



TECHNICAL BULLETIN

Valtek FlowTop V726

High Performance Valve

DN 15 - 400, PN 10 - 40

FCD SAENTBV726 11/14



FlowTop - Features

Actuator

FlowAct is the standard pneumatic linear actuator. Further interfaces for:

- Haselhofer Electric linear Actuator
- PSL Electric linear Actuator
- Linear thrust Unit „light“ or „heavy“ for Electric multi turn Actuator
- Manual Operation

(see page 26, 29)

High quality powder painted carbon steel actuator cases - extremely corrosion resistant. Paint is durable and resistant to chipping or flaking.

Direct air supply is ported through the internal passage in the yoke. Available only with direct mounting positioner or accessories on air to open application. **No tubing is required.**

Compact design up to six Spring Ranges available for use with or without a Positioner.

High quality long life springs properly aligned by spring plates.

Uninterrupted linear travel and no loss of operating force, due to reinforced rolling type diaphragm with minimum area variation during stroke.

A high quality durable solid ductile iron yoke is delivered as standard. It's a universal yoke which accepts different industry standard mountings available on the market.

Packing

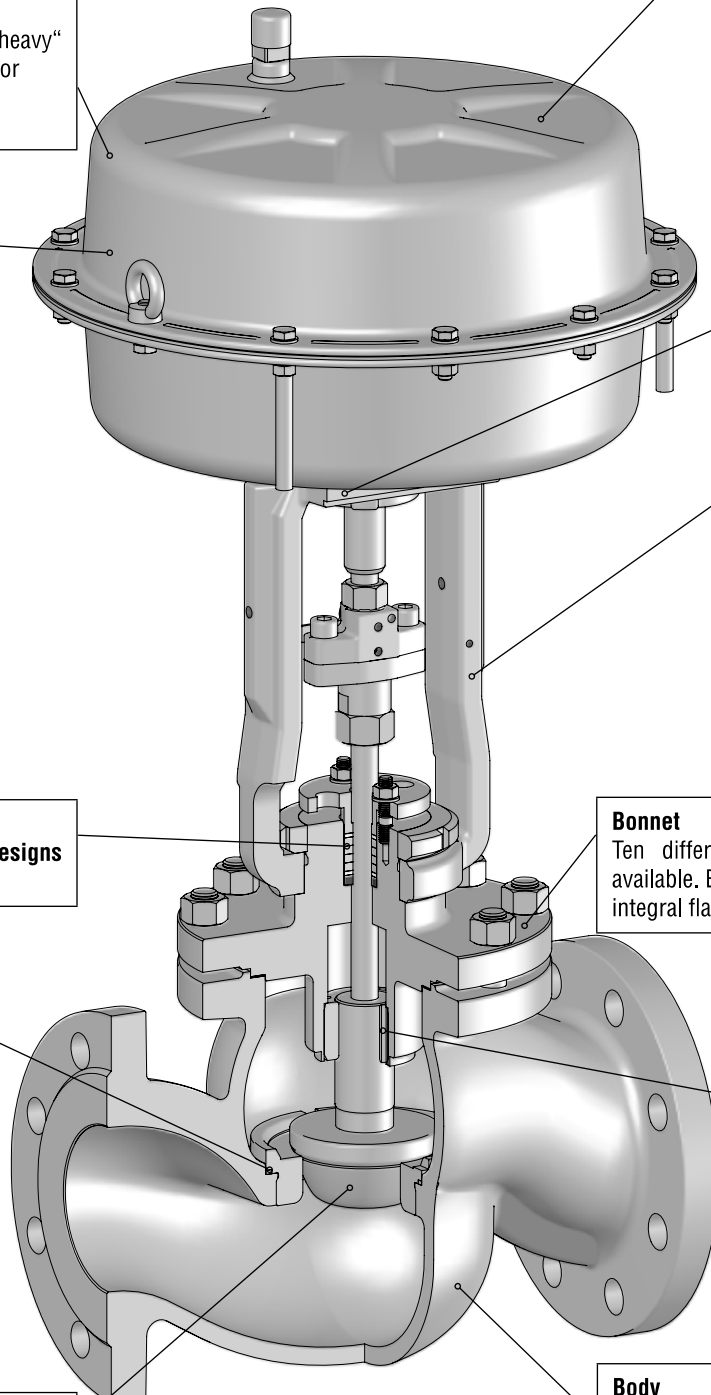
Nine **high quality packing designs** are available. (see page 13)

Bonnet

Ten different bonnet designs are available. Extremely **robust** design integral flange. (see page 10 - 12)

The **gasket seal** provides **practically** between seat and body.

Minimised vibration and wear because of heavy duty **solid, sturdy plug guiding.**



Trim

Eight standard trim designs and fourteen special trim designs are available.

(see page 14 - 21 resp. Special Brochure)

Body

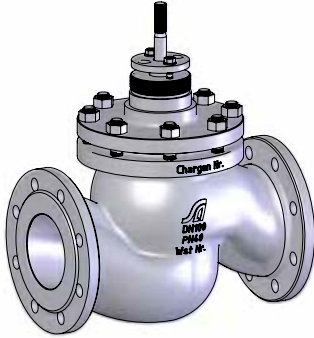
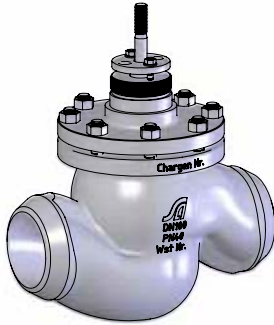
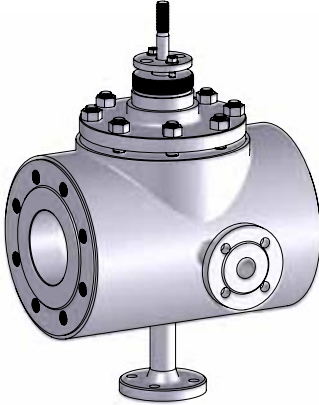
Nine different body designs available. The enlarged gallery enables **higher kvs** per trim and valve size than competitive products.

(see page 4 - 6)

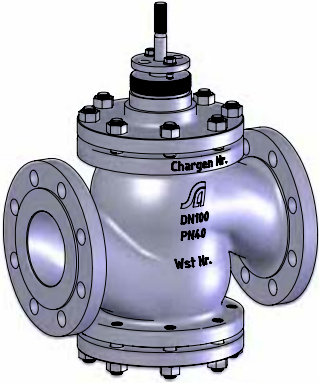
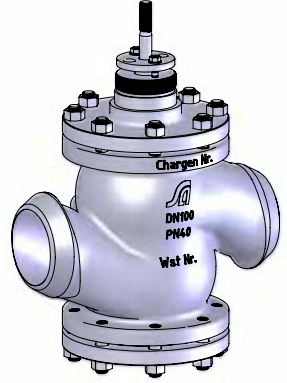
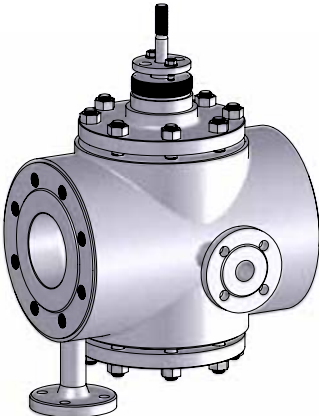
FlowTop - Advantages

Modular Design	The same bodies can be used for various different types of bonnet, packing, trim and actuators. This concept of a modular valve design allows the reduction of spare parts and offers an interchangeable valve for all applications.
Tight Shut - Off	FlowTop control valves offer Class IV shut-off as standard without the need for lapping plug and seat. Class VI shut-off is also available for FlowTop with a soft seat design.
Post guided	One solid guide stabilises the stem and plug during valve travel and minimises vibration and wear. A double plug guiding is also available depending on the service application and the trim selection.
Compact	Designed and engineered for applications with a limited installation envelope.
Low Noise and Anti - Cavitation Trim	SilentPack, MultiStream, Multi - Hole Plug, RLS, Silencer, reducing noise levels generated by vapours and gases and eliminating cavitation.
Versatile Packing Configuration	Available in PTFE and Graphite. Live loading kits are retrofittable without modification to the valve.
Fugitive Emissions Packing	Environmental packing design is available in accordance with „TA-Luft“ up to + 450 °C operating temperature.
Easy of Maintenance	By using a seat ring gasket between the body and the seat, the FlowTop allows faster maintenance without the necessity to remachine the body seat surface. The top entry design allows the valve body to remain in line whilst the trim is changed or replaced.
Wide Variety of Trim Sizes	Up to 17 kvs values per valve size.
Multifunction Yoke	The standard multifunction yoke is designed to accept all of the standard mountings available on the market including NAMUR (IEC 534.6) and the direct VDI / VDE 3847 / 3845 mounting.
High-Thrust Diaphragm	The actuator is compact, light weight and suitable for 6 bar air supply; multiple spring combinations reduces installation size and initial expenditure.
Dynamic Stability	Solid, sturdy plug head guiding minimises vibration and wear.
Certifications and Approvals (sample)	Quality assurance system certificated according to EN ISO 9001:2000 inc. product development. EC-Type - Examination according to PED 97/23/EC Module B + D ATEX - Declaration of Conformity according Derictive 94/9/EC TA-Luft - Certificate and Fugitive Emission according ISO 15848-1 SIL - Certificate according IEC 61508 DVGW - Certificate according EC Type Examination 90/396/EWG TR CU - Certificate according to Derictive TR CU 010/2011 (GOST-R) DNV - Type Approval
Multiple Application Usage	High-performance, general-service control valve used in many process industries including chemical, refinery, power, food and beverage, HVAC.

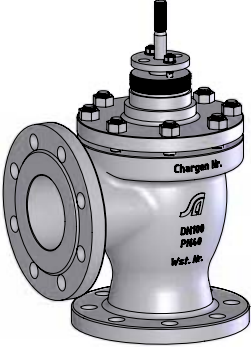
Body Design - „Three Flange“

Body Design	Type (Body) / Size	Body Material	Bonnet Design	Packing Design	Trim Design		
3-Flange	D Flanged PN 10 16 25 40 DN 15 20 25 32 40 50 65 80 100 125 150 200		1.0619 1.6220 1.4581 1.5419 1.4308	Without Balancing VN Standard Bonnet VB Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet VI Insulating Bonnet V-Ring Balancing ON Standard Bonnet OK Low Temperature Bonnet OI Insulating Bonnet			
	DS . . . Welded PN 10 16 25 40 DN 15 25 40 50 80 100 150 200		1.0619 1.4581 1.5419 1.4308	Piston-Ring Balancing KR High Temperature Bonnet Heavy Duty Design SN Standard Bonnet <i>see page 10 - 12</i>	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen S PTFE-V-Ring System <i>see page 13</i>	Parabolic Plug PON Standard POD Partial Stellite POK Contour Stellite POW Soft Seated Disk Plug TON Standard TOW Soft Seated <i>see page 14 - 21</i>	
	H Flanged with Heating Jacket PN 10 16 25 40 DN 25 40 50 80 100 150 200 Heating Jacket PN 25 DN 25		1.0619 1.4581	Without Balancing VN Standard Bonnet VB Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet V-Ring Balancing ON Standard Bonnet OK Low Temperature Bonnet Piston-Ring Balancing KR High Temperature Bonnet Heavy Duty Design SN Standard Bonnet <i>see page 10 - 12</i>		Special Trim Equipment see Special Brochure	
	HS . . . Welded with Heating Jacket			On Request			

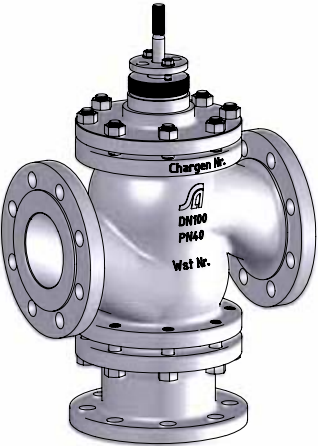
Body Design - „Four Flange“

Body Design	Type (Body) / Size	Body Material	Bonnet Design	Packing Design	Trim Design	
4-Flange	V Flanged PN 10 16 25 40 DN 25 32 40 50 65 80 100 150 200 250 300 400		1.0619 1.6220 1.4581 1.5419 1.4308	Without Balancing VN Standard Bonnet VB Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet VI Insulating Bonnet V-Ring Balancing ON Standard Bonnet OK Low Temperature Bonnet OI Insulating Bonnet		
	VS Welded PN 10 16 25 40 DN200 250 300 400		1.0619 1.4581 1.5419 1.4308	Piston-Ring Balancing KR High Temperature Bonnet Heavy Duty Design SN Standard Bonnet <i>see page 10 - 12</i>	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen S PTFE-V-Ring System <i>see page 13</i>	Parabolic Plug PON Standard POD Partial Stellite POK Contour Stellite POW Soft Seated Disk Plug TON Standard TOW Soft Seated <i>see page 14 - 21</i> Special Trim Equipment see Special Brochure
	G Flanged with Heating Jacket PN 10 16 25 40 DN200 250 300 400 Heating Jacket PN 25 DN 25		1.0619 1.4581	Without Balancing VN Standard Bonnet VB Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet V-Ring Balancing ON Standard Bonnet OK Low Temperature Bonnet Piston-Ring Balancing KR High Temperature Bonnet Heavy Duty Design SN Standard Bonnet <i>see page 10 - 12</i>		
	GS Welded with Heating Jacket			On Request		

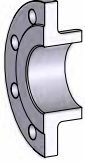
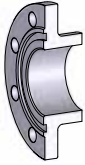
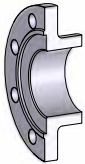

Body Design - „Angle“

Body Design	Type (Body) / Size	Body Material	Bonnet Design	Packing Design	Trim Design
Angle	E Flanged PN 10 16 25 40 DN 25 40 50 80 100 150 200 250 300		1.0619 1.6220 1.4581 1.5419 1.4308 Without Balancing VN Standard Bonnet VB Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet VI Insulating Bonnet V-Ring Balancing ON Standard Bonnet OK Low Temperature Bonnet OI Insulating Bonnet Piston-Ring Balancing KR High Temperature Bonnet Heavy Duty Design SN Standard Bonnet <i>see page 10 - 12</i>	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen S PTFE-V-Ring System <i>see page 13</i>	Parabolic Plug PON Standard POD Partial Stellite POK Contour Stellite POW Soft Seated Contoured Seat SOH Hardened SOK Contour Stellite Disk Plug TON Standard TOW Soft Seated <i>see page 14 - 21</i> Special Trim Equipment see Special Brochure
	ES . . . Welded PN 10 16 25 40 DN 25 40 50 80 100 150 200 250 300				

Body Design - „Three Way“

Body Design	Type (Body) / Sizes	Body Material	Bonnet Design	Packing Design	Trim Design
3-Way	W Flanged PN 10 16 25 40 DN 25 32 40 50 65 80 100 150 200 250 300		1.0619 1.6220 1.4581 1.5419 1.4308 Without Balancing VN Standard Bonnet VB Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet Heavy Duty Design SN Standard Bonnet <i>see page 10 - 12</i>	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen S PTFE-V-Ring System <i>see page 13</i>	Mixing MOT Tenifer treated Distributing VOT Tenifer treated <i>see page 14 - 21</i>

Body Connecting Design - „Detail“

Body Design	Type (Body)	Old Design	New Design
3-Flange 4-Flange Angle 3-Way	. K A . . . ¹⁾ 	according to DIN 2526	Form C Form B1
	. Q B . . . ¹⁾ 		Form N Form D
	. Y D . . . ¹⁾ 		Form R 13 Form F
¹⁾ ATTENTION: In accordance with the standard EN 1092-1: 2013-04 may Flanges DN 65 - PN 10 and PN 16 are delivered by arrangement against the standard instead of 8 bolt holes with 4 bolt holes. However, this is to be agreed separately ! Use coding . A . . . , . B . . . , . D . . .			
3-Flange 4-Flange Angle	. S . . . Welded 	according to EN 12627	

Body Pressure - Temperature Ratings

MAOP	PN	Body Material	Service Temperature in °C														
			-200	-60	- 40	-30	-10	20	100	150	200	250	300	350	400	450	
Maximum Allowable Operating Pressure in bar ¹⁾	10	1.0619		7,5	7,5	7,5	10	10	8,5	8,3	7,7	7,0	6,4	6,0	5,7		
		1.6220		7,5	10,0	10,0	10,0	10,0	7,5	7,1	6,8	6,6					
		1.4581		7,5	7,5	7,5	10,0	10,0	10,0	9,8	9,3	8,8	8,3	8,0	7,8		
		1.5419					10,0	10,0	10,0	10,0	9,2	8,5	7,6	7,0	6,3	5,9	
		1.4308	10,0	10,0	10,0	10,0	10,0	10,0	9,0	8,1	7,4	6,9					
	16	1.0619		12,0	12,0	12,0	16,0	16,0	13,7	13,3	12,4	11,3	10,2	9,6	9,1		
		1.6220		12,0	16,0	16,0	16,0	16,0	12,0	11,4	10,8	10,5					
		1.4581		12,0	12,0	12,0	16,0	16,0	16,0	15,6	14,9	14,1	13,3	12,8	12,4		
		1.5419					16,0	16,0	16,0	16,0	14,8	13,7	12,1	11,2	10,1	9,4	
		1.4308	16,0	16,0	16,0	16,0	16,0	16,0	14,5	13,1	11,9	11,0					
	25	1.0619		18,8	18,8	18,8	25,0	25,0	21,4	20,8	19,4	17,7	16,0	15,1	14,2		
		1.6220		18,8	25,0	25,0	25,0	25,0	18,8	17,9	16,9	16,4					
		1.4581		18,8	18,8	18,8	25,0	25,0	25,0	24,5	23,3	22,1	20,8	20,1	19,5		
		1.5419					25,0	25,0	25,0	25,0	23,2	21,4	19,0	17,5	15,8	14,7	
		1.4308	25,0	25,0	25,0	25,0	25,0	25,0	22,7	20,4	18,6	17,2					
	40	1.0619		30,0	30,0	30,0	40,0	40,0	34,2	33,3	31,0	28,3	25,7	24,1	22,8		
		1.6220		30,0	40,0	40,0	40,0	40,0	30,1	28,6	27,1	26,3					
		1.4581		30,0	30,0	30,0	40,0	40,0	40,0	39,2	37,3	35,4	33,3	32,1	31,2		
		1.5419					40,0	40,0	40,0	40,0	37,1	34,2	30,4	28,0	25,3	23,6	
		1.4308	40,0	40,0	40,0	40,0	40,0	40,0	36,3	32,7	29,9	27,6					

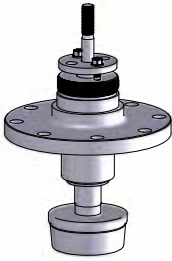
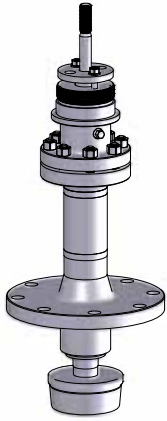
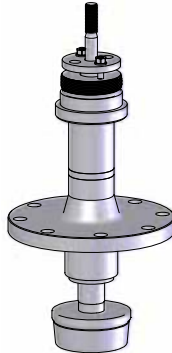
¹⁾ Maximum Allowable Operating Pressure in according to the relevant version of the standards EN 10213 and AD 2000 W10 !

Operating Temperature Range depending on Body, Bonnet, Packing in °C

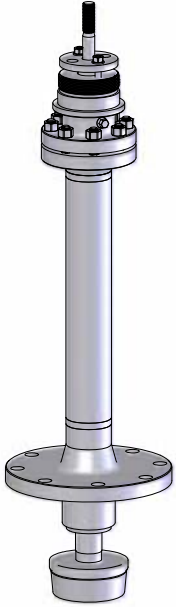
Body Material	Bonnet Design	Adjustable Packing			Spring loaded Packing					
		A	B	Y	N	O	Q	V	W	S
		PTFE	Graphite	Oxygen	PTFE	Graphite	PTFE TA-Luft	Graphite TA-Luft	Oxygen	PTFE V-Ring System
1.0619	VN Standard Bonnet	-30 ÷ 250	-10 ÷ 250	-	-30 ÷ 250	-10 ÷ 250	-30 ÷ 250	-10 ÷ 250	-	-30 ÷ 250
	VB Bellows Seal Bonnet	-60 ÷ 250	-10 ÷ 400	-	-60 ÷ 250	-10 ÷ 400	-60 ÷ 250	-10 ÷ 400	-	-60 ÷ 250
	VR High Temperature Bonnet	-	250 ÷ 400	-	-	250 ÷ 400	-	250 ÷ 400	-	-
	VK Low Temperature Bonnet	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-	-60 ÷ 250
	ON Standard Bonnet V-Ring balanced	-30 ÷ 250	-	-	-30 ÷ 250	-	-30 ÷ 250	-	-	-30 ÷ 250
	OK Low Temperature Bonnet V- Ring balanced	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-	-60 ÷ 250
	KR High Temperature Bonnet Piston-Ring balanced	-	250 ÷ 400	-	-	250 ÷ 400	-	250 ÷ 400	-	-
	SN Standard Bonnet Heavy Duty Design	-30 ÷ 250	-10 ÷ 400	-	-30 ÷ 250	-10 ÷ 400	-30 ÷ 250 ¹⁾	-10 ÷ 400 ¹⁾	-	-30 ÷ 250
1.6220	VN Standard Bonnet	-30 ÷ 250	-10 ÷ 250	-	-30 ÷ 250	-10 ÷ 250	-30 ÷ 250	-10 ÷ 250	-	-30 ÷ 250
	VK Low Temperature Bonnet	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-	-60 ÷ 250
	ON Standard Bonnet V-Ring balanced	-30 ÷ 250	-	-	-30 ÷ 250	-	-30 ÷ 250	-	-	-30 ÷ 250
	OK Low Temperature Bonnet V- Ring balanced	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-	-60 ÷ 250
1.4581	VN Standard Bonnet	-30 ÷ 250	-10 ÷ 250	-30 ÷ 200	-30 ÷ 250	-10 ÷ 250	-30 ÷ 250	-10 ÷ 250	-30 ÷ 200	-30 ÷ 250
	VB Bellows Seal Bonnet	-60 ÷ 250	-10 ÷ 400	-60 ÷ 200	-60 ÷ 250	-10 ÷ 400	-60 ÷ 250	-10 ÷ 400	-60 ÷ 200	-60 ÷ 250
	VR High Temperature Bonnet	-	250 ÷ 400	-	-	250 ÷ 400	-	250 ÷ 400	-	-
	VK Low Temperature Bonnet	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250	-	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250
	ON Standard Bonnet V-Ring balanced	-30 ÷ 250	-	-30 ÷ 200	-30 ÷ 250	-	-30 ÷ 250	-	-30 ÷ 200	-30 ÷ 250
	OK Low Temperature Bonnet V- Ring balanced	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250	-	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250
	SN Standard Bonnet Heavy Duty Design	-30 ÷ 250	-10 ÷ 400	-30 ÷ 200	-30 ÷ 250	-10 ÷ 400	-30 ÷ 250 ¹⁾	-10 ÷ 400 ¹⁾	-30 ÷ 200	-30 ÷ 250
1.5419	VN Standard Bonnet	-10 ÷ 250	-10 ÷ 250	-	-10 ÷ 250	-10 ÷ 250	-10 ÷ 250	-10 ÷ 250	-	-10 ÷ 250
	VR High Temperature Bonnet	-	250 ÷ 450	-	-	250 ÷ 450	-	250 ÷ 450	-	-
	KR High Temperature Bonnet Piston-Ring balanced	-	250 ÷ 450	-	-	250 ÷ 450	-	250 ÷ 450	-	-
	SN Standard Bonnet Heavy Duty Design	-10 ÷ 250	-10 ÷ 450	-	-10 ÷ 250	-10 ÷ 450	-10 ÷ 250 ¹⁾	-10 ÷ 450 ¹⁾	-	-10 ÷ 250
1.4308	VB Bellows Seal Bonnet	-200 ÷ 250	-10 ÷ 250	-200 ÷ 200	-200 ÷ 250	-10 ÷ 250	-200 ÷ 250	-10 ÷ 250	-200 ÷ 200	-200 ÷ 250
	VI Insulating Bonnet	-200 ÷ 250	-	-200 ÷ 200	-200 ÷ 250	-	-200 ÷ 250	-	-200 ÷ 200	-200 ÷ 250
	OI Insulating Bonnet V-Ring balanced	-200 ÷ 80	-	-200 ÷ 80	-200 ÷ 80	-	-200 ÷ 80	-	-200 ÷ 80	-200 ÷ 80
Dependencies	Trim Material	1.4571 -> -200 ÷ 450°C all, not for KR Bonnet								
		1.4122 -> -60 ÷ 450°C for KR Bonnet, alternate for 1.0619 / 1.5419 and VN, VR, VK Bonnet or MultiStream								
	Trim Material 1.4571 + Soft Seat	PTFE -> -60 ÷ 250°C								
PCTFE -> -200 ÷ 150°C										

1) up to DN 150

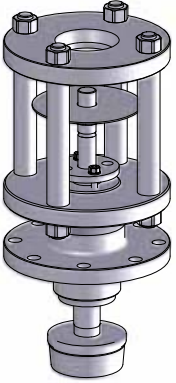
Bonnet Design - „Unbalanced“ for DN 15 - 400

Bonnet Design	Type (Bonnet)	Image	Material		Temperature Range	Application	Packing Design
			Body	Bonnet			
Without Balancing	. . VN . Standard Bonnet		1.0619 1.4581 1.5419 1.6220	1.0460 1.4571 1.4404 1.5415 1.0566	- 30 ÷ + 250 °C <i>see also</i> <i>Operating Temperature Range on Page 8 - 9</i>	Universal use	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen S PTFE V-Ring System <i>see page 13</i>
	. . VB . Bellows Seal Bonnet		1.0619 1.4581 1.4308 1.4408	1.0460 1.4571 1.4404 1.4571	- 60 ÷ + 400 °C <i>see also</i> <i>Operating Temperature Range on Page 8 - 9</i>	Use by toxic, smell strong, fleeting, costly media or vacuum	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen S PTFE V-Ring System <i>see page 13</i>
	. . VR . High Temperature Bonnet		1.0619 1.4581 1.5419	1.0460 1.4571 1.4404 1.5415	+ 250 ÷ + 450 °C <i>see also</i> <i>Operating Temperature Range on Page 8 - 9</i>	Use by possible overheating of packing and/or actuator	adjustable B Graphite spring loaded O Graphite V Graphite TA-Luft <i>see page 13</i>
	. . VK . Low Temperature Bonnet		1.0619 1.6220 1.4581	1.0460 1.0566 1.4571 1.4404	- 60 ÷ + 250 °C <i>see also</i> <i>Operating Temperature Range on Page 8 - 9</i>	Use by possible icing of the packing	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen S PTFE V-Ring System <i>see page 13</i>

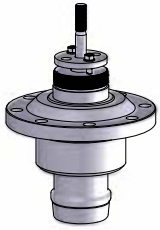
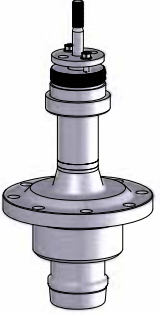
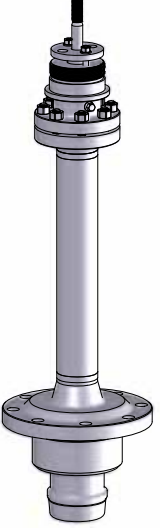
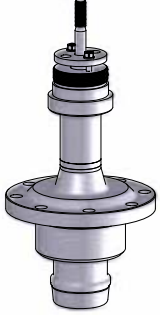
Bonnet Design - „Unbalanced“ for DN 15 - 400

Bonnet Design	Type (Bonnet)		Material		Temperature Range	Application	Packing Design
			Body	Bonnet			
Without Balancing	.. VI . Insulating Bonnet 		1.4308 1.4408	1.4571	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Use by cryogenic service	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen S PTFE V-Ring System <i>see page 13</i>










Bonnet Design - „Heavy Duty“ for DN 25 - 400

Bonnet Design	Type (Bonnet)		Material		Temperature Range	Application	Packing Design
			Body	Bonnet			
Heavy Duty Design	.. SN . Standard Bonnet 		1.0619 1.4581 1.5419	1.0460 1.4571 1.4404 1.5415	- 30 ÷ + 450 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal use by Electric multi turn Actuators	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite W Oxygen <i>see page 13</i>

Bonnet Design - „Pressure Balanced“ for DN 65 - 400

Bonnet Design	Type (Bonnet)	Material	Material		Temperature Range	Application	Packing Design
			Body	Bonnet			
V-Ring Balancing	.. ON . Standard Bonnet		1.0619 1.4581 1.6220	1.0460 1.4571 1.4404 1.0566	- 30 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal use	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen S PTFE V-Ring System <i>see page 13</i>
	.. OK . Low Temperature Bonnet		1.0619 1.6220 1.4581	1.0460 1.0566 1.4571 1.4404	- 60 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Use by possible icing of the packing	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen S PTFE V-Ring System <i>see page 13</i>
	.. OI . Insulating Bonnet		1.4308 1.4408	1.4571	- 200 ÷ + 80 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Use by cryogenic service	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen S PTFE V-Ring System <i>see page 13</i>
Piston-Ring Balancing	.. KR . High Temperature Bonnet		1.0619 1.5419	1.0460 1.5415	+ 250 ÷ + 450 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Use by possible overheating of packing and/or actuator	adjustable B Graphite spring loaded O Graphite V Graphite TA-Luft <i>see page 13</i>

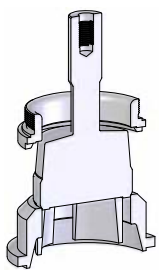
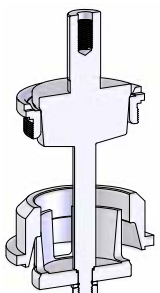
Packing Design - „Detail“

Packing Design	Type (Packing)	Material	Temperature Range	Application	Approvals
adjustable	.... A PTFE	 <p>Packing Rings Braided PTFE-Yarn impregnated with PTFE-Dispersion</p> <p>Chamber Washers PTFE-Carbon</p>	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemical resistance	FMPA for food application
	.... B Graphite	 <p>Packing Rings Braided Graphite made out of expanded pure Graphite-Yarn lubricated with a slip additive</p>	- 10 ÷ + 450 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemical resistance. Not suitable for oxidizing media !	-
	.... Y Oxygen	 <p>Packing Rings Braided Graphite resp. 100% PTFE silk yarns, impregnated with PTFE-Dispersion</p>	- 200 ÷ + 200 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Oxygen service only!	BAM for gaseous oxygen
spring loaded	.... N PTFE	 <p>Packing Rings Braided PTFE-Yarn impregnated with PTFE-Dispersion</p> <p>Chamber Washers PTFE-Carbon</p>	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemical resistance.	FMPA for food application
	.... Q PTFE „TA-Luft“	 <p>Packing Rings Braided Carbon-Yarn, covered with a sleeve of impregnated and lubricated PTFE-Yarn</p> <p>Chamber Washers PTFE-Carbon</p>	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemical resistance	TA-Luft ISO 15848-1
	.... O Graphite	 <p>Packing Rings Braided Graphite made out of expanded pure Graphite-Yarn lubricated with a slip additive</p>	- 10 ÷ + 450 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemical resistance. Not suitable for oxidizing media !	- TA-Luft ISO 15848-1
	.... V Graphite „TA-Luft“	 <p>Packing Rings Braided Graphite resp. 100% PTFE silk yarns, impregnated with PTFE-Dispersion</p>	-200 ÷ + 200 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Oxygen service only !	BAM for gaseous oxygen
	.... W Oxygen	 <p>Packing Rings Compression-molded PTFE-Yarn resp. PTFE-Carbon</p>	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemical resistance. Not suitable for abrasive media !	-
 S PTFE „V-Ring“ System				

Trim Design - „Standard“

Type (Trim) / Material			Medium	Flow	max. allowable Differential Pressure	Noise Reduction			
Parabolic Plug Characteristic: G . ↓ mod. equal per. L . ↓ linear	PON standard 316SS or 1.4571		<ul style="list-style-type: none"> • clean • marginally contaminated with particles • low clogging potential for dirty service 	gases, vapors and liquids	$\Delta p_1 < x_{Fz} \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$	none - noise reduction with Special Trim Equipment or Noise Insulating provided by customer			
	PON standard 1.4122				$\Delta p_1 < (x_{Fz} + 0,10) \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$				
	POH hardened 1.4122				$\Delta p_1 < (x_{Fz} + 0,15) \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$				
	POD partial stellited (seat surface) 316SS or 1.4571	$\Delta p_1 < (x_{Fz} + 0,10) \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$							
	POK full stellited (contour) 316SS or 1.4571	$\Delta p_1 < (x_{Fz} + 0,15) \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$							
Piston Plug with contoured seat Characteristic: G . ↓ mod. equal per.	POW soft seated 316SS or 1.4571+PTFE (-60 ÷ 250°C) POC 316SS or 1.4571+PCTFE (-200 ÷ +150 °C)		<ul style="list-style-type: none"> • clean • marginally contaminated with particles • low clogging potential for dirty service 	gases, vapors and liquids	$\Delta p_1 < x_{Fz} \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$	none - noise reduction with Special Trim Equipment or Noise Insulating provided by customer			
	SOK full stellited (contour) 316SS or 1.4571 SOH hardened 1.4122				$\Delta p_1 < (x_{Fz} + 0,20) \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$				
Disk Plug with Throttle Lip Characteristic: A . ↓ On / Off	TON standard 316SS or 1.4571				<ul style="list-style-type: none"> • clean • marginally contaminated with particles • low clogging potential for dirty service 		gases, vapors and liquids	$\Delta p < MAWP$	none - noise reduction with Special Trim Equipment or Noise Insulating provided by customer
	TON standard 1.4122									$\Delta p < MAWP$
	TOW soft seated 316SS or 1.4571+PTFE (-60 ÷ 250°C) TOC 316SS or 1.4571+PCTFE (-200 ÷ +150 °C)									$\Delta p < MAWP$
Characteristic values of incompressible fluids $\Delta p_1 \rightarrow x_{Fz} \rightarrow 0,79 - 0,24$ respectively compressible fluids $\Delta p_c \rightarrow x_T \rightarrow 0,82 - 0,61$ according to Flowserve Villach Operation (see also VDI/VDE 2173)									
Noise Reduction Trim Sets see Page 20 and Special Brochure									

Trim Design - „Three Way“

Type (Trim) / Material Characteristic L . → linear		Medium	Flow	max. allowable Differential Pressure	Noise Reduction
Mixing Plug	MOT tenifer treated 316SS or 1.4571	 <ul style="list-style-type: none"> • clean • marginally contaminated with particles 	gases, vapors and liquids	. . . . . G Flow direction under the plug	$\Delta p_1 < x_{FZ} \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$
	MON standard 1.4122					$\Delta p_1 < (x_{FZ} + 0,10) \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$
Distributing Plug	VOT tenifer treated 316SS or 1.4571	 <ul style="list-style-type: none"> • low clogging potential for dirty service 	gases, vapors and liquids	. . . . . G Flow direction under the plug	$\Delta p_1 < x_{FZ} \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$
	VON standard 1.4122					$\Delta p_1 < (x_{FZ} + 0,10) \cdot (p_1 - p_v)$ $\Delta p_c < x_T \cdot p_1$
Characteristic values of incompressible fluids $\Delta p_1 \rightarrow x_{FZ} \rightarrow 0,79 - 0,24$ respectively compressible fluids $\Delta p_c \rightarrow x_T \rightarrow 0,82 - 0,61$ according to Flowserve Villach Operation (see also VDI/VDE 2173)					

Noise Reduction Trim Sets see Page 20 and Special Brochure

Rangeability

EXCLUSION:
Stroke = 10 mm only !

Rangeability		Seat Diameter																										
		3	4	6	8	10	12	16	20	25	34	40	42	50	53	67	80	84	100	105	125	130	150	200	250	300	350	
Standard	1 : 30	•	•																									
	. . . . . G L .	1 : 50		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Special ¹⁾	1 : 70		•	•	•	•	•	•	•																			
	. . . . . H .	1 : 100																										

1) Modified equal percentage Flow Characteristic only!

Distributing Plug

Characteristic: linear

kvs (m ³ /h)	Seat Ø	Guide of Plug	Material / Design		Possible seat diameter depends on nominal size DN												
			316SS ²⁾⁵⁾ or 1.4571 ²⁾		1.4122 ²⁾		25	32	40	50	65	80	100	150	200	250	300
			tenifer treated	standard	Stroke = 20			40			60		80				
6,3	25	2	•	•	•												
10	25	2	•	•	•												
10	34	2	•	•	•		•										
16	34	2	•	•	•		•										
16	40	2	•	•	•			•									
25	40	2	•	•	•			•									
25	50	2	•	•	•				•								
40	50	2	•	•	•				•								
40	67	2	•	•	•					•							
63	67	2	•	•	•					•							
63	80	2	•	•	•						•						
100	80	2	•	•	•						•						
100	100	2	•	•	•							•					
160	100	2	•	•	•							•					
180	130	2	•	•	•								•				
250	130	2	•	•	•								•				
450	150	2	•	•	•									•			
710	200	2	•	•	•										•		
1000	250	2	•	•	•											•	

1) All materials
With Heavy duty bonnet: only for body 1.4581
2) Only with Body 1.0619, 1.5419
3) 316SS (1.4404 / 1.4571)

Disk Plug with Throttle Lip

Characteristic: on / off

kvs (m ³ /h)	Seat Ø	Guide of Plug	Material / Design				Possible seat diameter depends on nominal size DN														
			316SS ²⁾⁵⁾ or 1.4571 ²⁾			1.4122 ¹⁾	15	20	25	32	40	50	65	80	100	125	150	200	250	300	400
			N	W ³⁾	C ⁵⁾	N	Stroke = 20			40			60		80			100			
			standard	soft seated		standard															
6,3	16	1	•	•	•	•	•														
9	20	1	•	•	•	•		•													
16	25	1	•	•	•	•			•												
25	34	1	•	•	•	•				•											
35,5	40	1	•	•	•	•					•										
53	50	1	•	•	•	•						•									
90	67	1	•	•	•	•							•								
140	80	1	•	•	•	•								•							
200	100	1	•	•	•	•									•						
285	105	1	•	•	•	•										•					
400	130	1	•	•	•	•											•				
630	150	1	•	•	•	•												•			
1000	200	1	•	•	•	•													•		
1600	250	1	•	•	•	•														•	
3150	350	1	•	•	•	•														•	

1) Body in 1.0619, 1.5419
2) All materials
With Heavy duty bonnet: only for body 1.4581
3) PTFE from -50° to +250°C
4) 316SS (1.4404 / 1.4571)
5) PCTFE from -196° to +150°C > Only with Insulating bonnet

Mixing Plug

Characteristic: linear

1) All materials
 With Heavy duty bonnet; only for body 1.4581
 2) Only with Body 1.0619, 1.5419
 3) 316SS (1.4404 / 1.4511)

kvs (m³/h)	Seat Ø	Guide of Plug	Material / Design		Possible seat diameter depends on nominal size DN												
			316SS ³⁾ or 1.4571 ²⁾	1.4122 ²⁾	25	32	40	50	65	80	100	150	200	250	300		
			tenifer treated	standard	Stroke = 20			40			60	80					
6,3	25	2	•	•	•												
10	25	2	•	•	•												
10	34	2	•	•		•											
16	34	2	•	•		•											
16	40	2	•	•			•										
25	40	2	•	•			•										
25	50	2	•	•				•									
40	50	2	•	•				•									
40	67	2	•	•					•								
47,5	50	2	•	•				•									
63	67	2	•	•					•								
63	80	2	•	•						•							
80	67	2	•	•					•								
100	80	2	•	•						•							
100	100	2	•	•							•						
125	80	2	•	•						•							
160	100	2	•	•							•						
180	100	2	•	•							•						
180	130	2	•	•								•					
250	130	2	•	•									•				
355	130	2	•	•										•			
450	150	2	•	•											•		
710	200	2	•	•												•	
1000	250	2	•	•													•

Seat Leakage

Ø d = Seat Ø
 LF = Leakage Factor see Standard IEC 60534-4 Table 3, Remark 2 or ANSI / FCI 70-2-2006 Table 2

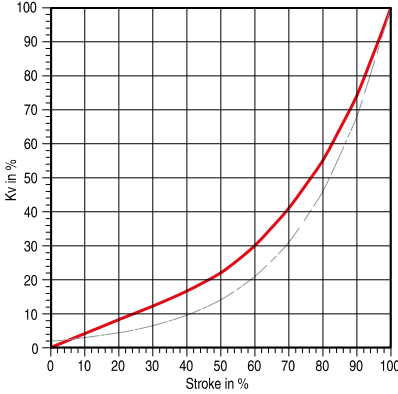
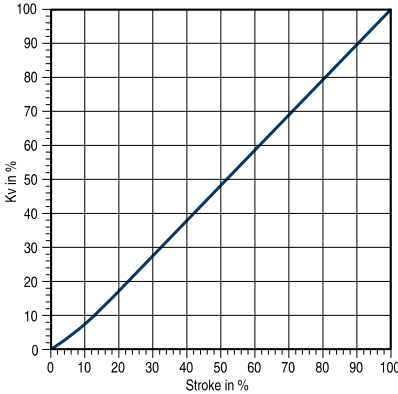
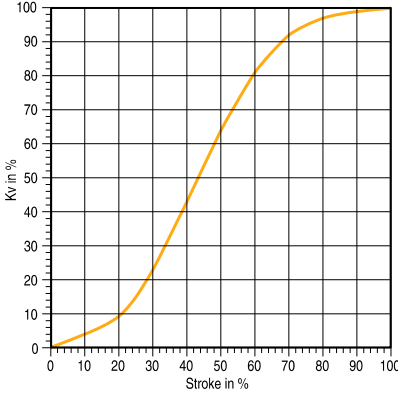
Standard	Balancing	Plug Code	Leakage Class	Test Medium	Test Pressure	max. Seat Leakage	Leakage Code	
IEC 60534-4:2007-06 resp. ANSI / FCI 70-2-2006	Without	metal to metal seated	... P ...	IV	Liquid	Operating Pressure	0,000 1 · kvs	IV L 2
			... D ...		Gas	Operating Pressure, max. 3,5 bar	0,000 1 · kvs	
		metal to metal seated, increased seal force	... S ...	V	Liquid	Operating Pressure	0,000 018 · Δp · Ø d	V L 2
			... F ...		Gas	Operating Pressure, max. 3,5 bar	0,000 010 8 · Ø d	
		soft seated	... T ...	VI	Gas	Operating Pressure, max. 3,5 bar	0,3 · Δp · LF	VI G 1
						Operating Pressure, max. 50.7 psi		
	V-Ring	metal to metal seated	... P ...	IV	Liquid	Operating Pressure	0,000 1 · kvs	IV L 2
			... D ...		Gas	Operating Pressure, max. 3,5 bar	0,000 1 · kvs	
			... Q ...		Operating Pressure, max. 50.7 psi	0,000 1 · cv		
		soft seated	... E ...	IV-S1	Liquid	Operating Pressure	0,000 005 · kvs	IV-S1 L 2
					Gas	Operating Pressure, max. 3,5 bar		
					Operating Pressure, max. 50.7 psi			
Piston-Ring	metal to metal seated	... O ...	III	Liquid	Operating Pressure, max. 3,5 bar	0,001 · kvs	III L 1	
					0,000 1 · cv			
EN 12266-1:2012-04	Without	metal to metal seated, increased seal force	P12	Liquid	Operating Pressure · 1,1	no visually leakage	A	
		soft seated		Gas	Operating Pressure, max. 6 bar			

Special Trim Equipment - Details see Special Brochure SAENBRNOIS-00

Type (Trim)		Characteristic	Medium	Flow	Differential Pressure	Noise Reduction	
..... G . → mod. equal per. or	..... L . → linear					
SilentPack	PK		<ul style="list-style-type: none"> • clean • high clogging potential for dirty service	..... G Flow direction under the plug	Type all Standard Trim $\Delta p_c < 0,5 \cdot p_1$	max. - 18 dB(A)
MultiStream	PC		<ul style="list-style-type: none"> • clean • marginally contaminated with particles • low clogging potential for dirty service 		Gases and Vapors	Type all Standard Trim $\Delta p_c < x_r \cdot p_1$	max. - 10 dB(A)
	PE						max. - 15 dB(A)
	PG						max. - 20 dB(A)
	PD						Type P . N → 316SS or 1.4571 P . W → 316SS or 1.4571 $\Delta p_c < x_{FZ} \cdot (p_1 - p_v)$	max. - 4 dB(A)
	PF		Liquids		Type P . N → 1.4122 P . D → 316SS or 1.4571 $\Delta p_c < (x_{FZ} + 0,10) \cdot (p_1 - p_v)$	max. - 8 dB(A)	
	PH				Type P . H → 1.4122 P . K → 316SS or 1.4571 $\Delta p_c < (x_{FZ} + 0,15) \cdot (p_1 - p_v)$	max. - 10 dB(A)	
	PI				Type P . N → 316SS or 1.4571 P . W → 316SS or 1.4571 $\Delta p_c < (x_{FZ} + 0,10) \cdot (p_1 - p_v)$	max. - 6 dB(A)	
	PQ				Type P . N → 1.4122 P . D → 316SS or 1.4571 $\Delta p_c < (x_{FZ} + 0,15) \cdot (p_1 - p_v)$	max. - 12 dB(A)	
	PW		Type P . H → 1.4122 P . K → 316SS or 1.4571 $\Delta p_c < (x_{FZ} + 0,20) \cdot (p_1 - p_v)$		max. - 16 dB(A)		
Multi Hole Plug	LO				$\Delta p_c < (x_{FZ} + 0,20) \cdot (p_1 - p_v)$	max. - 15 dB(A)	
RLS Radial Multi-Step System	AO		<ul style="list-style-type: none"> • clean • high clogging potential for dirty service	..... G Flow direction under or over the plug for Gases and Vapors G Flow direction over the plug for Liquids only	$\Delta p_c < x_r \cdot p_1$	max. - 30 dB(A)
	BO				$\Delta p_c < (x_{FZ} + 0,10) \cdot (p_1 - p_v)$		
	DO				$\Delta p_c < x_r \cdot p_1$		

NOTICE → expert knowledge is required for the selection of Trim!
The specified datas are used for a rough orientation only and may not taken for dimensioning !

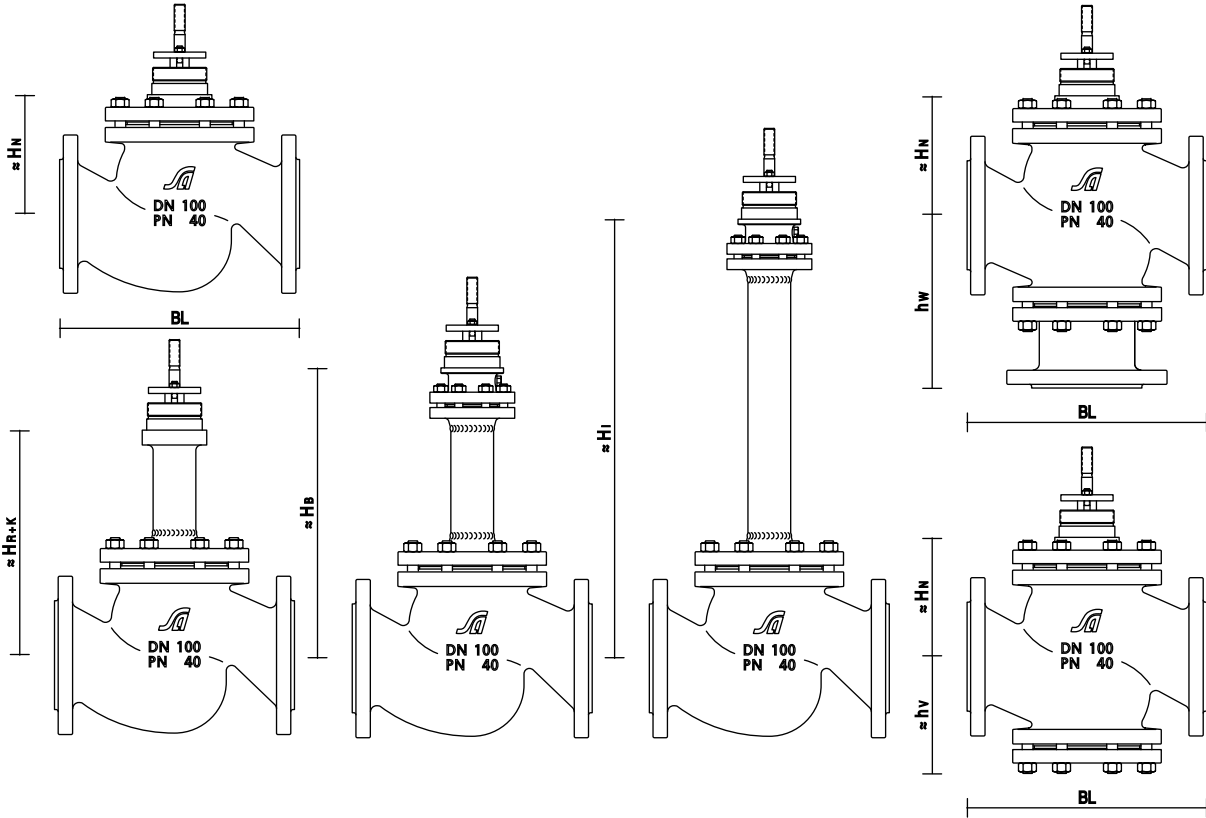
Valve Characteristic

	Type (Trim)	Application
<p>..... G .</p> <p>Modified equal percentage Flow Characteristic</p> <p>(Equal Percentage 1:50 only on request and shown as an example)</p>		<ul style="list-style-type: none"> • The equal percentage characteristic is used for highly changeable differential pressure. • A „soft“ inlet characteristic alleviates pressure impulses for short closing times. • The equal percentage characteristic relates equal increments of travel to equal percentage increments of the corresponding kv-value. • The equal percentage characteristic is recommended for a pressure ratio of $\Delta p_0 / \Delta p_{100} > 2$
<p>..... L .</p> <p>Linear Flow Characteristic</p>		<ul style="list-style-type: none"> • The linear characteristic is used for constant differential pressure under different loads. • The linear characteristic relates equal increments of travel to equal increments of the Kv-value. • The linear characteristic is recommended for a pressure ratio of $\Delta p_0 / \Delta p_{100} 1 - 2$
<p>..... A .</p> <p>On / Off Flow Characteristic with Throttle Lip</p>		<ul style="list-style-type: none"> • On / Off characteristic is mainly used for closing operations. • The stroke of the On / Off characteristic shows an approximate linear run up to a 1/4 of the seat diameter and furthermore enables the full flow area when open.

Dimensions and Weights

Three Flange, Four Flange, Three-Way Valve

(Values in Millimeter → mm respectively Kilogram → kg)

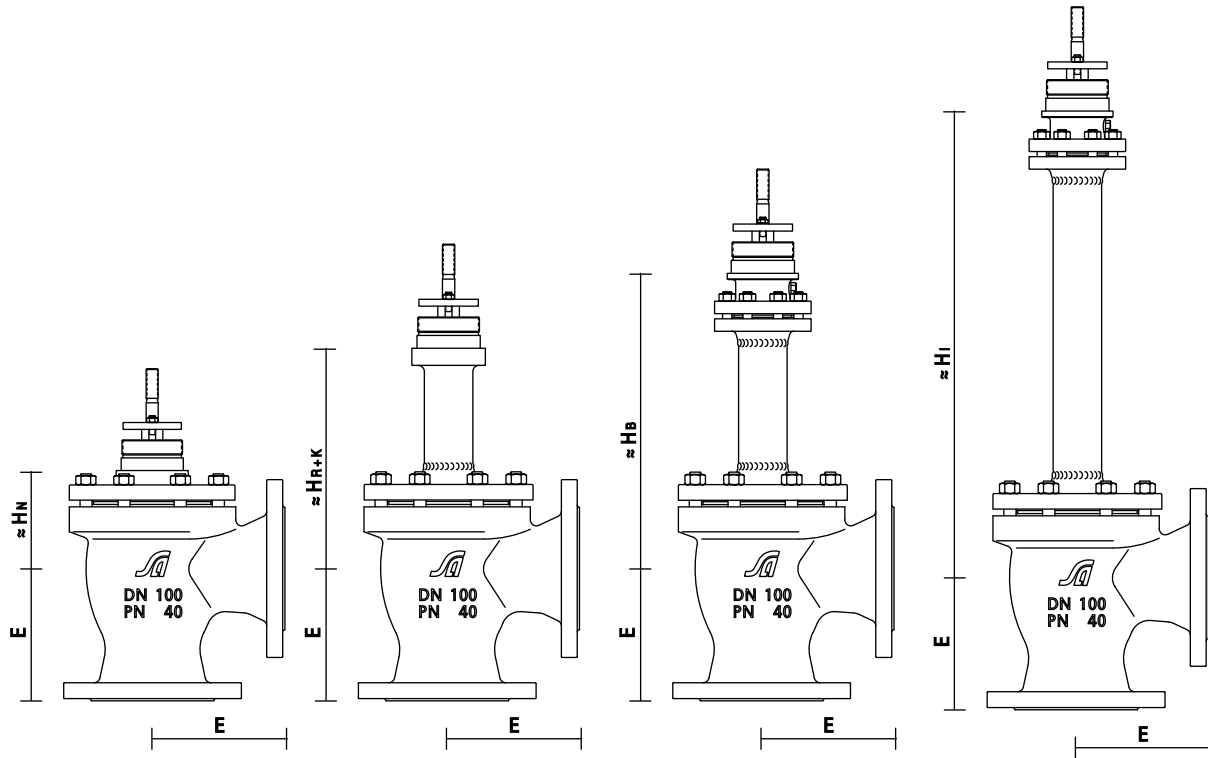


Description	Nominal Size DN															
	15	20	25	32	40	50	65	80	100	125	150	200	250	300	400	
BL Face to Face Dimensions acc. to EN 558-1 Basic Line 1	130	150	160	180	200	230	290	310	350	400	480	600	730	850	1100	
Stroke	20 mm															
≈ hv Centerline to Bottom Flange Dimension	-	-	95	110	110	115	165	165	175	-	260	350	430	470	540	
hw Centerline to Flange Tube Dimension	-	-	130	150	150	175	225	225	260	-	350	550	650	750	-	
≈ Height	Hn for Standard Bonnet	105	105	105	120	120	120	170	170	175	270	270	370	460	490	560
	Hb for Bellows Seal Bonnet	265	265	265	265	265	265	420	420	420	660	660	760	765	770	1280
	Hr+K for High / Low Temperature Bonnet	220	220	220	220	220	220	310	310	310	445	445	510	600	630	700
	Hi for Insulating Bonnet	650	650	650	650	650	650	650	650	650	670	670	800	800	800	800
≈ Weight for Valves with Three-Flange Body	and Standard Bonnet	5	6	7	11	12	16	30	35	50	70	95	218	-	-	-
	and Bellows Seal Bonnet	9	10	11	15	16	20	34	39	54	84	109	234	-	-	-
	and High / Low Temperature Bonnet	7	8	9	13,5	14,5	18,5	32	37	52	74	99	221	-	-	-
	and Insulating Bonnet	8	9	10	14	15	19	33	38	53	83	108	233	-	-	-
≈ Weight for Valves with Four-Flange Body	and Standard Bonnet	-	-	10	14	17	23	38	48	64	-	120	278	526	694	1355
	and Bellows Seal Bonnet	-	-	14	18	21	27	42	52	68	-	134	297	543	711	1385
	and High / Low Temperature Bonnet	-	-	12	16,5	19,5	25,5	40	50	66	-	124	281	528	697	1360
	and Insulating Bonnet	-	-	13	17	20	26	41	51	67	-	133	297	543	711	1365
≈ Weight for Three-Way Valves	and Standard Bonnet	-	-	11	18	19	25	45	51	72	-	152	320	540	735	-
	and Bellows Seal Bonnet	-	-	15	22	23	29	49	55	76	-	164	345	557	752	-
	and High / Low Temperature Bonnet	-	-	13	21	22	27	47	53	74	-	154	327	542	738	-
	and Insulating Bonnet	-	-	13	20	22	28	50	57	77	-	162	322	550	743	-
Flanges drilled and dimensioned acc. to	EN 1092-1, Form B1, F, D															
Welded ends comply with	EN 12627 - 2															

Dimensions and Weights

Angle

(Values in Millimeter → mm respectively Kilogram → kg)

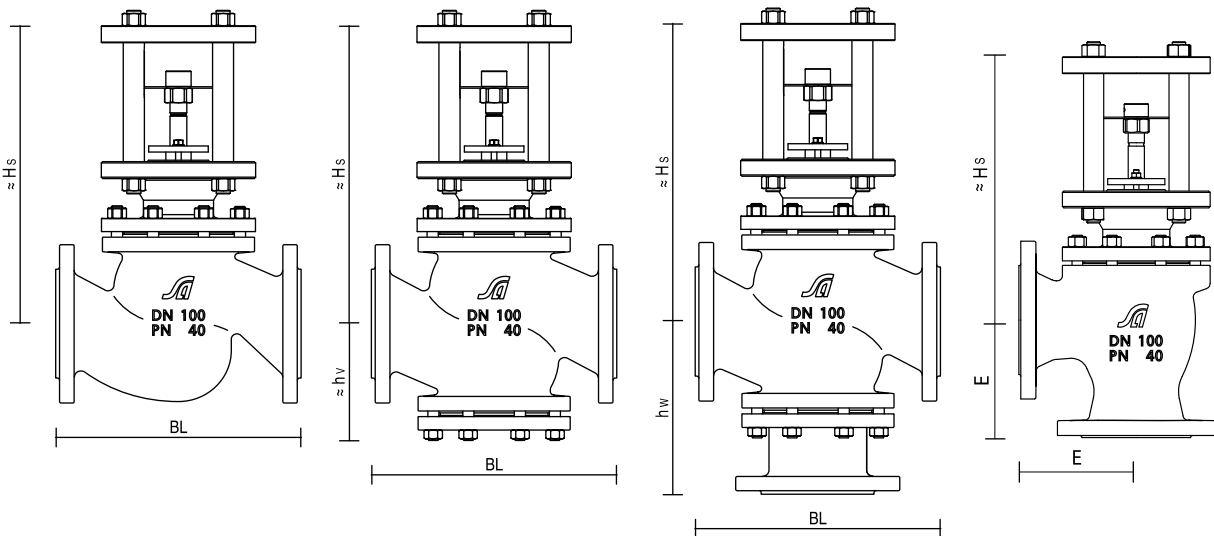


Description		Nominal Size DN								
		25	40	50	80	100	150	200	250	300
Stroke		20 mm		40 mm		60 mm	80 mm			
E	Centerline to Face Dimensions acc. to EN 558-1 Basic Line 1	100	115	125	155	175	225	275	325	375
≈ Height	HN for Standard Bonnet	85	90	90	120	130	205	280	345	355
	HB for Bellows Seal Bonnet	245	235	230	370	375	600	670	650	635
	HR + K for High / Low Temperature Bonnet	200	190	185	260	265	380	420	485	495
	HI for Insulating Bonnet	630	620	615	600	605	605	710	685	665
≈ Weight for Valves with Angle	and Standard-Bonnet	6,5	11	14	27	41	85	155	240	365
	and Bellows Seal Bonnet	10,5	15	18	34	45	102	171	255	380
	and High / Low Temperature Bonnet	8,5	13	16	32	43	89	155	240	366
	and Insulating Bonnet	9,5	14	17	33	44	98	168	248	371
Flanges drilled and dimensioned acc. to		EN 1092-1, Form B1, F, D								
Welded ends comply with		EN 12627 - 2								

Dimensions and Weights

Three Flange, Four Flange, Three-Way Valve with „Heavy Duty“ Bonnet only

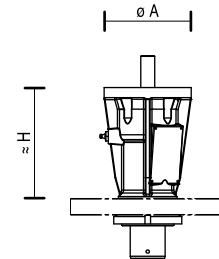
(Values in Millimeter → mm respectively Kilogram → kg)



Description	Nominal Size DN													
	25	32	40	50	65	80	100	125	150	200	250	300	400	
	20 mm				40 mm			60 mm		80 mm			100	
BL Face to Face Dimensions acc. to EN 558-1 Basic Line 1	160	180	200	230	290	310	350	400	480	600	730	850	1100	
E Centerline to Face Dimensions acc. to EN 558-1 Basic Line 1	100	-	115	125	-	155	175	-	225	275	325	375	-	
≈ h v Centerline to Bottom Flange Dimension	95	110	110	115	165	165	175	-	260	350	430	470	540	
h w Centerline to Flange Tube Dimension	130	150	150	175	225	225	260	-	350	550	650	750	950	
≈ H s for Standard Bonnet „Heavy Duty Design“	260	270	270	275	420	440	460	515	585	800	890	930	1000	
≈ H s for Standard Bonnet „Heavy Duty Design“ - Angle	240	-	240	240	-	390	415	-	520	710	775	795	-	
≈ Weight (kg)	Three Flange Valve and Standard-Bonnet „HDD“	13	17	18	22	51	53	74	97	129	306	-	-	-
	Four Flange Valve and Standard-Bonnet „HDD“	15	21	22	27	60	66	87	-	164	356	621	775	1487
	Angle Flange Valve and Standard-Bonnet „HDD“	12,5	-	17	20	-	48	64	-	112	239	343	465	-
	Three-Way Valve and Standard-Bonnet „HDD“	16	23	25	31	65	72	97	-	176	393	645	837	-
Flanges drilled and dimensioned acc. to	EN 1092-1, form B1, F, D													
Welded ends comply with	EN 12627 - 2													

Linear thrust Unit „heavy“

(Values in Millimeter → mm respectively Kilogram → kg)



Description	Linear thrust Unit	SI 15	SI 35	SI 36	SI 75	SI 120	SI 200	SI 300
	Stroke	20 / 40			60 / 80 / 100			
Ø A		125	127	175	175	175	210	300
≈ H		165	165	290	280	280	335	410
≈ Weight		7,5	7,5	25	22	22	46	93

Flanged Body Connecting Dimensions

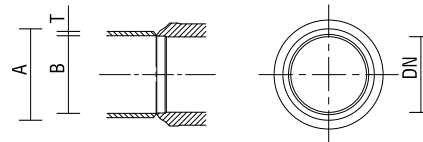


DN		15	20	25	32	40	50	65	80	100	125	150	200	250	300	400	
Nominal Pressure 10	D	Outside Diameter	90	105	115	140	150	165	185	200	220	250	285	340	395	445	565
	K	Pitch Circle Diameter	60	75	85	100	110	125	145	160	180	210	240	295	350	400	515
	n	Number of Bolts	4	4	4	4	4	4	8*	8	8	8	8	8	12	12	16
	L	Hole Diameter	14	14	14	18	18	18	18	18	18	18	22	22	22	22	26
	Gw	Size of Bolts	M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M 20	M 20	M 20	M 24
Nominal Pressure 16	D	Outside Diameter	90	105	115	140	150	165	185	200	220	250	285	340	405	460	580
	K	Pitch Circle Diameter	60	75	85	100	110	125	145	160	180	210	240	295	355	410	525
	n	Number of Bolts	4	4	4	4	4	4	8*	8	8	8	8	12	12	12	16
	L	Hole Diameter	14	14	14	18	18	18	18	18	18	18	22	22	26	26	30
	Gw	Size of Bolts	M12	M12	M12	M16	M16	M16	M 16	M 16	M 16	M 16	M 20	M 20	M 24	M 24	M 27
Nominal Pressure 25	D	Outside Diameter	90	105	115	140	150	165	185	200	235	270	300	360	425	485	620
	K	Pitch Circle Diameter	60	75	85	100	110	125	145	160	190	220	250	310	370	430	550
	n	Number of Bolts	4	4	4	4	4	4	8	8	8	8	8	12	12	16	16
	L	Hole Diameter	14	14	14	18	18	18	18	18	22	26	26	26	30	30	36
	Gw	Size of Bolts	M12	M12	M12	M16	M16	M16	M16	M16	M20	M 24	M 24	M 24	M 27	M 27	M 33
Nominal Pressure 40	D	Outside Diameter	95	105	115	140	150	165	185	200	235	270	300	375	450	515	660
	K	Pitch Circle Diameter	65	75	85	100	110	125	145	160	190	220	250	320	385	450	585
	n	Number of Bolts	4	4	4	4	4	4	8	8	8	8	8	12	12	16	16
	L	Hole Diameter	14	14	14	18	18	18	18	18	22	26	26	30	33	33	39
	Gw	Size of Bolts	M12	M12	M 12	M 16	M 16	M 16	M 16	M 16	M 20	M 24	M 24	M 27	M 30	M 30	M 36

Connecting Dimensions according to EN 1092 - 1 : 2013 in Millimeters

*) EN 1092 - 1: 2007 → number of bolts: 4

Preferred Dimensions of Body Welding Ends



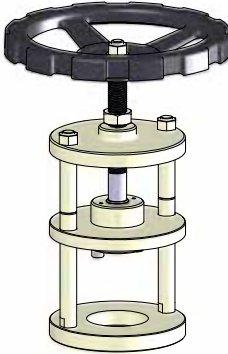
DN		15	25	40	50	80	100	150	200	250	300	400
Nominal Pressure	Valve Outside	A	22	35	50	62	91	117	172	223	278	413
	Valve Inside	B	$B = \varnothing D - 2 \times T$									
	Pipe Outside	D	21,3	33,7	48,3	60,3	88,9	114,3	168,3	219,1	273,0	323,9	406,4
PN 10	Pipe Thickness	T	2,0	2,6	2,6	2,9	3,2	3,6	4,5	6,3	6,3	7,1
PN 16		2,0	2,6	2,6	2,9	3,2	3,6	4,5	6,3	6,3	7,1	8,0
PN 25		2,0	2,6	2,6	2,9	3,2	3,6	4,5	6,3	6,3	7,1	8,8
PN 40		2,0	2,6	2,6	2,9	3,2	3,6	4,5	6,3	6,3	7,1	11,0

Connecting Dimensions according to EN 12627 - Figure 2 : 1999 in Millimeters

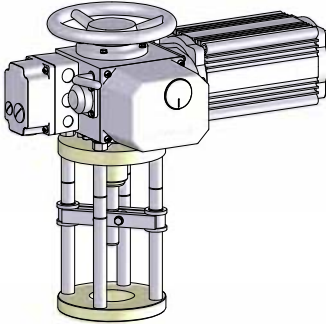
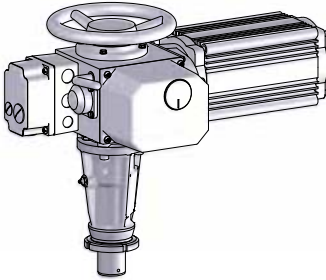
Actuator - „Linear Style“

Actuator Design	Type (Actuator) / Size	max. Force	Air / Power Supply	Failure Position	Hand Wheel	
pneumatic operated	IT 252 502 700 PB 252 502 700 1502 3002 Manufacturer: Flowserve Villach Operation		250 N ÷ 60 000 N depending on Actuator Size	1,2 bar ÷ 6,0 bar depending on Actuator Size	Stem • retracted • extended	<ul style="list-style-type: none"> • without • top mounted (option) • side mounted (option) depending on Actuator Size
	electric operated					
electric operated	AB 201 202 204 208 210 Manufacturer: PS Automation GmbH „Flowserve Design“		1 000 N ÷ 10 000 N depending on Actuator Size	220 - 240 V → 50 Hz 110 - 115 V → 50 Hz 24 V → 50 Hz 400 V → 50 Hz depending on Actuator Size	Stem • locked	<ul style="list-style-type: none"> • top mounted
	EB 1,2 / 1,2 4,5 / 4,5 8 / 8 12 / 12 20 / 15 20 / 20 25 / 25 Manufacturer: Haselhofer Feinmechanik GmbH „Flowserve Design“							1 200 N ÷ 25 000 N depending on Actuator Size	230 V → 50 Hz 400 V → 50 Hz 24 V DC depending on Actuator Size	Stem • locked	• side mounted

Actuator - „Linear Style“

Actuator Design	Type / Size	max. Force	Power Supply	Failure Position	Hand Wheel
hand operated	 <p> HB 12 16 20 Manufacturer: Flowserve Villach Operation </p>	13 00 N ÷ 30 000 N depending on Actuator Size	bi-manual Hand operating Force 200 N	Stem • locked	• top mounted

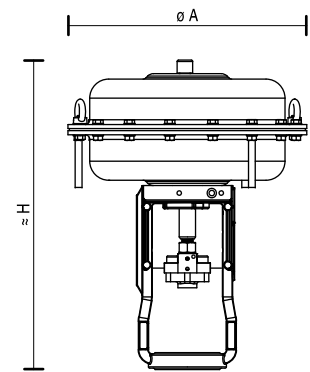
Actuator - „Multi Turn Style“

Actuator Design	Type	max. Force	max. Torque	Actuator Interface	Actuator
Linear thrust Unit „light“ linked to an electric multi turn actuator	 <p> LB 12 16 20 Manufacturer: Flowserve Villach Operation </p>	10 400 N ÷ 27 700 N depending on Linear thrust Unit Size	30 Nm ÷ 80 Nm depending on Linear thrust Unit Size	Output drive ISO 5210 A Connection Flange ISO 5210 F10	adapted for electrical multi turn actuators with output drives version „stem nut“ with trapezoid thread 24 x 5 left
Linear thrust Unit „heavy“ only linked to the bonnet SN and an electric multi turn actuator	 <p> SI 15 35 36 75 120 200 300 Manufacturer: Flowserve Villach Operation </p>	15 000 N ÷ 288 000 N depending on Linear thrust Unit Size	30 Nm ÷ 1700 Nm depending on Linear thrust Unit Size	Output drive ISO 5210 B3 Connection Flange ISO 5210 F10 F14 F16 F25 depending on Linear thrust Unit Size	adapted for electrical multi turn actuators with output drives version „bore“ with keyway

Pneumatic linear Actuator with multi-function Yoke

(Values in Millimeter → mm respectively Kilogram → kg)

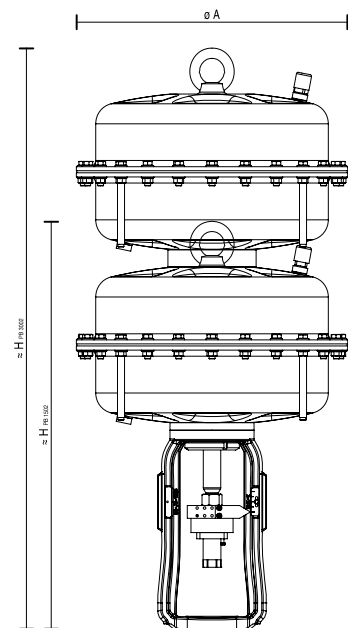
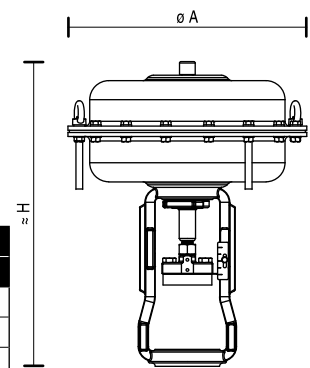
Description	Area (cm ²)	250		500		700	
	Stroke	10 / 20	20	40	20	40	40
∅ A		265	352	352	405	405	405
≈ H		335	455	560	545	545	550
≈ Weight		16	31	40	46	46	46



Pneumatic linear Actuator with NAMUR-Yoke

(Values in Millimeter → mm respectively Kilogram → kg)

Description	Area (cm ²)	250		500		700	
	Stroke	10 / 20	20	40	20	40	60
∅ A		265	352	352	405	405	405
≈ H		330	420	450	545	545	600
≈ Weight		16	31	40	46	46	46

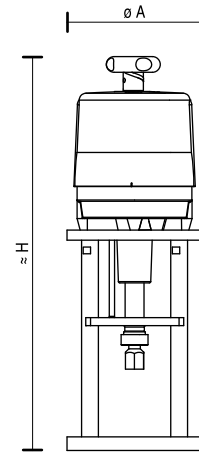


Description	Area (cm ²)	1500	3000
	Stroke	40 / 60 / 80 / 100	40 / 60 / 80 / 100
∅ A		548	548
≈ H		800	1140
≈ Weight		124	240

PSL - Electric linear Actuator

(Values in Millimeter → mm respectively Kilogram → kg)

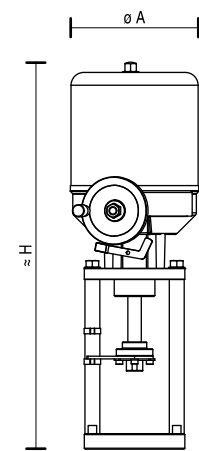
Description	Electric linear Actuator	AB 201	AB 202	AB 204	AB 208	AB 210
	Stroke	20	20	20/40	20/40	20/40
∅ A		219	219	219	236	236
≈ H		462	462	462	585	585
≈ Weight		5,5	5,7	9,5	12	12



Haselhofer - Electric linear Actuator

(Values in Millimeter → mm respectively Kilogram → kg)

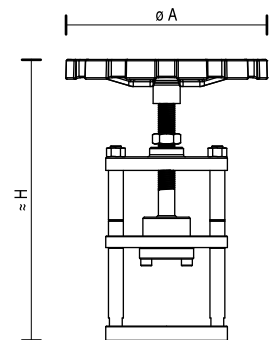
Description	Electric linear Actuator	EB 1,2	EB 4,5	EB 8	EB 12	EB 20	EB 25
	Stroke	10/20/40	20/40	20/40/60/80	20/40/60/80	20/40/60/80/100	20/40/60/80/100
∅ A		145	145	184	184	216	216
≈ H		505	535	570	570	660	660
≈ Weight		6,5	7,5	13	13	19	19



Manual Operation

(Values in Millimeter → mm respectively Kilogram → kg)

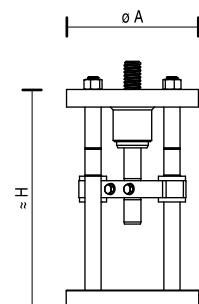
Description	Manual Operation	HB 12	HB 16	HB 20
	Stroke	20	40	60 / 80
∅ A		300	300	400
≈ H		400	450	480
≈ Weight		17	17	18



Linear thrust Unit „light“

(Values in Millimeter → mm respectively Kilogram → kg)

Description	Linear thrust Unit	LB 12	LB 16	LB 20
	Stroke	20	40	60 / 80
∅ A		196	196	196
≈ H		240	320	407
≈ Weight		12	17	20



SPM - Code

Type	DN	PN	Body / Cert.	Plug	Seat	kvs	Trim	Actuator
V726 DKVNA	50	40	1.0619/OOAO	PONP1GG	42	40	316SS	

Body Form		
Three-Flange		D
Three-Flange with Heating Jacket		H
Four-Flange		V
Four-Flange with Heating Jacket		G
Angle		E
Three-Way		W

Form of Connection		
Flange acc. to EN 1092-1	Form B1	K
	Form F	Y
	Form D	Q
see Page 7	Form B1	A
	Form F	B
	Form D	D
Welded Ends acc. to EN 12627		S

Bonnet Form		
without Pressure Balancing		V
with V-Ring Balancing		O
with Piston-Ring Balancing		K
with Heavy Duty Design		S

Bonnet Assembly		
Standard Bonnet		N
Bellows seal Bonnet		B
HT Extension Bonnet		R
LT Extension Bonnet		K
Insulating Bonnet		I

Packing Box Assembly		
PTFE-Rings, adjustable		A
Graphite-Rings, adjustable		B
Oxygen		Y
PTFE-Rings, loaded		N
Oxygen live loaded		W
Graphite-Rings, live loaded		O
PTFE, live loaded, "TA"		Q
Graphite-Rings, live loaded, "TA"		V
V-Ring Packing System		S

Nominal Size	15 - 400
--------------	----------

Nominal Pressure	PN 10 - 40
------------------	------------

Body Material	1.0619
	1.6220
	1.4581
	1.5419
	1.4308

Materials acc. to international Standards for Pressure Stressed Parts		
Standards for Materials		
DGRL (PED)		O ...
AD 2000		A ...
Certificates for Materials		
without		.O ...
2.2		.Z ...
3.1 (with list of certificates)		.B ...
3.1 (CMTR Body+ Bonnet)		.D ...
3.1 (CMTR Body+ Bonnet+ Bolting)		.E ...
3.1 (Code E+ Trim)		.H ...
3.2		.A ...

316SS or 1.4571 1.4122	Plug, Seat Material
---------------------------	------------------------

kvs - Value	0,01 - 2800
-------------	-------------

Port Size	3 - 350
-----------	---------

Flow tend to open	G
Flow tend to close	I

Characterstic		
modified - equal percentage		G
linear		L
on / off		A
modified - equal percentage with Special Rangeability		H

Plug Guiding		
Top		1
Top and Bottom		2

Seat Leakage			
		Liquid	Gas
IEC 60534	Class III	O	-
	Class IV	P	D
	Class IV - S1	Q	E
	Class V	S	P
	Class VI	-	T
EN 12 266	LR A	A	B

Plug Form		
standard		N
partial stellited		D
contour stellited		K
soft seated (-60 ± +250 °C)		W
soft seated (-200 ± +150 °C)		C
hardened		H
tenifer treaded		T

Plug		
Cont. Plug without Silent-Set		P O
with Silentpack		P K
with MultiStream Type C		P C
with MultiStream Type D		P D
with MultiStream Type E		P E
with MultiStream Type F		P F
with MultiStream Type G		P G
with MultiStream Type H		P H
with MultiStream Type I		P I
with MultiStream Type Q		P Q
with MultiStream Type W		P W
Disk Plug		T O
Multi-Hole Plug		L O
RLS-Unit, 2-step, Series I		A O
RLS-Unit, 2-step, Series II		B O
RLS-Unit, 3-step, Series II		D O
Mixing Plug		M O
Distributing Plug		V O

Standards and Certificates for final test		
Standards for final test		
DGRL	EN 1349 (Standard) Kat. IV	.. A . .. M .
Certificates for final test		
EN 10 204	without	... O
	2.2	... Z
	3.1	... B
	3.2	... A

IT 252 AAD0Z

Safety position at air failure
 Z Spring to close
 A Spring to open
 S Fail in place - Spring to close
 T Fail in Place - Spring to open

Hand Wheel
 O without
 L top, light-weight-variant IT 252 - 502
 H top, heavy-duty-variant IT 252 - 700

Spring Range			
	Actuator Size	Stroke	
AD	0,2 - 1,0	IT 252 / 502	20
AD	0,2 - 1,0	IT 502 / 700	40
BL	0,5 - 1,9	IT 252 / 502	20
BL	0,5 - 1,9	IT 502 / 700	40
MU	0,8 - 1,6	IT 252	10
DY	1,0 - 2,4	IT 252 / 502	20
DY	1,0 - 2,4	IT 502 / 700	40
IY	1,4 - 2,4	IT 252	10
VC	1,5 - 2,7	IT 252 / 502	20
VC	1,5 - 2,7	IT 502 / 700	40
VI	1,5 - 3,8	IT 252 / 252 / 502	20
VI	1,5 - 3,8	IT 502 / 700	40
JC	1,8 - 2,7	IT 700	20
FY	2,0 - 4,8	IT 252 / 502	20
FY	2,0 - 4,8	IT 502 / 700	40
CW	2,7 - 4,1	IT 252	10

Actuator Color
 A blue
 B white
 C yellow

Actuator Size with MULTI-yoke		
	Actuator Size	Stroke
IT 252	250 cm ²	10, 20
IT 502	500 cm ²	20, 40
IT 700	700 cm ²	20, 40

PB 252 ADY0Z

Safety position at air failure
 Z Spring to close
 A Spring to open
 S Fail in place - Spring to close
 T Fail in Place - Spring to open

Hand Wheel
 O without
 L top, light-weight-design PB 252 - 502
 H top, heavy-duty-design PB 252 - 700
 S lateral PB 1502 - 3002

Actuator Color
 A blue
 B white
 C yellow

Actuator Size with NAMUR-Yoke		
	Actuator Size	Stroke
PB 252	250 cm ²	10, 20
PB 502	500 cm ²	20, 40
PB 700	700 cm ²	20, 40, 60
PB1502	1500 cm ²	20, 40, 60, 80, 100
PB 3002	3000 cm ²	40, 60, 80, 100

EB 8/8 ZPO 50A

Stroke
 A-E / M M-10, A-20, B-40, C-60, D-80, E-100

Positioning Speed
 13,5 13,5 mm/min
 17 17 mm/min
 25 25 mm/min
 50 50 mm/min

Positioner
 O without
 M Positioning Electronics, input in mA or V adjustable

Transmitter
 O without
 F 1 additional travel limit switches
 P 1000 Ohm potentiometer Ω
 M 4 - 20 mA positioning feedback

Voltage
 Z 230 V, 50 Hz - AC
 D 400 V, 50 Hz - AC
 G 24 V - DC

Haselhofer - Electric linear Actuator
 EB 1,2/1,2 Actuating Power 1,2 kN
 EB 4,5/4,5 Actuating Power 4,5 kN
 EB 8/8 Actuating Power 8 kN
 EB 12/12 Actuating Power 12 kN
 EB 20/15 Actuating Power 15 kN
 EB 20/20 Actuating Power 20 kN
 EB 25/25 Actuating Power 25 kN

Spring Range				
	Actuator Size	Stroke		
AD	0,2 - 1,0	PB 252 / 502	20	
AD	0,2 - 1,0	PB 502 / 700 / 1502 / 3002	40	
AD	0,2 - 1,0	PB 700 / 1502 / 3002	60	
AD	0,2 - 1,0	PB 1502 / 3002	80	
GF	0,4 - 2,0	PB 1502 / 3002	40, 60, 80	
BL	0,5 - 1,9	PB 252 / 502	20	
BL	0,5 - 1,9	PB 502 / 700	40	
BL	0,5 - 1,9	PB 700	60	
KI	0,75 - 1,4	PB 1502 / 3002	40, 60, 80	
MU	0,8 - 1,6	PB 252	10	
HL	0,9 - 1,9	PB 1502 / 3002	100	
DY	1,0 - 2,4	PB 252 / 502	20	
DY	1,0 - 2,4	PB 502 / 700	40	
DY	1,0 - 2,4	PB 700 / 3002	60	
DY	1,0 - 2,4	PB 3002	80	
NA	1,2 - 2,6	PB 1502 / 3002	100	
EP	1,3 - 2,1	PB 3002	60, 80	
IY	1,4 - 2,4	PB 252	10	
VC	1,5 - 2,7	PB 252 / 502	20	
VC	1,5 - 2,7	PB 502 / 700 / 1502	40	
VC	1,5 - 2,7	PB 1502	60, 80	
VI	1,5 - 3,8	PB 252 / 502	20	
VI	1,5 - 3,8	PB 502 / 700	40	
VI	1,5 - 3,8	PB 700	60	
JC	1,8 - 2,7	PB 700	20	
JI	1,8 - 3,8	PB 1502 / 3002 ^{a)}	100	
FL	2,0 - 4,3	PB 1502 / 3002 ^{a)}	100	
FY	2,0 - 4,8	PB 252 / 502	20	
FY	2,0 - 4,8	PB 502 / 700	40	
FY	2,0 - 4,8	PB 700	60	
FS	2,0 - 3,5	PB 1502 / 3002 ^{a)}	60, 80	
FS	2,0 - 3,5	PB 3002 ^{a)}	40	
AJ	2,6 - 4,2	PB 1502	60, 80	
CW	2,7 - 4,1	PB 252	10	

^{a)} Actuator force above 39 kN not suitable for stem diameter 20mm

LB 16

Linear thrust Unit „light“				
	Thrust	Stroke	Torque	ISO5210 A
LB 12	10,4 kN	20 mm	30 Nm	F10
LB 16	17,3 kN	≤ 40 mm	50 Nm	F10
LB 20	27,7 kN	≤ 80 mm	80 Nm	F10

SI 35

Linear thrust Unit „heavy“				
	Thrust	Stroke	Torque	ISO5210 B3
SI 15	15 kN	≤ 40 mm	30 Nm	F10
SI 35	35 kN	≤ 40 mm	100 Nm	F10
SI 36	35 kN	≤ 100 mm	100 Nm	F10
SI 75	77 kN	≤ 100 mm	250 Nm	F14
SI 120	121 kN	≤ 100 mm	500 Nm	F14
SI 200	181 kN	≤ 100 mm	1000 Nm	F16
SI 300	288 kN	≤ 160 mm	1700 Nm	F25

HB 16

Manual Operation		
	Thrust	Stroke
HB 12	13 kN	20 mm
HB 16	23 kN	40 mm
HB 20	30 kN	≤ 80 mm

AB 204 ZQ0 30A

Stroke
 A-E / M M-10, A-20, B-40, C-60,

Positioning Speed
 15 15 mm/min A. 201, 202
 27 27 mm/min A. 210
 30 30 mm/min A. 202, 204, 208

Positioning Electronics
 O without
 M Positioning Electronics, input in mA or V adjustable

Positioning Feedback
 O without
 E 2 add. limit switches
 P 1000 Ohm potentiometer Ω
 D 2 - 1000 Ohm potentiometer Ω
 M Transmitter 4 - 20 mA
 Q 1000 Ohm potentiometer Ω with 2 limit switches
 N Transmitter 4 - 20 mA with 2 limit switches

Power
 Z 220 - 240 V 50 Hz - AC
 Y 110 - 115 V 50 Hz - AC
 F 24 V 50 Hz - AC
 D 400 V 50 Hz - AC (A^B 208/110)

PSL - Electric linear Actuator
 . B . . .
 . C . . . Code for three way design only !
 A . 201 Actuating Power 1 kN
 A . 202 Actuating Power 2 kN
 A . 204 Actuating Power 4,5 kN
 A . 208 Actuating Power 8 kN
 A . 210 Actuating Power 10 kN



Valtek FlowTop FCD SAENTBV726 11/14 Printed in Europe

To find your local Flowserve representative

or for more information about Flowserve Corporation,
visit www.flowserve.com or call USA 1 800 225 6989

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can (and often does) provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Operation Maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

© 2014 Flowserve Control Valves GmbH, Villach, Austria, Europe. Flowserve is a registered trademark of Flowserve Corporation.

USA

Flowserve Flow Control Division
1350 N. Mt. Springs Parkway
Springville, UT 84663

USA

Phone: +1 801 489 8611

Fax: +1 801 489 3719

Austria

Flowserve Control Valves GmbH
Kasernengasse 6
9500 Villach

AUSTRIA

Phone: +43 (0) 424241181 - 0

Fax: +43 (0) 424241181 - 50

France

Flowserve France S.A.S
PB 60 63307 Thiers Cedex
FRANCE

Phone: +33 4738 04266

Fax: +33 4738 01424

India

Flowserve India Controls Pvt Ltd.
Plot # 4, 1A, Road #8 EPIP
Whitefield Bangalore, Karnataka,
560066

INDIA

Phone: 918040146200

Fax: 918028410286

China

Flowserve Fluid Motion and
Control (Suzhou) Co., Ltd.
No. 35, Baiyu Road,
Suzhou Industrial Park, Shzhou
Jiangsu Province, P.R. 215021
CHINA

Phone: 86 512 6288 8790

Fax: 86 512 6288 8736

Singapore

Flowserve Pte. Ltd.
12 Tuas Avenue 20
Republic of Singapore 638824
Singapore

Phone: +65 6879 8900

Fax: +65 6862 4940

Saudi Arabia

Flowserve Abahsain Flow Control
Co.,
Ltd.

Makkah Road, Phase 4
Plot 10 & 12, 2nd Industrial City
Dammam, Kingdom of Saudi
Arabia

Phone: +966 3 857 3150 X 243

Fax: +966 3 857 4243