GLH

High Pressure

Globe
Control Valve

VSI CONTROLS
A PETROLVALVES COMPANY

INTRODUCTION

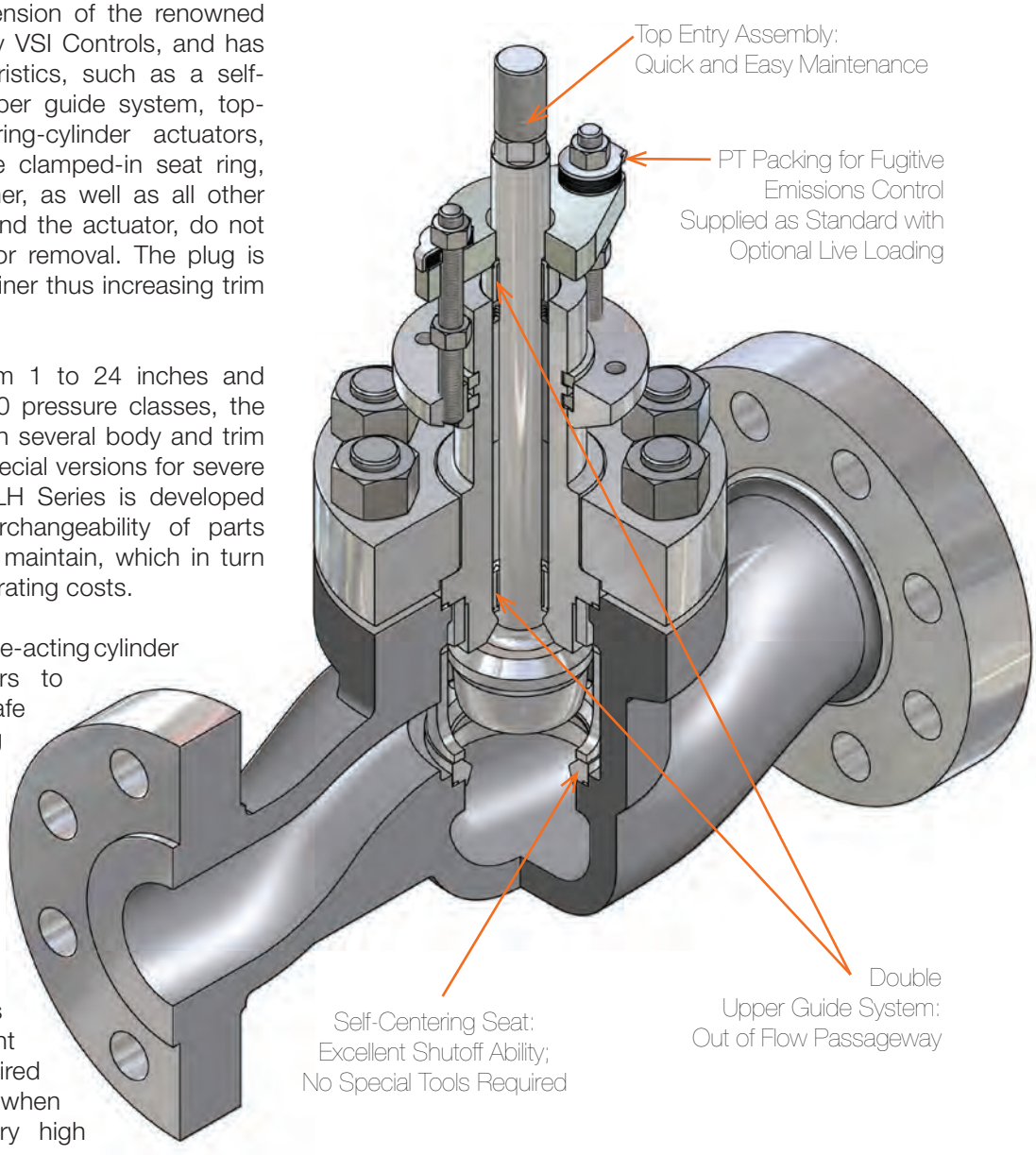
The globe control valve was designed primarily for critical high-pressure applications for the oil and gas, power and process industries. The GLH Series was developed as an extension of the renowned GLS control valve made by VSI Controls, and has similar advanced characteristics, such as a self-centering seat, double upper guide system, top-entry assembly, and spring-cylinder actuators, among other features. The clamped-in seat ring, secured by the seat retainer, as well as all other components of the valve and the actuator, do not require any special tools for removal. The plug is not guided by the seat retainer thus increasing trim service life.

Manufactured in sizes from 1 to 24 inches and ANSI 900, 1500, and 2500 pressure classes, the GLH Series is available with several body and trim configurations, including special versions for severe service conditions. The GLH Series is developed with the concept of interchangeability of parts that are extremely easy to maintain, which in turn translates into reduced operating costs.

The GLH Series uses a double-acting cylinder and piston type actuators to achieve the required fail-safe position, thereby providing high pneumatic stiffness, excellent positioning in throttling control, and fast and reliable responses to changes in the control signal. Operating with an air supply pressure of up to 150 psi (10.3 Bar), the actuators of the GLH Series provide more than sufficient force to achieve the desired tightness, even in cases when the valve experiences very high differential pressures.

VSI Controls offers a wide range of positioners, complete with high-performance anti-cavitation/ noise attenuation trim, making the GLH Series one of the most trusted and relied-upon control valves for high-pressure and severe application services worldwide.

GLH SERIES – BODY SUB-ASSEMBLY (FIGURE 1)



Rangeability 30:1 (Typical)

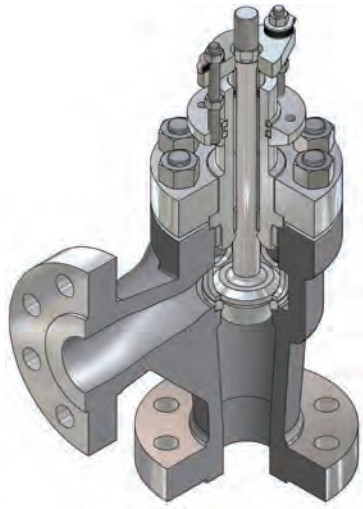
ANSI Class Shutoff IV — Metal Seat*
ANSI Class VI Shutoff — Soft Seat*

*Standard for valves with unbalanced trim.

Conventional Globe-Style Body

The GLH Series globe-style bodies (Fig. 1) present a streamlined and smooth passageway. The internal passages of the body presents a nearly constant area with no pockets, allowing a high capacity with minimum turbulence.

These bodies are designed with more uniform wall thickness, resulting in lower weight and lower cost, specially when the body is manufactured in stainless steel or in more expensive alloys.

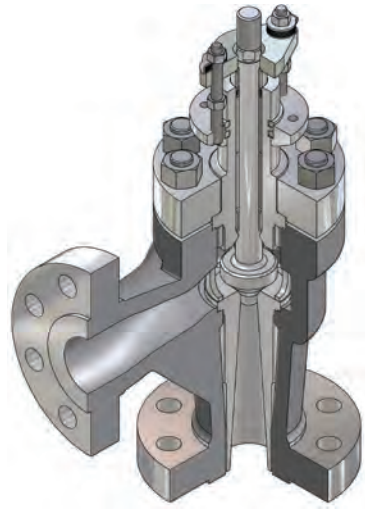


ANGLE-STYLE BODY (FIGURE 2)

Angle-Style Body

The GLH valve with angle body is fully interchangeable with the globe-style valve: except for the body, all other components are the same.

Depending on the application for which the valve is intended, the GLH valve with angle body may be supplied with an optional Venturi-Type seat ring, which extends itself up to the outlet flange of the body and provides an additional protection against the erosive action of the fluid.

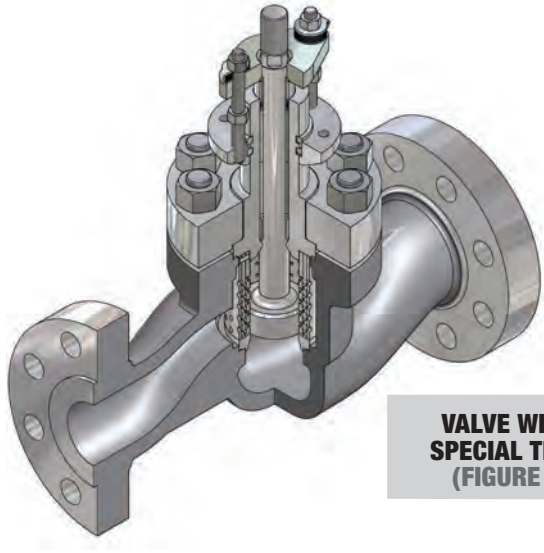


ANGLE VALVE W/VENTURI SEAT (FIGURE 3)

Special Versions

In addition to the conventional or angle-style bodies, valves of the GLH Series may be supplied with special configurations, such as:

- Three-way body design is available for converging flow (mixing action) or diverging flow (bypass action);
- The GLH Series offers a wide range of anti-cavitation trim (fig. 4), such as the Alpha Trim for services with low or medium cavitation, and the Gamma Trim for medium to high cavitation applications.
- Noise attenuation trims are also available for the GLH series, such as the Beta Trim and the Delta Trim, when the attenuation of high noise levels is necessary.



VALVE WITH SPECIAL TRIM (FIGURE 4)

With the GLH Series, the intelligent concept of design translates into performance and operational benefits:

Rugged

The GLH valve construction makes it less prone to corrosive attacks from process fluids when compared to conventional globe valves.

The rugged plug stem, as well as other valve components, are designed for heavy-duty services and can withstand high differential pressures.

When necessary, optional low-noise and anti-cavitation trims are also available, making the GLH Series control valves the ideal choice for high-pressure, severe service application.

Seating

In addition to providing accurate control, the concept of the GLH valve with a single and self-centering seat provides for an exceptional shutoff capability, normally assisted by the fluid pressure. In normal conditions, along with the air supply, the double-acting spring-cylinder actuator ensures a high seating force. In the event of an air supply loss, the actuator spring, plus the resulting force from fluid pressure, moves the plug to the required fail-safe position.

Easy, quick and low-cost maintenance

VSI Controls's top-entry assembly design simplifies maintenance tasks. Once the bonnet flange nuts are removed, the bonnet and the plug can easily be removed from the valve body, allowing access to other internal components.

The clamped-in seat ring, secured by the seat retainer, as well as all other components of the valve and the actuator, do not require the use of special tools for their disassembly and reassembly.

The compact size of the valve and its low weight helps its handling for maintenance and installation.

Guiding and Packing

The GLH Series guiding system deserves special recognition as not only does it eliminate the disadvantages of a guiding system at the seat retainer, the GLH guides, being well spaced and with large bearing support surfaces, eliminate the problems related to vibration in control valves.

Due to the use of this advanced guiding system, the rugged plug stem of the GL S valve may be subjected to twice the thrust produced by available oversized actuators, without the risk of buckling.

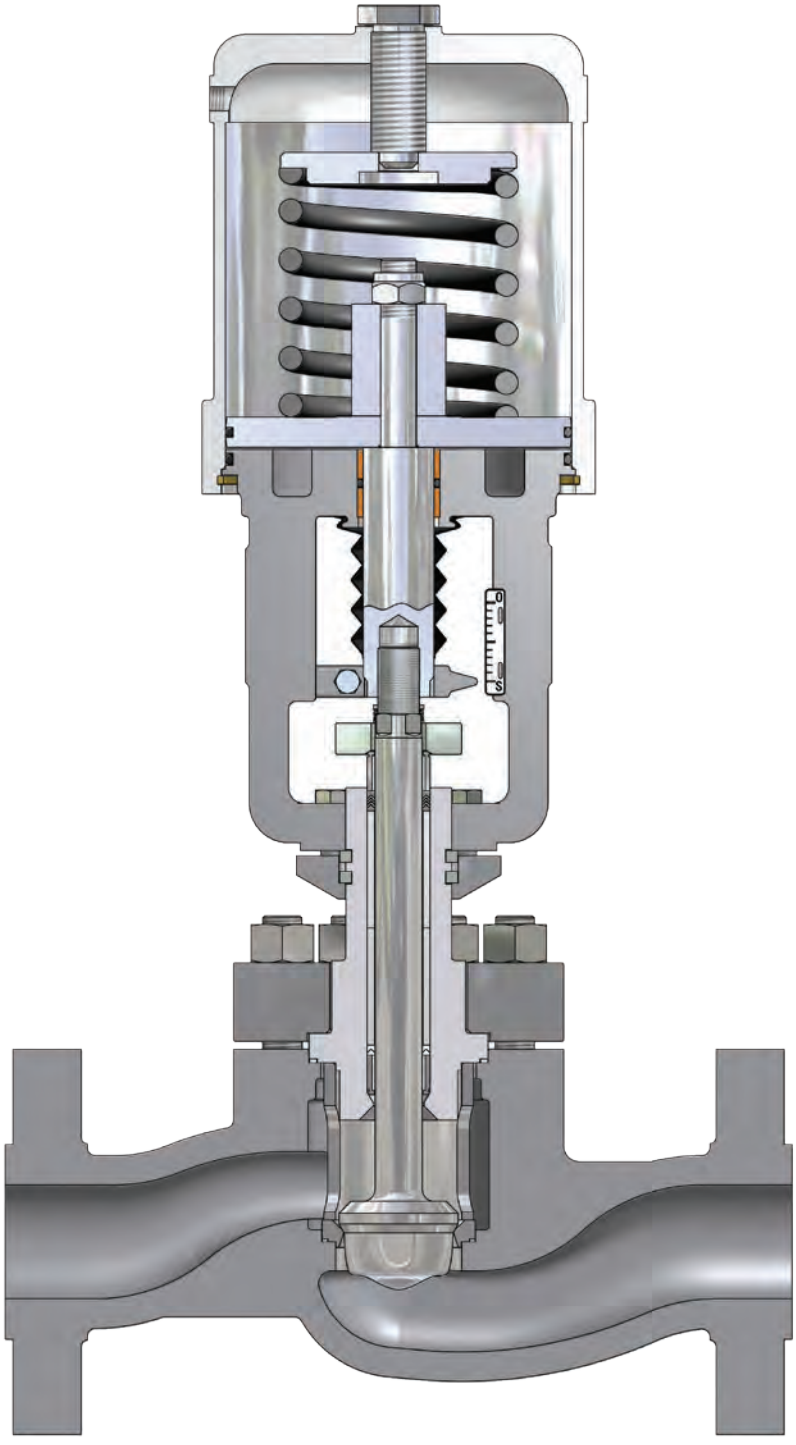
The depth of the GLH Series packing box allows the use of all packing options offered by VSI Controls, and the excellent surface finish of the bonnet bore and the plug stem contributes for a long packing life, with no leakage.

Trim that do not jam

The double upper guide system, located out of the flow passageway, assures a perfect alignment of the plug stem, while providing considerable clearance between the plug head and the seat retainer, eliminating friction problems related to the guiding system in the seat retainer (cage-guided).

Versatile

In addition to conventional globe-style bodies, angle-style three-ways or steam-jacketed bodies are also available. These bodies are compliant with several standards relevant to face-to-face dimensions.
The modular concept of the GLS design allows for a high degree of interchangeability between different valve sizes and versions, making VSI Controls a market leader in this regard, consequently benefiting the end user by reducing the need for a large inventory of spare parts.



GLH CONTROL VALVE (FIGURE 5)

Double Acting Spring-Cylinder Actuator – Advantages:

- High actuating thrust and pneumatic stiffness.
- Field reversible, without the need of additional parts.
- Provides reliable operation.
- Compact design when compared with spring-diaphragm actuators with equivalent thrust.
- Operates with a controlled movement and high-speed stroke.
- Accurate positioning with high response capability.
- High repeatability.
- Allows for the assembly of numerous types of positioners and accessories.
- Can optionally can be supplied with various types of manual handwheels and stroke stops.
- Operates with air supply pressure as high as 150 psi (10.3 Bar), without the need of a pressure regulator.
- Option to operate with natural gas.

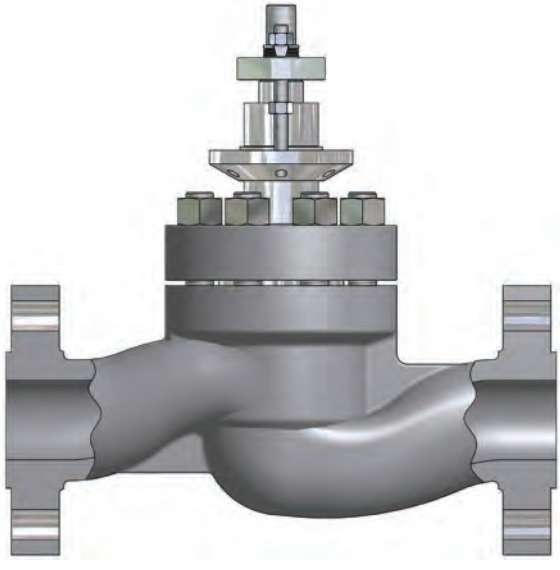
GLH valves are supplied with raised-face integral flanges as standard. In order to have better sealing with adjacent piping flanges, the contact surface of valve flanges are machined with spiral grooves. Other optional flange facings are available, such as: smooth finish, flat face, RTJ, large and small tongue, and, large and small groove.
In addition to the flanged versions, other types of end connections are available, such as: NPT threaded connection, socket weld (SW), and buttweld (BW).

Bonnet Flange

The bonnet flange design of the GLH Series uses a separable flange concept, not integral to the bonnet. As the bonnet flange does not come into contact with the operating fluid, it is normally manufactured in carbon steel; however, it may be manufactured in stainless steel or other materials to match the body if this is required due to the operating temperature or aggressive process.

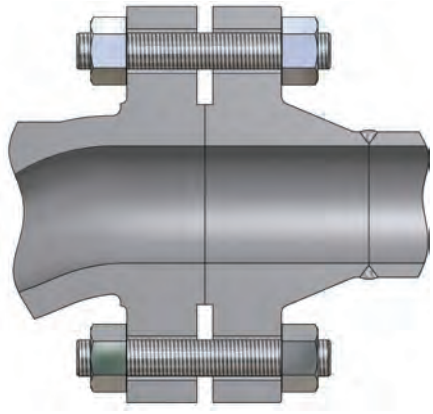
Bonnet Flange Bolting

The GLH Series bonnet is attached to the valve body by means of studs and nuts. The standard material is ASTM A193 Gr. B7 for studs and ASTM A194 Gr. 2H for nuts, suitable for operating temperatures from –20º to 800ºF (–28 to 426°C).
Optionally, studs and nuts may be supplied also in stainless steel, suitable for temperature ranges from –425 to 1500ºF (–253 to 815ºC). These temperature limits are valid for maximum operating pressure, as stated in ANSI B16.34.

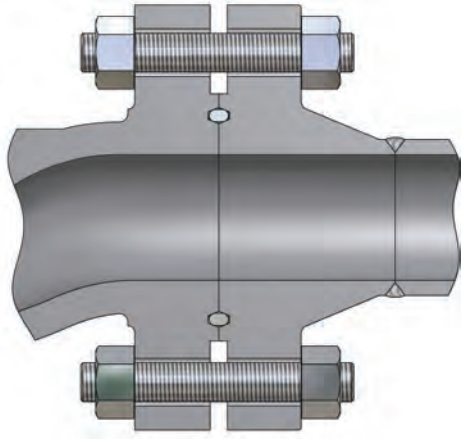


BODY END & BONNET FLANGES (FIGURE 6)

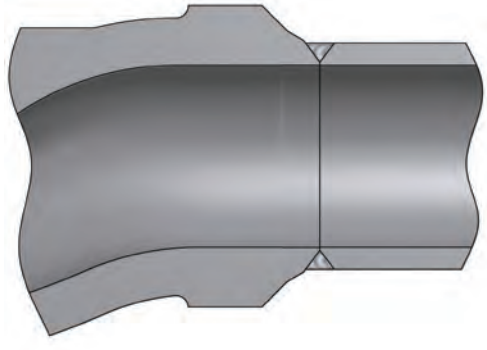
INTEGRAL FLANGE (FIGURE 7)



RTJ FLANGE (FIGURE 8)



BUTTWELD END CONNECTION (FIGURE 9)



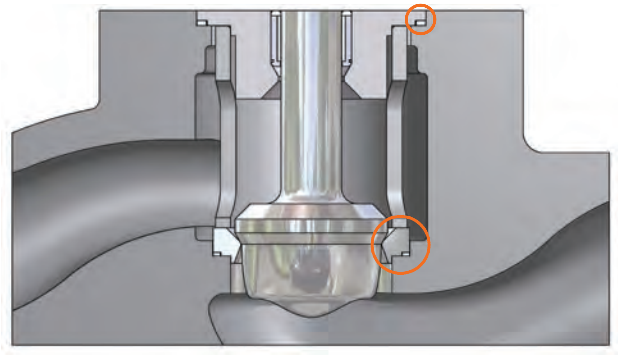
Gaskets

The GLH Series is designed with the bonnet gasket totally enclosed. The GLH valve bonnet has a shoulder projection that doubles as a mechanical stop, limiting the gasket compression. Thus, the bonnet gasket remains completely sealed, and its compression is determined by the depth of the shoulder projection in the bonnet. The body, seat retainer, and the seat itself are machined within tight tolerances to ensure proper gasket compression. In contrast to the bonnet, the seat ring does not in fact come into direct contact with the body, due to it resting on the gasket. By retaining proper clearance, this allows for thermal expansion while maintaining mechanical tolerances.

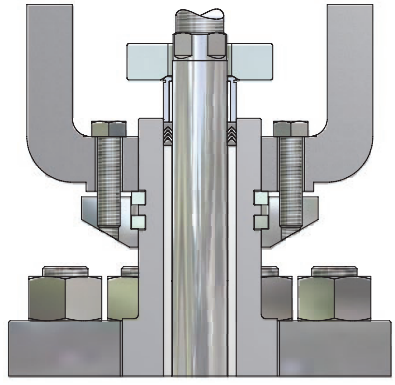
Clamps

The actuator of the GLH Series is attached to the valve by means of bolting that secures the actuator yoke to the valve bonnet. For smaller sizes, the actuator yoke is connected to the valve bonnet by means of two yoke clamps that are manufactured in investment cast stainless steel. Each clamp has a flat sloped surface, so when one clamp is bolted to the other, a force is generated, securing the actuator yoke firmly to the valve bonnet.

In contrast to conventional threaded clamps, the design of GLH clamps allows their easy removal, even under severe corrosive conditions.



BODY GASKETS (FIGURE 10)



YOKE BOLTING (FIGURE 11)

TEMPERATURE AND PRESSURE LIMITS FOR VALVE GASKETS (TABLE I)

	TYPE	GASKET MATERIAL	TEMPERATURE LIMITS		PRESSURE LIMITS
			°F	°C	
Standard Gaskets	Flat	PTFE	-200 to 350	-130 to 177	6000 psi @ -200°F (415 Bar @ -130°C) / 1000 psi @ 350°F (69 Bar @ 177°C)
	Spiral Wound	304 SS/Graphite	-320 to 750	-196 to 400	6250 psi (431 Bar)
	Spiral Wound	316 SS/Graphite	-320 to 1000(1)	-196 to 538(1)	6250 psi (431 Bar)
Optional Gaskets	Flat	AFG (2)	-20 to 600	-28 to 315	CF (3)
	Flat	KEL-F	-320(4) to 350	-196(4) to 177	6000 psi @ -320°F (415 Bar @ -196°C) / 1000 psi @ 350°F (69 Bar @ 177°C)
	Flat	PTFEG	-200 to 450	-130 to 232	6000 psi @ -200°F (415 Bar @ -130°C) / 500 psi @ 450°F (35 Bar @ 232°C)
	Spiral Wound	304 SS/AFG (2)	-20 to 750	-28 to 400	6250 psi (431 Bar)
	Spiral Wound	316 SS/AFG (2)	-20 to 1000	-28 to 538	6250 psi (431 Bar)
	Hollow O-Ring	Inconel X-750	-20 to 1500	-28 to 815	15000 psi (1034 Bar)

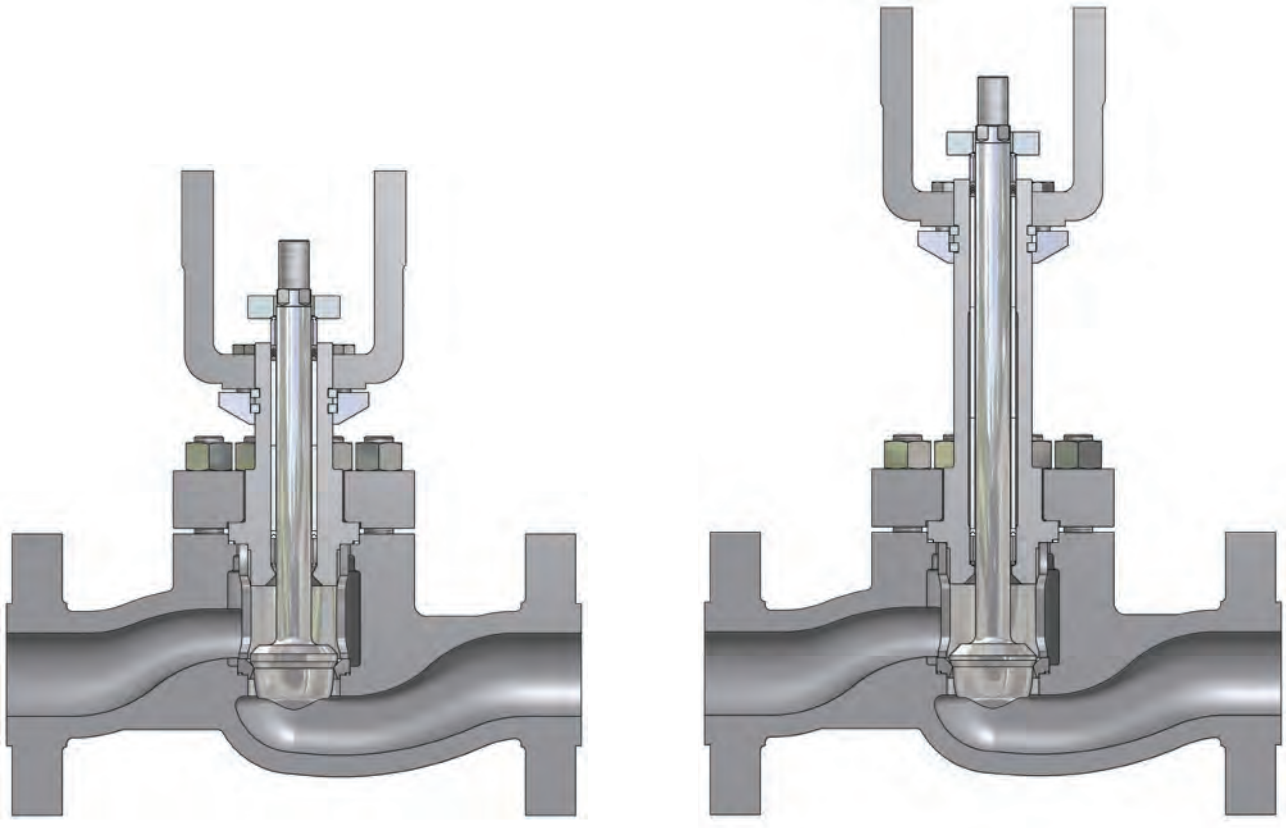
(1) Limited to 800°F (426°C) in oxidizing service. (2) Gasket material free of asbestos. (3) Contact the factory for the pressure limits of the non-asbestos material specified. (4) Lower temperatures upon request.

Standard Bonnet

The GLH Series standard bonnet is usually manufactured with the same material as the valve body and withstands operating temperatures from -20º to 426ºC), depending on the material (specified by the customer) and packing material (see Table IV for temperature limits for different packing materials).

Extended Bonnet

The extended bonnet protects the packing against excessive heat or cold that could affect the performance of the valve. The extended bonnet manufactured with carbon steel can be used with operating temperatures from -20º to 800ºF (-28º to 426ºC), and the extended bonnet manufactured with 304 or 316 stainless steel can work with operating temperatures from -150º to 1500ºF (-100º to 815ºC). Alternative materials are available.



GLH CONTROL VALVE – BONNET TYPES (FIGURE 12)

BONNET FLANGE AND BOLTING SPECIFICATIONS (TABLE II)

BONNET FLANGE (STANDARD)	BONNET FLANGE (OPTIONAL)	BONNET FLANGE STUDS & NUTS (STANDARD)	BONNET FLANGE STUDS & NUTS (OPTIONAL)
Carbon Steel	Stainless Steel [1] or same material as body	ASTM A193 Gr. B7 / ASTM A194 Gr. 2H [2]	304 or 316 Stainless Steel [1] [3] [4]

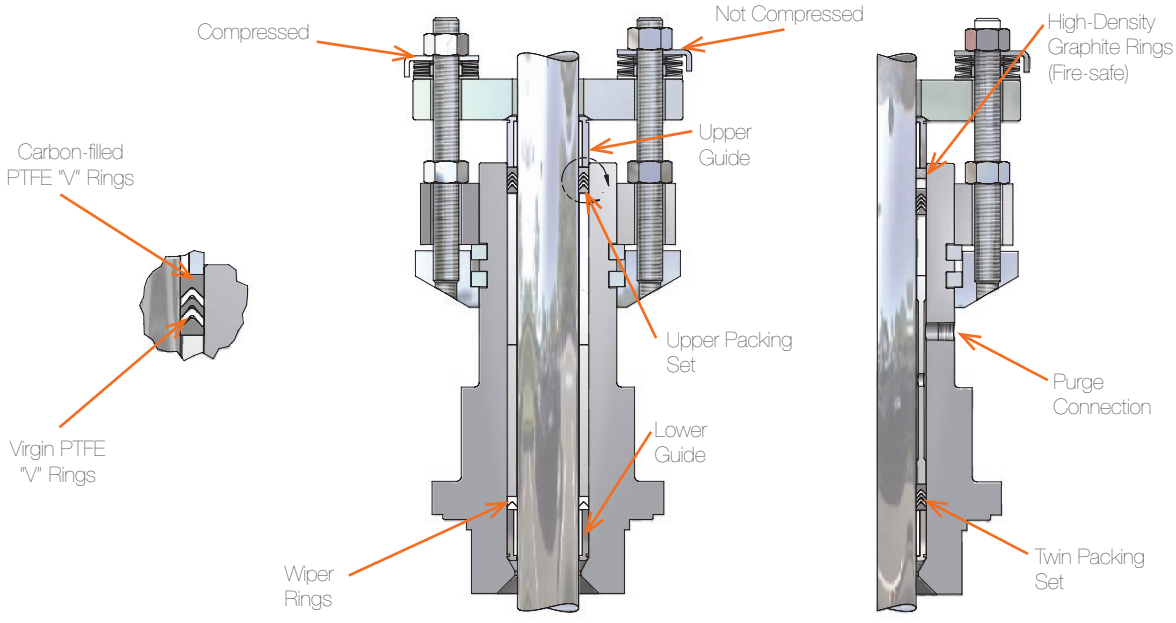
(1) Optional materials of bonnet flange and bonnet flange bolting are always necessary when the temperature limits of standard carbon steel or B7/2H are exceeded. (2) The operating temperature should be between –20º and 800ºF (–28º and 426ºC), provided that the body limits are respected. (3) The operating temperature should be between –425º and 1500ºF (–253º and 815ºC), provided that the body limits are respected. (4) Other materials can be provided upon request, depending on operating conditions and design criteria.

Packing Box

The GLH valve packing is deep and has excellent surface finish, allowing the use of all packing options offered by VSI Controls, with the following additional advantages:

1. PT packing for fugitive emissions control is standard for the GLH valves.
2. The spacing between the lower wiper packing set and the upper packing set, which is effectively responsible for stem sealing, is designed to restrict the wetted portion of the plug stem from reaching the upper packing set.
3. The packing eliminates problems caused by friction and wear, usually associated with the guide system in the seat retainer (cage-guided).
4. Two large and widely spaced guides (located out of the flow path) and a plug stem with a large diameter comprise the advanced guiding system of the GLH Series. The upper guide also works as a packing gland, while the lower guide, located next to the plug head, assures a sturdy alignment between the plug and the seat ring.
5. The available guide options cover all the applications of GLH valves.

TYPICAL GUIDING AND STANDARD PT PACKING ARRANGEMENT (FIGURE 13)



TEMPERATURE AND PRESSURE LIMITS FOR PLUG GUIDES/INSERTS (TABLE III)

GUIDE/INSERT MATERIALS	TEMPERATURE LIMITS		PRESSURE LIMITS
	°F	°C	
Stainless steel with graphite insert (1) (2)	-320 to 1500 (3)	-196 to 815 (3)	up to 1000 psi (69.0 Bar) for sizes up to 2 in. up to 600 psi (41.4 Bar) for 3 and 4 in. up to 500 psi (34.5 Bar) for sizes 6 in. and larger
Stainless steel with PTFEG insert	-20 to 300	-28 to 150	850 psi @ 100°F (58.6 Bar @ 38°C); 100 psi @ 300°F (6.9 Bar @ 150°C)
Bronze (solid guide) (4)	-425 to 500 (5)	-253 to 260 (5)	body rating
Alloy #6 (solid guide) (6)	-425 to 1500	-253 to 815	body rating

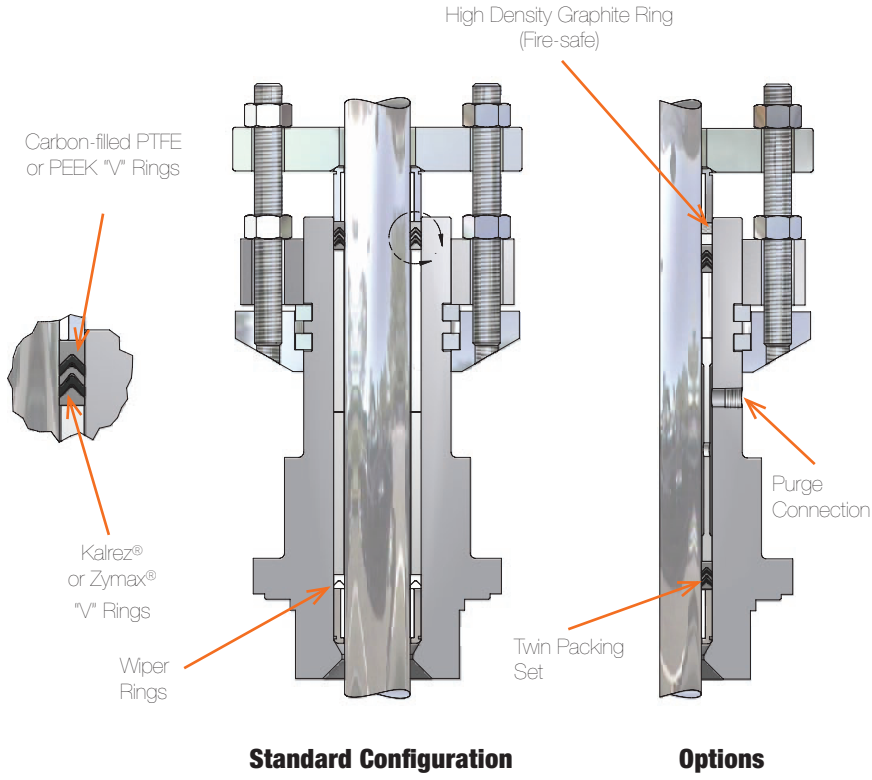
1The ΔP through the valve must be observed for each valve size. Contact the factory. (2) Do not use in oxygen-enriched services. In applications under cavitation conditions, using the lower guide with the graphite insert is not recommended. (3) For oxidizing services such as air, the maximum operating temperature is 800ºF (426ºC). (4) Bronze solid guides should not be used in corrosive applications or where NACE certification is required. (5) For the upper guide, the maximum temperature limit is 900ºF (482ºC). (6) Whenever the valve trim is composed of a 300 series stainless steel and the lower guide is made from Alloy #6, the plug stem must be hardened with Alloy #6 in the stem region that is in contact with the lower guide.

PTG and PTG XT Packing

WWhen the operating temperature exceeds the recommended limits of the PT packing, or even when a higher sealing capacity is expected, the PTG packing is the ideal choice. To comply with EPA* regulations, PTG packing assures emission levels much lower than 500 parts per million (usually 10 ppm), making it a highly reliable and economical option, instead of using metal bellows seals. The PTG packing set can be installed in all valves supplied by VSI Controls, offering a long useful life with a reduced need for retightening the packing set. Optionally, the PTG packing set may be supplied in a fire-safe version, in accordance with the requirements of API 607. For higher operating temperatures, the PTG XT is offered, and its application limits are provided in Table IV.

*EPA = Environmental Protection Agency

PTG & PTG XT PACKING SYSTEMS (FIGURE 14)



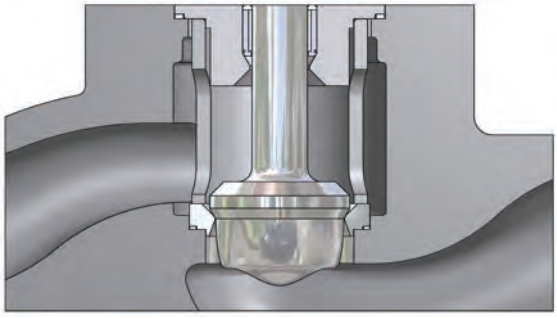
PACKING TEMPERATURE LIMITS (TABLE IV)

BONNET TYPE	PACKING MATERIAL	TEMPERATURE LIMITS (2)	
		ºF	ºC
Standard (1)	PTFE "V" Rings	-20 to 450	-28 to 232
	PT and PTG	-20 to 450	-28 to 232
	Braided PTFE	-20 to 500	-28 to 260
	Glass-filled PTFE (PTFEG)	-20 to 500	-28 to 260
	PTG XT	-20 a 550	-28 to 288
	Graphite/AFP (3)	-20 to 800	-28 to 426
	Graphite/AFP (3), Inconel Wire	-20 to 800 (4)	-28 to 426 (4)
	Graphite (5)	-20 to 800 (4)	-28 to 426 (4)
Extended (1)	PTFE "V" Rings	-150 to 700	-100 to 371
	PT and PTG	-20 to 700	-28 to 371
	Braided PTFE	-150 to 700	-100 to 371
	Glass-filled PTFE (PTFEG)	-150 to 700	-100 to 371
	PTG XT	-20 to 800	-28 to 426
	Graphite/AFP (3)	-20 to 1200	-28 to 650
	Graphite/AFP (3), Inconel Wire	-20 to 1200	-28 to 650
	Graphite (5)	-20 to 1500	-28 to 815

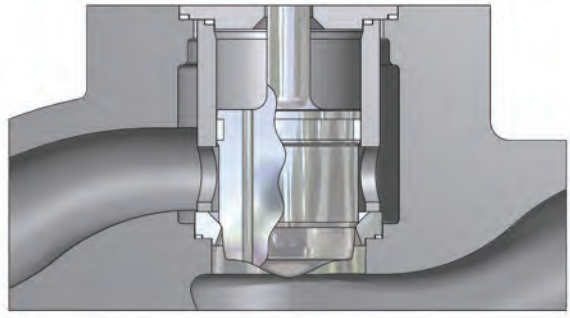
(1) ANSI B16.34 specifies acceptable pressure and temperature limits for pressure-retaining materials. Contact the manufacturer for additional information about the pressure versus temperature limits of packings. (2) Temperature limits are valid, provided that the pressure versus temperature limits of the body, bonnet, and remaining parts are respected. (3) High-temperature packing, free of asbestos. (4) For sizes from 3 to 12 inches, the maximum temperature limit is 850ºF (454ºC). (5) Do not use graphite packing in oxidizing services such as air or oxygen with operating temperatures higher than 750ºF (400ºC). Due to the increased friction, the use of graphite packing may require the use of extra-strong springs and/or oversized actuators.

Trim

The GLH Series trim is developed to eliminate the issues normally associated with valves that have threaded seats or a cage-guided plug design. Since the seat is not threaded, but is fixed onto the body by means of the bonnet and the seat retainer, its removal is quite simple, even when the valve operates in corrosive conditions.
In contrast to trim with a guide in the seat retainer, which is easily susceptible to wear and jamming, the GLH Series trim is guided by a double upper guide system that avoids contact between the seat retainer and the plug. Since there is no direct contact with the plug, the retainer may be manufactured in stainless steel, instead of costly hardened materials.
The flow characteristic is determined by the plug shape, instead of by openings located in the retainer.
For services with very high differential pressures, a pressure-balanced trim system is used to reduce the thrust needed to stroke the plug through the reduction of off-balance trim areas.
Valves with pressure-balanced trim should be used with clean fluids only, considering that the flow direction for the safety fail-closed position is under the plug, and for the fail-open position is over the plug.
Optionally, the GLH Series may be supplied with special trim to attenuate the noise level and for applications under cavitation conditions.



UNBALANCED TRIM (FIGURE 15)



PRESSURE-BALANCED TRIM (FIGURE 16)

SPECIFICATION GUIDE FOR PRESSURE-BALANCED PLUG SEALS (TABLE V)

MATERIAL OF PLUG SEALS[1]		TEMPERATURE LIMITS[2]		SHUTOFF CLASS	
		°F	°C	WITH METAL SEAT	WITH SOFT SEAT
PTFE Seals		0 to 350	-18 to 176	up to 10% of Class IV	up to 1% of Class IV
Reinforced PTFE Seals		0 to 400	-18 to 204	up to 10% of Class IV	up to 1% of Class IV
Buna-N O-Ring		-40 to 200	-40 to 93	Class IV or V	Class VI
Viton-A O-Ring		-10 to 400	-23 to 204	Class IV or V	Class VI
VMG Metal Seals	Sizes from 2 to 4 in.	300 to 1600	149 to 871	Class III	N/A
	Sizes 6 in. and larger	300 to 1600	149 to 871	Class IV	N/A

(1) Whenever metal seals such as VMG are used, the bore surface of the pressure-balanced sleeve must be hardened. (2) The temperature limits above are for information purposes only. Contact VSI Controls to confirm the maximum allowable temperature regarding the operating pressure.

Metal Seats

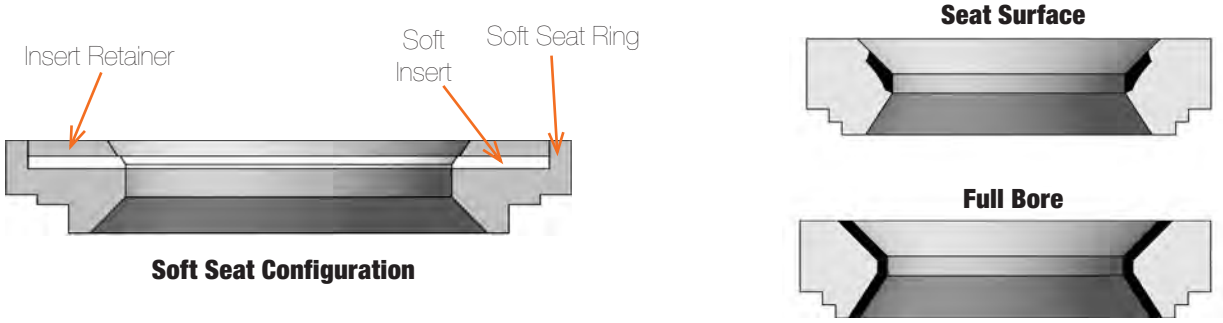
The GLH valve standard configuration, with an unbalanced trim and a metal seat, comply with ANSI B16.104/ FCI 70.2 class IV, which specifies a maximum allowable leakage of 0.01% of nominal valve capacity.
The exceptional sealing capacity of the GLH Series is easily reached due to its self-centering seat design. Higher seat leakage classes are available as an option.

Soft Seats

Soft seats are used in applications requiring extreme tightness, complying with ANSI B16.104/FCI 70.2 class VI. The GLH soft seat is comprised of a polymer assembled between two metal pieces, and is interchangeable with the metal seat. The soft seat inserts are usually manufactured in PTFE, and therefore the maximum operating temperature should be lower than 300ºF @ 290 psig (150ºC @ 20 barg).
For temperatures below –85ºF (–65ºC), soft seats may be used in high-pressure applications.

The standard manufacturing material for the GLH plug, seat, and seat retainer is 316 stainless steel, except in cases where special alloys are required or specified. As a general rule, hardened trim, such as Alloy 6 facing, heat-treated SS, should be used for all conditions of critical flow or in services where the operating temperature exceeds 600ºF (316ºC). Special alloys such as Alloy 20, Monel, Hastelloy C, Hastelloy B, and other materials may be supplied upon request.

Seats



GLH SERIES - SEAT OPTIONS (FIGURE 17)

Trim Data

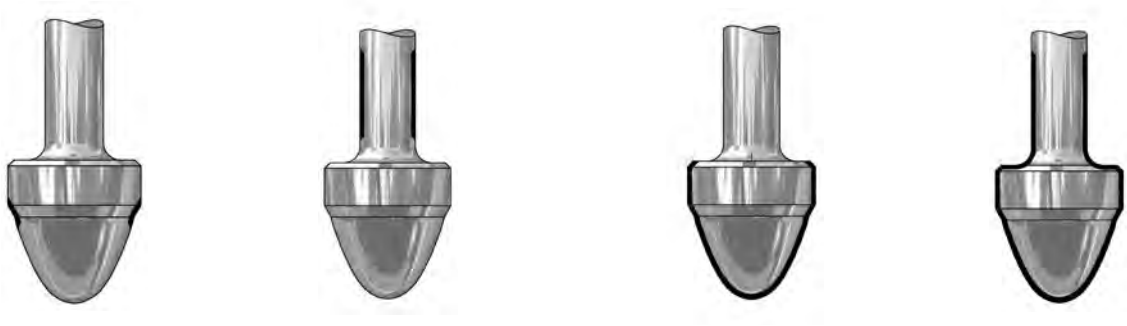
DIFFERENTIAL PRESSURE VALUES REQUIRING HARDENED TRIM (TABLE VI)

VALVE SIZE (Inches)	WATER				STEAM (SATURATED)				STEAM (SUPER-HEATED)				PROCESS FLUIDS (GENERAL)				CLEAN GASES			
	Throttling		On-Off		Throttling		On-Off		Throttling		On-Off		Throttling		On-Off		Throttling		On-Off	
	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar	psi	Bar
0.5 to 1.5	175	12.1	250	17.2	100	6.9	200	13.8	300	20.7	600	41.4	175	12.1	250	17.2	600	41.4	900	62.1
2 & 3	150	10.3	200	13.8	25	1.7	50	3.4	200	13.8	300	20.7	150	10.3	200	13.8	350	24.1	600	41.4
4 & 6	100	6.9	125	8.6	All Apps.		25	1.7	100	6.9	150	10.3	75	5.2	125	8.6	200	13.8	300	20.7
8 to 12	50	3.4	100	6.9	All Apps.		All Apps.		50	3.4	100	6.9	50	3.4	100	6.9	125	8.6	175	12.1

STANDARD UNBALANCED TRIM AND ACTUATOR DATA (TABLE VII)

VALVE SIZE (Inches)	ANSI CLASS	FULL AREA TRIM SIZE		SEAT AREA		STEM DIAMETER		STEM AREA		STROKE		STANDARD ACTUATOR SIZE
		in.	mm	in.²	cm²	in.	mm	in.²	cm²	in.	mm	
1	900-1500	0.81	21	0.518	3.345	0.575	14.6	0.259	1.674	0.75	19.05	25
	2500	0.71	18	0.405	2.613	0.575	14.6	0.259	1.674	0.75	19.05	25
1.5	900-1500	1.25	32	1.227	7.917	0.890	22.6	0.622	4.011	1.00	25.40	50
	2500	1.00	25	0.785	5.067	0.890	22.6	0.622	4.011	0.75	19.05	50
2	900-1500	1.63	41	2.074	13.38	0.890	22.6	0.622	4.011	1.50	38.10	50
	2500	1.25	32	1.227	7.917	0.890	22.6	0.622	4.011	1.00	25.40	50
3	900-1500	2.63	67	5.412	34.92	1.520	38.6	1.814	11.70	2.00	50.80	100
	2500	2.00	51	3.142	20.27	1.138	28.9	1.017	6.560	1.50	38.10	100
4	900-1500	3.50	89	9.621	62.07	1.520	38.6	1.814	11.70	2.50	63.50	100
	2500	2.63	67	5.412	34.92	1.520	38.6	1.814	11.70	2.00	50.80	100
6	900-1500	5.00	127	19.63	126.7	2.024	51.4	3.216	20.75	3.00	76.20	100
	2500	4.00	102	12.57	81.07	2.024	51.4	3.216	20.75	3.00	76.20	100
8	900-1500	6.25	159	30.68	198.0	2.524	64.1	5.002	32.27	4.00	101.6	100
	2500	5.00	127	19.63	126.7	2.524	64.1	5.002	32.27	3.00	76.20	100
10	900-1500	8.00	203	50.27	324.3	3.024	76.8	7.180	46.32	4.00	101.6	100
	2500	6.25	159	30.68	198.0	3.024	76.8	7.180	46.32	4.00	101.6	100
12	900-1500	9.50	241	70.88	457.3	3.024	76.8	7.180	46.32	4.00	101.6	100
	2500	8.00	203	50.27	324.3	3.024	76.8	7.180	46.32	4.00	101.6	100

PLUG – HARD FACING VARIATIONS (FIGURE 18)



Seat Surface | Lower Guide Area | Full Contour | Full Contour & LGA

CHARACTERISTICS OF TRIM MATERIALS (TABLE VIII)

TRIM MATERIALS	HARDNESS (R_c)	MAX. RECOMMENDED TEMPERATURE		IMPACT STRENGTH	CORROSION RESISTANCE	EROSION RESISTANCE	ABRASION RESISTANCE
		°F	°C				
316 Stainless Steel	8	600	316	Excellent	Excellent	Fair	Fair
Alloy #6	44	1500	815	Excellent	Excellent	Good	Good
416 Stainless Steel	40	800	426	Good	Fair	Good	Good
17-4 PH (H900)	44	800	426	Good	Good to Excellent	Good	Good
440C Stainless Steel	55-60	800	426	Fair	Fair	Excellent	Excellent
Monel K-500	32	600	316	Good	Good to Excellent	Fair to Good	Good
Tungsten	72	1200	650	Fair	Good on Bases, Poor on Acids	Excellent	Excellent
Colmonoy #5	45-50	1200	650	Good	Fair	Good	Good

PRESSURE-BALANCED TRIM AND ACTUATOR DATA (TABLE IX)

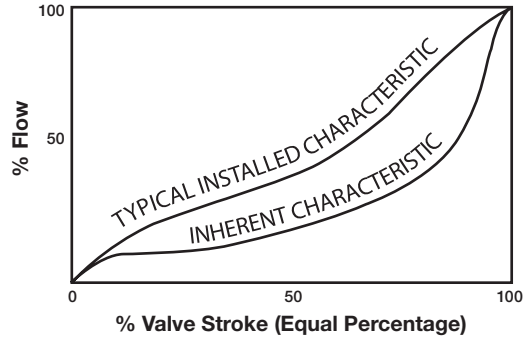
VALVE SIZE (Inches)	ANSI CLASS	FULL AREA TRIM SIZE		SEAT SIZE		STEM DIAMETER		STEM AREA		SLEEVE AREA		OFF-BALANCE AREA				STROKE		STAN-DARD ACTUA-TOR SIZE
												TENDING TO CLOSE (Flow Under)		TENDING TO OPEN (Flow Over)				
		in.	mm	$in.^2$	cm^2	in.	mm	$in.^2$	cm^2	$in.^2$	cm^2	$in.^2$	cm^2	$in.^2$	cm^2	in.	mm	
2	900-1500	1.63	41	2.074	13.38	0.575	14.6	0.259	1.674	2.41	15.5	0.09	0.58	0.35	2.25	1.00	25.4	50
	2500	1.25	32	1.227	7.92	0.575	14.6	0.259	1.674	1.55	10.0	0.07	0.45	0.33	2.12	1.00	25.4	50
3	900-1500	2.63	67	5.412	34.92	0.890	22.6	0.622	4.011	6.49	41.9	0.48	3.10	1.10	7.11	2.00	50.8	100
	2500	2.00	51	3.142	20.27	0.890	22.6	0.622	4.011	3.86	24.9	0.12	0,77	0.74	4.78	1.50	38.1	100
4	900-1500	3.50	89	9.621	62.07	1.138	28.9	1.017	6.560	11.41	73.61	0.80	5,16	1.82	11.7	2.00	50.8	100
	2500	2.63	67	5.412	34.92	1.138	28.9	1.017	6.560	6.77	43.7	0.37	2.39	1.39	8.95	2.00	50.8	100
6	900-1500	5.00	127	19.63	126.7	1.520	38.6	1.814	11.70	22.69	146.4	1.29	8.32	3.10	20.0	2.50	63.5	100
	2500	4.00	102	12.57	81.07	1.520	38.6	1.814	11.70	15.03	97.0	0.69	4.45	2.50	16.2	2.50	63.5	100
8	900-1500	6.25	159	30.68	198.0	2.024	51.4	3.216	20.75	35.78	230.8	1.96	12.6	5.18	33.4	4.00	101.6	100
	2500	5.00	127	19.63	126.7	2.024	51.4	3.216	20.75	23.76	153.3	0.99	6.38	4.21	27.1	3.00	76.2	100
10	900-1500	8.00	203	50.27	324.3	2.524	64.1	5.002	32.27	58.36	376.5	3.18	20.5	8.18	52.8	4.00	101.6	100
	2500	6.25	159	30.68	198.0	2.524	64.1	5.002	32.27	37.12	239.5	1.53	9.87	6.53	42.1	4.00	101.6	100
12	900-1500	9.50	241	70.88	457.3	2.524	64.1	5.002	32.27	79.53	513.1	3.74	24.1	8.74	56.4	4.00	101.6	100
	2500	8.00	203	50.27	324.3	2.524	64.1	5.002	32.27	56.75	366.1	1.57	10.1	6.57	42.4	4.00	101.6	100

GLH SERIES - SPECIFICATIONS & MATERIALS OF CONSTRUCTION (TABLE X)			
BODY	Sizes		1 to 24 inches
	ANSI Ratings		900, 1500 and 2500
	Forms		Globe, angle, 3-Way or special versions
	Materials of Construction		Carbon steel, stainless steel, chrome-moly steel and other castable alloys upon request
	End Connections		Integral flanges (all sizes) NPT threaded (0.5 to 2 inches) Socketweld (0.5 to 4 inches) Buttweld (all sizes) Grayloc (all sizes)
	Gaskets	Flat	PTFE, PTFEG*, KEL-F
		Spiral Wound	316 or 304 SS spiral wound with graphite, PTFE or other filler materials free of asbestos (AFG)
		O-Rings	Inconel X-750 / silver plated hollow O-Ring
BONNET	Types		Standard or extended
	Materials		Same as body
	Bonnet Flange		Separable, made from carbon steel or 316 stainless steel
	Guides	Type	Double upper guide on plug stem, out of flow path
		Materials	316 SS with PTFEG* or graphite insert, bronze, Alloy #6 or other materials available upon request
	Packings	Types	Standard with “V” or square rings, twin seal, packing for vacuum applications
		Materials	PTFE V-Rings, PTFEG* V-rings, braided PTFE, AFP** with Inconel wire, graphite and other materials upon request
TRIM	Types		Unbalanced Pressure-balanced, with elastomer, polymer or metal plug seals
	Flow Characteristics		Equal Percentage, Linear or Quick Open
	Materials		316 SS (standard), 304 SS, 347 SS, 416 SS, 420 SS, 440C SS, 17-4PH and other materials upon request
	Hard Facings	Materials	Alloy #6, Colmonoy #5 or other materials upon request
		Types	Hardening of seating surfaces, hardening of plug full contour and seat full bore, hardening of plug stem region in contact with the lower guide
	Soft Seats	Materials	PTFE, PTFEG*, FEP, KEL-F, polyurethane, PEEK
ACTUATOR	Types	Pneumatic	Double-acting cylinder with positive spring for failsafe action. Field reversible and available on sizes 25, 50, 100, 200, 300, 400, 500 and 600 Options: manual handwheel, limit stops and others (see the technical bulletin of linear actuators)
		Others	Manual, electro-mechanical or electro-hydraulic upon request
POSITIONER	Types		Pneumatic, analog electro-pneumatic or digital electro-pneumatic with multiple communication protocols

* PTFEG: Glass-Filled PTFE.
**AFP: Asbestos-free packing.

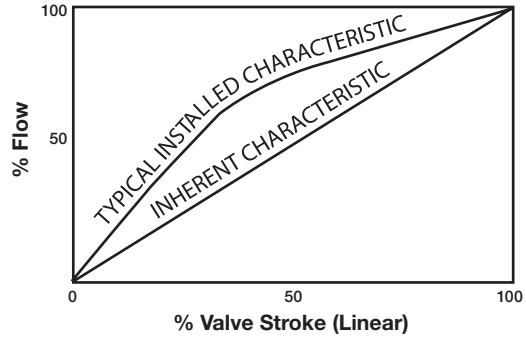
Equal Percentage

Equal Percentage is the most common characteristic used in process control. The flow rate change by valve stroke unit is directly proportional to the flow rate passing through the valve at the moment immediately before the stroke movement. Whenever the total differential pressure of the system is large when compared to the differential pressure through the valve, a valve with an Equal Percentage characteristic will perform in most control loops, similarly to a valve with a Linear characteristic



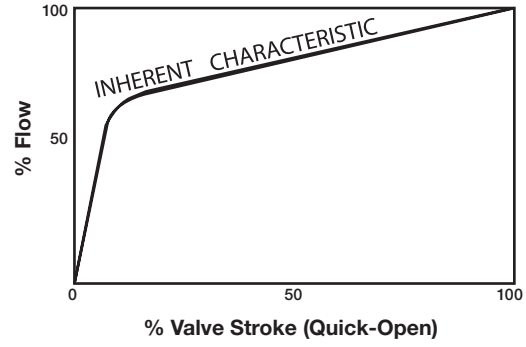
Linear

The Linear characteristic creates equal changes in flow rate per unit of valve stroke, regardless of plug position. Linear plugs are frequently used in systems where the differential pressure through the valve corresponds to the major part of the total differential pressure of the system.



Quick-open

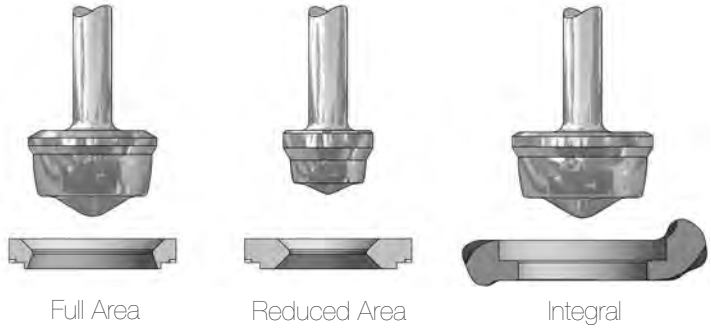
Quick-open plugs are used in on-off services and are designed to create large increments of flow rate, even from small opening percentages.



Trim Sizes

Two sizes of trim are normally available: the standard size, with full-area trim; and the second size, with reduced area trim. Reduced area trims are available in a wide variety of dimensions, which are necessary when the required CV, due to the process conditions, is relatively small for a specific body size intended to be used. In addition to these options, an integral trim may be supplied, which uses a special seat machined onto the valve body and an oversized plug to provide an even larger CV than the CV provided by the standard full-area trim.

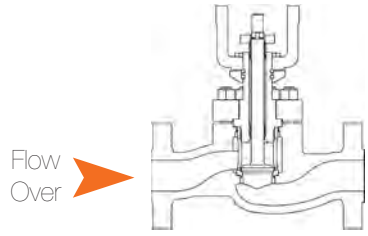
As the GLH valve trim is completely interchangeable by body size and pressure class, the change of trim size and valve nominal CV is a very simple operation.



TRIM SIZES (FIGURE 19)

FLOW COEFFICIENTS

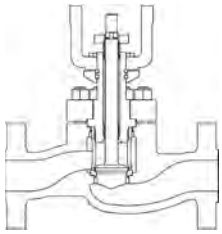
Class 900/1500



FLOW COEFFICIENTS (C_V) - EQUAL PERCENTAGE * (TABLE XI)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.81 (21)	0.75	19.05	9.8	8.7	7.3	5.4	3.9	2.7	1.89	1.29	0.85	0.58
	0.71 (18)	0.75	19.05	9.2	7.9	6.1	4.5	3.2	2.2	1.49	0.99	0.68	0.46
	0.63 (16)	0.75	19.05	8.4	6.6	4.9	3.5	2.4	1.71	1.11	0.76	0.51	0.35
	0.50 (13)	0.75	19.05	6.3	4.5	3.3	2.3	1.58	1.09	0.71	0.48	0.33	0.22
	0.38 (10)	0.75	19.05	4.1	2.8	1.92	1.32	0.90	0.61	0.42	0.27	0.182	0.132
	0.31 (8)	0.75	19.05	2.8	2.0	1.27	0.89	0.60	0.40	0.27	0.186	0.127	0.088
	0.25-06 (6.5-06)	0.75	19.05	1.92	1.31	0.87	0.59	0.39	0.27	0.192	0.121	0.083	0.057
	0.25-12 (6.5-12)	0.75	19.05	1.10	0.83	0.60	0.36	0.23	0.159	0.100	0.074	0.060	0.045
	0.12-00 (3.2-00)	0.50	12.70	0.57	0.36	0.22	0.150	0.110	0.072	0.054	0.038	0.027	0.019
1.5	1.25 (32)	1.00	25.40	24	22	18.4	13.3	9.6	6.6	4.6	3.1	2.1	1.43
	1.00 (25)	0.75	19.05	19.4	18.4	14.3	9.3	6.3	4.3	3.0	1.94	1.33	0.91
	0.81 (21)	0.75	19.05	15.9	12.9	8.7	6.0	4.1	2.8	1.89	1.29	0.85	0.59
	0.63 (16)	0.75	19.05	11.2	7.8	5.4	3.7	2.5	1.73	1.12	0.77	0.52	0.36
	0.38 (10)	0.75	19.05	4.2	2.9	1.88	1.28	0.87	0.59	0.41	0.27	0.178	0.128
2	1.63 (41)	1.50	38.10	37	35	29	22	15.7	10.8	7.4	5.0	3.4	2.3
	1.25 (32)	1.00	25.40	31	28	21	14.2	9.9	6.7	4.6	3.1	2.1	1.42
	1.00 (25)	0.75	19.05	24	19.8	14.9	9.3	6.2	4.3	2.9	1.88	1.29	0.88
	0.81 (21)	0.75	19.05	17.7	13.8	8.9	6.0	4.0	2.8	1.87	1.28	0.85	0.57
	0.63 (16)	0.75	19.05	11.1	8.0	5.3	3.6	2.5	1.72	1.11	0.77	0.51	0.35
	0.38 (10)	0.75	19.05	4.3	2.9	1.88	1.28	0.87	0.59	0.41	0.27	0.178	0.128
3	2.63 (67)	2.00	50.80	98	88	77	63	41	29	20	12.9	9.0	6.1
	2.00 (51)	1.50	38.10	75	64	55	42	25	17.1	11.1	7.9	5.2	3.5
	1.63 (41)	1.50	38.10	60	52	36	24	16.9	10.9	7.5	5.1	3.5	2.3
	1.25 (32)	1.00	25.40	38	34	23	14.1	9.9	6.8	4.5	3.0	2.1	1.41
4	3.50 (89)	2.50	63.50	176	160	141	118	76	51	35	24	16.1	11.1
	2.63 (67)	2.00	50.80	131	114	102	69	43	29	20	13.1	9.1	6.1
	2.25 (57)	2.00	50.80	105	90	70	42	29	22	14.9	9.7	6.6	4.6
	1.63 (41)	1.50	38.10	71	55	37	25	16.9	10.9	7.5	5.1	3.5	2.3
6	5.00 (127)	3.00	76.20	366	335	291	236	182	106	71	49	33	23
	3.50 (89)	2.50	63.50	254	210	167	132	79	52	35	24	16.0	11.0
	3.00 (76)	2.00	50.80	193	157	124	104	62	38	26	17.9	11.9	8.0
	2.63 (67)	2.00	50.80	155	124	103	72	43	29	20	12.9	9.1	6.1
8	6.25 (159)	4.00	101.6	570	521	447	361	256	164	112	76	51	35
	5.00 (127)	3.00	76.20	468	406	330	259	192	108	72	49	33	23
	3.50 (89)	2.50	63.50	276	222	177	135	80	52	35	24	16.0	11.0
	2.63 (67)	2.00	50.80	157	128	111	72	43	29	20	12.9	9.0	6.1

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.



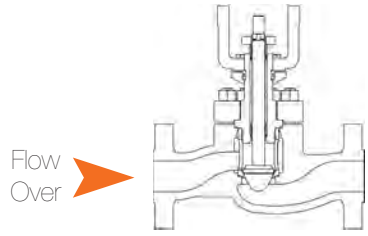
FLOW COEFFICIENTS (C_V) - EQUAL PERCENTAGE * (TABLE XII)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.81 (21)	0.75	19.05	9.3	8.3	7.0	5.2	3.8	2.6	1.79	1.19	0.83	0.57
	0.71 (18)	0.75	19.05	8.9	7.6	5.8	4.3	3.1	2.1	1.39	0.97	0.66	0.45
	0.63 (16)	0.75	19.05	7.8	6.4	4.7	3.4	2.3	1.59	1.09	0.73	0.50	0.34
	0.50 (13)	0.75	19.05	6.2	4.5	3.2	2.2	1.51	1.01	0.71	0.47	0.32	0.22
	0.38 (10)	0.75	19.05	3.8	2.7	1.87	1.28	0.85	0.57	0.39	0.27	0.177	0.118
	0.31 (8)	0.75	19.05	2.9	1.93	1.32	0.89	0.61	0.41	0.27	0.193	0.122	0.089
	0.25-06 (6.5-06)	0.75	19.05	1.87	1.18	0.83	0.56	0.37	0.26	0.177	0.118	0.079	0.053
	0.25-12 (6.5-12)	0.75	19.05	1.11	0.81	0.58	0.35	0.23	0.161	0.100	0.072	0.058	0.044
	0.12-00 (3.2-00)	0.50	12.70	0.55	0.35	0.21	0.150	0.100	0.070	0.053	0.037	0.026	0.019
1.5	1.25 (32)	1.00	25.40	22	21	17.2	12.2	9.1	6.4	4.4	2.9	2.0	1.42
	1.00 (25)	0.75	19.05	18.7	16.7	12.8	8.6	5.9	4.0	2.8	1.87	1.28	0.85
	0.81 (21)	0.75	19.05	16.3	12.2	8.7	5.9	4.1	2.8	1.83	1.22	0.86	0.59
	0.63 (16)	0.75	19.05	10.8	7.4	5.0	3.4	2.4	1.57	1.08	0.73	0.49	0.33
	0.38 (10)	0.75	19.05	4.1	2.8	1.88	1.28	0.85	0.57	0.40	0.27	0.178	0.119
2	1.63 (41)	1.50	38.10	36	33	28	21	14.8	10.8	7.2	4.9	3.3	2.3
	1.25 (32)	1.00	25.40	29	27	20	13.2	9.5	6.5	4.4	3.0	2.0	1.42
	1.00 (25)	0.75	19.05	24	20	14.3	9.2	6.2	4.2	2.9	1.94	1.33	0.88
	0.81 (21)	0.75	19.05	17.7	12.8	8.7	5.8	3.9	2.7	1.77	1.18	0.83	0.56
	0.63 (16)	0.75	19.05	11.0	7.7	5.2	3.5	2.4	1.60	1.10	0.74	0.50	0.34
	0.38 (10)	0.75	19.05	4.2	2.8	1.88	1.28	0.85	0.57	0.40	0.27	0.178	0.119
3	2.63 (67)	2.00	50.80	94	85	74	60	40	28	19.1	13.0	8.8	6.0
	2.00 (51)	1.50	38.10	71	61	53	41	25	15.9	10.9	7.5	5.1	3.5
	1.63 (41)	1.50	38.10	59	50	35	23	16.1	11.1	7.5	5.0	3.4	2.3
	1.25 (32)	1.00	25.40	37	32	22	14.2	9.7	6.6	4.4	3.0	2.0	1.42
4	3.50 (89)	2.50	63.50	166	151	134	112	72	49	34	23	15.9	11.0
	2.63 (67)	2.00	50.80	125	108	97	67	41	28	19.1	13.0	8.8	6.0
	2.25 (57)	2.00	50.80	101	87	68	41	28	21	13.9	9.5	6.4	4.5
	1.63 (41)	1.50	38.10	69	54	36	24	16.0	11.0	7.4	5.0	3.4	2.3
6	5.00 (127)	3.00	76.20	347	319	277	224	174	102	69	47	32	22
	3.50 (89)	2.50	63.50	245	203	161	127	76	50	34	23	16.0	11.0
	3.00 (76)	2.00	50.80	188	153	122	103	60	37	25	17.1	11.1	7.8
	2.63 (67)	2.00	50.80	150	120	100	69	42	28	18.9	12.9	8.8	6.0
8	6.25 (159)	4.00	101.6	545	498	428	346	246	157	108	74	50	34
	5.00 (127)	3.00	76.20	448	389	317	249	185	104	69	47	32	22
	3.50 (89)	2.50	63.50	268	215	171	131	77	51	34	23	16.0	11.0
	2.63 (67)	2.00	50.80	154	126	109	70	42	28	19.1	13.1	8.8	6.0

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.

FLOW COEFFICIENTS

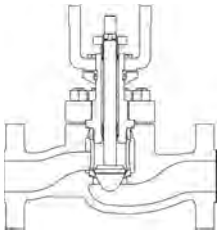
Class 900/1500



FLOW COEFFICIENTS (C_V) - LINEAR * (TABLE XIII)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.81 (21)	0.75	19.05	9.9	9.7	9.3	8.8	8.3	7.5	6.5	5.3	3.7	1.89
	0.71 (18)	0.75	19.05	9.3	8.8	8.4	7.9	7.3	6.5	5.5	4.3	3.0	1.49
	0.63 (16)	0.75	19.05	8.5	7.9	7.4	6.8	6.1	5.3	4.4	3.4	2.3	1.21
	0.50 (13)	0.75	19.05	6.4	5.8	5.4	4.8	4.2	3.6	2.9	2.2	1.49	0.73
	0.38 (10)	0.75	19.05	4.1	3.6	3.3	2.9	2.5	2.1	1.68	1.29	0.83	0.42
	0.31 (8)	0.75	19.05	2.9	2.6	2.3	2.0	1.67	1.47	1.18	0.86	0.57	0.29
	0.25-30 (6.5-30)	0.75	19.05	1.87	1.67	1.48	1.28	1.08	0.92	0.74	0.55	0.36	0.187
	0.25-36 (6.5-36)	0.75	19.05	1.09	0.99	0.93	0.83	0.72	0.61	0.51	0.39	0.26	0.129
	0.12-00 (3.2-00)	0.50	12.70	0.49	0.43	0.38	0.33	0.28	0.24	0.190	0.140	0.095	0.048
	0.12-06 (3.2-06)	0.50	12.70	0.22	0.20	0.180	0.160	0.140	0.120	0.098	0.074	0.050	0.026
	0.12-12 (3.2-12)	0.50	12.70	0.150	0.140	0.120	0.110	0.098	0.086	0.073	0.059	0.046	0.032
	0.12-18 (3.2-18)	0.50	12.70	0.053	0.045	0.038	0.031	0.025	0.019	0.013	0.008	0.004	0.001
	0.12-24 (3.2-24)	0.50	12.70	0.014	0.012	0.010	0.008	0.006	0.005	0.003	0.002	0.001	0.000
1.5	1.25 (32)	1.00	25.40	24	23	22	21	20	18.3	16.3	13.2	9.0	4.7
	1.00 (25)	0.75	19.05	21	20	17.7	16.7	14.7	12.8	10.8	8.3	5.8	2.9
	0.81 (21)	0.75	19.05	16.2	15.2	14.2	12.2	11.1	9.5	7.8	5.9	3.9	2.0
	0.71 (18)	0.75	19.05	14.0	13.0	11.0	10.0	8.9	7.5	6.1	4.6	3.1	1.60
	0.63 (16)	0.75	19.05	10.8	9.8	8.8	7.8	6.8	5.7	4.5	3.4	2.3	1.18
	0.38 (10)	0.75	19.05	4.3	3.8	3.4	3.0	2.5	2.1	1.68	1.28	0.83	0.42
2	1.63 (41)	1.50	38.10	41	39	37	36	33	30	26	21	15.2	7.9
	1.25 (32)	1.00	25.40	33	32	29	27	24	21	17.2	13.2	9.3	4.8
	1.00 (25)	0.75	19.05	26	24	22	19.1	17.1	14.1	12.1	9.0	6.0	3.0
	0.81 (21)	0.75	19.05	18.7	16.7	14.8	12.8	11.8	9.5	7.7	5.8	3.8	1.97
	0.71 (18)	0.75	19.05	14.8	13.8	11.8	10.9	9.1	7.6	6.1	4.5	3.1	1.58
	0.63 (16)	0.75	19.05	12.2	11.2	9.5	8.3	7.1	6.0	4.8	3.6	2.3	1.22
	0.38 (10)	0.75	19.05	4.3	3.8	3.4	3.0	2.5	2.1	1.68	1.28	0.83	0.42
3	2.63 (67)	2.00	50.80	104	101	97	92	86	78	67	54	39	19.8
	2.00 (51)	1.50	38.10	88	83	77	71	62	54	45	35	24	12.1
	1.63 (41)	1.50	38.10	68	63	57	51	45	38	31	23	15.9	7.8
	1.25 (32)	1.00	25.40	45	41	36	32	28	23	19.2	14.1	9.4	4.7
4	3.50 (89)	2.50	63.50	186	180	174	165	154	139	121	97	70	36
	2.63 (67))	2.00	50.80	153	144	133	122	108	93	77	60	41	21
	2.25 (57)	2.00	50.80	128	119	108	97	84	72	59	45	30	15.1
	1.63 (41)	1.50	38.10	77	69	62	54	47	39	31	24	15.9	7.8
6	5.00 (127)	3.00	76.20	381	370	357	339	316	286	248	201	142	74
	3.50 (89)	2.50	63.50	289	270	249	224	199	171	140	107	72	36
	3.00 (76)	2.00	50.80	236	216	196	175	153	130	105	80	54	27
	2.63 (67)	2.00	50.80	193	176	157	139	120	101	82	61	41	21
8	6.25 (159)	4.00	101.6	596	579	557	529	493	447	388	314	222	115
	5.00 (127)	3.00	76.20	515	488	458	422	381	332	277	215	147	75
	3.50 (89)	2.50	63.50	334	304	275	244	212	179	144	109	73	37
	2.63 (67)	2.00	50.80	206	185	163	143	123	103	83	62	41	21

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.



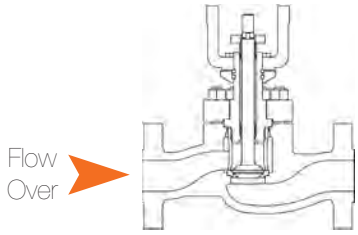
FLOW COEFFICIENTS (C_V) - LINEAR * (TABLE XIV)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.81 (21)	0.75	19.05	9.5	9.2	8.9	8.4	8.0	7.2	6.3	5.1	3.6	1.89
	0.71 (18)	0.75	19.05	9.0	8.6	8.2	7.7	7.0	6.3	5.3	4.2	2.9	1.49
	0.63 (16)	0.75	19.05	8.1	7.6	7.1	6.5	5.8	5.1	4.2	3.3	2.2	1.11
	0.50 (13)	0.75	19.05	6.2	5.6	5.2	4.7	4.1	3.5	2.8	2.2	1.49	0.72
	0.38 (10)	0.75	19.05	4.0	3.5	3.2	2.8	2.4	2.0	1.62	1.21	0.83	0.41
	0.31 (8)	0.75	19.05	2.9	2.5	2.2	2.0	1.72	1.41	1.11	0.87	0.58	0.28
	0.25-30 (6.5-30)	0.75	19.05	1.87	1.57	1.48	1.28	1.08	0.90	0.72	0.54	0.36	0.177
	0.25-36 (6.5-36)	0.75	19.05	1.11	1.01	0.92	0.82	0.72	0.62	0.50	0.38	0.26	0.131
	0.12-00 (3.2-00)	0.50	12.70	0.47	0.42	0.37	0.32	0.28	0.23	0.180	0.140	0.093	0.047
	0.12-06 (3.2-06)	0.50	12.70	0.22	0.20	0.180	0.160	0.140	0.120	0.096	0.073	0.049	0.031
	0.12-12 (3.2-12)	0.50	12.70	0.140	0.130	0.120	0.110	0.096	0.084	0.071	0.058	0.045	0.025
	0.12-18 (3.2-18)	0.50	12.70	0.052	0.044	0.037	0.030	0.024	0.018	0.013	0.008	0.004	0.001
	0.12-24 (3.2-24)	0.50	12.70	0.014	0.012	0.010	0.008	0.006	0.005	0.003	0.002	0.001	0.000
1.5	1.25 (32)	1.00	25.40	23	22	21	20	19.3	17.3	15.3	12.2	8.7	4.6
	1.00 (25)	0.75	19.05	20	18.8	17.8	15.8	14.9	12.9	10.9	8.3	5.6	2.9
	0.81 (21)	0.75	19.05	16.2	15.2	13.2	12.2	11.1	9.2	7.5	5.8	3.8	1.92
	0.71 (18)	0.75	19.05	12.8	11.8	10.8	9.7	8.5	7.2	5.8	4.4	3.0	1.48
	0.63 (16)	0.75	19.05	11.1	9.8	8.8	7.8	6.8	5.7	4.5	3.4	2.3	1.11
	0.38 (10)	0.75	19.05	4.2	3.7	3.3	2.9	2.5	2.1	1.58	1.19	0.81	0.41
2	1.63 (41)	1.50	38.10	38	37	36	34	32	29	25	20	14.8	7.5
	1.25 (32)	1.00	25.40	33	30	28	26	23	20	17.3	13.2	9.0	4.7
	1.00 (25)	0.75	19.05	25	23	21	18.7	15.7	13.8	10.8	8.5	5.7	2.9
	0.81 (21)	0.75	19.05	17.7	15.7	14.8	12.8	10.8	9.2	7.5	5.6	3.7	1.87
	0.71 (18)	0.75	19.05	14.9	12.9	11.9	9.9	8.8	7.5	6.0	4.5	3.0	1.49
	0.63 (16)	0.75	19.05	10.8	9.8	8.8	7.8	6.7	5.5	4.5	3.3	2.3	1.08
	0.38 (10)	0.75	19.05	4.2	3.7	3.3	2.9	2.5	2.1	1.58	1.19	0.81	0.41
3	2.63 (67)	2.00	50.80	99	96	93	88	82	75	66	53	38	19.9
	2.00 (51)	1.50	38.10	84	79	74	67	60	52	43	34	23	12.1
	1.63 (41)	1.50	38.10	66	60	55	49	43	37	30	23	15.0	7.7
	1.25 (32)	1.00	25.40	43	39	34	31	27	22	17.7	13.8	9.0	4.5
4	3.50 (89)	2.50	63.50	178	172	166	158	147	134	116	94	68	35
	2.63 (67)	2.00	50.80	147	137	127	117	104	90	75	58	40	20
	2.25 (57)	2.00	50.80	124	114	104	94	82	70	57	43	29	15.1
	1.63 (41)	1.50	38.10	74	66	59	52	44	37	31	23	14.8	7.7
6	5.00 (127)	3.00	76.20	363	353	340	323	302	274	239	193	138	72
	3.50 (89)	2.50	63.50	279	260	240	217	192	165	136	104	71	36
	3.00 (76)	2.00	50.80	228	210	190	170	148	126	102	78	52	26
	2.63 (67)	2.00	50.80	185	169	151	134	116	97	78	59	40	20
8	6.25 (159)	4.00	101.6	567	551	531	506	472	429	374	303	215	112
	5.00 (127)	3.00	76.20	495	469	440	406	367	321	268	209	143	73
	3.50 (89)	2.50	63.50	323	295	266	236	205	173	140	106	71	36
	2.63 (67)	2.00	50.80	198	178	158	139	119	100	80	60	40	20

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.

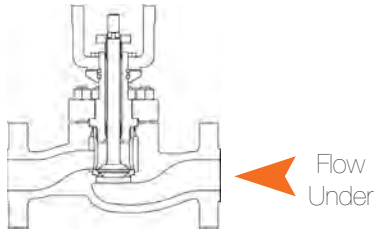
FLOW COEFFICIENTS

Class 900/1500



FLOW COEFFICIENTS (C_V) - QUICK-OPEN * (TABLE XV)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.81 (21)	0.75	19.05	9.9	9.9	9.8	9.6	9.4	9.3	8.0	5.9	3.6	1.88
1.5	1.25 (32)	1.00	25.40	27	27	26	26	26	23	18.8	13.8	8.7	4.8
2	1.63 (41)	1.50	38.10	45	45	44	44	43	43	37	28	15.0	8.2
3	2.63 (67)	2.00	50.80	118	118	116	115	114	102	86	64	39	22
4	3.50 (89)	2.50	63.50	204	204	201	198	195	174	146	107	69	37
6	5.00 (127)	3.00	76.20	422	422	421	420	386	339	283	215	142	76
8	6.25 (159)	4.00	101.6	656	648	641	631	621	551	455	349	218	116

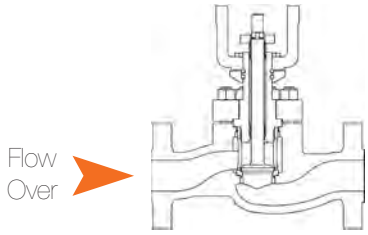


FLOW COEFFICIENTS (C_V) - QUICK-OPEN * (TABLE XVI)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.81 (21)	0.75	19.05	9.5	9.4	9.3	9.2	9.1	8.9	7.7	5.7	3.5	1.88
1.5	1.25 (32)	1.00	25.40	27	25	25	25	25	22	19.4	13.3	8.8	4.9
2	1.63 (41)	1.50	38.10	43	43	42	42	42	41	35	27	15.0	8.0
3	2.63 (67)	2.00	50.80	111	111	110	109	109	97	83	62	38	21
4	3.50 (89)	2.50	63.50	195	195	192	190	187	167	142	105	67	36
6	5.00 (127)	3.00	76.20	406	406	404	403	372	328	274	209	138	74
8	6.25 (159)	4.00	101.6	628	620	614	605	597	531	440	339	212	114

* The data above refer to the valves with unbalanced trim. Pressure-balanced trim is not available with the quick-open characteristic.

Class 2500



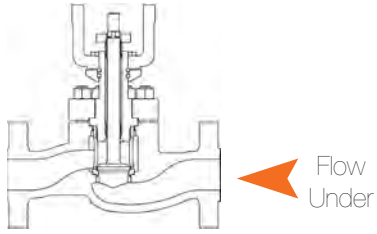
FLOW COEFFICIENTS (C_V) - EQUAL PERCENTAGE * (TABLE XVII)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.71 (18)	0.75	19.05	8.3	7.3	5.8	4.4	3.1	2.2	1.5	0.99	0.68	0.46
	0.63 (16)	0.75	19.05	7.6	6.3	4.8	3.5	2.4	1.69	1.09	0.76	0.51	0.35
	0.50 (13)	0.75	19.05	6.0	4.5	3.3	2.3	1.58	1.09	0.71	0.49	0.33	0.22
	0.38 (10)	0.75	19.05	4.0	2.8	1.92	1.31	0.90	0.61	0.41	0.27	0.182	0.131
	0.31 (8)	0.75	19.05	2.9	1.98	1.29	0.90	0.60	0.41	0.28	0.188	0.129	0.089
	0.25-09 (6.5-09)	0.75	19.05	1.92	1.31	0.87	0.59	0.39	0.27	0.192	0.121	0.083	0.057
	0.25-15 (6.5-15)	0.75	19.05	1.10	0.83	0.60	0.36	0.23	0.159	0.100	0.074	0.060	0.045
	0.12-03 (3.2-03)	0.50	12.70	0.57	0.36	0.22	0.150	0.110	0.072	0.054	0.038	0.027	0.019
1.5	1.00 (25)	0.75	19.05	15.8	14.8	11.9	8.5	5.9	4.1	2.9	1.88	1.28	0.88
	0.81 (21)	0.75	19.05	14.2	12.2	8.5	6.0	4.2	2.8	1.93	1.32	0.87	0.60
	0.63 (16)	0.75	19.05	10.0	7.4	5.2	3.6	2.5	1.69	1.09	0.76	0.51	0.35
	0.38 (10)	0.75	19.05	4.3	2.9	1.92	1.32	0.89	0.61	0.41	0.27	0.182	0.132
2	1.25 (32)	1.00	25.40	23	22	18.5	12.7	9.3	6.4	4.4	2.9	2.0	1.37
	1.00 (25)	0.75	19.05	20	18.4	14.3	9.3	6.3	4.3	3.0	1.94	1.33	0.91
	0.81 (21)	0.75	19.05	16.8	12.8	8.8	5.9	4.1	2.8	1.88	1.28	0.85	0.57
	0.63 (16)	0.75	19.05	10.9	7.7	5.3	3.6	2.5	1.68	1.09	0.75	0.51	0.35
	0.38 (10)	0.75	19.05	4.2	2.9	1.87	1.28	0.87	0.59	0.40	0.27	0.177	0.128
3	2.00 (51)	1.50	38.10	59	53	48	39	25	16.8	10.9	7.7	5.2	3.5
	1.63 (41)	1.50	38.10	53	46	34	24	16.2	11.1	7.7	5.1	3.5	2.3
	1.25 (32)	1.00	25.40	35	31	22	13.8	9.6	6.6	4.4	3.0	2.1	1.38
4	2.63 (67)	2.00	50.80	104	94	86	64	42	29	20	13.1	9.1	6.1
	2.25 (57)	2.00	50.80	88	79	65	41	29	21	14.9	9.8	6.6	4.6
	1.63 (41)	1.50	38.10	65	53	36	24	16.8	10.9	7.5	5.1	3.5	2.3
6	4.00 (102)	2.50	63.50	261	242	215	181	136	83	52	33	21	15.0
	3.50 (89)	2.50	63.50	218	188	156	126	78	52	35	24	16.0	11.0
	3.00 (76)	2.00	50.80	176	147	120	102	62	38	26	17.9	12.0	8.0
	2.63 (67)	2.00	50.80	147	120	100	71	43	29	20	13.0	9.1	6.1

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.

FLOW COEFFICIENTS

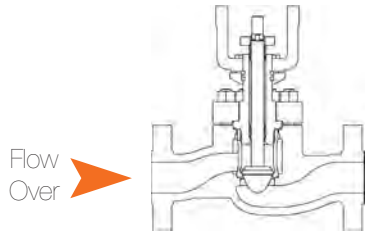
Class 2500



FLOW COEFFICIENTS (C_V) - EQUAL PERCENTAGE * (TABLE XVIII)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.71 (18)	0.75	19.05	8.0	7.0	5.6	4.2	3.0	2.1	1.39	0.97	0.66	0.45
	0.63 (16)	0.75	19.05	7.3	6.0	4.6	3.3	2.3	1.61	1.10	0.74	0.50	0.34
	0.50 (13)	0.75	19.05	5.7	4.3	3.2	2.2	1.48	0.99	0.69	0.47	0.32	0.22
	0.38 (10)	0.75	19.05	3.9	2.7	1.93	1.32	0.87	0.59	0.40	0.27	0.182	0.122
	0.31 (8)	0.75	19.05	2.8	1.91	1.31	0.89	0.60	0.40	0.27	0.191	0.121	0.089
	0.25-09 (6.5-09)	0.75	19.05	1.79	1.19	0.84	0.57	0.38	0.26	0.179	0.119	0.080	0.054
	0.25-15 (6.5-15)	0.75	19.05	1.10	0.81	0.58	0.35	0.23	0.159	0.100	0.072	0.058	0.044
	0.12-03 (3.2-03)	0.50	12.70	0.55	0.35	0.21	0.150	0.100	0.070	0.053	0.037	0.026	0.019
1.5	1.00 (25)	0.75	19.05	15.2	14.2	12.2	8.4	5.9	4.1	2.8	1.93	1.32	0.87
	0.81 (21)	0.75	19.05	12.8	10.8	8.0	5.6	3.8	2.7	1.77	1.18	0.83	0.57
	0.63 (16)	0.75	19.05	9.8	7.2	5.0	3.5	2.4	1.61	1.11	0.74	0.50	0.34
	0.38 (10)	0.75	19.05	4.1	2.8	1.88	1.28	0.85	0.57	0.40	0.27	0.178	0.119
2	1.25 (32)	1.00	25.40	23	22	17.8	12.8	9.0	6.2	4.2	2.9	1.97	1.38
	1.00 (25)	0.75	19.05	19.2	17.2	13.1	8.9	6.1	4.1	2.8	1.92	1.31	0.87
	0.81 (21)	0.75	19.05	16.1	12.1	8.7	5.8	4.0	2.7	1.81	1.21	0.85	0.57
	0.63 (16)	0.75	19.05	10.8	7.4	5.0	3.4	2.4	1.57	1.08	0.73	0.49	0.33
	0.38 (10)	0.75	19.05	4.1	2.8	1.88	1.29	0.85	0.57	0.40	0.27	0.178	0.119
3	2.00 (51)	1.50	38.10	58	51	46	37	24	16.1	11.1	7.6	5.1	3.5
	1.63 (41)	1.50	38.10	48	43	32	23	15.8	10.9	7.2	4.9	3.4	2.3
	1.25 (32)	1.00	25.40	34	31	22	14.1	9.6	6.6	4.4	3.0	2.0	1.41
4	2.63 (67)	2.00	50.80	97	88	82	61	40	28	18.9	12.9	8.7	6.0
	2.25 (57)	2.00	50.80	86	77	63	39	28	21	13.9	9.5	6.4	4.5
	1.63 (41)	1.50	38.10	63	50	35	24	15.8	10.9	7.3	4.9	3.4	2.3
6	4.00 (102)	2.50	63.50	248	230	205	174	131	80	50	32	20	15.0
	3.50 (89)	2.50	63.50	211	181	149	121	75	50	34	23	16.0	11.0
	3.00 (76)	2.00	50.80	171	143	116	99	60	37	25	17.1	11.0	7.8
	2.63 (67)	2.00	50.80	140	115	97	69	42	28	18.9	12.9	8.8	6.0

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.



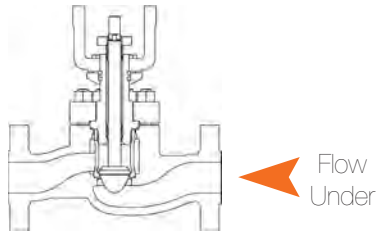
FLOW COEFFICIENTS (C_V) - LINEAR * (TABLE XIX)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.71 (18)	0.75	19.05	8.4	8.0	7.8	7.3	6.9	6.2	5.3	4.2	3.0	1.49
	0.63 (16)	0.75	19.05	7.6	7.2	6.8	6.4	5.8	5.1	4.3	3.3	2.3	1.19
	0.50 (13)	0.75	19.05	6.3	5.8	5.3	4.7	4.1	3.5	2.9	2.2	1.51	0.75
	0.38 (10)	0.75	19.05	4.0	3.6	3.2	2.9	2.5	2.1	1.72	1.31	0.85	0.42
	0.31 (8)	0.75	19.05	2.9	2.6	2.3	2.0	1.68	1.48	1.19	0.87	0.57	0.29
	0.25-33 (6.5-33)	0.75	19.05	1.88	1.68	1.48	1.29	1.09	0.92	0.74	0.55	0.37	0.188
	0.25-39 (6.5-39)	0.75	19.05	1.09	0.99	0.93	0.83	0.72	0.61	0.51	0.39	0.26	0.129
	0.12-03 (3.2-03)	0.50	12.70	0.49	0.43	0.38	0.33	0.28	0.24	0.190	0.140	0.095	0.048
	0.12-09 (3.2-09)	0.50	12.70	0.22	0.20	0.180	0.160	0.140	0.120	0.098	0.074	0.050	0.026
	0.12-15 (3.2-15)	0.50	12.70	0.150	0.140	0.120	0.110	0.098	0.086	0.073	0.059	0.046	0.032
	0.12-21 (3.2-21)	0.50	12.70	0.053	0.045	0.038	0.031	0.025	0.019	0.013	0.008	0.004	0.001
	0.12-27 (3.2-27)	0.50	12.70	0.014	0.012	0.010	0.008	0.006	0.005	0.003	0.002	0.001	0.000
1.5	1.00 (25)	0.75	19.05	16.1	16.1	15.1	14.1	13.1	12.1	12.1	12.1	5.7	3.0
	0.81 (21)	0.75	19.05	13.8	12.8	11.8	10.8	9.9	8.8	7.3	5.6	3.8	1.97
	0.71 (18)	0.75	19.05	12.1	12.1	11.1	9.7	8.6	7.4	6.1	4.5	3.1	1.51
	0.63 (16)	0.75	19.05	10.0	9.4	8.6	7.6	6.7	5.7	4.6	3.5	2.3	1.20
	0.38 (10)	0.75	19.05	4.3	3.8	3.4	2.9	2.5	2.1	1.68	1.28	0.83	0.42
2	1.25 (32)	1.00	25.40	26	25	24	22	21	18.8	15.8	12.9	8.9	4.5
	1.00 (25)	0.75	19.05	22	20	19.2	17.2	16.1	14.1	11.1	8.8	5.8	3.0
	0.81 (21)	0.75	19.05	16.9	15.9	13.9	12.9	10.9	9.3	7.5	5.7	3.9	1.98
	0.71 (18)	0.75	19.05	14.1	13.1	12.1	10.1	9.1	7.7	6.1	4.6	3.1	1.61
	0.63 (16)	0.75	19.05	11.2	10.2	9.3	8.1	7.0	5.9	4.8	3.6	2.3	1.22
	0.38 (10)	0.75	19.05	4.3	3.8	3.4	3.0	2.5	2.1	1.69	1.29	0.83	0.42
3	2.00 (51)	1.50	38.10	64	62	59	56	53	47	41	33	23	11.9
	1.63 (41)	1.50	38.10	56	53	49	45	41	35	29	23	16.1	8.0
	1.25 (32)	1.00	25.40	41	38	34	31	27	23	17.8	13.9	9.2	4.7
4	2.63 (67)	2.00	50.80	111	107	103	97	91	81	70	56	39	19.9
	2.25 (57)	2.00	50.80	102	96	90	83	75	66	55	43	30	15.1
	1.63 (41)	1.50	38.10	71	64	58	52	45	38	31	23	16.1	8.0
6	4.00 (102)	2.50	63.50	263	257	248	232	209	187	159	126	86	41
	3.50 (89)	2.50	63.50	241	229	216	200	181	159	133	104	71	36
	3.00 (76)	2.00	50.80	205	193	178	162	144	123	101	78	53	27
	2.63 (67)	2.00	50.80	177	164	149	133	116	99	80	61	41	21

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.

FLOW COEFFICIENTS

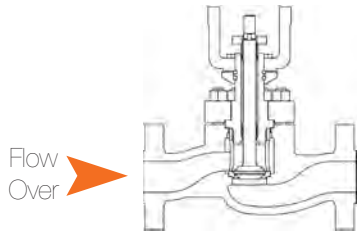
Class 2500



FLOW COEFFICIENTS (C_V) - LINEAR * (TABLE XX)

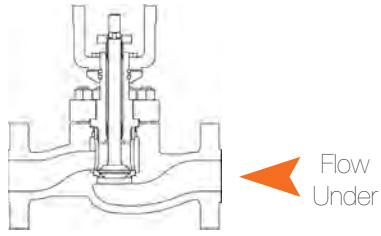
VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.71 (18)	0.75	19.05	8.0	7.7	7.4	7.0	6.6	5.9	5.1	4.1	2.9	1.49
	0.63 (16)	0.75	19.05	7.4	7.0	6.6	6.1	5.6	4.9	4.1	3.2	2.2	1.09
	0.50 (13)	0.75	19.05	6.0	5.5	5.0	4.5	4.0	3.4	2.8	2.1	1.41	0.74
	0.38 (10)	0.75	19.05	3.9	3.5	3.1	2.8	2.4	1.99	1.59	1.19	0.82	0.41
	0.31 (8)	0.75	19.05	2.8	2.5	2.2	2.0	1.69	1.39	1.09	0.84	0.57	0.28
	0.25-33 (6.5-33)	0.75	19.05	1.87	1.57	1.48	1.28	1.08	0.90	0.72	0.54	0.36	0.177
	0.25-39 (6.5-39)	0.75	19.05	1.10	1.00	0.91	0.81	0.71	0.61	0.50	0.38	0.26	0.130
	0.12-03 (3.2-03)	0.50	12.70	0.47	0.42	0.37	0.32	0.28	0.23	0.180	0.140	0.093	0.047
	0.12-09 (3.2-09)	0.50	12.70	0.22	0.20	0.180	0.160	0.140	0.120	0.096	0.073	0.049	0.031
	0.12-15 (3.2-15)	0.50	12.70	0.140	0.130	0.120	0.110	0.096	0.084	0.071	0.058	0.045	0.025
	0.12-21 (3.2-21)	0.50	12.70	0.052	0.044	0.037	0.030	0.024	0.018	0.013	0.008	0.004	0.001
	0.12-27 (3.2-27)	0.50	12.70	0.014	0.012	0.010	0.008	0.006	0.005	0.003	0.002	0.001	0.000
1.5	1.00 (25)	0.75	19.05	16.2	15.2	14.2	14.2	13.2	11.1	11.1	11.1	5.7	2.9
	0.81 (21)	0.75	19.05	13.9	12.9	11.9	10.9	9.7	8.5	7.0	5.5	3.8	1.89
	0.71 (18)	0.75	19.05	12.2	11.2	10.2	9.4	8.3	7.1	5.9	4.5	3.1	1.53
	0.63 (16)	0.75	19.05	9.9	9.0	8.2	7.3	6.4	5.4	4.4	3.4	2.3	1.09
	0.38 (10)	0.75	19.05	4.1	3.7	3.3	2.9	2.5	1.98	1.58	1.19	0.81	0.41
2	1.25 (32)	1.00	25.40	24	24	23	21	19.8	18	14.8	11.9	8.6	4.4
	1.00 (25)	0.75	19.05	21	20	18	17.3	15.3	13.2	11.2	8.6	5.8	3.0
	0.81 (21)	0.75	19.05	15.9	14.9	13.9	11.9	10.9	9.0	7.4	5.7	3.8	1.89
	0.71 (18)	0.75	19.05	13.9	12.9	10.9	9.9	8.6	7.3	5.9	4.5	3.0	1.49
	0.63 (16)	0.75	19.05	11.0	9.8	8.8	7.8	6.7	5.6	4.5	3.4	2.3	1.10
	0.38 (10)	0.75	19.05	4.2	3.7	3.3	2.9	2.5	2.1	1.58	1.19	0.81	0.41
3	2.00 (51)	1.50	38.10	61	59	57	54	51	46	39	32	22	11.9
	1.63 (41)	1.50	38.10	55	51	47	44	39	34	28	22	15.1	7.8
	1.25 (32)	1.00	25.40	40	36	33	30	26	22	18.1	13.1	9.2	4.6
4	2.63 (67)	2.00	50.80	106	103	98	93	87	78	68	54	38	19.9
	2.25 (57)	2.00	50.80	97	92	87	80	73	64	54	42	29	15.1
	1.63 (41)	1.50	38.10	68	62	56	50	44	37	30	23	15.1	7.8
6	4.00 (102)	2.50	63.50	252	245	237	222	200	180	154	122	84	40
	3.50 (89)	2.50	63.50	231	219	207	191	174	153	129	101	70	35
	3.00 (76)	2.00	50.80	199	187	172	157	139	120	99	76	52	26
	2.63 (67)	2.00	50.80	168	156	141	127	111	94	77	58	40	19.8

* The data above refer to the valves with unbalanced trim. Consult VSI Controls to obtain information regarding the C_V of pressure-balanced valves.



FLOW COEFFICIENTS (C_V) - QUICK-OPEN * (TABLE XXI)

VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.71 (18)	0.75	19.05	8.8	8.8	8.7	8.6	8.4	7.8	6.8	5.2	3.3	1.79
1.5	1.00 (25)	0.75	19.05	17.9	17.9	17.9	16.9	16.9	15.9	13.9	10.9	6.7	3.6
2	1.25 (32)	1.00	25.40	28	28	28	27	27	25	22	17.2	11.2	5.7
3	2.00 (51)	1.50	38.10	70	70	69	69	67	62	53	41	26	14.1
4	2.63 (67)	2.00	50.80	114	114	113	111	109	99	88	68	43	23
6	4.00 (102)	2.50	63.50	269	269	266	263	259	229	199	159	100	45



FLOW COEFFICIENTS (C_V) - QUICK-OPEN *(TABLE XXII)

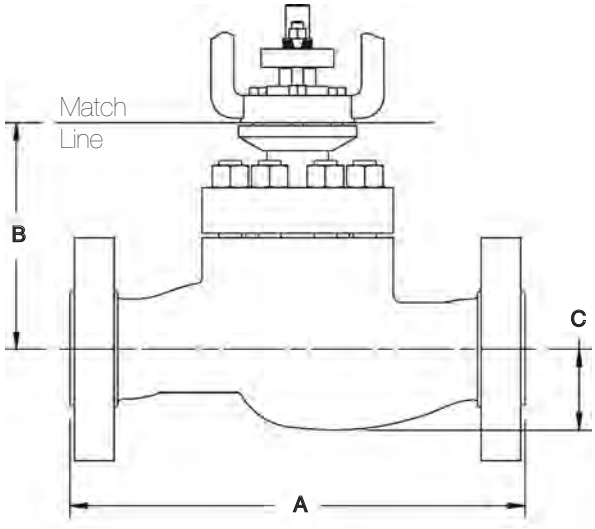
VALVE SIZE (Inches)	TRIM SIZE T.N.	STROKE		C_V AT PERCENT OPEN									
		in.	mm	100	90	80	70	60	50	40	30	20	10
1	0.71 (18)	0.75	19.05	8.3	8.3	8.2	8.1	8.1	7.5	6.6	5.0	3.2	1.79
1.5	1.00 (25)	0.75	19.05	17.8	17.8	17.8	16.8	16.8	15.8	13.8	10.9	6.9	3.8
2	1.25 (32)	1.00	25.40	27	27	27	26	26	24	21	16.2	10.1	6.1
3	2.00 (51)	1.50	38.10	65	65	64	64	63	58	50	40	25	12.9
4	2.63 (67)	2.00	50.80	109	109	108	107	104	99	85	65	40	22
6	4.00 (102)	2.50	63.50	261	261	257	255	250	235	205	155	100	55

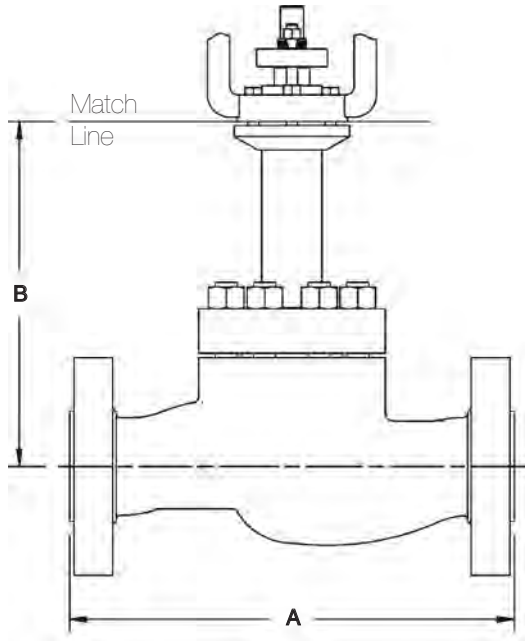
* The data above refer to the valves with unbalanced trim. Pressure-balanced trim is not available with the quick-open characteristic.

Valve Sizing

GLH valves are sized and selected according to rigorous criteria established by VSI Controls, based on internationally recognized standards and procedures. Consult VSI Controls to receive valuable technical support, which will help you regarding control-valve sizing and application issues.

DIMENSIONS, ESTIMATED SHIPPING WEIGHTS

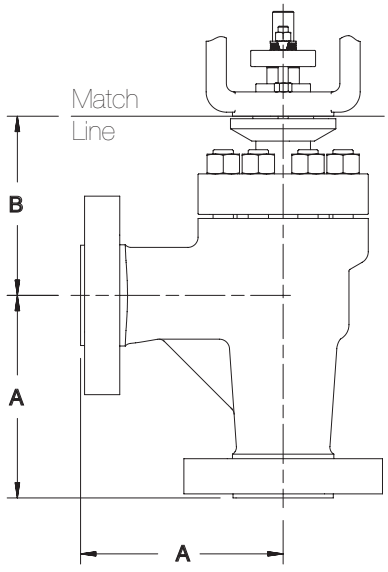




DIMENSIONS - GLOBE VALVE - ANSI CLASS 900, 1500 & 2500 (TABLE XXIII)

VALVE SIZE (Inches)	A						B								C				Clearance Required Above Actuator for Disassembly	
	Face-to-Face (1)						Standard Bonnet				Extended Bonnet									
	Class 900		Class 1500		Class 2500		Class 900-1500		Class 2500		Class 900-1500		Class 2500		Class 900-1500		Class 2500		Class 900-2500	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1	11.5	292	11.5	292	12.5	318	5.6	143	6.8	173	10.1	257	11.3	286	1.8	44	1.8	44	3.6	90
1.5	13.1	333	13.1	333	15.0	381	8.7	221	8.7	221	13.2	334	13.2	334	2.7	68	2.4	60	5.6	141
2	14.8	375	14.8	375	16.3	413	8.7	221	8.7	221	13.2	334	13.2	334	2.8	71	3.0	77	6.1	154
3	17.4	441	18.1	460	26.0	660	11.4	289	12.9	328	18.4	467	19.9	506	4.2	106	3.7	94	8.4	214
4	20.1	511	20.9	530	29.0	737	12.4	316	14.6	371	19.4	493	21.6	549	4.4	113	5.4	138	10.7	272
6	28.1	714	30.3	768	34.0	864	19.4	493	17.4	442	26.4	671	27.3	692	7.2	183	7.3	185	13.6	345
8	36.0	914	38.3	972	40.3	1022	18.6	473	24.3	616	24.2	613	31.3	794	9.4	240	10.3	262	17.8	451
10	39.0	991	42.0	1067	54.0	1372	21.9	556	26.0	660	28.9	734	33.0	838	11.2	284	10.0	254	19.5	495
12	44.5	1130	48.0	1219	62.0	1575	26.6	675	28.0	711	33.6	852	35.0	889	14.0	356	12.9	327	20.5	512

(1) The dimensions above are in accordance with the latest edition of ANSI/ISA-75.08.06 (long pattern) and are applicable only to flanged valves with raised face flanges. For RTJ flanges and other types of end connections, consult VSI Controls.



DIMENSIONS - ANGLE VALVE - ANSI CLASS 900, 1500 & 2500 (TABLE XXIV)

VALVE SIZE (Inches)	ANSI Class	A (1)		B				Clearance Required Above Actuator for Disassembly	
				Standard Bonnet		Extended Bonnet			
		in.	mm	in.	mm	in.	mm	in.	mm
0.5 to 1	900-1500	5.5	140	4.7	119	9.2	234	3.6	90
	2500	6.0	152	5.8	147	10.3	262	3.6	90
1.5	900-1500	6.5	165	6.5	165	11.0	279	5.6	142
	2500	7.5	191	7.0	178	11.5	292	5.6	142
2	900-1500	7.3	185	7.1	180	11.6	295	6.1	155
	2500	8.9	226	7.9	201	12.4	315	6.1	155
3	900-1500	9.3	236	9.8	249	16.8	427	8.4	213
	2500	13.0	330	11.2	284	18.2	462	8.3	211
4	900-1500	12.5	318	11.1	282	18.1	460	9.7	246
	2500	14.5	368	12.6	320	19.6	498	10.7	272
6	900-1500	13.9	353	13.3	338	20.3	516	12.2	310
	2500	17.0	432	16.1	409	23.1	587	13.6	345
8	900-1500	16.4	417	14.5	368	21.5	547	16.7	424
	2500	20.1	511	20.8	528	27.8	706	17.8	452
10	900-1500	19.5	495	15.6	396	22.6	574	18.3	465
	2500	25.0	635	21.1	536	28.1	714	19.7	500

(1) Dimension A is in accordance with VSI Controls's standards.

ESTIMATED SHIPPING WEIGHTS* (TABLE XXV)

VALVE SIZE (Inches)	Class 900		Class 1500		Class 2500		Add for Extended Bonnet	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
1	100	45	120	54	150	68	5	2
1.5	170	77	180	82	210	95	5	2
2	200	91	220	100	300	136	5	2
3	400	182	430	195	500	227	15	7
4	590	268	610	277	940	427	20	9
6	1000	454	1170	531	1400	636	40	18
8	1100	499	1320	599	1740	790	65	30
10	2050	931	2200	999	2600	1180	90	41

ADDITIONAL WEIGHT FOR OVERSIZED ACTUATORS (TABLE XXVI)

Standard Original Size	Oversized Actuator Required	Add	
		lbs.	kg
25	50	30	14
50	100	90	41
100	200	125	57

* The globe-style valve is equipped with a standard size actuator and positioner.

The information and specifications contained in this brochure are considered accurate. However, they are provided only for information purposes and should not be considered as certified. VSI Controls products are continuously improved and upgraded, and the specification, dimensions, and information contained herein are subject to change without notice. For further information or to confirm these presented here, contact your VSI Controls representative.Instructions for installation, operation and maintenance of the GLH control valve are outlined in IOM Bulletin #3.

Cat. VSI Controls GLH - Rev.09/2017 PN-9914002

VSI CONTROLS
A PETROLVALVES COMPANY

WorldWide presence through the Companies of the Group:
italy - uk - the netherlands - norway - usa - brazil - singapore - australia - russia - kazakhstan