

GLS[®]
BELLOWS-PAC[®]

GLOBE
CONTROL VALVE
METAL BELLOWS SEAL



VALTEK[™]
SULAMERICANA

GLS[®] Bellows-Pac[®] Body Subassembly

Product waste, operational security, environmental responsibility and international regulations are great reasons for implementing at industrial plants safeguards regarding leakage emissions on processes that are harmful and dangerous to humans and the environment.

As a security option against leakages through the packing set in a control valve, ValtekSul developed a modern and efficient system of metal bellows, Bellows-Pac[®], for globe valves.

Manufactured as molded metal bellows and a minimum of welded junctions, the Bellows-Pac[®] achieves a long operational life of up to 5 million cycles. This technology assures years of safe and reliable operation with pressure fluids of up to 1090 PSI (75 kg/cm²) and service temperatures between -320°F and 940°F (-195°C to 538°C).

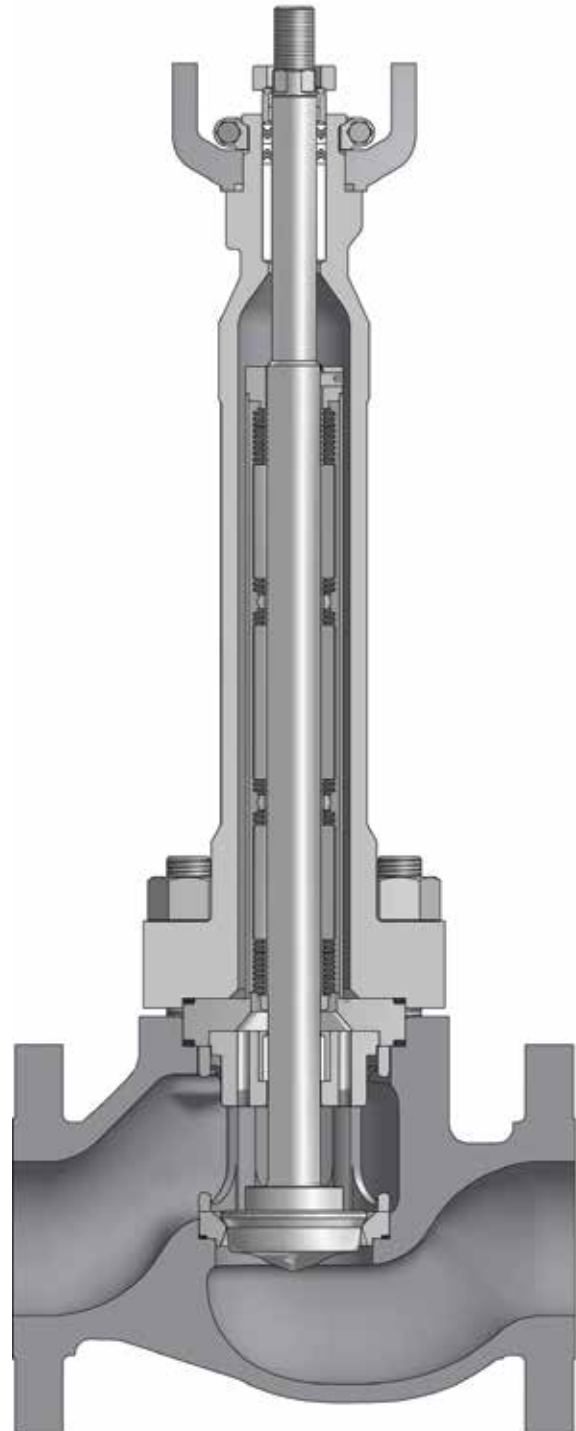
A mechanical protection envelops and protects the bellows acting as a pressure barrier during the operation, permitting the employment of a single sealing gasket, avoiding in this way the contact of the fluid with the bellows housing during the operational process.

The external pressurization to the bellows, eliminating the forces of differential pressure, increases the lifespan as well as extends the maximum admissible pressure removing the risk of the "bellows twisting" phenomenon.

The plug, manufactured as a unique piece, has a replaceable head, which allows the change of trim without affecting the bellows seal.

The Bellows-Pac[®] seal permits its use on the GLs globe control valve of ValtekSul, simply by changing the standard bonnet set for the bellows set and lower guide.

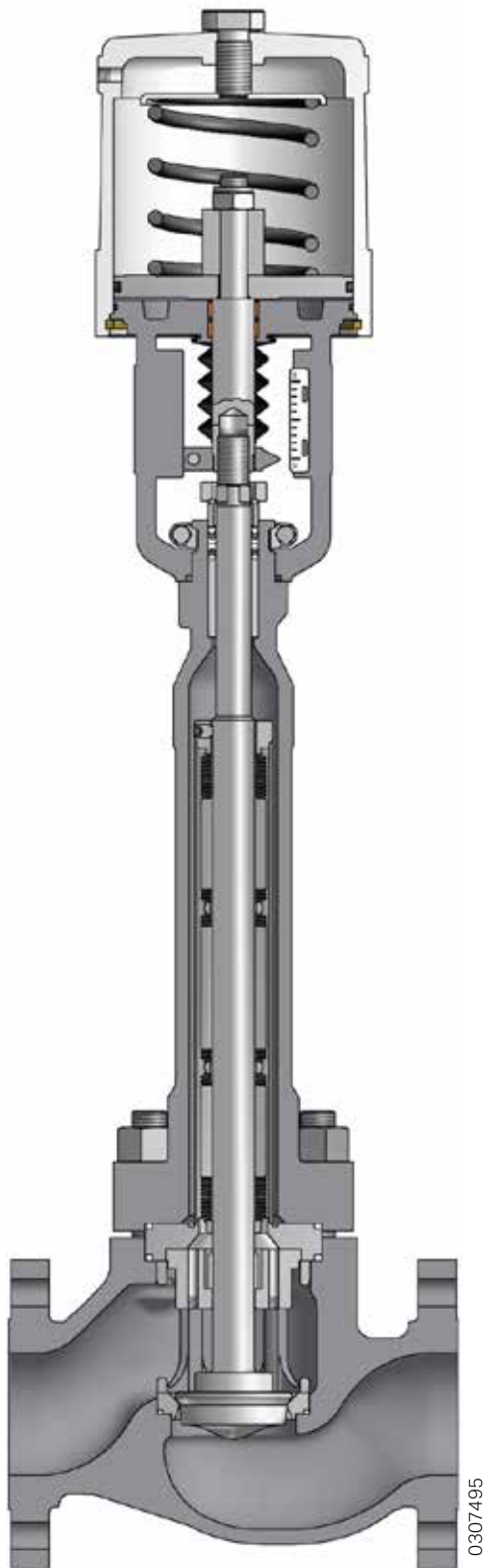
The bellows service life is influenced by the uneven loads applied on it, called "bellows forces", using the Bellows-Pac[®] the bellows external area is pressurized providing a stable pressure load, reducing the bellows twisting. The external pressurization also increases the maximum pressure class admitted in the bellows.



Metal Bellows Seal Bellows-Pac[®]

Tightness ANSI Class IV — Metal Seat Ring
Tightness ANSI Class VI — Soft Seat Ring

GLs Bellows-Pac® Additional Advantages



GLs Bellows-Pac® Control Valve

Advantages:

- » No need for the top gasket bellow seal;
- » Bellows located out of flow area, eliminating fluid direct impact and bellows erosion;
- » Connections for monitoring;
- » Single bellows protection system;
- » Externally pressurized bellows increases lifespan, pressure operational limits and eliminates "bellows twisting" phenomenon;
- » Connection for leakage indicator alarms;
- » Anti-rotation pin avoids the plug/ bellows set torsion
- » When the plug is placed in the seat ring, the bellows is relaxed;
- » Bellows with great number of convolutions, avoiding fatigue and increasing lifespan;
- » Replaceable plug, allowing easy trim change, as well as its stroke characteristic;
- » High interchangeability with GLs Series globe valve.

GLs Bellows-Pac®

Advantages and Characteristics

Advantages	Characteristics
Eliminates fugitive emissions	No-leakage stem seal
Compatible with a wide range of fluids	Available with AISI 316L stainless steel, Inconel or Hastelloy C bellows
Relaxed bellows	Bellows in relaxed condition when the valve is in closed position
Protected from external damages	A cover wraps the bellows protecting it during the handling, installation and service
There is no erosion or impact of the fluid on the bellows	Bellows is out of flow line
Bellows minimum tension	A great number of convolutions reduce the amount of bellows movement
Reduced failure potential	An anti-rotation pin prevents the accidental plug/bellows twist; this rotation is the biggest responsible for failures
Easy change of stroke characteristic and trims	Replaceable head plug
Quick failure detection	An alarm connection, in the bellows housing, can be monitored visually, electronically or by pressure
Minimum seal to monitor	Single-gasket seal reduces the possibilities of potential leaks
Do not require special packing	Employs the standard packing materials of ValtekSul
Application in diverse temperatures	Temperature range of -319°F to 1000°F (-195°C to +538°C)
Permits the entrance of fluid particles	Bellows with a great number of spirals
Long lifespan	Due to its design, the bellows presents low mechanical tension with a minimum number of welds
Assured integrity	Bellows seal tested for leaks with the use of Helium
High interchangeability of parts	Most of Bellows-Pac parts are interchangeable with GLs valve parts
Unchanged size	A valve containing the Bellows-Pac seal and cylinder actuator is shorter than compared to a valve with diaphragm actuator

Bellows-Pac® Seal Lifespan

Valve Nominal Diameter (in.)	ANSI Class	Cycles with Full Stroke at 70°F (21°C)			
		150 psi (10,5 Kg/cm²)		600 psi (42 Kg/cm²)	
		Minimum	Medium	Minimum	Medium
½, ¾, 1	150, 300	2.000.000	5.000.000	125.000	780.000
1½, 2,	150, 300	2.000.000	5.000.000	90.000	500.000
3	150, 300	520.000	2.000.000	40.000	250.000
4	150	500.000	2.500.000		
4	300	275.000	1.400.000	33.000	160.000
6	150	200.000	1.300.000		
6	300	100.000	550.000	17.000	90.000
8	150	375.000	1.350.000		
8	300	56.000	350.000	21.000	110.000

GLs Bellows-Pac®

General Specifications Chart

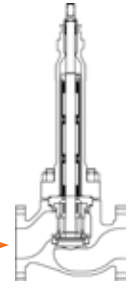
GLs Series with Bellows-Pac

Body	Diameters	1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8
	ANSI Class	150-300-600
	Types	Globe, Angle-style, Extended Output
	Manufacturing Materials	Stainless Steel, Cast materials compatible with bellows seal materials
	Connections	Separable flanges (0.5 to 4 inches) Integral flanges (all sizes) Socketweld, SW (0.5 to 2 inches) Buttweld, BW (all sizes)
	Separable Flanges	Carbon steel, Stainless steel, other materials under request
Bonnet	Type	Single-piece Bellows-Pac bonnet, no contact with fluid
	Materials	Carbon steel, Stainless steel
Bellows	Materials	Stainless steel AISI 316L (UNS S 31603) Inconel 625 (UNS N 06625) Hastelloy C-22 (UNS N 10276)
Packing	Type	Twin
	Materials	PTFE - "V" rings PTFEG* - "V" rings AFP** with Inconel wire Other materials under request
Gaskets	Flat	PTFE, PTFEG*, Kel-F
	Spiral-wound	AISI 316 with graphite lining and other asbestos-free materials
Trim	Characteristics	Equal Percentage, Linear, Quick-Open
Guides	Type	Double upper guide on the valve stem
	Materials	AISI 316 with PTFE* insert
Actuator	Pneumatic type	Double acting piston-cylinder, with fail-safe spring Field reversible Optionals: Manual handwheel Stroke limiters
Positioner	Type	Pneumatics Analogic electro-pneumatics Chronos Digital

* PTFEG: reinforced PTFE with fiber glass

** AFP: Asbestos-free packing

GLs Bellows-Pac® Flow Coefficient - C_v



Flow Coefficient (C_v) - Equal Percentage Flow Direction: Flow Over

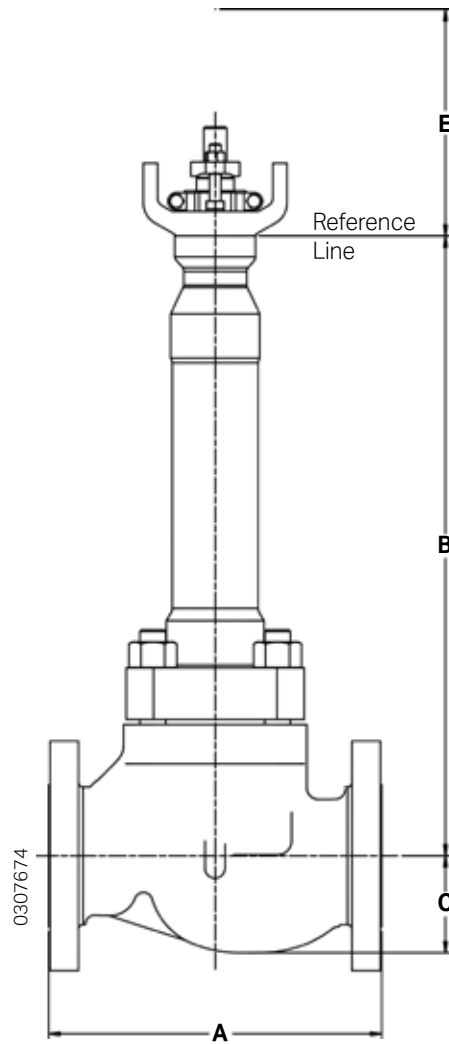
Flow Direction →

Valve Nominal Diameter (in.)	Nominal Trims Size T/N	Stroke		Opening Percentage									
		in.	mm	100	90	80	70	60	50	40	30	20	10
0.50	13 (0.50)	0.50	12.70	4.5	4.0	3.1	2.4	1.7	1.2	0.76	0.49	0.31	0.22
	8 (0.31)	0.50	12.70	2.4	2.1	1.7	1.3	0.83	0.60	0.40	0.26	0.17	0.12
0.75	18 (0.71)	0.50	12.70	7.5	6.5	5.2	4.0	2.8	1.9	1.3	0.83	0.53	0.38
	13 (0.50)	0.50	12.70	5.5	4.8	3.8	3.0	2.0	1.4	0.93	0.60	0.39	0.28
1.00	8 (0.31)	0.50	12.70	2.5	2.2	1.7	1.4	0.96	0.63	0.42	0.28	0.17	0.13
	20 (0.81)	0.50	12.70	11	9.6	7.6	5.8	4.1	2.8	1.9	1.2	0.77	0.55
	13 (0.50)	0.50	12.70	5.6	4.9	3.8	2.9	2.0	1.4	0.98	0.62	0.39	0.28
1.50	8 (0.31)	0.50	12.70	2.5	2.2	1.7	1.4	0.96	0.63	0.42	0.28	0.17	0.13
	32 (1.25)	1.00	25.40	31	27	21	16	11	7.7	5.3	3.4	2.2	1.6
	25 (1.00)	0.75	19.05	21	18	14	11	7.7	5.3	3.5	2.3	1.4	1.0
2.00	20 (0.81)	0.75	19.05	19	17	13	10	7.1	4.7	3.3	2.1	1.4	0.95
	41 (1.63)	1.00	25.40	43	37	29	22	16	11	7.3	4.7	3.0	2.2
	32 (1.25)	1.00	25.40	32	28	22	16	12	8.0	5.4	3.5	2.2	1.6
	25 (1.00)	0.75	19.05	22	19	15	11	8.1	5.5	3.7	2.4	1.5	1.1
3.00	20 (0.81)	0.75	19.05	20	18	14	11	7.4	5.0	3.4	2.2	1.4	1.1
	67 (2.63)	1.50	38.10	105	92	73	56	38	26	18	12	7.4	5.8
4.00	41 (1.63)	1.50	38.10	48	42	33	25	18	12	8.1	5.3	3.3	2.5
	90 (3.50)	2.00	50.80	205	178	141	108	76	52	35	23	14	10
6.00	55 (2.25)	2.00	50.80	111	97	77	59	41	28	19	12	7.8	5.6
	125 (5.00)	2.50	63.50	405	352	279	215	150	101	69	45	28	20
8.00	90 (3.50)	2.50	63.50	235	204	162	124	87	59	40	26	17	12
	160 (6.25)	3.00	76.20	700	608	483	371	259	175	119	77	49	35
8.00	125 (5.00)	3.00	76.20	475	413	328	252	175	119	81	52	33	24

Flow Coefficient (C_v) - Linear Flow Direction: Flow Over

Valve Nominal Diameter (in.)	Nominal Trims Size T/N	Stroke		Opening Percentage									
		in.	mm	100	90	80	70	60	50	40	30	20	10
0.50	13 (0.50)	0.50	12.70	4.5	4.0	3.6	3.1	2.7	2.2	1.8	1.4	0.90	0.45
	8 (0.31)	0.50	12.70	2.4	2.2	1.9	1.7	1.4	1.2	0.96	0.72	0.48	0.24
0.75	18 (0.71)	0.50	12.70	7.5	6.8	6.0	5.3	4.5	3.8	3.0	2.3	1.5	0.75
	13 (0.50)	0.50	12.70	5.5	5.0	4.4	3.9	3.3	2.8	2.3	1.7	1.1	0.55
1.00	8 (0.31)	0.50	12.70	2.5	2.3	2.0	1.8	1.5	1.3	1.0	0.75	0.50	0.25
	20 (0.81)	0.50	12.70	11	9.9	8.8	7.7	6.6	5.5	4.4	3.3	2.2	1.1
	13 (0.50)	0.50	12.70	5.6	5.0	4.5	4.0	3.3	2.8	2.2	1.7	1.1	0.56
1.50	8 (0.31)	0.50	12.70	2.5	2.3	2.0	1.8	1.5	1.3	1.0	0.75	0.50	0.25
	32 (1.25)	1.00	25.40	31	28	25	22	19	16	12	9.3	6.2	3.1
	25 (1.00)	0.75	19.05	21	19	17	15	13	11	8.4	6.3	4.2	2.1
2.00	20 (0.81)	0.75	19.05	19	17	15	13	11	9.5	7.6	5.7	3.8	1.9
	41 (1.63)	1.00	25.40	43	39	34	30	26	22	17	13	8.6	4.3
	32 (1.25)	1.00	25.40	32	29	25	22	19	16	13	9.6	6.4	3.2
	25 (1.00)	0.75	19.05	22	20	17	15	13	11	8.8	6.6	4.4	2.2
3.00	20 (0.81)	0.75	19.05	20	18	16	14	12	10	8.0	6.0	4.0	2.0
	67 (2.63)	1.50	38.10	105	95	85	74	63	53	42	32	21	11
4.00	41 (1.63)	1.50	38.10	48	43	38	34	29	24	19	14	9.6	4.8
	90 (3.50)	2.00	50.80	205	184	164	143	123	103	82	62	41	21
6.00	55 (2.25)	2.00	50.80	111	101	89	78	67	56	44	33	22	11
	125 (5.00)	2.50	63.50	405	365	324	284	243	203	162	122	81	41
8.00	90 (3.50)	2.50	63.50	235	211	188	164	141	118	94	71	47	24
	160 (6.25)	3.00	76.20	700	630	560	490	420	350	280	210	140	70
8.00	125 (5.00)	3.00	76.20	475	428	380	333	285	237	190	142	95	47

GLs Bellows-Pac® Dimensions



Dimensions (in.)

Valve Nominal Diameter (in.)	Actuator Size	A				B	C	E Clearance for Disassembly
		ANSI*	ANSI/ISA**					
		Class 150, 300, 600	Class 150	Class 300	Class 600			
0.50 & 0.75	25	8.5	7.3	7.5	8.0	12.10	1.5	3.35
1.0	25	8.5	7.3	7.8	8.3	12.10	1.5	3.35
1.5	25	9.5	8.8	9.3	9.9	16.53	1.8	5.12
2.0	25	11.5	10.0	10.5	11.3	16.53	2.3	5.52
3.0	50	14.0	11.8	12.5	13.3	19.02	3.4	7.10
4.0	50	17.0	13.9	14.5	15.5	27.20	5.2	9.45
6.0	50		17.8			29.10	5.5	11.62
6.0	100			18.6	20.0	29.10	5.8	11.62
8.0	100		21.4			35.24	7.1	12.00
8.0	100			22.4	24.0	35.24	7.5	12.80

* Bodies with separable flanges. See GLs Valve Catalogue.

** According to ANSI/ISA -75.08.01 - Latest Edition (Integral Flanges).

Quality Management System



ISO 9001-2015
Certificate nº 31001 QM 15
DQS GmbH
DQS Brazil
ISO 14001™ Certified

ValtekSul Brasil

Main Office and Factory

Rua Goiás, 345 - Diadema - SP - Brazil

Call Center +55 11 4072-8600

www.valteksul.com.br

www.valteksul.com

VALTEK™
SULAMERICANA
THE CONTROL VALVES COMPANY

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For additional information, please consult your Valtek Sulamericana representative. Specific assembly, operation and maintenance instructions for GLs Control Valves - Bellows-Pac can be found at the Maintenance Catalogue nº 12.

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