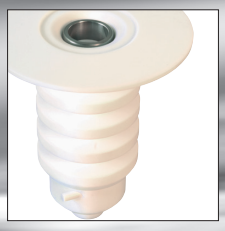
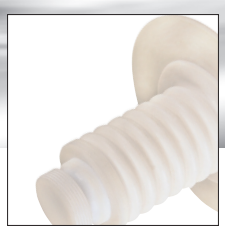
AEGIS® RSS SERIES

Fully Lined Bellows Sealed Control Valves

RSS Series





- Corrosion-resistant PFA lining
- ISO/DIN and ANSI/ISA face-to-face
- Heavy-duty Paraflon® bellows
- Special designs for chlorine and high-purity media

ABS Quality Evaluations, Inc. ★ Management System Certification ★

ISO 9001:2008

ASSOCIATE CHLORINE INSTITUTE MEMBERS

Aegis® RSS Series

Bellows-Sealed Globe Control Valves

Fields of application

Flow control of corrosive, hazardous and ultrapure process fluids and gases.

The **Aegis® RSS Series** is especially suitable:

- for media where stainless steel and exotic alloys do not provide sufficient corrosion resistance
- as an economic alternative to exotic alloy valves
- for environmentally critical media - German Clean Air Act – "TA-Luft"
- for metal-reactive media, e.g. H_2O_2
- for biotechnology and high-purity media where excellent cleaning and anti-adhesive surfaces are important
- for highly permeating media

Operating range

- -60 to +200 °C (-75 to 400 °F) operating temperature
- 0.1 mbar vacuum up to 16 bar (235 psi) operating pressure

Design

PFA Lined Bellows-sealed globe valve with a secondary packing system in compliance with German Clean Air Act - TA-Luft. Pneumatic or electric actuation. Also available as manually operated, control or shut-off valves (HVR, HV series).

Control characteristics in accordance with DIN EN 60534

- Equal percentage or linear Rangeability 1:25
- Bubble tight shut off - EN 12266-1 Class A
- V-control plug: Cv 0.012-1.40 Rangeability 1:100

Applicable Standards

- Face-to-face to ISO 5752-R.1 (DIN EN 558-1 R.1), flanges ISO 7005-2/PN 16, on request drilled to ASME 150#
- Face-to-face to ANSI/ISA 75.08.01 Cl. 150, flanges ASME B16.5 Cl. 150 RF
- Face-to-face to ANSI/ISA 75.08.01 Cl. 300 for DN 1" to 2", flanges ASME B16.5 Cl. 300 RF

① **Heavy Duty PFA Lining**
- Optional PFA-L antistatic
- Lining thickness: 5-6mm (0.2"-0.3") 1/2"+3/4" Valve sizes: 3.5-4 mm (0.14"-0.16")

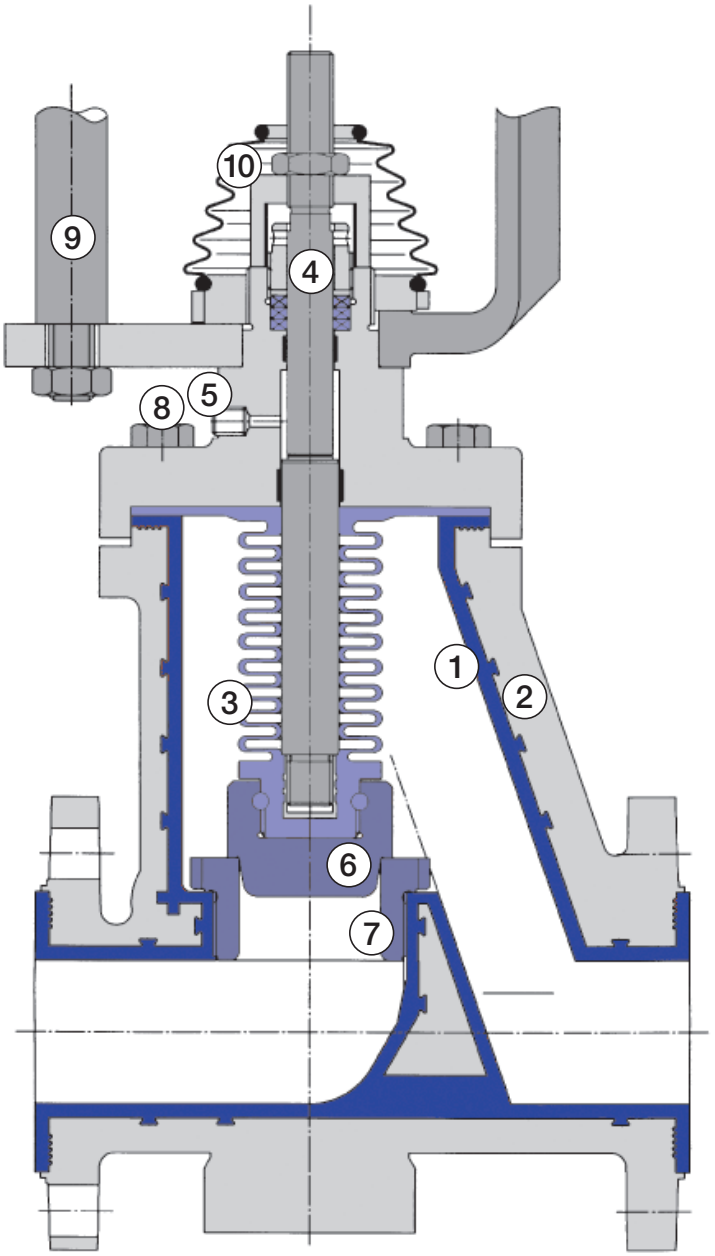
② **High Security One-Piece Valve Body** as well as all other pressure-bearing components
- Made of cast ductile iron EN-JS 1049 (ASTM A395), Option: 1.0619 (GS-C 25)
- Absorbs system pressure and pipe forces
- Top entry = simple maintenance of bellows, plug and seat
- Body heating jackets available

③ **PTFE Bellows** hermetically seals the product chamber from the atmosphere and protects the valve stem against corrosion
- **Heavy-duty Paraflon® and Hastelloy bellows** For critical applications where extreme permeation and pressure/temperature conditions exist such as **chlorine, chlorinated organics and hydrochloric acid**

④ **Secondary Packing System** adjustable from outside as a standard feature

⑤ **Optional Leak Detection Port** for hazardous applications

⑥ **Exchangeable valve plug**
- Standard material (Paraflon®)
- Screwed to bellows and secured by means of PTFE locking cord
- Change in Cv value by replacing seat/plug
- Special V-control plug made of Paraflon® for minimum Cv-values
- Special U-plug if there is a risk of cavitation



⑦ **Exchangeable seat**
made of Paraflon®

⑧ **Easy top entry maintenance**
of the wetted internals with an easily removable valve bonnet

High-quality external corrosion protection:

- Epoxy coating of the valve; valve stem and fasteners made of stainless steel, Alloy 20 or Hastelloy C276

⑨ **Actuators and accessories**

- Pneumatic or electric actuators
- Positioners, limit switches, etc.

⑩ **Travel stop**
protects plug and seat against excessively high shut-off forces
Comes standard with protective rubber bellows

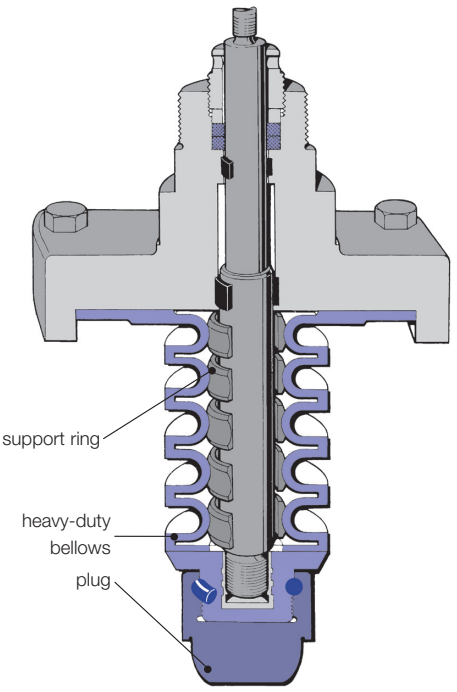
Heavy-duty Paraflon® Bellows

Developed specifically for hazardous service process liquids and gases:

- **Highly permeating media:**
  The wall thickness of 2.5 mm (0.1“) ensures superior resistance to permeation.

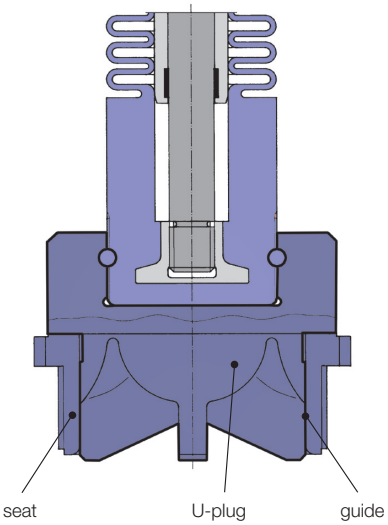
- **Higher pressures and temperatures:**
  The convolutions of the bellows retain their function even at a pressure of 16 bar (235 psi) and at elevated temperatures. They are internally supported on the stainless steel support rings (not on the valve stem!) and remain flexible. On request, support rings are also available in PTFE/carbon for an operating pressure of 10 bar (145 psi).

- **For high-purity media:**
  Large convolution distances facilitate flushing/sterilization of the inner valve chamber (see also page 5 “Version for biotechnology/high-purity media”).



Cavitation Prone Applications

This special U-plug (U = circumferential guiding) is recommended, when cavitation might occur with 3“, 4“ and 6“ RSS Valves. It reliably overcomes the higher loads by dividing the medium flow and through the permanent guide in the valve seat. Universal for all RSS bellows versions.



RSS V-plug - Highly Controllable, Low Flow Applications

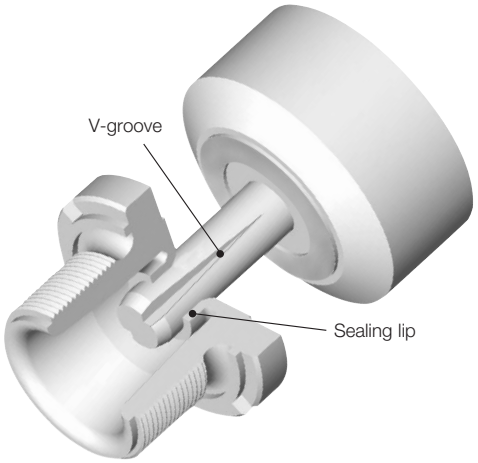
The V-plug made of compression-proof and dimensionally stable Paraflon®, has 1 to 4 grooves, depending on the Cv value. When the valve opens, the V-grooves offer an expanding opening cross section while the plug is always guided in the seat.

This ensures high-quality control even at elevated temperatures and differential pressures. A dynamic sealing lip integrated into the seat limits the flow precisely to the V-grooves, thus preventing undesired leakage. A PTFE locking cord prevents the plug from unscrewing.

Customer benefits:
Lower costs than exotic alloys, shorter delivery times, metal-free, maximum chemical resistance. The V-plugs are the preferred version for 1/2“-1“ RSS valves that require a low Cv value.

Operating range

- Up to 235 psi at 360 °F
- Pressure/temperature diagram: see page 6
- Not for highly viscous or solids-containing media



k_{vs100}-values (m^3/h), Cv-values (US GPM)

1/2“-3/4“: seat Ø 8 mm. Travel 15 or 20 mm.
1“: seat Ø 14 mm. Travel 15 or 20 mm.

k_{v100}	0.01	0.02	0.05	0.10	0.20	0.50	0.80	1.20*
Cv	0.012	0.023	0.06	0.12	0.23	0.58	0.93	1.40*

Other sizes and k_v/Cv-values on request.
* only DN 25 (1“)

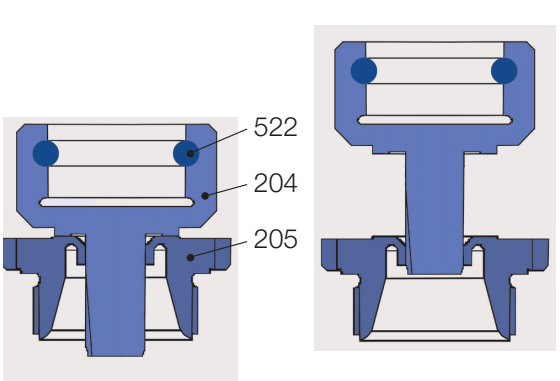
Control characteristics

Quadratic curve, **rangeability 1:100**

Travel (%)	5	10	20	30	40	50	60	70	80	90	100
Flow rate (%)	1.25	2	5	10	17	26	37	50	64	81	100

Components and material

204	Plug	Paraflon®
205	Seat	Paraflon®
522	Cord	PTFE



Version for highly permeating media (e.g. chlorine)

① The special bushing – material e.g. **Hastelloy C** – protects the cover flange in the valve stem area against corrosive attack by permeating media. The valve stem, also Hastelloy C, remains moveable.
Bellows: Paraflon® heavy-duty bellows with PTFE/carbon or Hastelloy C support rings or bellows made of Hastelloy C
② The thick-walled seamless PFA body lining provides **outstanding protection against permeation**.

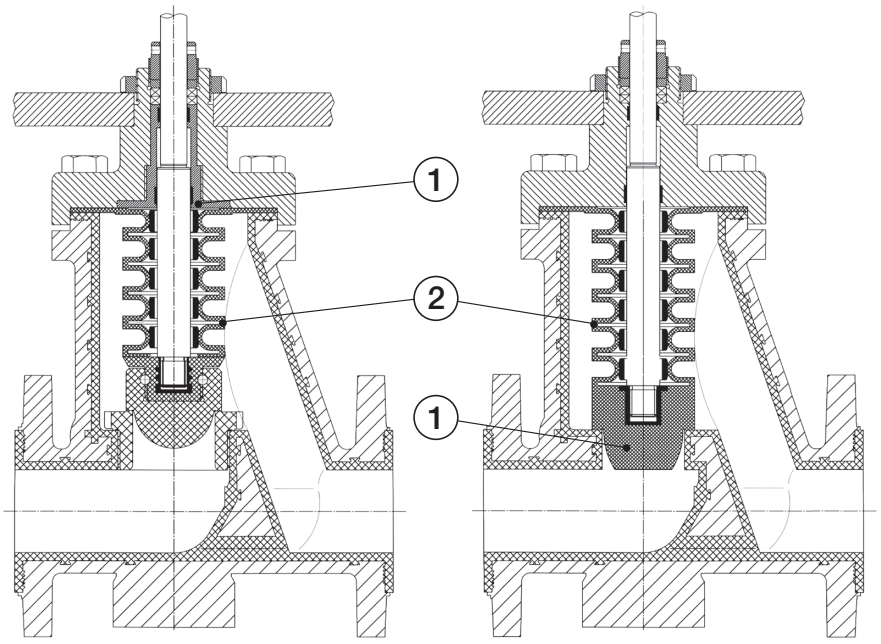
Version for "biotechnology/ pure media"

Pharmaceutical, fine and semiconductor chemicals, fermentation etc., suitable for CIP and SIP!
Our industry proven design features:

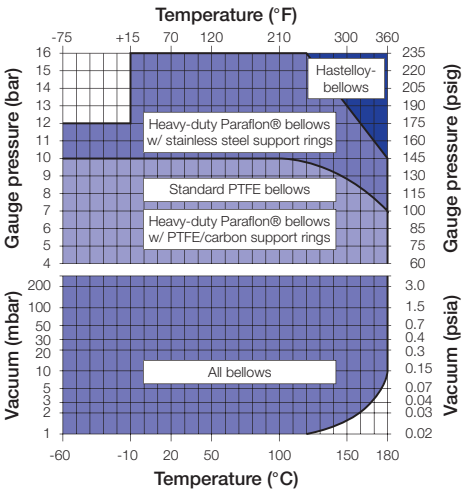
- Cavity free profile.
- Anti-adhesive PFA body lining without fillers with seamlessly integrated seat.
- One-piece PTFE bellows/plug design ① with large convolution distances, easy to clean ②. 1/2"+3/4" with standard bellows.
- On request, special "high-purity media production process" and FDA conformity certificate.

Design for combustible and potentially explosive media

The antistatic lining made of PFA-L reliably ensures the dissipation of electrostatic charges through the plastic lining and the metallic body. PFA-L has the same large pressure/ temperature range as virgin PFA. Its chemical resistance is excellent however it must be specifically verified for each application due to the 3% carbon enriched PFA.

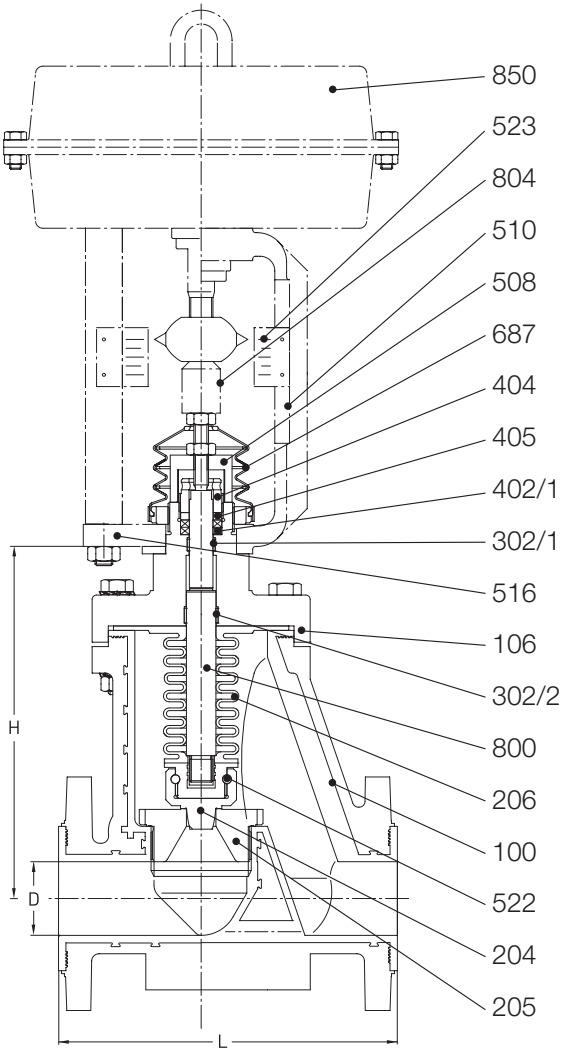


Pressure/Temperature Range



Bellows Travel Range

Size (Inch)	Standard (Inch)	Heavy Duty (Inch)
1/2"*	.590"/.787"	-
3/4"	.590"/.787"	-
1"	-	.590"
1 1/2"	-	.590"/.787"
2"	-	.590"/.787"
3"	-	1.181"
4"	-	1.181"
6"	-	1.968"



Bill of Materials

Item	Designation	Material
100	Body	Shell: ductile iron EN-JS 1049/ ASTM A395, optionally cast steel GS-C 25 (1.0619)
		Lining: PFA, optionally PFA-L antistatic
106	Cover	D.c.i. EN-JS 1049/ASTM A395
204	Plug	Paraflon®
205	Seat	Paraflon®
206	Bellows	Paraflon®, PTFE, PTFE/carbon antistatic, Hastelloy. Heavy-duty version: with stainless steel or PTFE/carbon support rings
302/x	Guide ring	PTFE/carbon
402/1	Packing ring	PTFE/carbon
404	Packing nut	Stainless steel
405	Thrust ring	Stainless steel
508	Travel stop*	Stainless steel
510	Bracket	Steel, epoxy-coated
516	Yoke	Ductile cast iron, epoxy-coated
522	Round cord	PTFE
523	Travel indicator	Stainless steel
687	Protect. bellows	Rubber, w/travel stop
800	Valve stem	316SS
801	Guide**	316SS (3", 4", 6" only)
804	Coupling	Stainless steel
850	Actuator	according to specification
917/1	Screw-in pipe connector***	Stainless steel, optionally hex. head screw plug

* depending on shut-off force
** Component not shown *** option. with safety stuffing box

Dimensions and weights

Face-to-face lengths ISO 5752 series 1 (DIN EN 588-1 series 1)*,
flanges ISO 7005-2/PN16 (DIN EN 1092-2)*

Size (Inch)	H (Inch)	L (Inch)	Weight** (Lb)
1/2"	5.11	5.11	13
3/4"	5.11	5.11	13
1"	7.28	6.30	24
1-1/2"	8.85	7.87	35
2"	9.05	9.05	42
2-1/2"	9.05	11.41	44
3"	13.38	12.20	86
4"	13.78	13.78	97
6"	20.15	18.89	341

* formerly DIN 3202/F1, 2532/33
** without actuator

Face-to-face lengths ANSI/ISA 75.08.01 Class 150# and 300#
flanges ASME B16.5 Class 150# and 300# Raised face

Size (Inch)	H (Inch)	L 150# (Inch)	L 300# (Inch)	Weight** (Lb)
1/2"*	5.11	5.11**	-	13
3/4"	5.11	5.11***	-	13
1"	7.28	7.24	7.75	26
1 1/2"	8.85	8.74	9.25	35
2"	9.05	10.00	10.51	42
3"	13.38	11.73	-	86
4"	13.77	13.89	-	97
6"	20.15	18.89***	-	341

* DN 1/2": flanges with tapped bore
** without actuator *** not to ANSI/ISA

Flow rates k_{v100} (m^3/h), Cv (US gpm)

DN			Seat-Ø mm (inch)																				
DIN/ISO (mm)	ANSI (inch)	k_{v100}/ Cv	145 (5.7)	120 (4.7)	120 (4.7)	96 (3.8)	80 (3.1)	65 (2.6)	50 (2)	40 (1.6)	30 (1.2)	25 (1)	20 (0.8)	15 (0.6)	8 (0.3)	DN 15+20 (½" + ¾"): Seat ø 8 mm (0.31") DN 25 (1"): Seat ø 14 mm (0.55")							
15+20	½ + ¾	k_{v100} Cv												4 4.7	2 2.33		0.80 0.93	0.50 0.58	0.20 0.23	0.10 0.12	0.05 0.06	0.02 0.023	0.01 0.012
25	1	k_{v100} Cv										11 12.8	7 8.2	4 4.7	2 2.33	1.20 1.40	0.80 0.93	0.50 0.58	0.20 0.23	0.10 0.12	0.05 0.06	0.02 0.023	0.01 0.012
40	1½	k_{v100} Cv								28 32.6	15 17.5	11 12.8	7 8.2	4 4.7									
50+65	2	k_{v100} Cv							42 48.9	28 32.6	15 17.5	11 12.8	7 8.2										
80	3	k_{v100} Cv					100* 117*	65 75.7	42 48.9	28 32.6	15 17.5												
100	4	k_{v100} Cv				155* 180*	100* 117*	65 75.7	42 48.9														
150	6	k_{v100} Cv	360 420	300 350	240 280																		

* If a U-plug is used, the k_{v100} (Cv) values reduce from 155 m^3/h (180 US gpm) to 135 m^3/h (157 US gpm) and from 100 m^3/h (117 US gpm) to 90 m^3/h (105 US gpm).

Remarks: 1. V-control plugs are used for the k_{v100} values 0.01 to 1.2 (Cv 0.012 to 1.4),
2. The next lower k_{v100} (Cv) value can also be attained by using a different plug without changing the seat diameter. This may be important as it is only necessary to replace the plug if the k_{v100} (Cv) value is later changed.
3. Conversion k_{v100} to Cv (US gpm) = k_{v100} x 1.165.

Required Shut-off forces (N) with seat and plug made of Paraflon®

Max. Δp bar/psi, valve in closed position

Standard PTFE bellows (max. oper. pressure 10 bar/145 psi)
Heavy-duty Paraflon® bellows (max. oper. press. 16 bar/232 psi)**
Hastelloy C-bellows (max. oper. pressure 16 bar/232 psi)

Mechanical travel stop (see shaded cells)
has to be provided if
- Δp > 10 bar/145 psi and seat Ø 14-50 mm (0.55"-2")
- Δp > 6 bar/ 87 psi and seat Ø 65 mm (2,6")

Seat-ø mm (inch)	bar/ psi															
	1/ 14.5	2/ 29	3/ 43.5	4/ 58	5/ 72.5	6/ 87	7/ 102	8/ 116	9/ 131	10/ 145	11/ 160	12/ 174	13/ 189	14/ 203	15/ 218	16/ 232
8 (0.32)	290	310	330	350	370	390	410	430	450	470	495	510	525	540	555	570
14+15 (0.55+0.6)	330	385	435	490	540	595	645	695	750	800	865	900	935	970	1005	1040
20 (0.8)	390	460	525	595	665	730	800	865	935	1010	1145	1195	1250	1300	1355	1410
25 (1.0)	450	545	640	735	830	925	1020	1115	1205	1305	1475	1550	1625	1705	1780	1855
30 (1.2)	550	680	805	935	1065	1190	1320	1445	1575	1705	1890	1990	2095	2195	2295	2400
40 (1.6)	680	885	1085	1290	1490	1695	1895	2095	2300	2480	2750	2915	3080	3250	3415	3570
50 (2.0)	830	1130	1425	1720	2020	2315	2610	2910	3205	3500	3790	4035	4280	4525	4770	5020
65 (2.6)	1040	1500	1960	2420	2890	3350	3810	4270	4740	5190	5675	6070	6465	6860	7255	7650
80 (3.1)	1300	1970	2630	3300	3960	4630	5300	5960	6630	7305	7945	8525	9105	9685	10265	10850
96 (3.8)	1600	2520	3440	4370	5290	6210	7130	8050	8980	9900	10790	11610	12425	13240	14060	14880
120 (4.7)	2375	3710	5022	6379	7691	9025	10371	11672	13029	14363	15675	16829	18084	19317	20527	31705
145 (5.7)	3468	5416	7332	9313	11229	1377	15142	17041	19023	20972	22887	24571	26404	28204	29971	31705

DN 15+20, ½"+¾" | DN 25, 1" | DN 40, 1 ½" | DN 50 + 65, 2"+ 2 ½" | DN 80, 3" | DN 100, 4" | DN 150, 6"

Attention: If Δp < p_2, then insert p_2 instead of Δp (see operating limits in pressure/ temperature diagram).

* Plugs and seats made of other materials sometimes require higher shut-off forces. Details on request.

** - available for 1"-4". Heavy-duty Paraflon® bellows with PTFE/carbon support rings: max. operating pressure 10 bar/145 psi.
- 1" with .6" travel. In the case of actuators with a larger travel, the required control curve is achieved by means of positioners.
- Valve opening travel requires higher forces than with standard PTFE bellows: 1" = 900 N; 1½", 2", 2½" = 2000 N; 3", 4" = 800 N, 6" = 2400 N
Please consider this when sizing the actuator.

Product Key

RSS	2	A	1	F	B	S	T	15	G	7	X
1) Type											
Lined PFA Globe Control Valve											
2) Valve size											
1/2", 3/4", 1", 1,5", 2", 3", 4", 6"											
3) Pressure Class											
ASME Class 150*		A									
ASME Class 300		B									
4) Bolting material											
Stainless steel A4-70 (AISI 316)*			1								
Carbon steel B7M			2								
Alloy 20			3								
5) Lining											
PFA*				F							
PFA - Antistatic				L							
PFA - High Purity				H							
6) Bellows											
Standard Duty PTFE - 150psi max (1/2" - 3/4" only)					A						
Paraflon® with 316SS support rings - 230psi max*					E						
Paraflon® with Hastelloy C support rings - 230psi max					F						
Paraflon®/TFM 6220 antistatic/SS support rings - 230psi max					G						
7) Valve stem											
316SS*						1					
Hastelloy C4						2					
8) Seat / Plug											
Paraflon®*							A				
Hastelloy C4							B				
9) Kv-Value											
See table for proper match up											
10) Control characteristics											
Linear									L		
Equal percentage*									G		
11) Actuation											
Bare shaft (w/o coupling & bracket)										6	
Prepared for actuator (incl. coupling & bracket)										7	
With actuator & accessories										8	
12) Special design											
Please specify the details											X

*Denotes standard

Sizing Information

In order to properly size RSS globe control valves, please provide the following information:

Inlet Pressure	Specific gravity	Viscosity
Outlet Pressure	Process fluid	Temperature
Density	Vapor Pressure	Connection Size

Aegis Flow Technologies L.L.C.
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IDEX FLUID & METERING