

Product overview valve technology

# The sliding gate valve principle by Schubert & Salzer

This is how easy control can be. Over 25 years ago, Schubert & Salzer Control Systems took a new approach in control valves. We developed the sliding gate control valve: a practical, light and highly accurate valve. It operates based on a principle that had already excited Leonardo Da Vinci. Even today, it satisfies the most challenging requirements that are placed on a control valve.

## The alternative when the demands are high

The GS valve product line controls liquids, steam and gases with accuracy; quickly and efficiently. A stationary sealing plate (2) fixed in the body (1) perpendicular to the direction of flow has a number of slots or orifices (3) a moving disc of equal height across its face with identical slot configuration and designed so it cannot rotate, slides vertically against it thereby changing the rate flow. The differential pressure presses the moving disc (3) against the fixed disc (2) and seals it.

## Sliding gate valves are used to control gases, steam and liquids

- Chemical and pharmaceutical industry
- Steel and aluminum plants
- Food and beverage industry
- Breweries
- Textile manufacturing
- Tire production
- Plastics and rubber
- Research and development
- Gas and compressed air production and utilization
- & many more.



# Details

Positioner

Pilot line

Diaphragm shell

Diaphragm disc

Coupling

Adjusting nut

Packing tube

Chevron packing, spring loaded

Bellows (where needed)

Column

Valve stem

Body cover

Coupling ring

Moving disc (3)

Fixed disc (2)

Body (1)

Sliding gate valves are used to control gases, steam and liquids. The traditional weakness of a control valve, the valve seats..... does not exist in a sliding gate.



# The advantages of sliding gate valves

## Fits into tight spaces

Compact construction for minimum use of space and ease of installation

## Variable $C_v$ values

A simple exchange of the fixed disc (plate) is all that's needed to change the  $C_v$  value at any time - possible range of  $C_v = 0.05$  to 1056

## Extremely low leakage rate

< 0.0001% of the  $C_v$  value due to the self-lapping action of the moving disc and the pressure of the medium against the moving disc, using a surface seal instead of an annular seal.

## Outstanding rangeability

Up to 160:1

## Standard packing environmentally safe

Schubert & Salzer's standard packing is certified by the TUV to comply with the German TA-Luft-standard which limits valve packing emissions. The applied testing procedure verifies if the tested sealing design is equivalent to a bellows solution. The measured leakage rate (after 150,000 full valve cycles) was  $8E-8$  mbar l/s and is far below the allowable leakage standard of  $4.7E-6$  mbar l/s.

## Optimal flow control

Avoids cavitation problems in the valve and operates quietly by reducing turbulence

## Easy to install and maintain

Thanks to the compact construction, the low weight and the innovative seal disc design makes easy work of installation and maintenance.

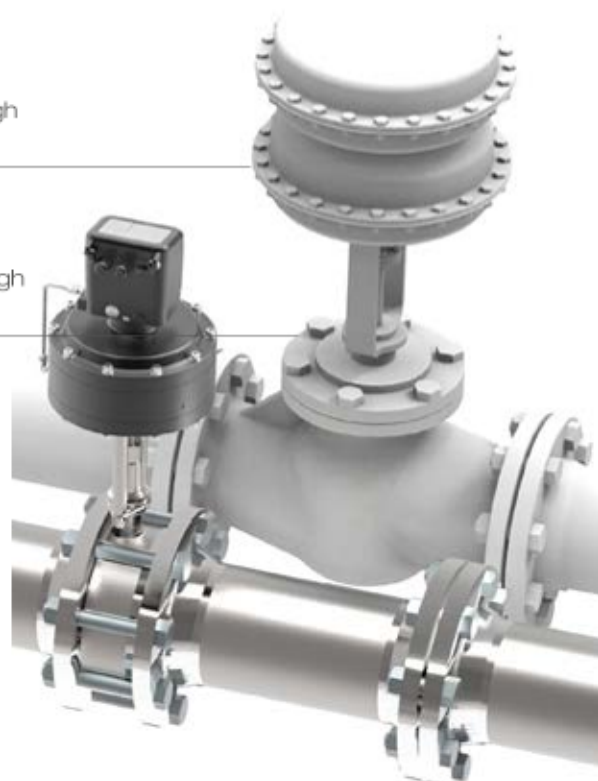
## Minimal wear

Low turbulence means less erosion. The short stroke ( $1/4"$  to  $1/2"$ ) insures greater packing life and also requires reduced actuation energy.

## High differential pressures

Using its unique compact design and low energy consumption, the GS valve gives accurate control of high differential pressures up to 1450 psi

## Size Comparison 10 inch GS vs Globe



Size comparison between a normal globe valve and a [Schubert & Salzer sliding gate valve](#). In the example, the line size of both valves are identical.



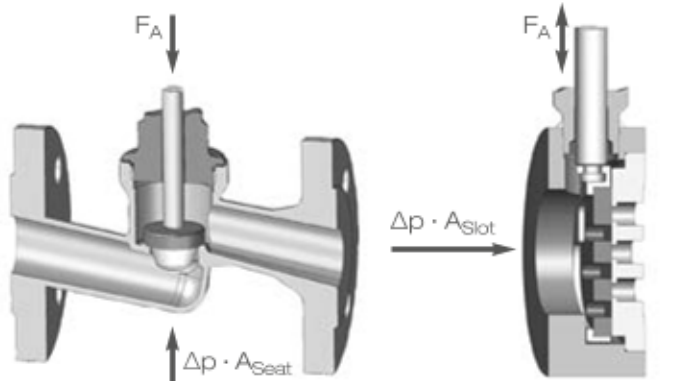
# Variable Cv Values

Ordering code		-	A	1	B	6	2	7	C	3	4	8	5	9
Size	Charact.	100 %	63 %	40 %	25 %	20%	16 %	12 %	10 %	6,3 %	2,5 %	2 %	1 %	0,4%
1/2"	(mod.) linear	4.6	3	2	1.6	-	0.82	0.57	0.51	0.3	0.16	0.09	0.05	-
	eq. perc.	2	-	1.3	-	0.4	-	-	-	0.12	-	-	-	-
3/4"	(mod.) lin.	7.4	-	-	-	-	1.16	-	-	-	-	0.15	-	-
	eq. perc.	3.5	-	1.7	-	-	-	-	-	-	-	-	-	-
1"	(mod.) linear	13	7.4	4.6	-	-	1.9	-	1.08	0.72	0.3	-	0.16	0.05
	eq. perc.	5.8	-	2.8	-	1.3	-	-	-	-	-	-	-	-
1 1/4"	(mod.) linear	19	12	-	-	-								
	eq. perc.	9.3	-	-	-	-								
1 1/2"	(mod.) lin.	30	19	13	8.1	-								
	eq. perc.	13	9.9	-	3.2	-								
2"	(mod.) linear	52	32	23	14	12								
	eq. perc.	22	14	-	-	-								
2 1/2"	(mod.) linear	60	41	-	17									
	eq. perc.	35	-	-	9.3									
3"	(mod.) linear	107	67	46										
	eq.perc.	56	41	-										
4"	(mod.) linear	179	110	72										
	eq.perc.	89	56	-										
5"	(mod.) linear	275	-	110										
	eq.perc.	135	-	-										
6"	(mod.) linear	392	246	-										
	eq.perc.	171	104	-										
8"	(mod.) linear	650	408	-										
	eq.perc.	-	-	-										
10"	(mod.) linear	1056												
	eq.perc.	-												

## Seating Elements



		Function unit			
		Carbon - SST	SFC	STN2	STN3
Characteristics	Friction coefficient	+	+	-	-
	Actuator force	+	+	-	-
	Leakage rate	+	+	-	-
	Chem. Resistance	+	+	+	+
	Ability for high differential pressure	-	+	+	+
	Edge stability	-	+	+	+
	Application during cavitation	-	+	+	+
	Application at low valve opening (liquids and steam)	-	+	+	+
Applications	Range of use	Gases, fluids, steam without possibility for condensate hammer (continuous applications)	Reinforced alternative to carbon tribological pairing without influence to actuating forces, stability and rigidity of the STN2 pairing	Loaded fluids, like steam even at the danger of water hammers	Applications with very high differential pressures
	Fluid temperature	-328°F to 892°F	-76°F to 572°F	-76°F to 988°F	
Setup	Fixed disc	Stainless steel, coated with Stellite			Stellite
	Moving disc	Carbon	Stainless steel combined coating technique - SFC	Stainless steel coated with Tribaloy	Tribaloy
Availability		1/2"- 10"		1/2"-6"	1/2"-1"

$$\frac{F_{a, \text{Sliding gate valve}}}{F_{a, \text{Seat valve}}} = \frac{\Delta p \cdot \mu \cdot A_{\text{Slot}}}{\Delta p \cdot A_{\text{Seat}}} \approx 10\%$$


$F_A = \Delta p \cdot A_{\text{Seat}}$                        $F_A = \Delta p \cdot \mu \cdot A_{\text{Slot}}$

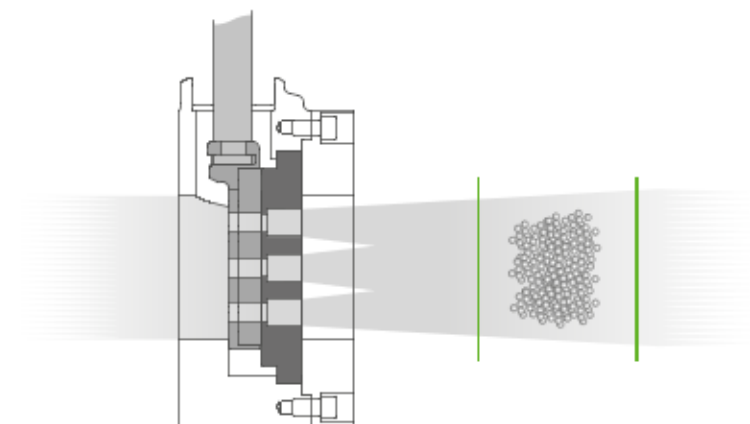
## Efficiency

The outstanding feature of the sliding gate valve is the actuating force which is approximately 10% of that needed to actuate a globe valve of the same size and differential pressure. This permits the use of much smaller actuators even though both designs of the same size have similar flow rates!

This beneficial feature stems from the fact that, in the sliding gate valve, closure is perpendicular to the direction of flow and not against it, as with the globe valve.

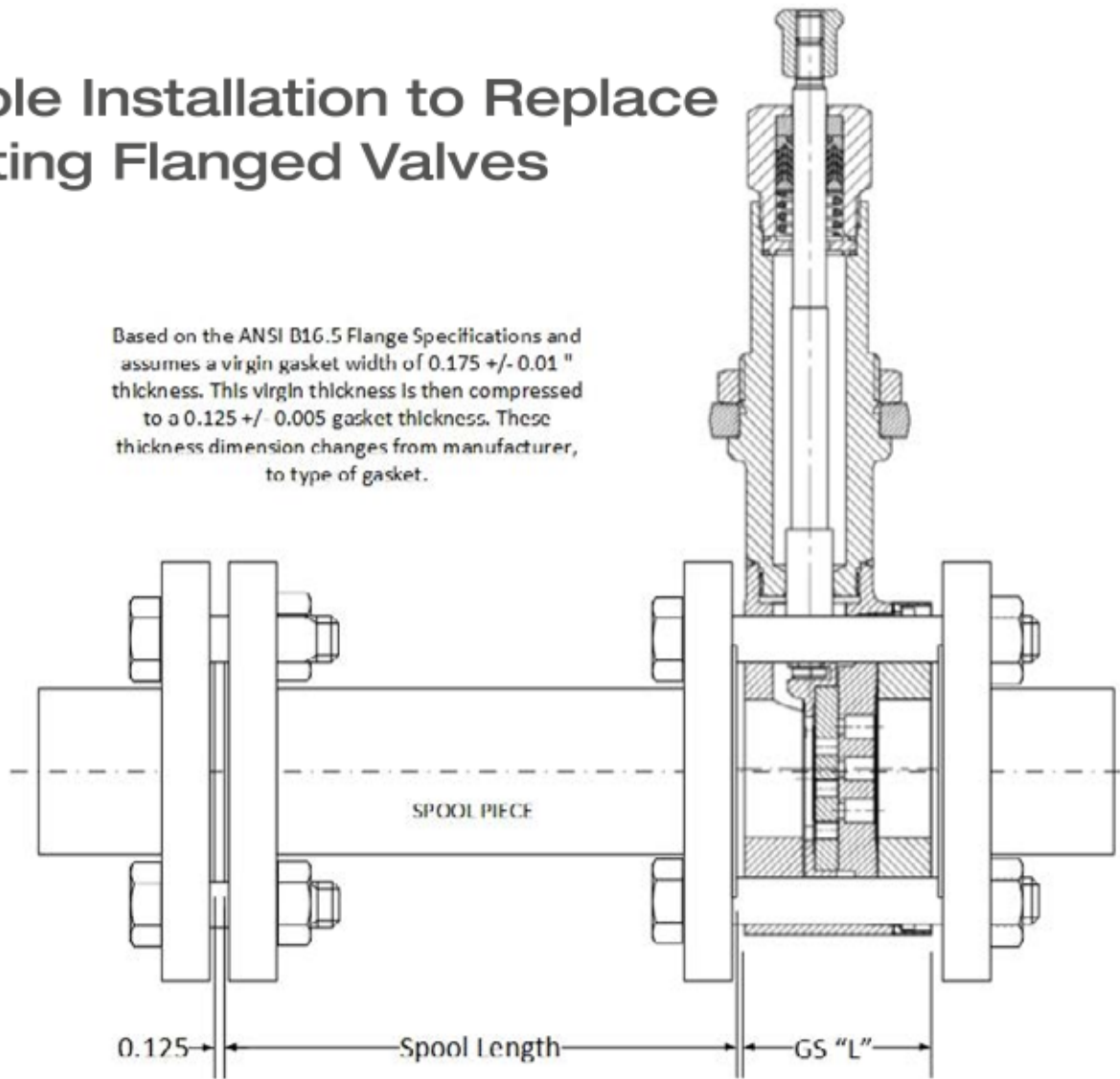
## Cavitation

A high rate of flow through the narrowest cross section of a valve will lower the local pressure below the vapor pressure of the liquid. Vapor bubbles form which then collapse in the regions of higher pressure. When they come into contact with solid boundaries (valve body), the imploding bubbles can cause damage. In the case of a sliding gate valve, these dangerous cavitation zones are external, or more accurately, they are located about **3 - 6 ft** beyond the valve. The cavitation bubbles then collapse around the center of the pipe-line without damaging consequences.



# Simple Installation to Replace Existing Flanged Valves

Based on the ANSI B16.5 Flange Specifications and assumes a virgin gasket width of 0.175 +/- 0.01 " thickness. This virgin thickness is then compressed to a 0.125 +/- 0.005 gasket thickness. These thickness dimension changes from manufacturer, to type of gasket.



**Spool Piece Adapters for Retrofitting Schubert & Salzer GS Wafer Flanges**

Nominal Size	150#	300#	600#	150#	300#	600#	S&S GS Valve L Dimension (in.)
	ANSI B16.5Standard Face to Face Dimension (in.)			Spool Piece Length (in.)			
1/2"	7.25	7.50	8.00	4.93	5.18	5.68	2.20
3/4"	7.25	7.63	8.13	4.93	5.30	5.80	2.20
1"	7.25	7.75	8.25	4.93	5.43	5.93	2.20
1-1/4"	NA	8.38	NA	NA	6.06	NA	2.20
1-1/2"	8.75	9.25	9.88	6.43	6.93	7.55	2.20
2"	10.00	10.50	11.25	7.36	7.86	8.61	2.52
2-1/2"	10.88	11.50	12.25	8.07	8.70	9.45	2.68
3"	11.75	12.50	13.25	8.88	9.63	10.38	2.75
4"	13.88	14.50	15.50	10.80	11.43	12.43	2.95
5"	Consult Factory						3.15
6"	17.75	18.63	Consult Factory	14.48	15.35	Consult Factory	3.15
8"	21.38	Consult Factory		17.60	Consult Factory		3.65
10"	26.50			22.59			3.78

Virgin Gasket Width in. 0.175 may vary  
Nominal Gasket Compression Width in. 0.125 may vary

Based on the ANSI B16.5 Flange Specifications and assumes a virgin gasket width of 0.175 +/- 0.01 " thickness. This virgin thickness is then compressed to a 0.125 +/- 0.005 gasket thickness. These thickness dimension changes from manufacturer, to type of gasket used.





#### Sliding gate control valve 8021

Nominal size: 1/2" - 10"

Nominal pressure: ANSI Class 150 - 600

Media temperature: -76°F to +662°F, optional  
-328°F to +986°F

Material: carbon steel, stainless steel,  
hastelloy, duplex, inconel & others upon request

Positioner: pneumatic, analog  
electropneumatic, digital electro-pneumatic,  
Ex-I version, AS-I bus connection



#### Sliding gate control valve 8020

Nominal size: 1/2" - 10"

Nominal pressure: ANSI Class 150 - 600

Media temperature: -76°F to +662°F,  
optional -328°F to +986°F

Material: carbon steel, stainless steel,  
hastelloy, duplex, inconel & others upon  
request

Side mount positioner: pneumatic,  
analog electro-pneumatic,  
digital electro-pneumatic,  
Ex-Version, Various communication  
protocols available, ex. Hart, Fieldbus  
Foundation, Profibus, etc.



#### Manual Sliding gate valve 8050

Nominal size: 1/2" - 10"

Nominal pressure: ANSI Class 150 - 600

Media temperature: -76°F to +662°F,  
optional -328°F to +986°F.

Gear operator available

Material: carbon steel, stainless steel,  
hastelloy, duplex, inconel & others upon  
request

## Modular Design, 360° of Installation





#### Sliding gate motor valve 8230

Nominal size: 1/2"-2" (others on request)  
 Nominal pressure: ANSI class 150 - 300  
 Media temperature: -76°F to +662°F,  
 Material: carbon steel, stainless steel,  
 hastelloy, duplex, inconel & others upon  
 request  
 Actuation: On/off and control actuation,  
 optional positioning control and  
 position feedback plus limit switches



#### Sliding gate control valve 8043/44

Nominal size: 1/2" - 10"  
 Nominal pressure: ANSI Class 150 - 300  
 Media temperature: -76°F to +662°F  
 Material: carbon steel, stainless steel,  
 hastelloy, duplex, inconel & others upon  
 request  
 Positioner: pneumatic,  
 analog electro-pneumatic,  
 digital electro-pneumatic,  
 Ex-i version, AS-i bus connection



#### Sliding gate motor valve 8037

Nominal size: 1/2" - 10"  
 Nominal pressure: ANSI Class 150 - 600  
 Media temperature: -76°F to +662°F  
 optional -328°F to 986°F  
 Material: carbon steel, stainless steel,  
 hastelloy, duplex, inconel & others upon  
 request  
 Power supply: 24 ... 230 V AC/DC  
 (Multi-zone power pack)  
 Explosion-proof (gas version):  
 II 2G Ex de [ia] IIC T6/T5  
 Protection class: IP 66  
 Optional actuation with 3-point  
 control + position electronics obtainable



#### Sliding gate motor valve 8038

Nominal size: 1/2" - 10"  
 Nominal pressure: ANSI Class 150 - 600  
 Media temperature: -76°F to +662°F  
 optional -328°F to 986°F  
 Material: carbon steel, stainless steel,  
 hastelloy, duplex, inconel & others upon  
 request  
 Dead band: +/- 2%  
 Repeatability: +/- 0,1%  
 Stroking speed: adjustable between  
 4,7 and 35 seconds  
 Actuator: high resolution motor actuator  
 for control and switching with stroke  
 monitoring, limit switches and optional  
 fail safe unit



#### Sliding gate pressure regulator 8011

Nominal size: 1/2" - 6"  
 Nominal pressure: ANSI Class 150 - 300  
 Media temperature: -76°F to +572°F  
 Pressure ranges: 7 psi to 145 psi  
 Material: Stainless steel  
 Self-operated pressure controller  
 Enclosed spring housing



#### Sliding gate stop valve 8040/41

Nominal size: 1/2" - 8"  
 Nominal pressure: ANSI Class 150 - 300  
 Media temperature: -76°F to +662°F  
 Material: carbon steel, stainless steel  
 Accessories: metal bellows, pilot valve,  
 limit switches, stroke limiter

# Seat valves by Schubert & Salzer

Seat valves are the extremely reliable all-rounders in the valve world. Our range includes stop valves and control valves in stainless steel or bronze, with actuators either made of stainless steel, non-ferrous metal or lightweight polymer. They are available in a variety of end connections, including threaded, weld ends, flanged versions and tri-clamps. Actuation is either pneumatic or electric motor-driven.

## Angle seat valves

Angle seat valves in the form of stop and control units offer a particularly compact construction and perform a very high number of switch cycles. In its many versions, the construction of the valve gives a highly efficient flow rate and can even be used in lightly contaminated media.

## Flange valves

In larger sizes, flange valves are easier to remove from pipelines than threaded valves. This range is supplied to various connection standards as angle and straight flanged seat valves.

## Three-way valves

Depending on its design, the three-way valve can perform a variety of functions: it can mix and distribute media flows or charge and discharge an operating component (e.g. a pressure cylinder). It is installed in a pipeline by threaded connections.





# Angle seat valve 7010

## 7010 Technical Data

	Body Material		
	Brass	Bronze	SST 316
Nominal size	2 1/2" and 3"	1/2" - 2"	1/4" - 3"
Connections: NPT thread Tri clamp Welding ends (ISO: SAE), Tube ends ANSI 150 ANSI 300	2 1/2" - 3"	1/2" - 2"	1/4" - 3"
Nominal pressure	235 psi	235 psi	580 psi
Max. fluid temperature <b>*Optional Type 220 HT-Version</b>	-22°F up to 338°F	-22°F up to 338°F up to +392°F	-22°F up to 338°F <b>up to +428°F*</b>
Ambient temperature	-5 °F up to +140°F		
Viscosity of the fluid	maximum 600 mm <sup>2</sup> /s (600cSt, 80°E)		
Vacuum	maximum 0.075 mm mercury (Hg)		
Working pressure for inverted packing	maximum 175 psi		
Seating seal	PTFE, Glass reinforced PTFE, PEEK, EPDM, Viton, Buna N, Vulkollan		

## 7010 Key Features

Rotating actuator

Chrome plated brass  
& stainless housings for  
high heat dissipation  
& corrosion resistance.  
Actuator not susceptible  
to UV degradation, and  
is suitable for washdown.

Dual stem bearings for  
"true" guidance and  
superior life

Precision roller-burnished  
and polished 316 SS  
stem for long life

NPT standard connection  
& optional end  
connections

Chevron Packing

O-Ring

Packing  
PTFE filled  
with carbon

Spring  
loading on  
packing  
rings for  
tight sealing

guide rings

Fully repairable for  
optimum serviceability with-  
out removal from system

5-PTFE Chevron Packing Rings

Spring loading on packing  
rings for tight sealing

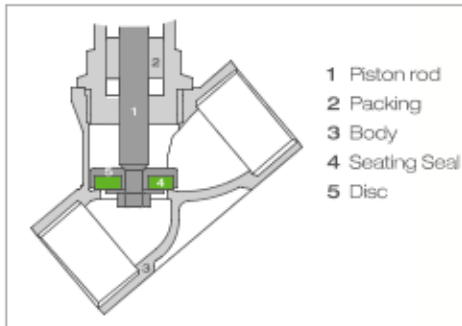
Wiping ring prior to packing  
gland to protect against  
contamination

PTFE seal provides  
resistance to aggressive  
fluids, high temperatures &  
tight sealing. Other seat  
materials available

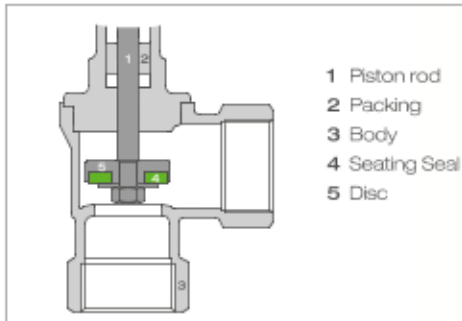
Water-hammer free flow  
under seat

Normally closed version shown

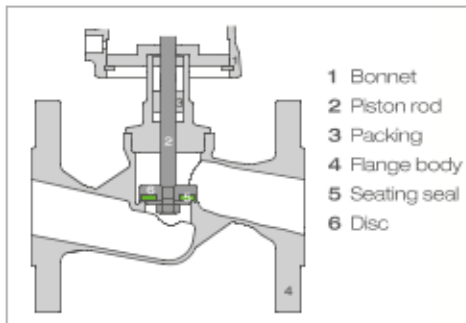
## Angle seat valves (1) (2) (3)



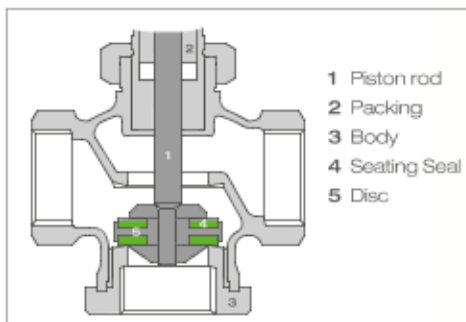
## Right-angled valves (6)



## Flange valves (4)



## Three-way valves (5)





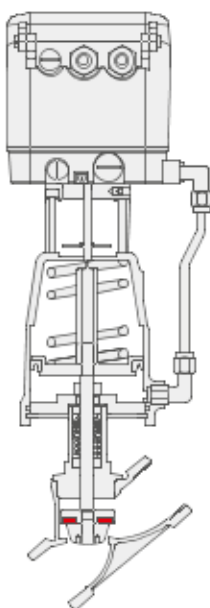
**(1) Angle seat stop valve 7010**

Nominal size: 1/4" - 3"  
 Working pressure up to 580 psi  
 Media temperature:  
 -22°F up to +428°F,  
 optional to -74°F  
 Material: Bronze and 316 stainless steel



**(6) Right angle valve 7050**

Nominal size: 1/2" - 2"  
 Working pressure: Up to 580 psi  
 Media temperature: -22°F to +428°F  
 Material: Stainless steel  
 Actuation: stop and control actuation



**(2) Angle seat control valve 7020**

Nominal size: 1/4" - 3"  
 Working pressure up to 250 psi  
 Media temperature: -22°F to +428°F,  
 optional to -74°F  
 Material: Stainless steel  
 Positioner: pneumatic,  
 analog electro-pneumatic,  
 digital electro-pneumatic,  
 Ex-i version, AS-i bus connection  
 Direct acting 3-15 psi, 6-30 psi



**(3) Angle seat motor valve 7210**

Nominal size: 1/4" - 2"  
 Working pressure: Up to 580 psi  
 Media temperature: -22°F to +428°F  
 Material: Bronze and stainless steel  
 Actuation: stop and control actuation,  
 optional position control and  
 position feedback plus limit switches



**1) Check valve 4000**

Nominal size: 3/8" - 2 1/2"  
 Working pressure: up to 580 psi, ANSI #  
 150, DIN flanged versions  
 Media temperature: -4°F to +392°F  
 Material: Stainless steel

**Line strainer 4005**

Nominal size: 3/8" - 2 1/2"  
 Material: Stainless steel, multiple end  
 connections



**(5) Three-way control valve 7082**

Nominal size: 1/2" - 2"  
 Working pressure: Up to 232 psi  
 Media temperature: -22°F to +428°F  
 Material: Stainless steel  
 Positioner: digital electro-pneumatic,  
 Ex-i version, AS-i bus connection  
 Available with pneumatic actuator as  
 3/2-way stop valve 7080 in corrosion-  
 resistant bronze, Motor actuators  
 available as well



**4) Integrally flanged valve 7032/7037**

Nominal size: 1/2" - 2"  
 On/Off or Modulating  
 Nominal pressure: ANSI # 150, DIN  
 Media temperature: -22°F to +428°F,  
 optional to -74°F  
 Material: Stainless steel  
 Positioner: pneumatic,  
 analog electro-pneumatic,  
 digital electro-pneumatic,  
 Ex-i version, AS-i bus connection  
 Direct acting 3-15 psi, 6-30 psi





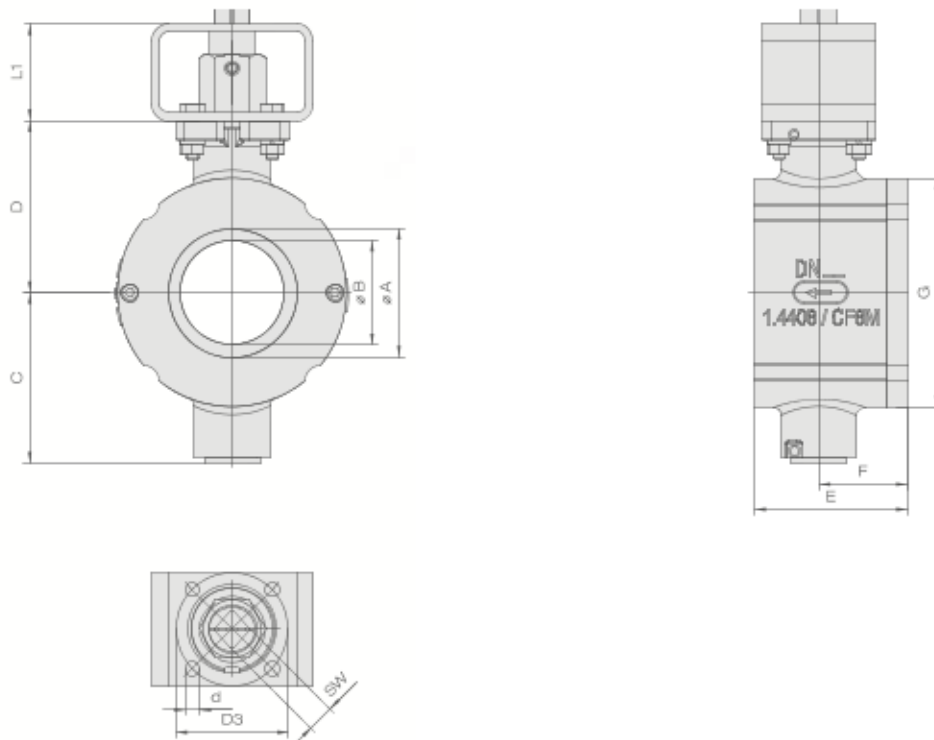
## Ball sector valves by Schubert & Salzer

The ball sector valve is designed to succeed in harsh applications; slurries, dry media and fluids with suspended solids or fibers. It is suitable for control and isolation.

With pneumatic and electrical actuators, it is the best choice for very precise control within a broad range of industries and a variety of process applications.

*Pulp fiber & Digestive liquors, Mining Slurries, Dry Powders, Oils, Coal & Carbon, Steam, Molasses, Sugar Slurries, Limestone & Fly Ash Suspensions, Miscellaneous Fluids, Combustion Gases, Coke Gases and more.*

# Standard Dimensions without Actuator (with Mounting Kit ISO 5211)



Size	A	B	C	D	E	F	G	L1	d	D3	SW	DIN/ISO 5211
1"	0.93	0.79(0.59)	2.87	2.91	1.97	1.02	2.87	2.36	0.26	1.97	0.55	F 05
1 1/2"	1.61	1.26(0.96)	3.11	3.15	2.28	1.22	3.7	2.36	0.26	1.97	0.55	F 05
2"	2.09	1.57	3.23	3.27	2.8	1.5	4.41	2.36	0.26	1.97	0.55	F 05
3"	3.15	2.56	4.17	4.21	3.74	2.17	5.59	2.36	0.35	2.76	0.67	F 07
4"	3.94	3.15	4.61	4.65	4.41	2.44	6.85	2.36	0.35	2.76	0.67	F 07
6"	5.91	4.72	6.1	6.14	6.69	3.74	8.66	3.15	0.43	4.02	0.87	F 10
8"	7.87	6.1	7.24	7.28	8.27	4.72	11.02	3.15	0.53	4.92	1.06	F 12
10"	9.84	7.69	8.98	9.02	10.63	5.71	13.31	3.15	0.53	4.92	1.06	F 12

Dimensions for 12" on request

Dimension in inch

## 4040 valve body, acc to ANSI ISA-75.08.02



Positioner

Air Tubing

Actuator

Drive adapter

Bracket

O-ring (part 14)

O-ring (part 13)

Bearing pin

Ball sector

Seat support ring

O-ring (part 16)

Seat ring

O-ring (part 15)

Seat retaining ring

Bearing pin

Body

O-ring (part 13)

O-ring (part 14)



# matter...

Compact top mount  
Schubert & Salzer  
digital positioner

Wide range of  
accessories available,  
mounting to  
NAMUR standard

Pneumatic actuator  
(double or single  
acting) or motor  
actuator mounting to  
DIN/ISO 5211

Mounting kit  
according to  
DIN/ISO 5211

Wafer body designed  
to suit ANSI or  
DIN standards up to  
10" (DN 300 flanged)

Centric and  
maintenance-free, high  
temperature bearings

Visual  
position indication

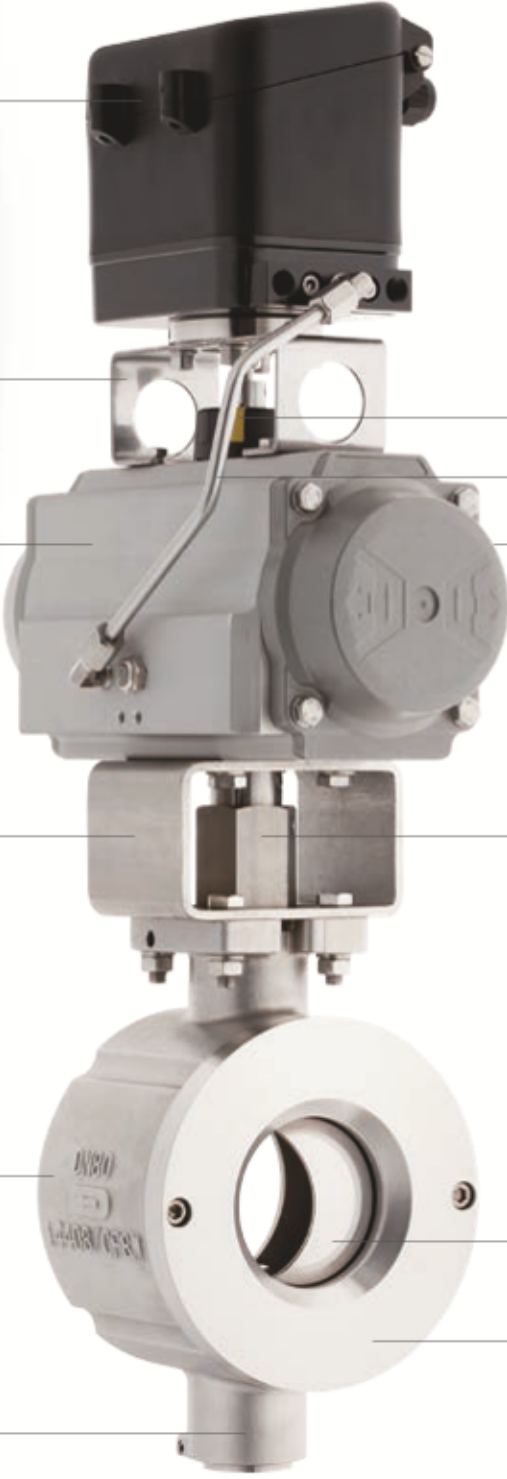
Tubing

Adjustable travel  
stops

Close toleranced  
coupling to ensure  
precise positioning  
and repeatability

Ball sector optional  
with hardened surface  
treatments for  
demanding media and  
modified equal  
percentage  
flow characteristic with  
rangeability of 300:1

Seat retaining ring and  
valve seat available in  
various material  
combinations; easy to  
install and maintain

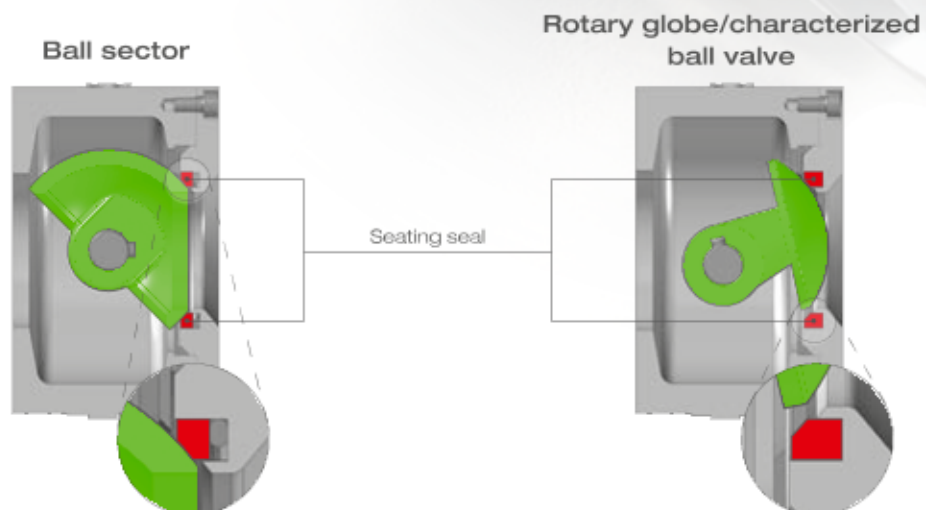


# The advantages of ball sector valves

## Wear resistance

Generally segmented ball or rotary globe valves use excentric shafts, which cause the ball or plug to lift up from the valve seat when starting to open. Thus, sealing areas are instantly exposed to permanent wear. More-over, particulate can migrate between the seal ring and ball/plug, causing damage leading to leakage.

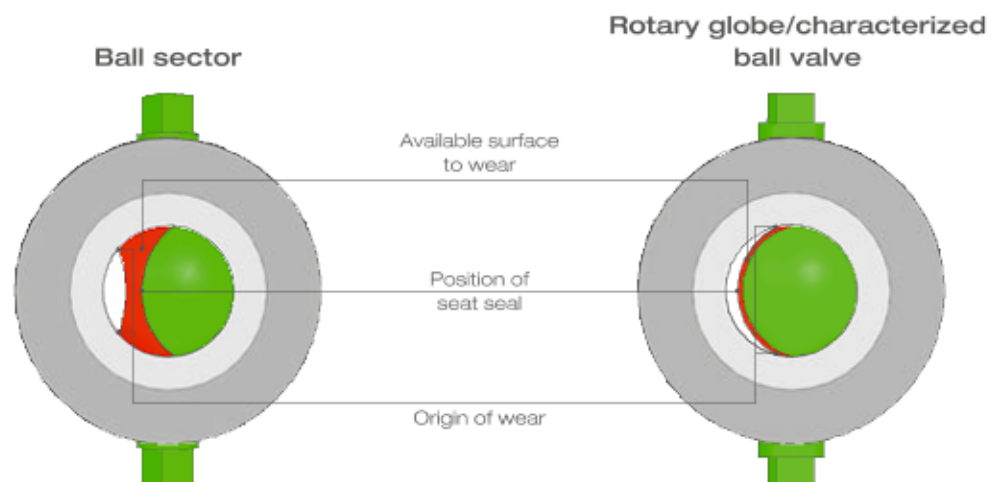
The ball sector valve has centric and robust trunnions which allows the ball sector to maintain constant contact with the valve seat, eliminating contamination by the media. The permanent actuation torque is not affected by changes in the differential pressure.



## Life span

This smart seal design, combined with a variety of materials, precision radius ball sector and valve seat increases the life span of the valve substantially

over butterfly valves or alike. It is therefore particularly suitable for abrasive, high viscosity or fiber containing media.



# Technical Information

Design	Flangeless, wafer type (size 12" flanged)	
Nominal sizes	1" up to 12"	
Body material	Cast parts	CF8M (1.4408)
	Tuned parts	316 L (1.4404)
Bearing material	High temperature plain bearing (Igidur Z)	
Actuator Mount	Mounting kit DIN/ISO 5211	
Nominal pressure	1" - 2"	ANSI150, ANSI300, 580 psi (for flanges 145 psi - 580 psi)
	3" - 4"	ANSI150, ANSI300, 365 psi
	6" - 12"	ANSI150, 235 psi
	Other pressure ranges on request	
Fluid temperature	-76°F up to +446°F	
Ambient temperature	-40°F up to +176°F (special version on request)	
Characteristic	Almost equal percentage	
Rangeability	300:1	

## Valve Sizes, C<sub>v</sub>-Values, Torques

Nominal size	C <sub>v</sub>	Orifice inch	Rotation angle nominal (1)	Max. pressure nominal	Max. pressure nominal ANSI	Req. torque (lbf ft) on/off-operation	control operation	Standard mounting kit DIN/ISO
1" (50%)	14.5	0.59	65°	580 psi	ANSI 300	11	18	F05/SW14
1"	24.4	0.75	90°	580 psi	ANSI 300	11	18	F05/SW14
1 1/2" (50%)	39.4	0.98	60°	580 psi	ANSI 300	22	37	F05/SW14
1 1/2"	74.2	1.26	90°	580 psi	ANSI 300	22	37	F05/SW14
2"	109	1.57	90°	580 psi	ANSI 300	22	37	F05/SW14
3"	295.8	2.52	90°	365 psi	ANSI 150	44	74	F07/SW17
4"	452.4	3.15	90°	365 psi	ANSI 150	66	111	F07/SW17
6"	939.6	4.72	90°	235 psi	ANSI 150	111	184	F10/SW22
8"	1583.4	6.1	90°	235 psi	ANSI 150	155	258	F10/SW27
10"	2575.2	7.68	90°	235 psi	ANSI 150	266	443	F12/SW27
12"	4454.4	9.84	90°	235 psi	ANSI 150	664	1106	F14/SW36

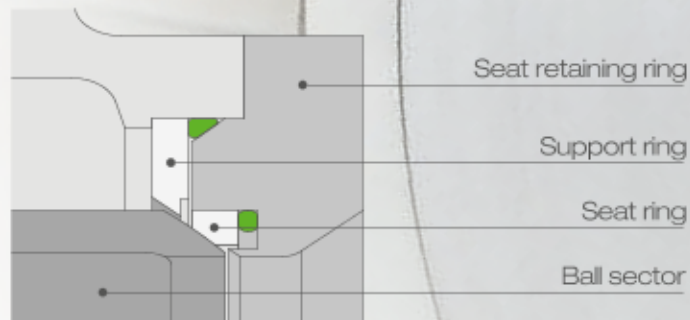
## Maximum Working Pressure

Nominal size	Maximum differential pressure (Δp)								
	Seat ring PTFE			Seat ring PEEK				Seat ring Stellite	
	up to 176°F psi	248°F psi	338°F psi	up to 176°F psi	248°F psi	338°F psi	428°F psi	up to 176°F psi	338°F psi
1" - 2"	365	230	85	580	580	365	230	580	580
3" - 4"	230	175	75	365	365	230	145	365	365
6" - 12"	230	175	60	230	230	175	115	230	230

# Shaft Seals (O-Ring)

	Min. temp (°F)	Max. temp (°F)
Viton (standard)	5	392
EPDM	-40	284
NBR	-40	212
FFKM	5	428

Special material on request



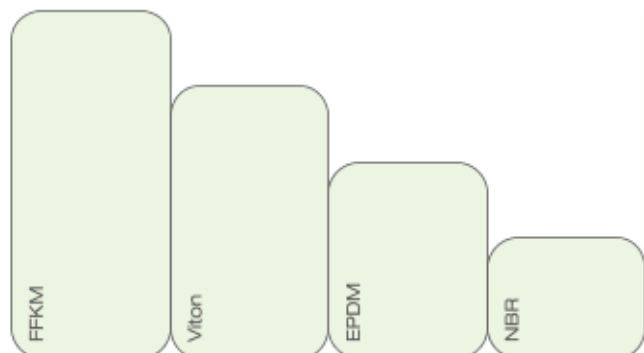
## Valve Seat Combinations

Seat ring	Ball sector	Leakage	Min. temp (°F)*
PTFE	Stainless steel polished	$5 \times 10^{-7}$ from max. $C_v$	-40 up to +338°F
PEEK	Stainless steel polished	$5 \times 10^{-7}$ from max. $C_v$	-40 up to +428°F
PTFE	Stainless steel, hard chrome plated	$5 \times 10^{-7}$ from max. $C_v$	-40 up to +338°F
PEEK	Stainless steel, hard chrome plated	$5 \times 10^{-7}$ from max. $C_v$	-40 up to +428°F
Stellite	Stainless steel, hard chrome plated and lapped	Class IV-S1 acc. EN 1349 (IEC 534-4) $5 \times 10^{-6}$ from max. $C_v$	-40 up to +446°F
PTFE	Stainless steel, hard chrome plated and lapped	Class VI acc. EN 1349 (IEC 534-4)	-40 up to +338°F

\* Please note the restrictions of the o-ring material

## Material Selection Matrix

### Sealings



### Seat ring



### Abrasiveness



### Seat combination



### Retaining ring





#### **Ball sector valve 4040**

Nominal size: 1" - 12"

Nominal pressure: PN 10 - 40,

ANSI # 150 - 300

Material: stainless steel 1.4408 (CF8M) and 1.4404 (316L)

Various seat material combinations  
Positioner: pneumatic, analogue electro-pneumatic, digital electro-pneumatic, Ex-i version



#### **On/off ball sector valve 4040**

Nominal size: 1" - 12"

Nominal pressure: PN 10 - 40,

ANSI # 150 - 300

Material: stainless steel 1.4408 (CF8M) and 1.4404 (316L)

Various seat material combinations  
Single or double acting on/off actuators  
Various switch boxes available  
Other versions: manual actuation



#### **Motorized ball sector valve 4030**

Nominal size: 1" - 12"

Nominal pressure: PN 10 - 40,

ANSI # 150 - 300

Material: stainless steel 1.4408 (CF8M) and 1.4404 (316L)

Various seat material combinations  
Actuator: various electric actuators



#### **Highly precise ball sector valve 4032**

Nominal size: 3" - 10"

Nominal pressure: PN 10 - 40,

ANSI # 150 - 300

Material: stainless steel 1.4408 (CF8M) and 1.4404 (316L)

Various seat material combinations  
Actuator: electric actuator, highly precise (8000 steps) incl. control cabinet



#### **Ex-motorized ball sector valve 4037**

Nominal size: 1" - 4" (others on request), 1" - 3" also available with spring return

Nominal pressure: PN 10 - 40,

ANSI # 150 - 300

Material: stainless steel 1.4408 (CF8M) and 1.4404 (316L)

Various seat material combinations  
Actuator: Ex-certified motor actuator  
II2G/D EEx Ia IIC T6/T5 and IEC Ex

# Sanitary valves by Schubert & Salzer

In many industries, purity commands top priority. Sanitary valves from Schubert & Salzer operate to the highest requirements for purity with maximum efficiency. The bodies are CIP and SIP capable, to avoid contamination by bacteria as these valves have no dead zones.

## Right angle valves

Very good control and ideal sanitary conditions are often a contradiction in terms. 6020 and 6021 aseptic control valves from Schubert & Salzer Control Systems satisfy both tasks perfectly. These right angle valves offer ideal prerequisites for the food and beverage industries. Elastomers available for FDA and USP Class VI.

## Pinch valves

The 7077 control valve for endless tubes offers a modern alternative to conventional pinch or diaphragm valves. The pinch valve can be used at any position on an endless tube for on/off and control operations. With no dead space, the highest sanitary demands can be met. For those applications where flexibility is not a priority, the 7079 pinch control valve offers an alternative and is integrated permanently in pipelines. As well, the entire design can be used in food-related and sterile processes. Pinch valves can also be operated as control valves with a positioner retrofit.



# Details

Positioner

Sensing pin

Support bolt

Piston spring

Pilot line

Piston

Flange

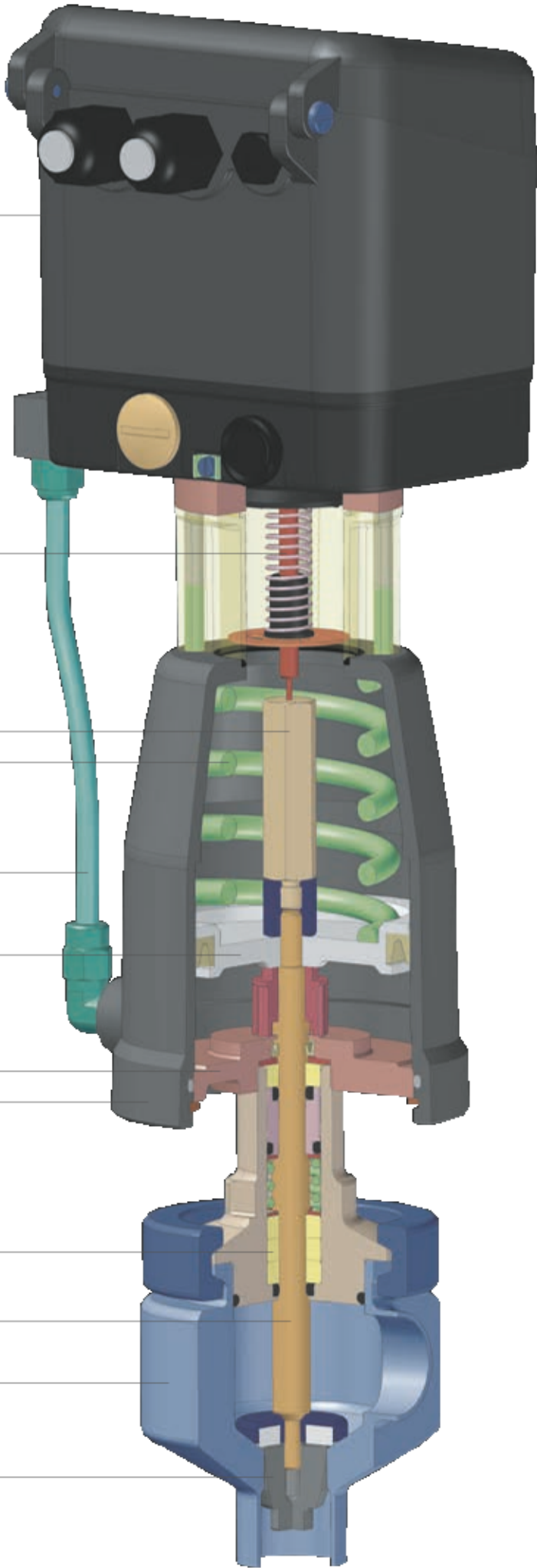
Actuator

Guide rings

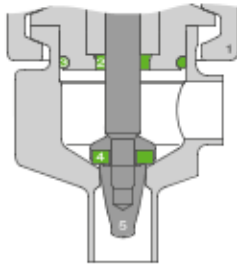
Valve stem

Body

Control plug

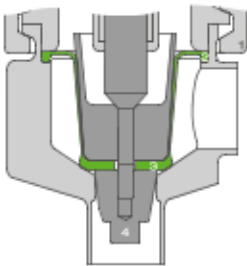


## Hygienic right angle valves (1)



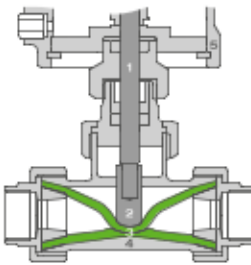
- 1 Clamp connection
- 2 Stem seal
- 3 Body seal
- 4 Seating seal
- 5 Control plug

## Aseptic right angle valves (2)



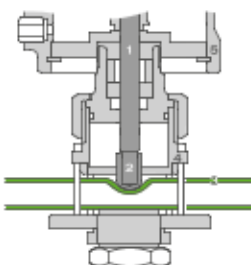
- 1 Clamp connection
- 2 Body seal with diaphragm
- 3 Seating seal with diaphragm
- 4 Control plug

## Pinch valves (3)



- 1 Valve stem
- 2 Actuating pin
- 3 Pinch tube
- 4 Body
- 5 Actuator

## Endless tube pinch valve (4)



- 1 Body
- 2 Actuating pin
- 3 Pinch tube
- 4 Body
- 5 Actuator







**(1) Hygienic right angle control valve 6020**  
 Nominal size: 1/2" - 1 1/2" (2" tri-clamps)  
 Nominal pressure: 232 psi  
 Media temperature: -4°F to +392°F  
 Material: 316L Stainless steel  
 Positioner: pneumatic, analog electro-pneumatic, digital electro-pneumatic,  
 Ex-i version, AS-i bus connection



**2) Aseptic right angle control valve 6021**  
 Nominal size: 1/2" - 1 1/2" (2" tri-clamps)  
 Nominal pressure: 160 psi  
 Media temperature: -4°F to +275°F optional to +160°C  
 Material: 316L Stainless steel  
 Positioner: pneumatic, analog electro-pneumatic, digital electro-pneumatic,  
 Ex-i version, AS-i bus connection



**(3) Pinch control valve 7079**  
 Nominal size: 1/2" - 2"  
 Operating pressure: to 88 psi  
 Media temperature: -22°F to +266°F  
 Tube material: NBR and EPDM (conforming to FDA), Viton  
 Positioner: pneumatic, analog electro-pneumatic, digital electro-pneumatic,  
 Ex-i version, AS-i bus connection



**4) Endless tube control valve 7077**  
 Tube diameter: 10 - 18 mm, 3/8"-5/8"  
 Operating pressure: to 58 psi (depending on tube)  
 Media temperature: -22°F to +338°F (depending on pinched tube)  
 Material: Stainless steel  
 Positioner: pneumatic, analog electro-pneumatic, digital electro-pneumatic,  
 Ex-i version, AS-i bus connection



## Positioners by Schubert & Salzer

Compact positioners in analogue and digital versions for adaptation to pneumatic control valves

- Mounting the positioner on top of the valve actuation, no external moving parts. This increases operating efficiency, provides better control and less hysteresis
- Extremely compact, space saving design when integrating into systems
- Suitable for linear & rotary actuation
- Visual and electronic display of valve position



#### Digital Positioner 8049

Connections: G 1/8", NPT 1/8"

Input signal: 0/4 - 20 mA,

optional 0/2 - 10 V

Adaptation to actuator: self-learning

Adaptability: 3 - 28 mm (sliding stem),  
max. 270° (rotary stem)

Versions: 2 and 4-wire

Configuration: via PC software

Ambient temperature: -20°C to +75°C /  
-4°F to +167°F

Also in ATEX version

Optional feedback module available

Version for rotational actuation  
available

Accessories: Set point signal

AS-i profile, Bluetooth, remote mount

Electrical connections: M12 or 1/2"

conduit

Communication Software with interface

Dongle or Bluetooth: logs Maintenance

Data and allows easy change of valve  
characteristics



#### Digital Positioner 8049 (stainless steel)

Entirely in stainless steel

Connections: G 1/8", NPT 1/8"

Accessories: Set point signal

AS-i profile

Input signal: 0/4 - 20 mA, optional

0/2 - 10 V

Adaptation to actuator: self-learning

Stroke range: 3 - 28 mm

Versions: 2 and 4-wire

Configuration: via PC software

Ambient temperature:

-20°C to +75°C / -4°F to +167°F

Also in ATEX version



#### Digital Positioner 8049 IPC

Positioner with process controller with  
integrated process controller

Input signal: 0/4 - 20 mA, PT-100

Sampling rate: ca. 50 ms

Set point setting: external/internal

Configuration: via PC software

Ambient temperature:

-20°C to +75°C / -4°F to +167°F



#### Digital position indicator 2040

Optical and electronic position

indicator for mounting on pneumatic

valves with linear or quarter turn actuator

Valve position output via switching contacts

Display of error messages

Display of maintenance intervals

Supply voltage: 24 V DC

Temperature range: -20°C to +75°C /

-4°F to +167°F

Configuration: via PC software



#### Positioner 8047 p/p

Input signal range:

pneumatic 3 - 15 psi

Stroke range: 5 - 22 mm / 0.2" - .87"

(depending on stroke return spring)

Pilot energy: 43 - 87 psi

Hysteresis: < +/- 1%

Air consumption: 400 - 600 NI/h

(depending on air supply)



#### Positioner 8047 i/p

Input signal range:

electro-pneumatic 0/4 - 20 mA

Stroke range: 5 - 22 mm / 0.2" - .87"

(depending on stroke return spring)

Pilot energy: 43 - 87 psi

Hysteresis: < +/- 1%

Air consumption: 400 - 600 NI/h

(depending on air supply)

Also in ATEX version

M12 connection

# Electric actuators

Besides a precise throttling element, a precise actuator is also required for solving complex control applications.

This requirement is achieved by electrical Schubert & Salzer actuators, model 2030 and 2032. These actuators are focused on control accuracy, high positioning speed

and reliability. These actuators are field configurable through Schubert & Salzer's device config communications software, complete with diagnostics capability. All motors are interchangeable with existing actuators (including Belimo).



## Actuator 2030

Fast and high-resolution actuator  
Regulating speed up to 0.75 mm/s (.03 "/s)  
Dead band:  $\pm 0.2\%$  of the valve stroke  
Repeatability: approx.  $\pm 0.1\%$   
Actuating force: 2.0 kN  
Protection class: IP67  
Ambient temperature:  $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  /  $14^{\circ}\text{F}$  to  $140^{\circ}\text{F}$   
Low temperature version to  $-40^{\circ}\text{C}$  /  $\text{F}$   
Automatic valve adaption  
Diagnostics functions  
Also available with safety position in case of power failure



## Actuator 2032

Compact and precise actuator  
Regulating speed up to 1.5 mm/s (.06 "/s)  
Dead band:  $\pm 0.6\%$  of the valve stroke  
Repeatability: approx.  $\pm 0.3\%$   
Actuating force: 0.8 kN  
Protection class: IP65  
Ambient temperature:  $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  /  $14^{\circ}\text{F}$  to  $140^{\circ}\text{F}$   
Automatic valve adaption  
Diagnostics functions  
Also available with safety position in case of power failure



# Customized valve manifolds

Compact valve manifolds by Schubert & Salzer reduce piping, maintenance time and ultimately minimize investment costs.

In many systems, processes require connecting multiple valves for different media so that they can together carry out a special process function. A connection system well-known from the field of hydraulics and adapted to the respective application, allows for the intelligent combination of several valves in a customer-specific manifold. All necessary connections between the individual process valves are integrated in the manifold. On the customer side, connections for process media input and output in the desired number are available depending on the requirement.

Manifolds can be manufactured either completely from stainless steel or solid carbon steel with threaded valve seats. Additional pressure and temperature sensors can be integrated at any time. The manifolds are developed and manufactured individually according to your P&I diagrams.

Applications include:

Tire Presses

Food & Beverage

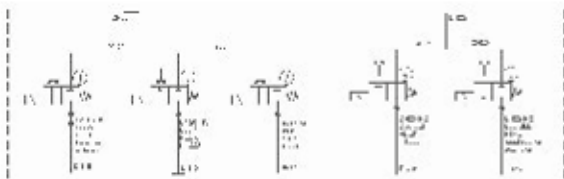
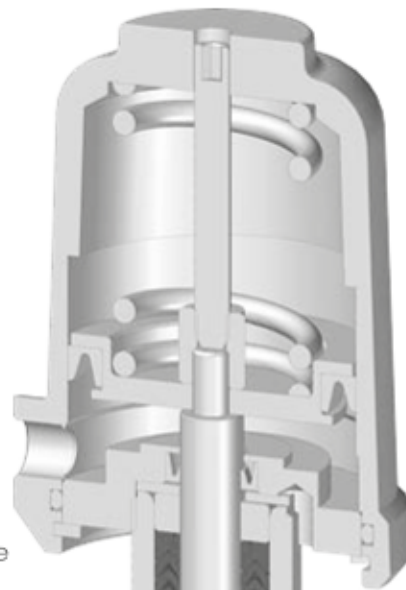
Multiple Pipe Racks

Specialty Chemicals

bioPharm

Electronics

more...



## Segmented disc valves by Schubert & Salzer

Perfect and variable control with high precision over a wide flow range, this is made possible by the segmented disc valves by Schubert & Salzer.

Due to the robust design and the reciprocal flow direction, segmented disc valves are suitable for fluids, gases and steam, even those carrying a high degree of particulate. The wide range of applications includes areas such as building materials, chemical and power plants, pipelines, water and waste water treatment, and shipbuilding. A simple yet effective valve design!



# Details

Analogue actuation  
(such as 4-20 mA  
or 3-point actuation)

Electric actuator  
(customised speci-  
fications possible)

Actuators available  
in various voltages  
and accessories

Gear rack rotating  
the moving disc

Optical position  
indication

Adjustable gland  
nut packing

Body with space-  
saving wafer design  
according to DIN  
(special designs  
according to ANSI)

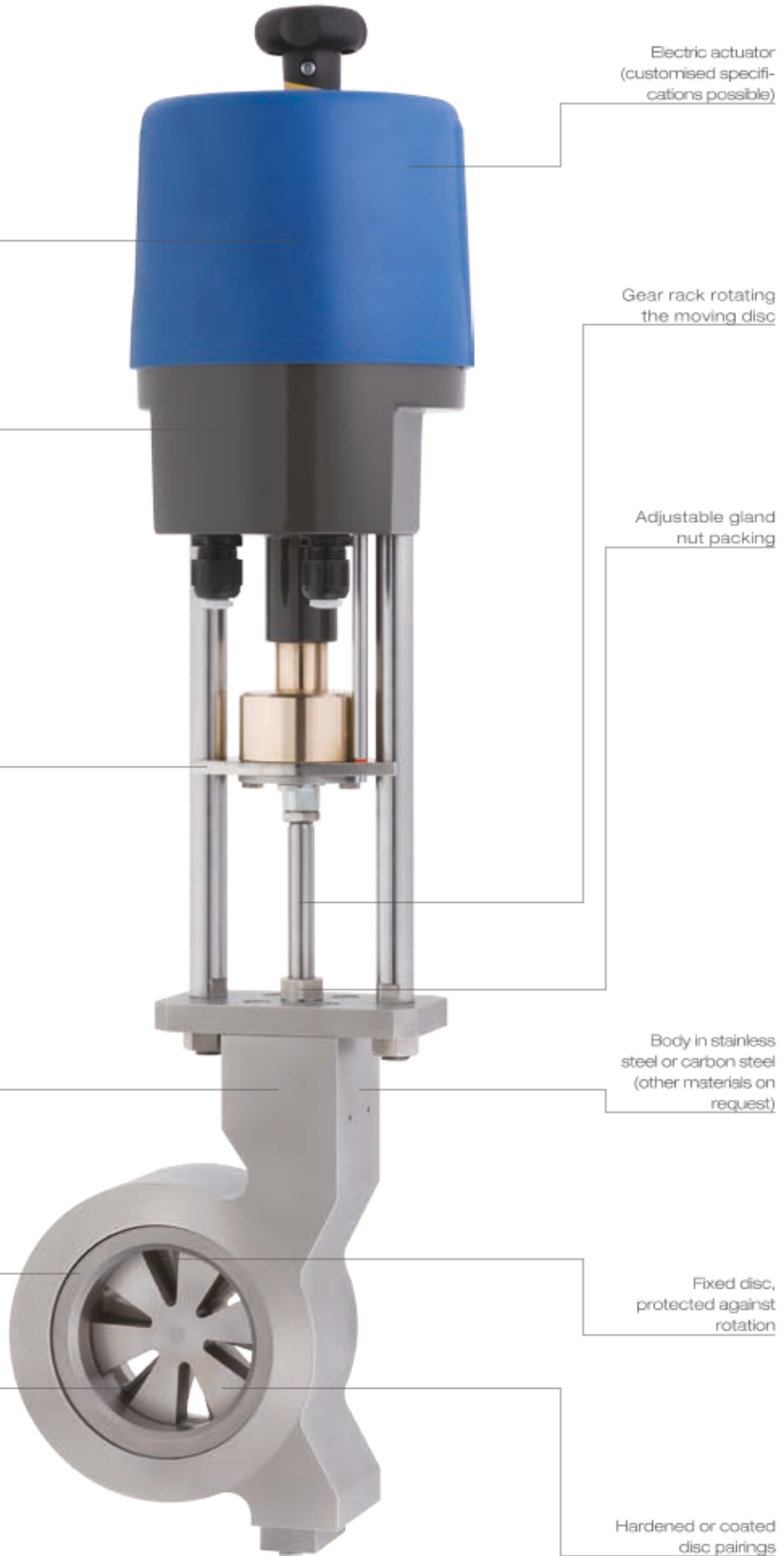
Body in stainless  
steel or carbon steel  
(other materials on  
request)

Spring pre-tension-  
ing of the sealing  
disc, this means  
control opposite to  
the flow direction is  
possible as well

Fixed disc,  
protected against  
rotation

The special contour  
of the sealing disc  
provides durability in  
case of contami-  
nated media

Hardened or coated  
disc pairings





# Functional principle of segmented disc valves

Segmented disc valves work on a very simple but effective principle.

The central throttling element - the segmented discs that rotate and seal against each other - are positioned in the valve body perpendicular to the flow direction. The fixed disc is a non-rotating element whose geometry determines the Cv and flow characteristic. The moving disc having the same number of segments is driven by a linear stem which opens and closes the segments in precise segments to regulate superior control.

The movable segmented disc is constantly pressed onto the fixed disc by a spring assembly regardless of the prevailing differential pressure. As a result, the flow can be bi-directional and the valve can be installed in any position.



This special design makes segmented disc valves one of the few valves that combine control precision even in extreme operating conditions with a high seal tightness and very low exposure to wear.

## Technical information

Design		Wafer design for flanges according to DIN EN 1092-1 type B
Nominal sizes		DN 25 to DN 300/ 1"-12" (on request up to DN 800, 32")
Nominal pressure *	DN 25 - DN 150	PN 25 according to DIN 2401 (also suitable for flanges PN 10 - PN 25)
*Consult Factory	DN 200	PN 25 according to DIN 2401
for ANSI ratings	DN 250 - DN 300	PN 16 according to DIN 2401
Media temperature		-60°C to +220°C, -76°F to 428°F (higher temperatures on request)
Ambient temperature*		-30°C to +100°C , -22°F to 212°F
Rangeability		60 : 1
Characteristic		Modified linear
Leak rate % of C <sub>v5</sub>		< 0.001, 10 X > ANSI Class IV

\* Note Limits of the positioner!

# Details

Positioner

Pilot line

Diaphragm housing

Diaphragm plate

Coupling

Adjusting nut

Column

End positions

Protection tube

Serrated Linear Stem

Packing

Segment disc fixed

Segment disc moving

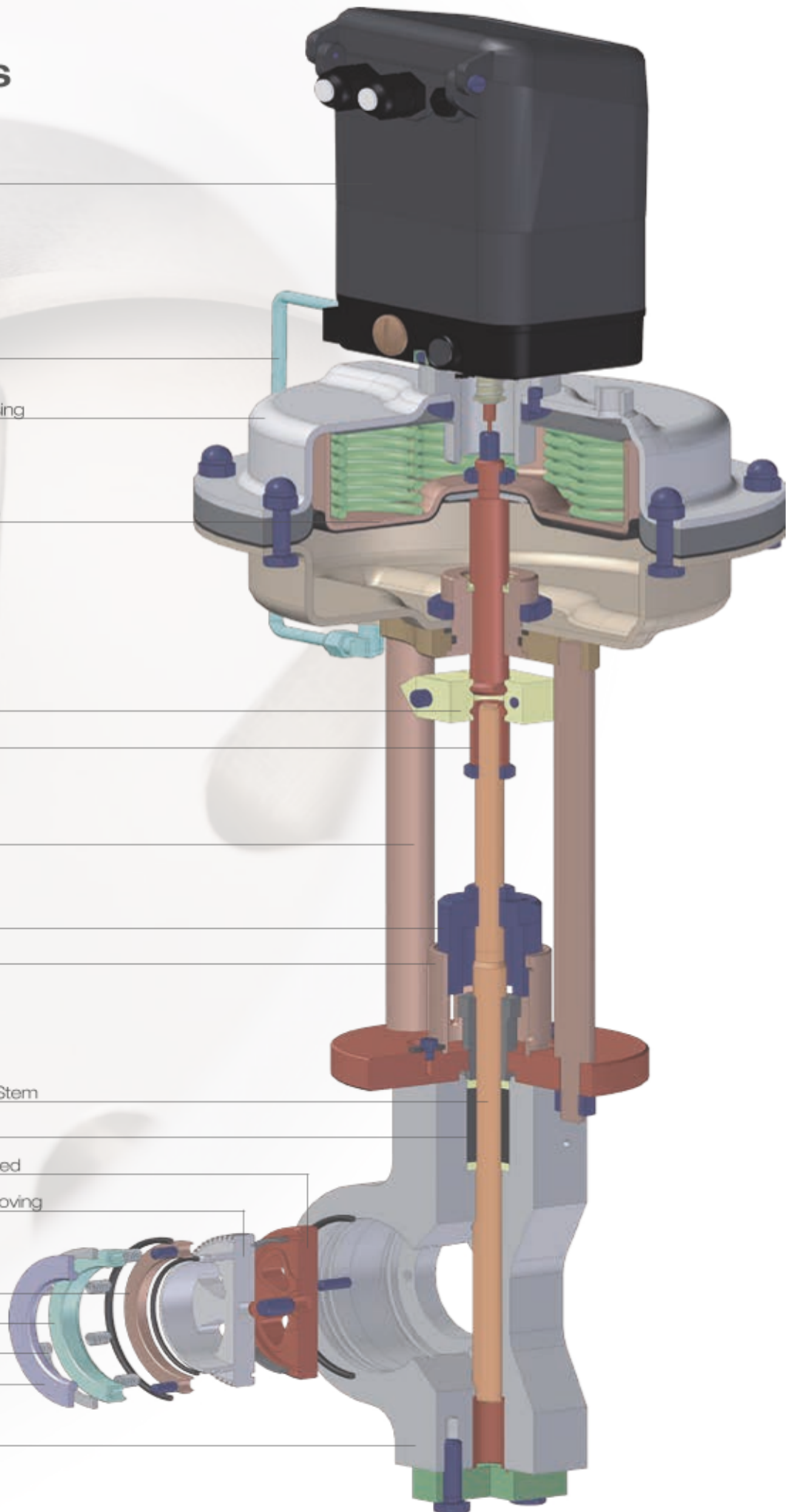
Sliding ring

Spring retainer

Circlip

Retaining ring

Body





#### Segment disc valve

##### with pneumatic actuator 5020

Nominal size: DN 25 - 300 (on request up to DN 800) 1" to 12", up to 32"

Nominal pressure: PN 25 (PN 16 for DN 250 and larger)

Material: Stainless steel (also available in carbon steel for 6 inch and larger)

Available with and without positioner

Positioner: pneumatic, analog electro-pneumatic, digital electro-pneumatic, Ex-i version



#### Segment disc valve

##### with motor actuator 5030

Nominal size: DN 25 - 300 (on request up to DN 800) 1" to 12", up to 32"

Nominal pressure: PN 25 (PN 16 for DN 250 and larger) ANSI

Material: Stainless steel (also available in carbon steel for 6 inches and larger)

Actuator: Various electrical actuators available, stop and control actuators, optional position control and position feedback plus limit switch



#### Segment disc valve

##### with manual actuator 5050

Nominal size: DN 25 - 200 (on request up to DN 800) 1" to 12", up to 32"

Nominal pressure: PN 25, ANSI

Material: Stainless steel (also available in carbon steel for 6 inch and larger)

Actuator: Smooth-running ball-bearing manual actuation

# Segmented disc orifices

Adjustable orifice for the precise adjustment of a defined flow.

- Adjustable while installed
- Defined characteristics
- End positions
- Space-saving wafer design
- Light weight
- Low-noise operation
- High  $C_v$  values



## Technical Information

Design		Wafer design for flanges according to DIN EN 1092-1 type B (ANSI connections upon request)
Nominal sizes		DN 15 up to DN 300, 1" to 12"
Nominal pressure		PN 16 according to DIN 2401 (also suitable for flanges PN 10), ANSI
Media temperature	Carbon steel body	-10°C to +220°C, +14°F to 428°F
	Red bronze body	-30°C to +170°C, -22°F to 338°F
Seals	NBR	-30°C to +100°C, -22°F to 212°F
	EPDM	-30°C to +140°C, -22°F to 284°F
	VITON	-15°C to +180°C, -5°F to 212°F
	PTFE	-30°C to +220°C, -22°F to 428°F



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