

Valtek FlowPro V724

High Performance Valve

DN 25 - 300, PN 63 - 160

FCD VLENTBV724 03/15



FlowPro - 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, 27)

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.

Packing

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

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

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

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.

Bonnet

Ten different bonnet designs are available. Extremely **robust** design integral flange. (see page 9 - 12)

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

Body

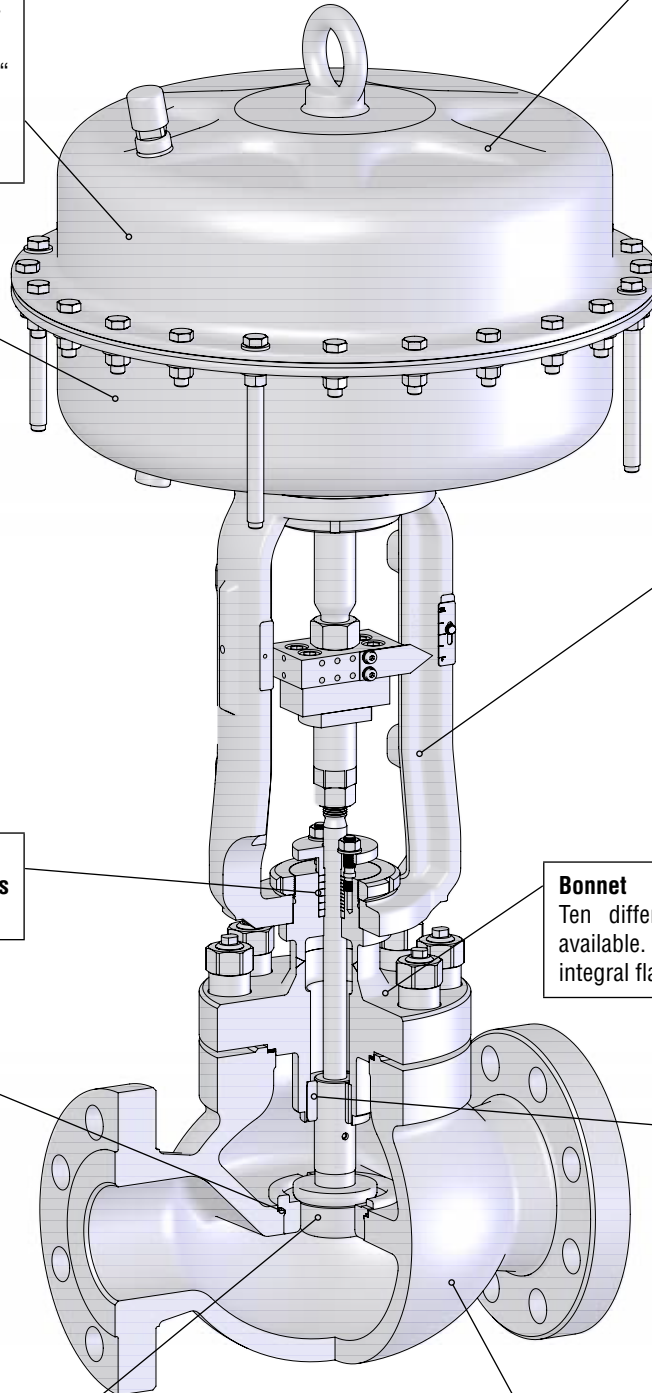
Seven different body designs available. The enlarged gallery enables **higher kvs** per trim and valve size than competitive products.

(see page 3 - 8)

Trim

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

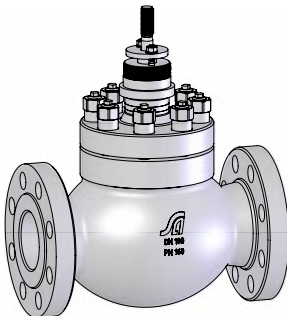
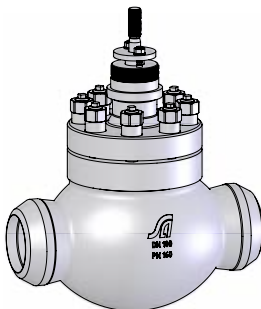
(see page 14 - 21 resp. Special Brochure)



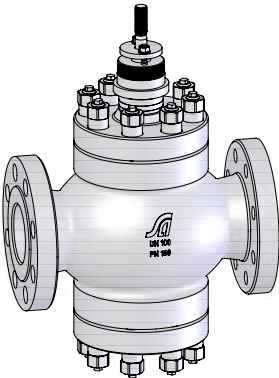
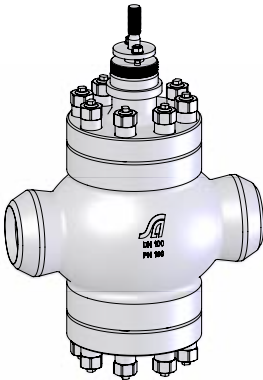
FlowPro - Advantages

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	FlowPro 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 FlowPro with a soft seat design.
Post guided	One solid guide stabilizes the stem and plug during valve travel and minimizes 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 vapors and gases and eliminating cavitation.
Versatile Packing Configuration	Available in PTFE and Graphite. Live loading kits are retrofitable 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 FlowPro 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 minimizes vibration and wear.
Certifications and Approvals (sample)	<p>Quality assurance system certificated according to EN ISO 9001:2000 inc. product development.</p> <p>EC-Type - Examination according to PED 97/23/EC Module B + D</p> <p>ATEX - Valve and pneumatic actuator are a "equipment without its own potential source of ignition (BOPZ)" and do not therefore fall under the definition in the scope of Directive 94/9/EC</p> <p>TA-Luft - Certificate and Fugitive Emission according ISO 15848-1</p> <p>SIL - Certificate according IEC 61508</p> <p>DVGW - Certificate according EC Type Examination 90/396/EWG</p> <p>TR CU - Certificate according to Directive TR CU 010/2011 (GOST-R)</p> <p>DNV - Type Approval</p>
Multiple Application Usage	High-performance, general-service control valve used in many process industries including chemical, refinery, power, food and beverage, HVAC.

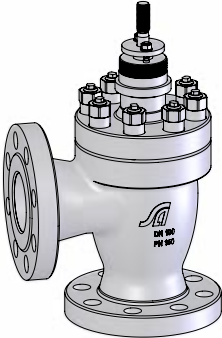
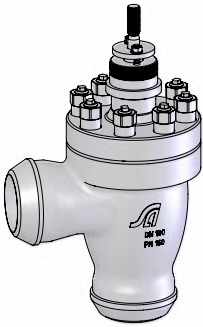
Body Design - „Three Flange“

Body Design	Type (Body) / Size	Body Material	Bonnet Design	Packing Design	Trim Design	
3-Flange	D Flanged PN 63 100 160 DN 25 40 50 80 100 150 200		1.0619 1.4581 1.4408 1.6220 1.4308 1.5419 1.7357	Without Balancing VN Standard Bonnet VF 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 9 - 11</i>	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen <i>see page 12</i>	Parabolic Plug PON Standard POD Partial Stellite POK Contour Stellite POW Soft Seated Disk Plug TON Standard TOW Soft Seated <i>see page 13 - 21</i> Special Trim Equipment <i>see Special Brochure</i>
	DS Welded PN 63 100 160 DN 25 40 50 80 100 150 200		1.0619 1.4581 1.4408 1.4308 1.5419 1.7357			

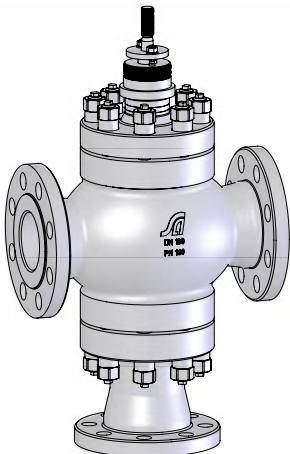
Body Design - „Four Flange“

Body Design	Type (Body) / Size	Body Material	Bonnet Design	Packing Design	Trim Design
4-Flange	<p>V Flanged</p> <p>PN 63 100 160</p> <p>DN 25 40 50 80 100 150 200 250 300</p> 	<p>1.0619 1.4581 1.4408 1.6220 1.4308 1.5419 1.7357</p>	<p>Without Balancing</p> <p>VN Standard Bonnet VF Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet VI Insulating Bonnet</p> <p>V-Ring Balancing</p> <p>ON Standard Bonnet OK Low Temperature Bonnet OI Insulating Bonnet</p> <p>Piston-Ring Balancing</p> <p>KR High Temperature Bonnet</p> <p>Heavy Duty Design</p> <p>SN Standard Bonnet</p> <p><i>see page 9 - 11</i></p>	<p>adjustable</p> <p>A PTFE B Graphite Y Oxygen</p> <p>spring loaded</p> <p>N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen</p> <p><i>see page 12</i></p>	<p>Parabolic Plug</p> <p>PON Standard POD Partial Stellite POK Contour Stellite POW Soft Seated</p> <p>Disk Plug</p> <p>TON Standard TOW Soft Seated</p> <p><i>see page 13 - 21</i></p> <p>Special Trim Equipment</p> <p>see Special Brochure</p>
	<p>VS Welded</p> <p>PN 63 100 160</p> <p>DN 25 40 50 80 100 150 200 250 300</p> 	<p>1.0619 1.4581 1.4408 1.4308 1.5419 1.7357</p>			






Body Design - „Angle“

Body Design	Type (Body) / Size	Body Material	Bonnet Design	Packing Design	Trim Design
Angle	E Flanged PN 63 100 160 DN 25 40 50 80 100 150 200 250 300		1.0619 1.4581 1.4408 1.6220 1.4308 1.5419 1.7357 Without Balancing VN Standard Bonnet VF 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 9 - 11</i>	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen <i>see page 12</i>	Parabolic Plug PON Standard POD Partial Stellite POK Contour Stellite POW Soft Seated Disk Plug TON Standard TOW Soft Seated <i>see page 13 - 21</i> Special Trim Equipment see Special Brochure
	ES Welded PN 63 100 160 DN 25 40 50 80 100 150 200 250 300		1.0619 1.4581 1.4408 1.4308 1.5419 1.7357		

Body Design - „Three Way“

Body Design	Type (Body) / Sizes	Body Material	Bonnet Design	Packing Design	Trim Design
3-Way	W Flanged PN 63 100 DN 40 50 80 100 150 200 250 300		1.0619 1.4581 1.5419 Without Balancing VN Standard Bonnet VF Bellow Seal Bonnet VR High Temperature Bonnet VK Low Temperature Bonnet Heavy Duty Design SN Standard Bonnet <i>see page 9 - 11</i>	adjustable A PTFE B Graphite Y Oxygen spring loaded N PTFE O Graphite Q PTFE TA-Luft V Graphite TA-Luft W Oxygen <i>see page 12</i>	Mixing MOT Tenifer treated Distributing VOT Tenifer treated <i>see page 13 - 21</i>

Body Connecting Design - „Detail“

Body Design	Type (Body)		Old Design		New Design	
3-Flange 4-Flange Angle 3-Way	. M . . .		according to DIN 2526	Form E	according to EN 1092-1	Form B2
	. Q . . .		according to DIN 2512	Form N		Form D
	. Y . . .		according to DIN 2513	Form R 13		Form F
	. L . . .		according to DIN 2696	Form L	-	
3-Flange 4-Flange Angle	. S . . . Welded		according to EN 12627			

Body Pressure - Temperature Ratings

MAOP	PN	Body Material	Service Temperature in °C													
			-200	-100	-60	-10	50	100	200	250	300	350	400	450	500	530
Maximum Allowable Operating Pressure in bar ¹⁾	63	1.0619			47	63	63	54	48	44	40	38	36			
		1.4581			47	63	63	63	58	55	52	50	49			
		1.4408			63	63	63	59	50	47	43	41	40			
		1.6220		47	47	63	63	47	42	41	40					
		1.4308	63	63	63	63	63	57	47	43	40					
		1.5419				63	63	63	58	54	48	44	39	37		
		1.7357				63	63	63	63	63	57	53	50	46	41	23
	100	1.0619			75	100	100	85	77	70	64	60	57			
		1.4581			75	100	100	100	93	88	83	80	78			
		1.4408			100	100	100	94	79	74	69	66	64			
		1.6220		75	75	100	100	75	67	65	63					
		1.4308	100	100	100	100	100	90	74	69	64					
		1.5419				100	100	100	92	85	76	70	63	59		
		1.7357				100	100	100	100	100	91	84	79	73	65	37
	160	1.0619			120	160	160	137	124	113	102	96	91			
		1.4581			120	160	160	160	149	141	133	128	124			
		1.4408			160	160	160	151	127	119	110	105	102			
		1.6220		120	120	160	160	120	108	105	102					
		1.4308	160	160	160	160	160	145	119	110	102					
		1.5419				160	160	160	148	137	121	112	101	94		
		1.7357				160	160	160	160	160	147	135	127	118	104	59

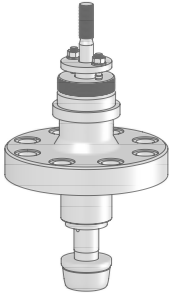
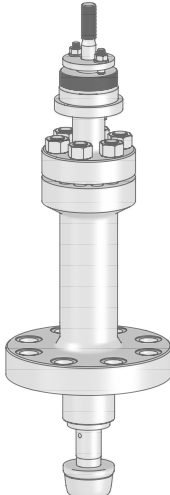
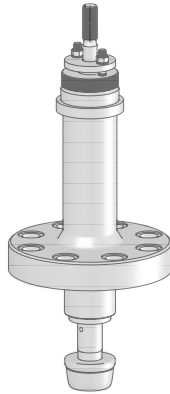
¹⁾ Maximum Allowable Operating Pressure in according to the relevant version of the standards EN 1092 resp. AD 2000 W10 !

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

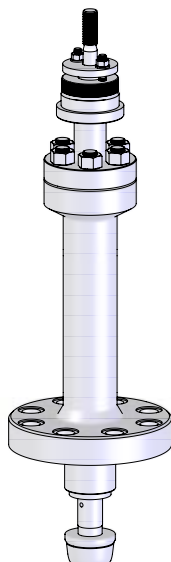
Body Material	Bonnet Design	Adjustable Packing			Spring loaded Packing				
		A	B	Y	N	O	Q	V	W
		PTFE	Graphite	Oxygen	PTFE	Graphite	PTFE TA-Luft ¹⁾	Graphite TA-Luft ¹⁾	Oxygen
1.0619	VN Standard Bonnet	-30 ÷ 250	-10 ÷ 250	-	-30 ÷ 250	-10 ÷ 250	-30 ÷ 250	-10 ÷ 250	-
	VF Bellows Seal Bonnet	-60 ÷ 250	-10 ÷ 400	-	-60 ÷ 250	-10 ÷ 400	-60 ÷ 250	-10 ÷ 400	-
	VR High Temperature Bonnet	-	250 ÷ 400	-	-	250 ÷ 400	-	250 ÷ 400	-
	VK Low Temperature Bonnet	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-
	ON Standard Bonnet, V-Ring balanced	-30 ÷ 250	-	-	-30 ÷ 250	-	-30 ÷ 250	-	-
	OK Low Temp. Bonnet, V-Ring balanced	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-
	KR High Temp. 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 ²⁾	-10 ÷ 400 ²⁾	-
1.4581	VN Standard Bonnet	-30 ÷ 250	-10 ÷ 250	-30 ÷ 200	-30 ÷ 250	-10 ÷ 250	-30 ÷ 250	-10 ÷ 250	-30 ÷ 200
	VF Bellows Seal Bonnet	-60 ÷ 250	-10 ÷ 400	-60 ÷ 200	-60 ÷ 250	-10 ÷ 400	-60 ÷ 250	-10 ÷ 400	-60 ÷ 200
	VR High Temperature Bonnet	-	250 ÷ 400	-	-	250 ÷ 400	-	250 ÷ 400	-
	VK Low Temperature Bonnet	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250	-	-60 ÷ 250	-	-60 ÷ 200
	ON Standard Bonnet, V-Ring balanced	-30 ÷ 250	-	-30 ÷ 200	-30 ÷ 250	-	-30 ÷ 250	-	-30 ÷ 200
	OK Low Temp. Bonnet, V- Ring balanced	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250	-	-60 ÷ 250	-	-60 ÷ 200
	SN Standard Bonnet, Heavy Duty Design	-30 ÷ 250	-10 ÷ 400	-30 ÷ 200	-30 ÷ 250	-10 ÷ 400	-30 ÷ 250 ²⁾	-10 ÷ 400 ²⁾	-30 ÷ 200
1.4408	VI Insulating Bonnet	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250	-	-60 ÷ 250	-	-60 ÷ 200
	OI Insulating Bonnet, V-Ring balanced	-60 ÷ 250	-	-60 ÷ 200	-60 ÷ 250	-	-60 ÷ 250	-	-60 ÷ 200
1.6220	VN Standard Bonnet	-30 ÷ 250	-10 ÷ 250	-	-30 ÷ 250	-10 ÷ 250	-30 ÷ 250	-10 ÷ 250	-
	VK Low Temperature Bonnet	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-
	ON Standard Bonnet, V-Ring balanced	-30 ÷ 250	-	-	-30 ÷ 250	-	-30 ÷ 250	-	-
	OK Low Temp. Bonnet, V- Ring balanced	-60 ÷ 250	-	-	-60 ÷ 250	-	-60 ÷ 250	-	-
1.4308	VF Bellows Seal Bonnet	-200 ÷ 250	-10 ÷ 300	-	-200 ÷ 250	-10 ÷ 300	-200 ÷ 250	-10 ÷ 300	-
	VI Insulating Bonnet	-200 ÷ 250	-	-200 ÷ 200	-200 ÷ 250	-	-200 ÷ 250	-	-200 ÷ 200
	OI Insulating Bonnet, V-Ring balanced	-200 ÷ 250	-	-200 ÷ 200	-200 ÷ 250	-	-200 ÷ 250	-	-200 ÷ 200
1.5419	VN Standard Bonnet	-10 ÷ 250	-10 ÷ 250	-	-10 ÷ 250	-10 ÷ 250	-10 ÷ 250	-10 ÷ 250	-
	VR High Temperature Bonnet	-	250 ÷ 450	-	-	250 ÷ 450	-	250 ÷ 450	-
	ON Standard Bonnet, V-Ring balanced	-10 ÷ 250	-	-	-10 ÷ 250	-	-10 ÷ 250	-	-
	KR High Temp. 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 ²⁾	-10 ÷ 450 ²⁾	-
1.7357	VR High Temperature Bonnet	-	250 ÷ 530	-	-	250 ÷ 450	-	250 ÷ 450	-
	SN Standard Bonnet, Heavy Duty Design	-10 ÷ 250	-10 ÷ 530	-10 ÷ 200	-10 ÷ 250	-10 ÷ 450	-10 ÷ 250 ²⁾	-10 ÷ 450 ²⁾	-10 ÷ 200
Dependencies	Trim - Material	1.4571 -> -200 ÷ 450°C all, limited positioning force at SN Bonnet, not for KR Bonnet and not for 1.7357							
		1.4122 -> -60 ÷ 450°C for 1.0619, 1.5419 and 1.7357, for KR Bonnet only, alt. for MultiStream, not for VF, VI, OI Bonnet							
		1.4922 -> 450 ÷ 530°C for 1.7357							
	Soft Seat - Material	PTFE -> -60 ÷ 250°C for 1.4571 only			Balancing - Material				
		PCTFE -> -200 ÷ 150°C for 1.4571 only			V-Ring -> -60 ÷ 250°C				
					PE-UHMW -> -200 ÷ 80°C				

¹⁾ for PN 63 only ²⁾ up to DN 100

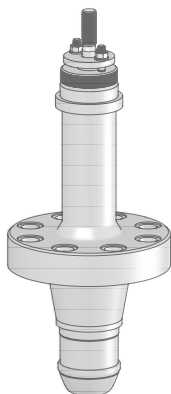
Bonnet Design - „Unbalanced“ for DN 25 - 300

Bonnet Design	Type (Bonnet)		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 1.5415 1.0566	- 30 ÷ + 250 °C <i>see also Working Temperature Range on Page 7 - 8</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 <i>see page 13</i>
	.. VF . Bellows Seal Bonnet		1.0619 1.4581 1.4308 1.4408	1.0460 1.4571 1.4571 1.4571	- 60 ÷ + 400 °C <i>see also Working Temperature Range on Page 7 - 8</i>	Use by toxic, smell strong, fleeting, costly media or vacuum	einstellbar A PTFE Y Sauerstoff gefedert N PTFE Q PTFE TA-Luft W Sauerstoff <i>siehe Seite 13</i>
	.. VR . High Temperature Bonnet		1.0619 1.4581 1.5419 1.7357	1.0460 1.4571 1.5415 1.7335	+ 250 ÷ + 530 °C <i>see also Working Temperature Range on Page 7 - 8</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	- 60 ÷ + 250 °C <i>see also Working Temperature Range on Page 7 - 8</i>	Use by possible icing of the packing	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen <i>see page 13</i>

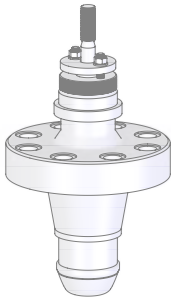
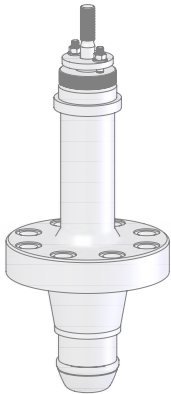
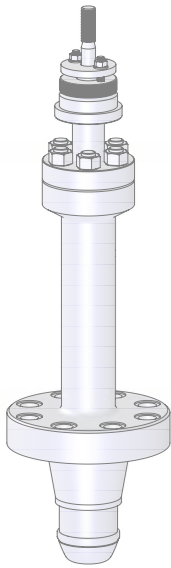
Bonnet Design - „Unbalanced“ for DN 25 - 300

Bonnet Design	Type (Bonnet)		Material		Temperature Range	Application	Packing Design	
			Body	Bonnet				
Without Balancing	.. VI .	Insulating Bonnet		1.4408 1.4308	1.4571 1.4571	- 200 ÷ + 250 °C see also Working Temperature Range on Page 7 - 8	Use by cryo- genic service	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen see page 13

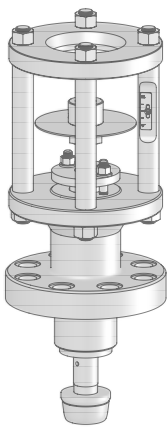
Bonnet Design - „Piston ring balancing“ for DN 50 - 300

Bonnet Design	Type (Bonnet)		Material		Temperature Range	Application	Packing Design
			Body	Bonnet			
Piston-Ring Balancing	.. KR .High Temperature Bonnet		1.0619	1.0460	+ 250 ÷ + 450 °C	Use by possible overheating of packing and/or actuator	adjustable B Graphite
			1.5419	1.5415	<i>see also</i>		spring loaded O Graphite
			1.7357	1.7335	<i>Working Temperature Range</i>		V Graphite TA-Luft
					<i>on Page 7 - 8</i>		<i>see page 13</i>







Bonnet Design - „Pressure Balanced“ for DN 80 - 300

Bonnet Design	Type (Bonnet)		Material		Temperature Range	Application	Packing Design
			Body	Bonnet			
V-Ring Balancing	.. ON . Standard Bonnet		1.0619 1.4581 1.6220 1.5419	1.0460 1.4571 1.0566 1.5415	- 30 ÷ + 250 °C <i>see also Working Temperature Range on Page 7 - 8</i>	Universal use	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen <i>see page 13</i>
	.. OK . Low Temperature Bonnet		1.0619 1.4581 1.6220	1.0460 1.4571 1.0566	- 60 ÷ + 250 °C <i>see also Working Temperature Range on Page 7 - 8</i>	Use by possible icing of the packing	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen <i>see page 13</i>
	.. OI . Insulating Bonnet		1.4308 1.4408	1.4571 1.4571	- 200 ÷ + 80 °C <i>see also Working Temperature Range on Page 7 - 8</i>	Use by cryogenic service	adjustable A PTFE Y Oxygen spring loaded N PTFE Q PTFE TA-Luft W Oxygen <i>see page 13</i>

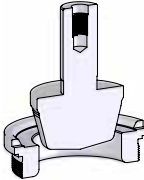
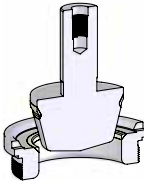
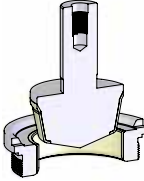
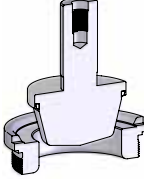
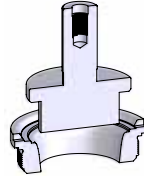
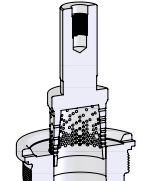
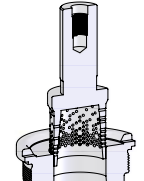
Bonnet Design - „Heavy Duty“ for DN 25 - 400

Bonnet Design	Type (Bonnet)		Material		Temperature Range	Application	Packing Design
			Body	Bonnet			
Heavy Duty Design	.. SN . Standard Bonnet		1.0619	1.0460	- 30 ÷ + 530 °C <i>see also Working Temperature Range on Page 7 - 8</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>
			1.4581	1.4571			
			1.5419	1.5415			
			1.7357	1.7335			

Packing Design - „Detail“

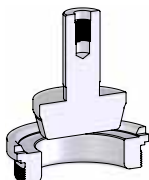
Packing Design	Type (Packing)		Material	Temperature Range	Application	Approvals
adjustable	.... A PTFE		Packing Rings Braided PTFE-Yarn impregnated with PTFE-Dispersion Chamber Washers PTFE-Carbon	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemi- cal resistance	FMPA for food application
	.... B Graphite		Packing Rings Braided Graphite made out of expanded pure Graphite-Yarn lubricated with a slip additive	- 10 ÷ + 530 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemi- cal resistance. Not suitable for oxidizing media !	-
	.... Y Oxygen		Packing Rings Braided Graphite resp. 100% PTFE silk yarns, impregnated with PTFE- Dispersion	- 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		Packing Rings Braided PTFE-Yarn impregnated with PTFE-Dispersion Chamber Washers PTFE-Carbon	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemi- cal resistance.	FMPA for food application
	.... Q PTFE „TA-Luft“		Packing Rings Braided Carbon-Yarn, covered with a sleeve of impregnated and lubricated PTFE-Yarn Chamber Washers PTFE-Carbon	- 200 ÷ + 250 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemi- cal resistance	TA-Luft ISO 15848-1
	.... O Graphite		Packing Rings Braided Graphite made out of expanded pure Graphite-Yarn lubricated with a slip additive	- 10 ÷ + 450 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Universal chemi- cal resistance. Not suitable for oxidising media !	-
	.... V Graphite „TA-Luft“					TA-Luft ISO 15848-1
	.... W Oxygen		Packing Rings Braided Graphite resp. 100% PTFE silk yarns, impregnated with PTFE- Dispersion	-200 ÷ + 200 °C <i>see also Operating Temperature Range on Page 8 - 9</i>	Oxygen service only !	BAM for gaseous oxygen

Trim Design - „Standard“

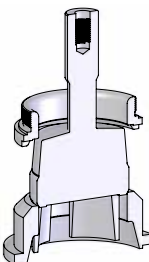
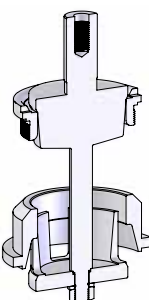
Type (Trim) / Material			Medium	Flow	max. allowable Differential Pressure	Noise Reduction	
Parabolic Plug Characteristic: G . ↓ mod. equal per. L . ↓ linear	PON standard 1.4571		<ul style="list-style-type: none">• clean• marginally contaminated with particles• low clogging potential for dirty service	gases, vapors and liquids G Flow direction under the plug	$\Delta p_i < x_{FZ} \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	none - noise reduction with Special Trim Equipment or Noise Insulating provided by customer
	PON standard 1.4122 or 1.4922					$\Delta p_i < (x_{FZ}+0,10) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
	POH hardened 1.4122 or 1.4922					$\Delta p_i < (x_{FZ}+0,15) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
	POD partial stellited (seat surface) 1.4571					$\Delta p_i < (x_{FZ}+0,10) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
	POK full stellited (contour) 1.4571					$\Delta p_i < (x_{FZ}+0,15) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
Piston Plug with contoured seat Characteristic: G . ↓ mod. equal per.	POW soft seated 1.4571+PTFE (-60 ÷ 250°C) POC 1.4571+PCTFE (-200 ÷ +150 °C)			 I Flow direction over the plug	$\Delta p_i < x_{FZ} \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
	SOK full stellited (contour) 1.4571							$\Delta p_i < (x_{FZ}+0,20) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$
Venturi Plug Characteristic: G . ↓ mod. equal per.	SOH hardened 1.4122				$\Delta p_i < (x_{FZ}+0,15) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$		
	PVK full stellited (contour) 1.4571 Seat ≤ 16 mm							$\Delta p_i < (x_{FZ}+0,20) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	max. - 15 dB(A)
LVH hardened 1.4122 Seat ≥ 20 mm							
Characteristic values of incompressible fluids $\Delta p_i \rightarrow x_{FZ} \rightarrow 0,79 - 0,24$ 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 21 and Special Brochure

Trim Design - „Standard“

Type (Trim) / Material Characteristic A . → on / off			Medium		Flow	max. allowable Differential Pressure	Noise Reduction
Disk Plug with Throttle Lip	TON standard 1.4571		<ul style="list-style-type: none">• clean• marginally contaminated with particles• low clogging potential for dirty service	gases, vapors and liquids	. . . . . G Flow direction under or I over the plug	$\Delta p < \text{MAWP}$	none - noise reduction with Special Trim Equipment or Noise Insulating provided by customer
	TON standard 1.4122 or 1.4922						
Δp_i respectively Δp_c values see page 14							

Trim Design - „Three Way“

Type (Trim) / Material Characteristic L . → linear			Medium		Flow	max. allowable Differential Pressure	Noise Reduction
Mixing Plug	MOT tenifer treated 1.4571		<ul style="list-style-type: none">• clean• marginally contaminated with particles• low clogging potential for dirty service	gases, vapors and liquids	. . . . . G Flow direction under the plug	$\Delta p_i < x_{FZ} \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	none - noise reduction with Special Trim Equipment or Noise Insulating provided by customer
	MON standard 1.4122					$\Delta p_i < (x_{FZ} + 0,10) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
Distributing Plug	VOT tenifer treated 1.4571					$\Delta p_i < x_{FZ} \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
	VON standard 1.4122					$\Delta p_i < (x_{FZ} + 0,10) \cdot (p_i - p_v)$ $\Delta p_c < x_T \cdot p_i$	
Δp_i respectively Δp_c values see page 14							

Rangeability

EXCLUSION:
Stroke = 10 mm only !

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

1) Modified equal percentage Flow Characteristic only!

Contoured Plug ¹⁾

Characteristic: modified - equal percentage

kvs (m³/h)	Seat Ø	Guide of Plug	Balancing "K"	Balancing "Q"	Material / Design						Possible seat diameter depends on nominal size DN									
					1.4571					1.4122 / 1.4922		25	40	50	80	100	150	200	250	300
					N	D	K	W	C	N	H									
					standard	partial stellite	full stellite	soft seated ²⁾	standard	hardened	Stroke = 20 mm									
0,16	4	1					•		•	•										
0,25	4	1					•		•	•										
0,40	4	1			•		•		•	•	•									
0,63	6	1			•		•		•	•	•									
1,6	8	1			•		•		•	•	•									
2,5	10	1			•		•		•	•	•									
4,0	12	1			•	•	•	•	•	•	•									
6,3	16	1			•	•	•	•	•	•	•	•								
10	20	1			•	•	•	•	•	•	•	•	•							
16	25	1			•	•	•	•	•	•		•	•							
25	34	1/2			•	•	•	•	•	•		•	•							
40	42	1/2	•		•	•	•	•	•	•			•	•						
63	53	1/2	•	•	•	•	•	•	•	•				•	•					
100	67	1/2	•	•	•	•	•	•	•	•				•	•					
160	84	1/2	•	•	•	•	•	•	•	•					•					
200	100	1/2	•	•	•	•	•	•	•	•						•	•			
355	125	1/2	•	•	•	•	•	•	•	•						•	•	•		
450	150	1/2	•	•	•	•	•	•	•	•							•	•	•	
710	200	1/2	•	•	•	•	•	•	•	•								•	•	
1000	250	1/2	•	•	•	•	•		•	•									•	

¹⁾ Restrictions on page 8, 14 and 15 !

²⁾ Not possible with max. seat diameter !

Contoured Plug ¹⁾

Characteristic: linear

kvs (m³/h)	Seat Ø	Guide of Plug	Balancing "K"	Balancing "Q"	Material / Design						Possible seat diameter depends on nominal size DN									
					1.4571					1.4122 / 1.4922		25	40	50	80	100	150	200	250	300
					N	D	K	W	C	N	H									
					standard	partial stellited	full stellited	soft seated		standard	hardened										Stroke = 20 mm		40 mm		80 mm
4,0	12	1			•	•	•	•		•	•	•								
6,3	16	1			•	•	•	•		•	•	•	•							
10	20	1			•	•	•	•		•	•	•	•							
16	25	1			•	•	•	•		•	•		•	•						
25	34	1/2			•	•	•	•		•	•		•	•						
40	42	1/2	•		•	•	•	•		•	•			•	•					
63	53	1/2	•	•	•	•	•	•		•	•				•	•				
100	67	1/2	•	•	•	•	•	•		•	•				•	•				
160	84	1/2	•	•	•	•	•	•		•	•				•		•			
200	100	1/2	•	•	•	•	•	•		•	•					•	•			
355	125	1/2	•	•	•	•	•	•		•	•						•	•	•	
450	150	1/2	•	•	•	•	•	•		•	•							•	•	
710	200	1/2	•	•	•	•	•	•		•	•								•	•
1000	250	1/2	•	•	•	•	•	•		•	•									•

¹⁾ Restrictions on page 8, 14 and 15 !

Piston Plug Design with Contoured Seat¹⁾

Characteristic: modified - equal percentage

kvs (m ³ /h)	Seat Ø	Guide of Plug	Material / Design		Possible seat diameter depends on nominal size DN								
			1.4571	1.4122	25	40	50	80	100	150	200	250	300
			K	H									
			full stellited	hardened									
6,3	20	1	•	•	•	•							
10	25	1	•	•	•	•	•						
16	34	1	•	•		•	•						
25	42	1/2	•	•		•	•						
40	53	1/2	•	•			•	•					
63	67	1/2	•	•				•	•				
100	84	1/2	•	•				•	•				
160	100	1/2	•	•					•	•			
200	125	1/2	•	•						•	•		
355	150	1/2	•	•						•	•	•	
450	200	1/2	•	•							•	•	•
710	250	1/2	•	•								•	•

¹⁾ Restrictions on page 8, 14 and 15 !

Venturi Seat Design¹⁾

Characteristic: modified - equal percentage

kvs (m ³ /h)	Seat Ø	Plug design	Material / Design		Possible seat diameter depends on nominal size DN					
			1.4571	1.4122	25	40	50	80	100	150
			K	H						
			full stellited	hardened						
1,6	8	Contoured Plug	•		•					
2,5	10		•		•					
4,0	12		•		•					
6,3	16		•		•					
6,3	16		•			•				
6,3	20	Multi Hole Plug		•		•				
10	25			•		•				
6,3	20			•			•			
10	25			•			•			
20	34			•			•			
28	42			•				•		
50	53			•				•		
50	53			•					•	
71	67			•					•	
160	84			•						•
200	100			•						•

¹⁾ Restrictions on page 8, 14 and 15 !

Disk Plug with Throttle Lip ¹⁾

Characteristic: on / off

kvs (m ³ /h)	Seat Ø	Guide of Plug	Material / Design		Possible seat diameter depends on nominal size DN								
			1.4571	1.4122 / 1.4922	25	40	50	80	100	150	200	250	300
			standard		Stroke = 20 mm			40 mm		80 mm			
10	20	1	•	•	•								
25	34	1	•	•		•							
40	42	1	•	•			•						
100	67	1	•	•				•					
160	84	1	•	•					•				
400	125	1	•	•						•			
630	150	1	•	•							•		
1000	200	1	•	•								•	
1600	250	1	•	•									•

¹⁾ Restrictions on page 8, 14 and 15 !

Mixing Plug ¹⁾

Characteristic: linear

kvs (m ³ /h)	Seat Ø	Guide of Plug	Material / Design			Possible seat diameter depends on nominal size DN							
			1.4571	1.4122		40	50	80	100	150	200	250	300
			T	N	H	Stroke = 20 mm	40 mm	80 mm	100 mm	150 mm	200 mm	250 mm	300 mm
			temper treated	standard	hardened								
25	34	2	•	•	•	•							
40	42	2	•	•	•		•						
100	67	2	•	•	•			•					
160	84	2	•	•	•				•				
355	125	2	•	•	•					•			
450	150	2	•	•	•						•		
710	200	2	•	•	•							•	
1000	250	2	•	•	•								•

¹⁾ Restrictions on page 8, 14 and 15 !

Distributing Plug ¹⁾

Characteristic: linear

kvs (m ³ /h)	Seat Ø	Guide of Plug	Material / Design			Possible seat diameter depends on nominal size DN							
			1.4571	1.4122		40	50	80	100	150	200	250	300
			T	N	H	Stroke = 20 mm	40 mm	80 mm	100 mm	150 mm	200 mm	250 mm	300 mm
			temper treated	standard	hardened								
25	34	2	•	•	•	•							
40	42	2	•	•	•		•						
100	67	2	•	•	•			•					
160	84	2	•	•	•				•				
355	125	2	•	•	•					•			
450	150	2	•	•	•						•		
710	200	2	•	•	•							•	
1000	250	2	•	•	•								•














¹⁾ Restrictions on page 8, 14 and 15 !

Seat Leakage

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

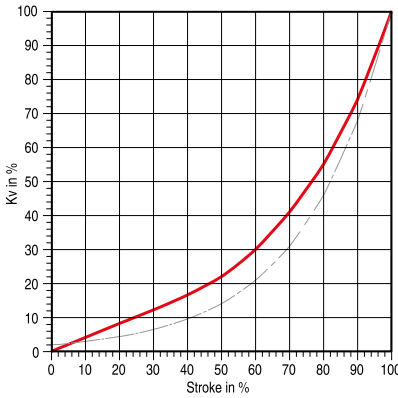
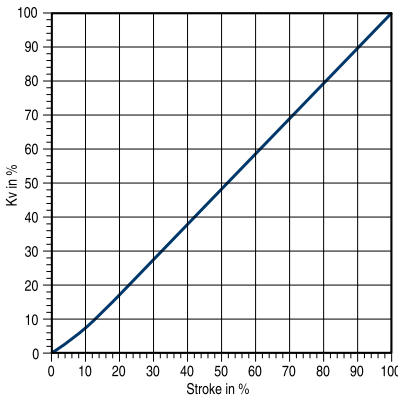
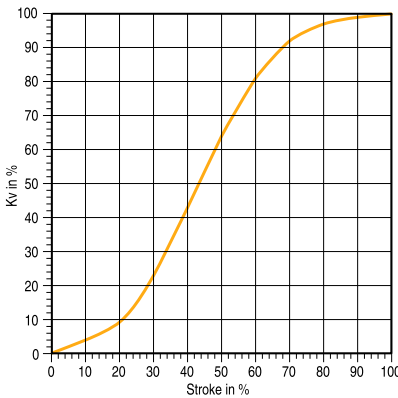
Standard	Balancing	Plug Code		Leakage Class	Test Medium	Test Pressure	max. Seat Leakage	Leakage Code
IEC 60534-4:2007-06 resp. ANSI / FCI 70-2-2006	Without	metal to metal seated	... P ...	IV	Liquid	Operating Pressure	0,000 1 · kvs 0,000 1 · cv	IV L 2
			... D ...		Gas	Operating Pressure, max. 3,5 bar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

Special Trim Equipment - Details see Special Brochure SAENBRNOIS-00

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

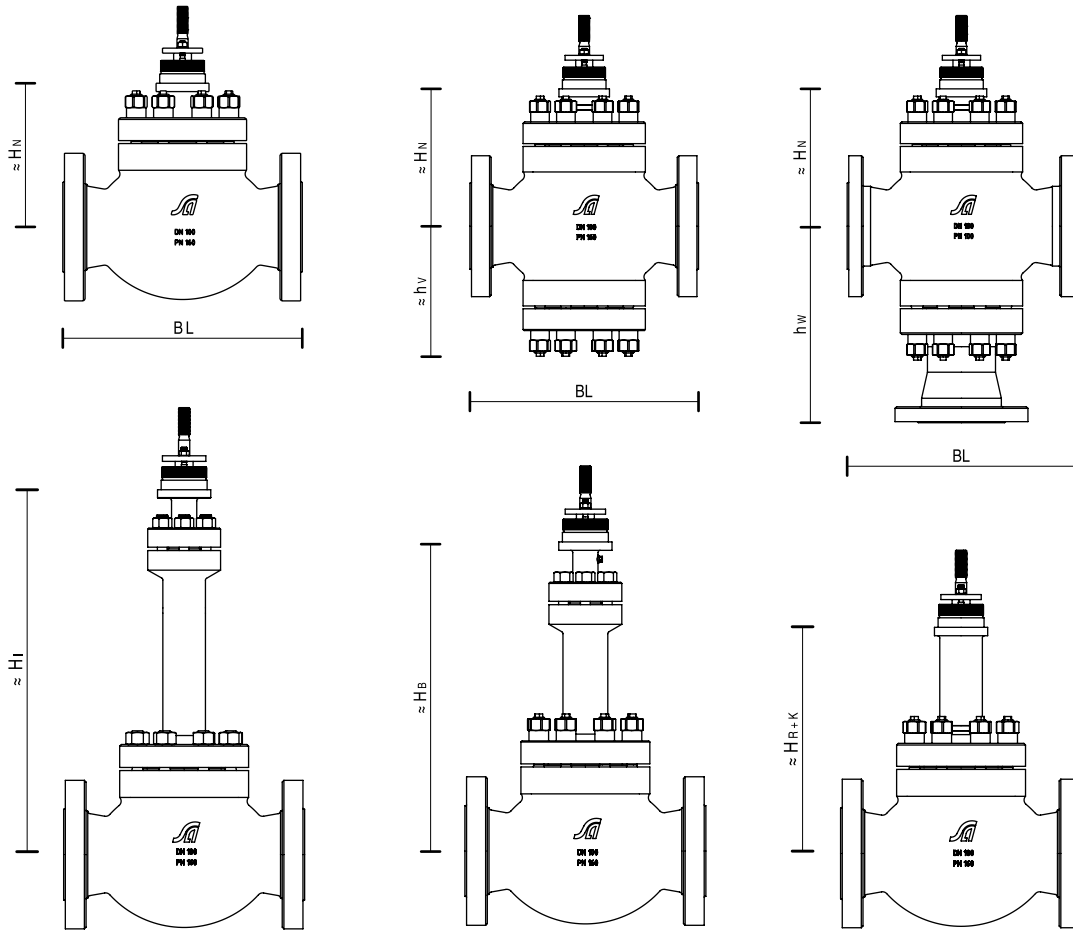
NOTICE → expert knowledge is required for the selection of Trim! The specified datas are used for a rough orientation only and may not taken for dimensioning !

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)

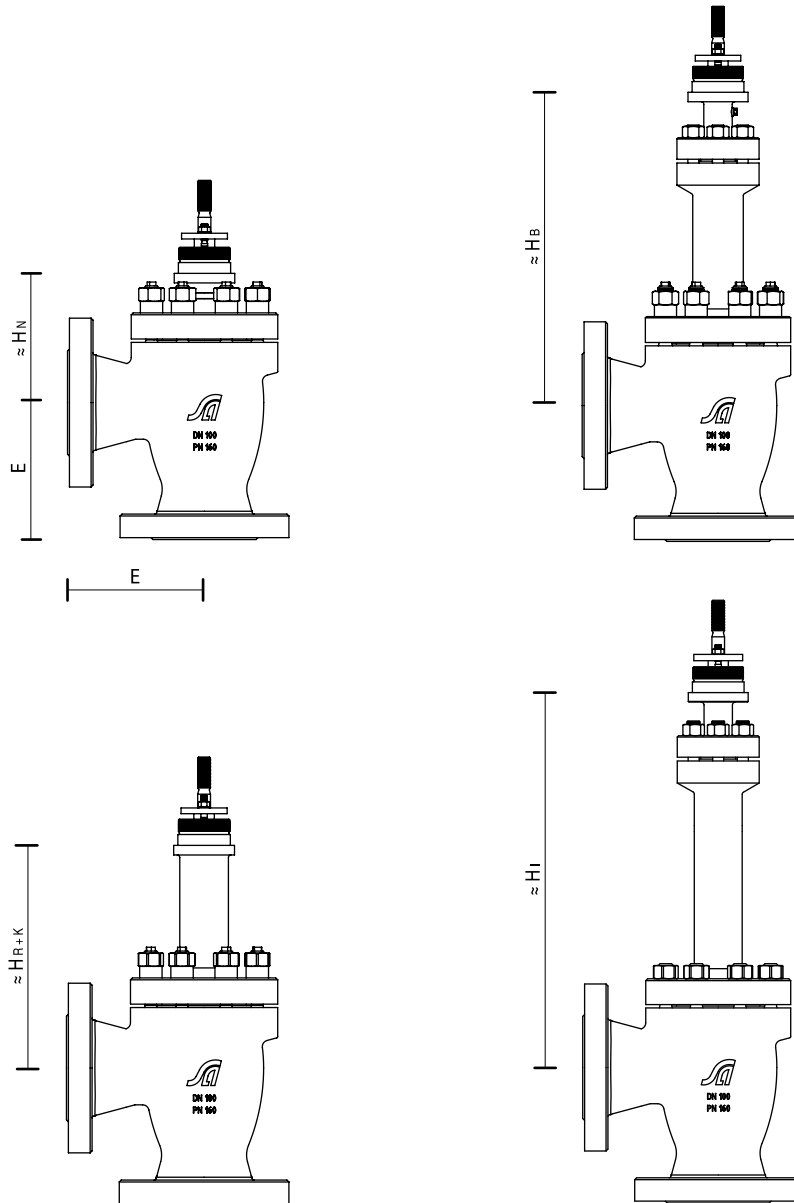


Description		Nominal Size DN									
		Stroke									
		25	40	50	80	100	150	200	250	300	
		20 mm			40 mm			80 mm			
BL	Face to Face Dimensions acc. to EN 558:2008 Basic Line 2	230	260	300	380	430	550	650	775	900	
≈ h v	Centerline to Bottom Flange Dimension	120	135	165	195	245	315	400	480	535	
h w	Centerline to Flange Tube Dimension acc. to EN 558:2008 Basic Line 26	-	240	250	310	350	450	550	650	750	
≈ Height	H N for Standard Bonnet	150	180	205	220	260	325	405	490	540	
	H B for Bellows Seal Bonnet	330	360	360	550	550	900	900	905	960	
	H R + K for High / Low Temperature Bonnet	150	180	205	365	405	470	545	625	675	
	H I for Insulating Bonnet	650	650	650	650	650	670	800	800	800	
≈ Weight for Valves with Three-Flange Body	and Standard-Bonnet	13	22	28	62	96	236	476	-	-	
	and Bellows Seal Bonnet	20	30	36	77	110	264	502	-	-	
	and High / Low Temperature Bonnet	13	22	28	67	101	241	481	-	-	
	and Insulating Bonnet	23	36	41	81	114	256	501	-	-	
≈ Weight for Valves with Four-Flange Body	and Standard Bonnet	16	27	36	74	121	266	534	858	1265	
	and Bellows Seal Bonnet	23	35	44	89	135	294	560	881	1280	
	and High / Low Temperature Bonnet	16	27	36	79	126	271	539	863	1270	
	and Insulating Bonnet	26	41	49	93	139	286	559	877	1274	
≈ Weight for Three-Way Valves	and Standard Bonnet	11	35	46	87	138	291	576	984	1438	
	and Bellows Seal Bonnet	15	43	54	102	152	319	602	1007	1453	
	and High / Low Temperature Bonnet	13	35	46	92	143	296	581	989	1443	
Flanges drilled and dimensioned acc. to		EN 1092-1, Form B2, F, D									
Welded ends comply with		EN 12627 - 2									

Dimensions and Weights

Angle

(Values in Millimeter → mm respectively Kilogram → kg)

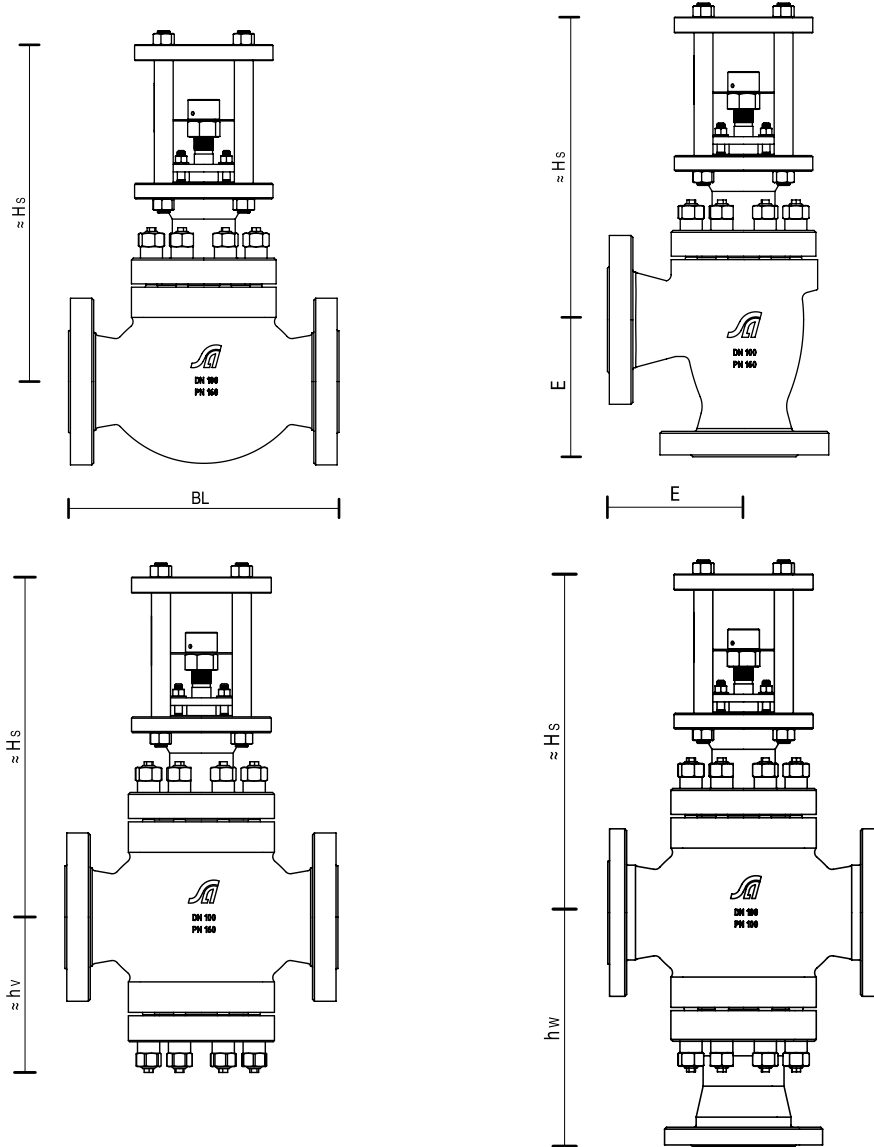


Description		Stroke	Nominal Size DN						
			25	40	50	80	100	150	200
			20 mm			40 mm		80 mm	
E Centre to Face Dimensions acc. to EN 558:2008 Basic Line 9			115	130	150	190	215	275	325
≈ Height	H N for Standard Bonnet		130	155	170	180	205	245	295
	H B for Bellows Seal Bonnet		305	330	325	510	495	815	790
	H R + K for High / Low Temperature Bonnet		130	155	170	325	350	390	435
	H I for Insulating Bonnet		630	625	615	610	595	590	690
≈ Weight for Valves with Angle	and Standard-Bonnet		13	24	33	60	80	194	354
	and Bellows Seal Bonnet		20	32	41	75	94	222	380
	and High / Low Temperature Bonnet		13	24	33	65	85	199	359
	and Insulating Bonnet		23	38	46	79	98	214	379
Flanges drilled and dimensioned acc. to			EN 1092-1, Form B2, F, D						
Welded ends comply with			EN 12627 - 2						

Dimensions and Weights

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

(Values in Millimeter → mm respectively Kilogram → kg)



Description		Nominal Size DN								
		Stroke								
		25	40	50	80	100	150	200	250	300
BL	Face to Face Dimensions acc. to EN 558:2008 Basic Line 2	230	260	300	380	430	550	650	775	900
E	Centre to Face Dimensions acc. to EN 558:2008 Basic Line 9	115	130	150	190	215	275	325	-	-
≈ hv	Centerline to Bottom Flange Dimension	120	135	165	195	245	315	400	480	535
hw	Centerline to Flange Tube Dimension	-	240	250	310	350	450	550	650	750
≈ Hs	for Standard Bonnet „Heavy Duty Design“	325	400	365	490	515	780	860	925	975
≈ Weight (kg)	Three Flange Valve and Standard-Bonnet „HDD“	24	33	40	84	120	326	566	-	-
	Angle Flange Valve and Standard-Bonnet „HDD“	24	35	45	82	104	284	444	-	-
	Four Flange Valve and Standard-Bonnet „HDD“	27	38	48	96	145	356	624	945	1353
	Three-Way Valve and Standard-Bonnet „HDD“	-	46	58	109	162	381	666	1071	1526
Flanges drilled and dimensioned acc. to		EN 1092-1, form B2, F, D								
Welded ends comply with		EN 12627 - 2								

Flanged Body Connecting Dimensions



DN			25	40	50	80	100	150	200	250	300
Nominal Pressure 63	D	Outside Diameter	140	170	180	215	250	345	415	470	530
	K	Pitch Circle Diameter	100	125	135	170	200	280	345	400	460
	n	Number of Bolts	4	4	4	8	8	8	12	12	16
	L	Hole Diameter	18	22	22	22	26	33	36	36	36
	Gw	Size of Bolts	M16	M20	M20	M20	M24	M30	M33	M33	M33
Nominal Pressure 100	D	Outside Diameter	140	170	195	230	265	355	430	505	585
	K	Pitch Circle Diameter	100	125	145	180	210	290	360	430	500
	n	Number of Bolts	4	4	4	8	8	12	12	12	16
	L	Hole Diameter	18	22	26	26	30	33	36	39	42
	Gw	Size of Bolts	M16	M20	M24	M24	M27	M30	M33	M36	M39
Nominal Pressure 160	D	Outside Diameter	140	170	195	230	265	355	430	515	585
	K	Pitch Circle Diameter	100	125	145	180	210	290	360	430	500
	n	Number of Bolts	4	4	4	8	8	12	12	12	16
	L	Hole Diameter	18	22	26	26	30	33	36	42	42
	Gw	Size of Bolts	M16	M20	M24	M24	M27	M30	M33	M39	M39

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

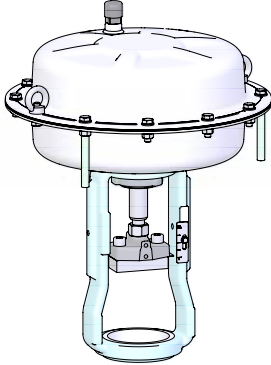
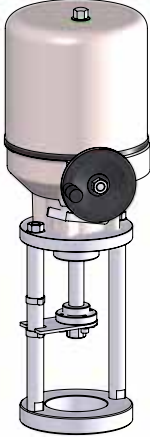
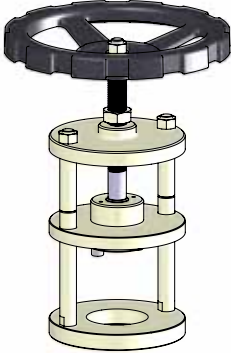
Preferred Dimensions of Body Welding Ends



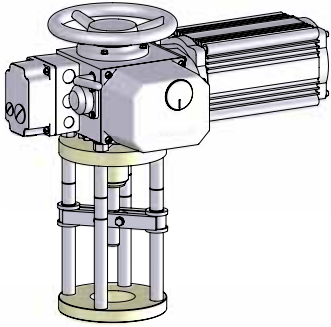
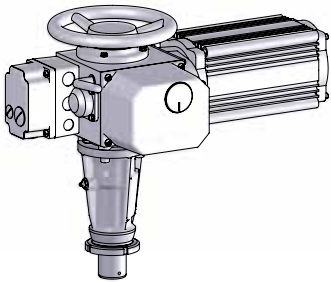
DN			25	40	50	80	100	150	200	250	300
Nominal Pressure	A	Valve Outside	35	50	62	91	117	172	223	278	329
	B	Valve Inside	B = øD - 2xT								
	D	Pipe Outside	33,7	48,3	60,3	88,9	114,3	168,3	219,1	273,0	323,9
PN 63	T	Pipe Thickness	2,6	2,9	4,0	4,5	4,5	6,3	7,1	8,8	11,0
PN 100			2,6	3,6		5,0	5,6	8,0	8,8	10,0	12,5
PN 160			2,9	3,6		6,3	8,0	12,5	16,0	20,0	22,2

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	<p>PD 253 503 701 1502 3002</p> <p>Manufacturer: Flowserve Villach Operation</p> 	<p>250 N ÷ 60 000 N</p> <p>depending on Actuator Size</p>	<p>1,4 bar ÷ 6,0 bar</p> <p>depending on Actuator Size</p>	<p>Stem</p> <ul style="list-style-type: none"> retracted extended 	<ul style="list-style-type: none"> without top mounted (option) side mounted (option) <p>depending on Actuator Size</p>
electric operated	<p>ED 1,2 / 1,2 4,5 / 4,5 8 / 8 12 / 12 20 / 15 20 / 20 25 / 25</p> <p>Manufacturer: Haselhofer Feinmechanik GmbH „Flowserve Design“</p> 	<p>1 200 N ÷ 25 000 N</p> <p>depending on Actuator Size</p>	<p>230 V → 50 Hz 400 V → 50 Hz 24 V DC</p> <p>depending on Actuator Size</p>	<p>Stem</p> <ul style="list-style-type: none"> locked 	<ul style="list-style-type: none"> side mounted
hand operated	<p>HD 12 16 20</p> <p>Manufacturer: Flowserve Villach Operation</p> 	<p>13 00 N ÷ 30 000 N</p> <p>depending on Actuator Size</p>	<p>bi-manual Hand operating Force 200 N</p>	<p>Stem</p> <ul style="list-style-type: none"> locked 	<ul style="list-style-type: none"> top mounted

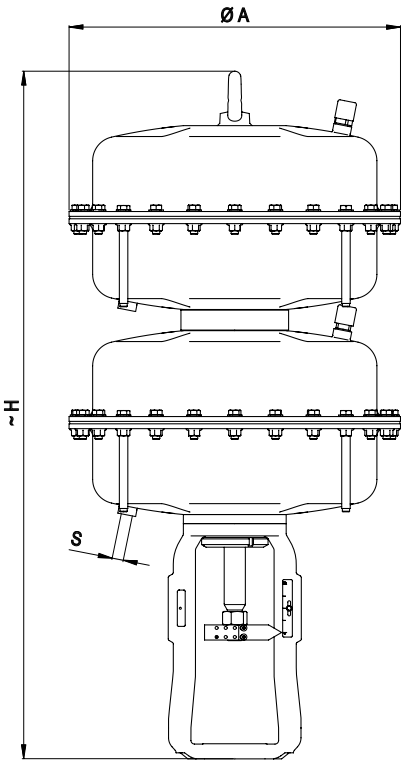
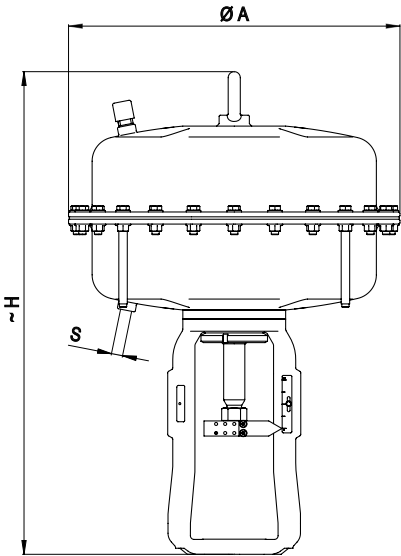
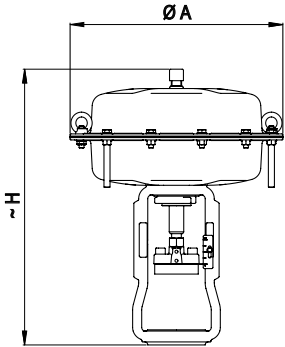
Actuator - „Multi Turn Style“

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

**Pneumatic linear Actuator
with NAMUR-Yoke**

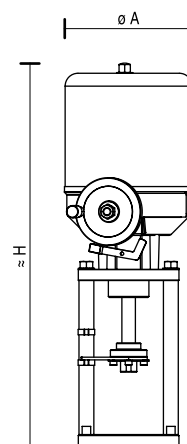
All further information see Technical Bulletin - FlowAct !

Description	Area (cm²)	250	500		700	
	Stroke	20	20	40	20	40
Ø A	mm	260	355		390	
≈ H	mm	335	420	460	465	500
≈ Weight	kg	10	21	22	31	



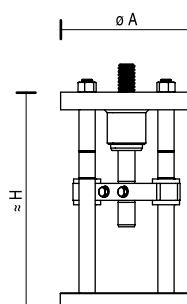
Description	Area (cm²)	1500	3000
	Stroke	20 / 40 / 80	40 / 80
Ø A	mm	548	548
≈ H	mm	800	1140
≈ Weight	kg	125	230

Haselhofer - Electric linear Actuator



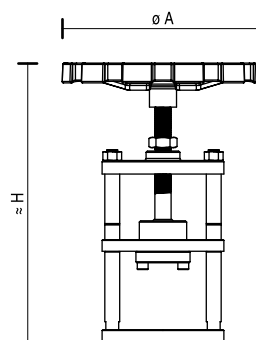
Description	Electric linear Actuator	ED 1,2	ED 4,5	ED 8	ED 12	ED 20	ED 25
	Stroke	20 / 40	20 / 40	20 / 40 / 80	20 / 40 / 80	20 / 40 / 80	20 / 40 / 80
Ø A	mm	145	145	184	184	216	216
≈ H	mm	505	535	570	570	660	660
≈ Weight	kg	6,5	7,5	13	13	19	19

Linear thrust Unit „light“



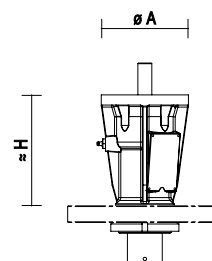
Description	Linear thrust Unit	LD 12	LD 16	LD 20
	Stroke	20	40	80
Ø A	mm	196	196	196
≈ H	mm	240	320	407
≈ Weight	kg	12	17	20

Manual Operation



Description	Manual Operation	HD 12	HD 16	HD 20
	Stroke	20	40	80
Ø A	mm	300	300	400
≈ H	mm	400	450	480
≈ Weight	kg	17	17	18

Linear thrust Unit „heavy“



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

SPM - Code

Type	DN	PN	Body / Cert.	Plug	Seat	kvs	Trim	Actuator
V724 DEVNA	50	160	1.0619/00A0	P0NP1GG	42	40	1.4571	

Body Form

Three-Flange D
Four-Flange V
Angle E
Three-Way W

Form of Connection

Flange acc. to Form B2 M
EN 1092-1 Form F Y
Form D Q

Flange acc. to Form E E
DIN 2526 Form N N
DIN 2512 Form R R
DIN 2513 Form L L
DIN 2696

Welded Ends acc. to S
EN 12627

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 F
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

Nominal Size

25 - 300

Nominal Pressure

PN 63 160

Body Material

1.0619
1.4581
1.4408
1.6220
1.4308
1.5419
1.7357

Materials acc. to international Standards for Pressure Stressed Parts

DGRL (Standard) 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 ...

1.4571 Plug, Seat
1.4122 or 1.4922 Material

kvs - Value 0,16 - 1600
Port Size 4 - 250
Flow tend to open G
Flow tend to close I

Characterstic

modified - equal percentage G
linear L
on / off A

modified - equal percentage H
with Special Rangeability

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 F
Class VI - T

EN 12 266 LR A A -

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 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

Piston Plug S O
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
Cont. Plug with Venturi Seat P V
Multi-Hole Plug + Venturi Seat L V

Mixing Plug M O
Distributing Plug V O

Standards and Certificates for final test

Standards for final test

DGRL EN 1349 (Standard) .. A .
Kat. IV .. M .

Certificates for final test

EN 10 204 without ... O
2.2 ... Z
3.1 ... B
3.2 ... A

30

PD 253 BDY0Z

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 PD 253 - 503
H	top, heavy-duty-design PD 253 - 701
S	side PD 1502
Z	centric PD 1502 - 3002

Spring Range

	Actuator Size	Stroke
AD	0,2 - 1,0 PD 253 / 503	20
AD	0,2 - 1,0 PD 503 / 701 / 1502 / 3002	40
AD	0,2 - 1,0 PD 1502 / 3002	80
GF	0,4 - 2,0 PD 1502 / 3002	40, 80
BL	0,5 - 1,9 PD 253 / 503	20
BL	0,5 - 1,9 PD 503 / 701	40
KI	0,75 - 1,4 PD 1502 / 3002	40, 80
MU	0,8 - 1,6 PD 1502	20
DY	1,0 - 2,4 PD 253 / 503	20
DY	1,0 - 2,4 PD 503 / 701	40
DY	1,0 - 2,4 PD 3002	40, 80
EP	1,3 - 2,1 PD 3002	40, 80
VP	1,5 - 2,1 PD 1502	20
VC	1,5 - 2,7 PD 253 / 503	20
VC	1,5 - 2,7 PD 503 / 701 / 1502	40
VC	1,5 - 2,7 PD 1502	80
VI	1,5 - 3,8 PD 253 / 503	20
VI	1,5 - 3,8 PD 503 / 701	40
JC	1,8 - 2,7 PD 701	20
FY	2,0 - 4,8 PD 253 / 503	20
FY	2,0 - 4,8 PD 503 / 701	40
FS	2,0 - 3,5 PD 1502 / 3002 ^{a)}	80
FS	2,0 - 3,5 PD 3002 ^{a)}	40
TD	2,3 - 3,4 PD 701	20
AJ	2,6 - 4,2 PD 1502	40, 80
RJ	3,0 - 4,2 PD 701	20

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

Actuator Color

A	blue
B	white
C	yellow

Actuator Size with NAMUR-Yoke

	Actuator Size	Stroke
PD 253	250 cm ²	20
PD 503	500 cm ²	20, 40
PD 701	700 cm ²	20, 40
PD 1502	1500 cm ²	20, 40, 80
PD 3002	3000 cm ²	40, 80

ED 8/8 ZPO 50A

Stroke

A	20 mm
B	40 mm
D	80 mm

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

ED 1,2/1,2	Actuating Power 1,2 kN
ED 4,5/4,5	Actuating Power 4,5 kN
ED 8/8	Actuating Power 8 kN
ED 12/12	Actuating Power 12 kN
ED 20/15	Actuating Power 15 kN
ED 20/20	Actuating Power 20 kN
ED 25/25	Actuating Power 25 kN

LD 16

Linear thrust Unit „light“

	Thrust	Stroke	Torque	ISO5210 A
LD 12	10,4 kN	20 mm	30 Nm	F10
LD 16	17,3 kN	≤ 40 mm	50 Nm	F10
LD 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

HD 16

Manual Operation

	Thrust	Stroke
HD 12	13 kN	20 mm
HD 16	23 kN	40 mm
HD 20	30 kN	≤ 80 mm



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