Trim: Unbalanced

Body Rating: 150-300-600

Trim Characteristics: Linear

Flow Direction: Flow Over

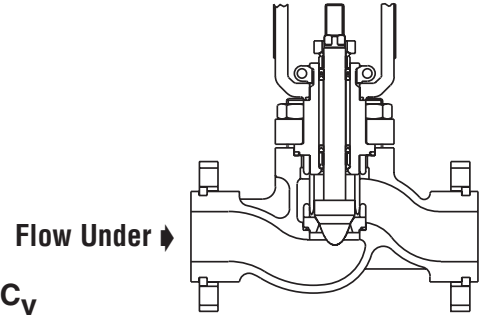


Tabla XIX: Flow Capacity, C_V

Size (inch)	Trim n°	Stroke (inch)	F _L @ 100%	C _V at Percent Open										
				100	90	80	70	60	50	40	30	20	10	5
1/2	0.50	0.75	0.88	5.1	5.0	4.7	4.4	3.9	3.5	2.8	2.2	1.43	0.68	0.47
	0.38	0.75	0.90	3.6	3.5	3.3	3.0	2.6	2.2	1.75	1.34	0.86	0.34	0.24
	0.31	0.75	0.89	2.7	2.5	2.3	2.1	1.80	1.52	1.20	0.92	0.57	0.29	0.166
	0.25A	0.75	0.88	1.71	1.70	1.64	1.42	1.26	1.01	0.82	0.61	0.38	0.20	0.096
	0.12A	0.50	0.85	0.42	0.43	0.40	0.34	0.29	0.25	0.194	0.133	0.088	0.038	0.019
3/4	0.72	0.75	0.91	9.2	9.2	9.2	8.9	8.3	7.1	6.0	4.4	3.1	1.35	0.66
	0.62	0.75	0.89	9.0	8.8	8.5	8.1	7.1	6.1	4.7	3.6	2.3	1.20	0.70
	0.50	0.75	0.85	6.2	6.0	5.6	5.1	4.5	3.8	3.1	2.3	1.58	0.62	0.34
	0.38	0.75	0.90	3.9	3.8	3.4	3.1	2.7	2.3	1.82	1.35	0.92	0.36	0.21
	0.31	0.75	0.89	2.8	2.7	2.5	2.2	1.85	1.56	1.23	0.92	0.56	0.23	0.147
	0.25A	0.75	0.89	1.93	1.91	1.76	1.57	1.34	1.12	0.88	0.61	0.39	0.168	0.090
	0.12A	0.50	0.85	0.46	0.44	0.41	0.35	0.30	0.25	0.20	0.140	0.081	0.034	0.017
1	0.81	0.75	0.91	15.0	15.0	14.5	13.2	11.8	9.7	7.9	6.0	3.8	2.1	1.17
	0.72	0.75	0.93	13.0	12.7	11.9	10.5	9.1	7.6	5.8	4.4	2.6	0.98	0.56
	0.62	0.75	0.93	10.2	9.8	9.2	8.1	7.1	6.1	4.7	3.6	2.3	1.20	0.68
	0.50	0.75	0.90	6.7	6.4	5.9	5.2	4.6	3.8	3.0	2.2	1.42	0.63	0.34
	0.38	0.75	0.91	4.0	3.8	3.5	3.1	2.6	2.1	1.74	1.27	0.86	0.37	0.20
	0.31	0.75	0.90	2.9	2.8	2.5	2.2	1.91	1.62	1.26	0.97	0.62	0.27	0.149
	0.25A	0.75	0.90	1.76	1.74	1.70	1.47	1.26	0.95	0.77	0.54	0.37	0.158	0.081
	0.12A	0.50	0.92	0.49	0.47	0.42	0.36	0.30	0.26	0.20	0.144	0.100	0.055	0.036
1 1/2	1.25	1.00	0.89	32	30	29	28	26	23	19.1	15.0	10.6	5.4	3.0
	1.00	0.75	0.91	21	21	20	18.9	17.5	15.2	12.6	9.9	6.7	2.9	1.89
	0.81	0.75	0.92	13.7	13.4	13.0	12.5	11.5	10.1	8.1	5.5	3.2	1.60	0.80
	0.72	0.75	0.91	13.0	12.7	11.9	10.5	9.1	7.6	5.8	4.4	2.6	1.00	0.60
	0.62	0.75	0.88	11.0	9.7	8.6	7.6	6.6	5.5	4.4	3.4	2.3	1.10	0.55
2	1.62	1.50	0.91	51	50	50	49	44	37	30	23	15.1	6.7	4.0
	1.25	1.00	0.88	35	34	31	29	26	22	17.8	13.6	9.1	3.7	2.4
	1.00	0.75	0.92	22	21	20	19.4	17.5	14.8	12.0	9.2	5.6	2.7	1.78
	0.81	0.75	0.80	14.3	14.0	13.7	13.2	11.9	10.1	8.1	5.5	3.2	1.56	0.80
	0.72	0.75	0.90	13.0	12.7	11.9	10.5	9.1	7.6	5.8	4.4	2.6	1.00	0.60
	0.62	0.75	0.90	11.0	9.7	8.6	7.6	6.6	5.5	4.4	3.4	2.3	1.10	0.55
3	2.62	2.00	0.91	114	112	109	105	99	88	73	55	37	17.6	9.4
	2.00	1.50	0.90	82	77	73	66	59	52	43	34	24	13.8	9.0
	1.62	1.50	0.89	52	50	46	42	37	33	29	22	15.2	6.5	3.6
	1.25	1.00	0.90	37	35	33	30	26	22	17.8	13.6	9.1	3.7	1.90
4	3.50	2.50	0.90	195	187	177	165	151	134	113	89	62	32	16.0
	2.62	2.00	0.92	134	128	118	106	92	80	65	53	35	16.0	7.8
	2.25	2.00	0.89	102	96	89	82	73	63	52	40	27	14.0	7.0
	1.62	1.50	0.88	53	50	46	42	37	32	29	22	15.2	7.3	3.8
6	5.00	3.00	0.90	433	418	395	367	332	291	245	193	134	70	35
	3.50	2.50	0.89	233	218	201	180	157	132	109	87	70	40	26
	3.00	2.00	0.91	182	173	160	143	125	108	88	68	49	25	15.0
	2.62	2.00	0.90	149	139	129	115	100	84	67	53	37	21	12.7
8	6.25	4.00	0.90	681	657	620	575	520	456	383	301	210	109	55
	5.00	3.00	0.91	481	456	426	392	352	306	255	197	135	68	34
	3.50	2.50	0.90	273	254	233	210	185	158	129	99	67	34	17.0
	2.62	2.00	0.90	166	156	144	128	111	92	74	55	38	22	14.0
10	8.00	4.00	0.90	1056	1014	963	900	824	732	621	490	340	174	88
	6.25	4.00	0.89	702	664	610	548	477	403	325	244	165	106	70
	5.00	3.00	0.89	557	518	476	429	378	323	257	190	136	69	34
12	9.50	4.00	0.90	1400	1370	1310	1220	1110	980	820	639	480	252	124
	7.38	4.00	0.89	983	928	858	771	669	561	451	339	233	149	85
	6.25	4.00	0.91	852	795	728	642	548	440	340	250	165	107	54

Dimensions

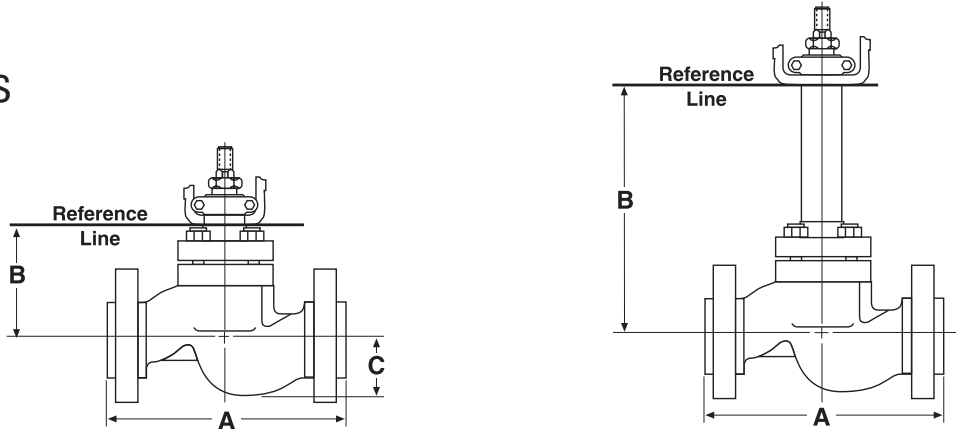


Table XX: Valve Dimensions (mm) - Class 150, 300, 600

Body Size (inch)	A				B		C	Space needed for disassembling above actuator
	ANSI/Globe*	ANSI/ISA**			Standard Bonnet	Extended Bonnet		
	Class 150, 300, 600	Class 150	Class 300	Class 600				
1/2 & 3/4	216	184	194	206 [†]	97	212	38	64
1	216	184	197	210	97	212	44	64
1 1/2	241	222	235	251	132	246	59	102
2	292	254	267	286	138	252	57	114
3	356	298	318	337	172	312	86	147
4	432	353	368	394	214	354	133	190
6		451			256	395	139	254
6			473	508	311	451	146	254
8		543			318	457	180	277
8			568	610	365	505	190	290
10		673			359	498	214	302
10			708	752	359	524	227	308
12		737			359	498	243	320
12			775	819	413	578		320

*Optimum standard in accordance with ANSI/ISA S75.20, 1992

**In accordance with ANSI/ISA S75.03, 1985

† For threaded ends, consider 210

Table XXI: Valve Dimensions (mm) - Classes 900, 1500, 2500

Body Size (inch)	A			B						C		Space needed for disassembling	
	Distance between flanges*			Standard Bonnet			Extended Bonnet						
	Class 900	Class 1500	Class 2500	Class 900	Class 1500	Class 2500	Class 900	Class 1500	Class 2500	Class 1500	Class 2500	Class 1500	Class 2500
1	279	279	305 ²	143	143	173	257	257	286	44	44	90	90
1 1/2	330	330	381 ¹	220	220	221	334	334	334	68	60	141	141
2	375	375	400	220	220	221	334	334	334	71	77	154	154
3	460	460	660 ¹	289	289	328	467	467	506	106	94	214	211
4	530	530	737 ¹	316	316	371	496	496	549	113	138	246	272
6	762 ²	762 ²	864 ¹	493	493	442	671	671	692	183	184	309	344
8	832	832	1022	473	473	616	613	613	794	240	262	424	451
10	991	991	1270	556	556	660	734	734	838	284	264	465	495
12	1130	1130	1422	675	675	711	852	852	889	356	327	492	521
14	1257	1257		629	629		806	806				521	

*ANSI/ISA S75.15, 1987

(1) ANSI/ISA S75.16, 1987

(2) Optimum standard

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Dimensions

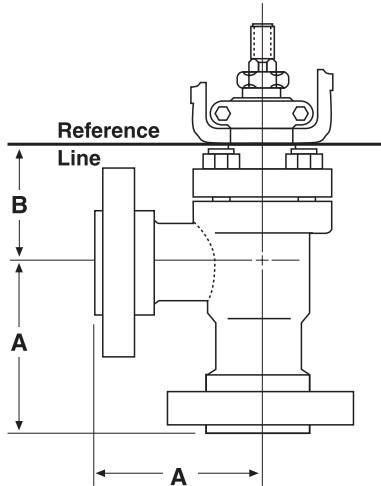


Table XXII: Dimensions (mm) - Angle Body

Body (inch)	ANSI Class	B		A	Space needed for disassembling
		Standard bonnet	Extended bonnet		
1/2 a 1	150 a 600	78	192	108	64
1 1/2	150 a 600	92	206	121	102
2	150 a 600	100	214	146	114
3	150 a 600	124	264	178	147
4	150 a 600	156	295	222	190
6	150	180	320	226	254
	300 a 600	241	381	279	254
8	150	229	368	330	349
	300 a 600	275	414	330	349

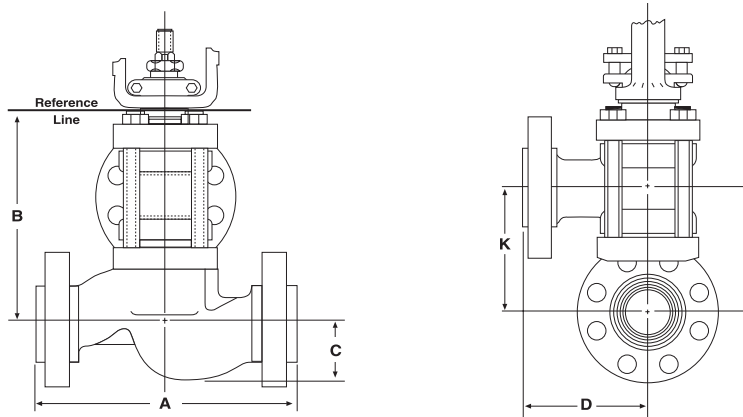


Table XXIII: Dimensions (mm) - 3-way Body

Body Size (inch)	A				B		C	D	K	Space for disassembling
	ANSI/Globe*	ANSI/ISA**			Standard Bonnet	Extended Bonnet				
	Class 150, 300, 600	Class 150	Class 300	Class 600						
1/2 & 3/4	216	184	194	206 ⁺	170	284	38	108	87	86
1	216	184	197	210	170	284	44	108	87	86
1 1/2	241	222	235	251	230	341	59	121	137	127
2	292	254	267	286	236	347	59	146	143	140
3	356	298	318	337	329	470	86	178	194	181
4	432	353	368	394	423	562	133	216	251	240
6		451			548	675	139	226	356	294
			473	508	654	794	146	254	406	294
8		543			608	748	179	272	381	310
			568	610	767	907	191	305	464	310

* In accordance with ANSI B16.10, 1986

** In accordance with ANSI/ISA S75.03, 1985

+ For threaded ends, consider 210

OpGL

The information and specifications described in this brochure are considered accurate, however they are intended for information purpose only and should not be considered as certified information.

Considered that Optimux products are continuously improved and upgraded, specifications, dimensions, and information described herein are subject to change without notice.

For further information or verification, consult your Optimux representative. Specific instructions for the installation, operation, troubleshooting and maintenance of the OpGL control valves are contained on the OpGL Maintenance bulletin.

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