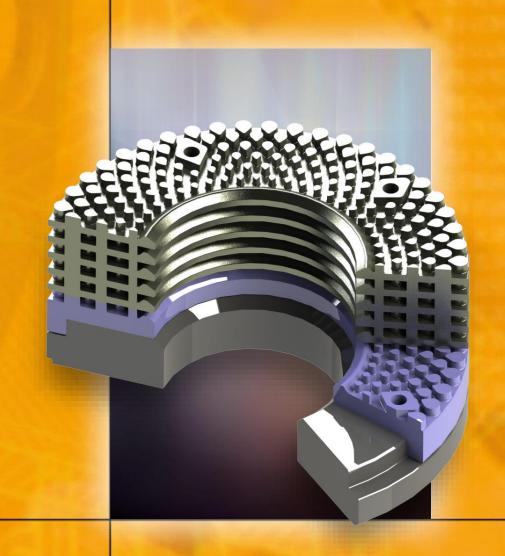
Severe Service Control Valves



SchuFI

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SchuF is fully registered, accredited and certified worldwide





SchuF Control Valves

Control valves work to keep a process variable such as flow or pressure within a predefined operating range. They are often the last piece of equipment in a process loop that can compensate a load disturbance and are therefore considered critical valves.

Why choose SchuF?

The SchuF Group is an industry-renowned valve supplier with over 100 years' experience designing and manufacturing application-specific valve solutions.

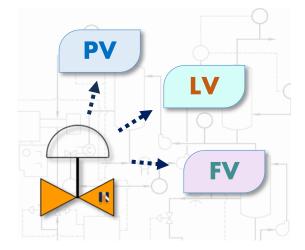
SchuF has developed over 20,000 control valve variations in its hundred-year history. Each has its own specific characteristics tailored to the process-control elements that are most important for it- pressure, level, flow or temperature.

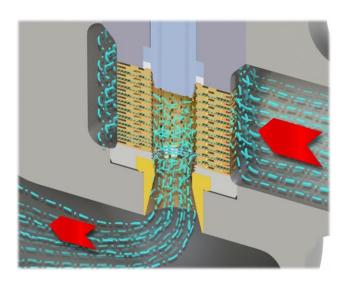
SchuF has the capability to ship our unique and highlypraised valve solutions world-wide from production facilities located in Germany, India, Ireland, Italy, the United Kingdom and the United States.

SchuF has an extensive product selection with a vast and diverse range of applications, from oil production to concrete manufacture. SchuF's team of skilled engineers and product specialists design each valve from the ground up to meet specific application requirements and provide optimal service-life and performance.

Where does SchuF use its expertise?

- Discharge and feed flow-control valves in PET, PVC, PP & PE reactors
- Level, pressure & steam injection control valves in PTA processes
- Level control of flashing fluid in coal liquefaction or heavy oil upgrading
- Feed and level control for gasification according to the Siemens, Lurgi, GE and Shell process licenses
- Flow control of powder in fine chemical& pharmaceutical processes
- Resurge and flare control for gas
- Steam, feedwater and condensate control in power generation and Cogen/CHP facilities





- High-precision multi-port flow control of highly viscous, non linear, non-Newtonian polymer fluids
- Discharge flow control valves for urea reactors where urea-grade stainless steel is mandatory
- Fully-jacketed short-body wafer control valves, for Nylon and PC production
- Mineral processing applications such as high-pressure acid leaching (HPAL)
- Sour water and Amine letdown in several refinery processes
- Bio Fuels (Renmatix)
- Hydrocarbon fluid separation and injection in Oil and Gas industries



Control Valve Types

In line Control Valves

Straight Globe Valve – Type 72

Straight Globe control valves combine the protection of a bellows seal with the controllability and leak-tightness of a SchuF control valve. They are used in arduous and lethal services with critical media such as chlorine, phosgene, hydrofluoric acid, NH_3 , CO_2 , urea etc. They are Eurochlor compliant.

- Designed for at least 20,000 operations
- Emergency stuffing boxes as standard
- Linear, equal % or on/off control
- Optional Bellows Seal, which is located in the bonnet area and thus not exposed to erosive flow
- Wide variety of control trims available (see page 8-10)
- Loose self-aligning disc for absolute shut-off, (ASME Class VI)
- Metallic sealing surfaces with different hardness (Stellite®...)



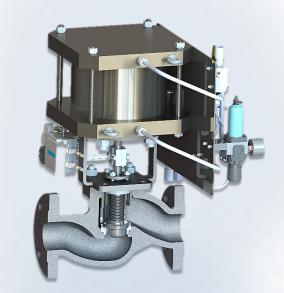
The Y-globe control valve can be installed in process lines from 1 inch to 24 inches and is **ideal to control flow or to reduce pressure**. It has a **sturdy design, superior flow and control characteristics** (compared to globe or ball control valves) and **zero-leakage sealing** performance.

- High throughput (e.g. 4" (DN 100) –
 Cv min 140 to max 300)
- Flow optimized low pressure drop
- Equal %, linear or custom control characteristics
- Class VI process shut-off and zero leakage to atmosphere performance
- Dead-and slow-space-free options

Wafer Valve – Type 76

Ideal for limited-space control applications

- Space-saving design
- Cost-optimised
- Linear or equal %
- ½ inch to 3 inch
- Up to ASME 2500#









Control Valve Types

In line Control Valves

V-notch Ball Valve

By choosing the SchuF line of characterized

V-Control ball valves, a full range of control
applications is available with superior flow control.

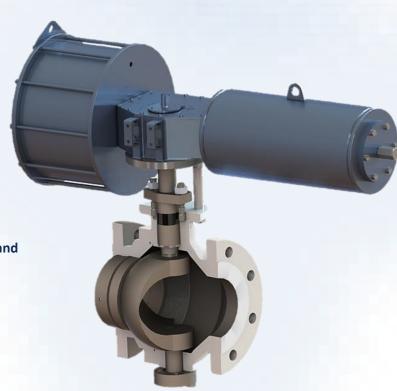
These quarter-turn-control ball valves are more compact,
lighter weight and much less expensive than comparably
sized globe valves and segmented control valves currently
available in the market.

- Superior rangeabilty and repeatability
- High flow capacity
- Ability to function with fluids containing solids and fibers
- Ease of maintenance
- Exceptional interface with PLCs and computer command signals
- SchuF high-quality pneumatic and electric control actuators
- Accurate positioning



The SchuF Segmented Ball Valve offers an accurate control with a clogging free design. High capacity and superior sealing properties make this valve type a perfect In-Line valve for control purposes, even with high solid content mediums.

- Superior rangeabilty and repeatability
- High flow capacity
- Ability to function with fluids containing solids and fibers
- Flow optimized low pressure drop
- Erosive medium control
- Ease of maintenance and seal replacement
- Accurate positioning





Control Valve Types

Angle Control Valves - Model 74

The SchuF Model 74 Angle Control Valve is designed for critical or severe applications involving level control and pressure let-down in High Pressure Acid Leach (HPAL), Hydrocracking, Coal Liquefaction, PTA and other demanding processes.

The SchuF Angle Control Valve is often custom-made to suit process requirements in order to optimise field performance. Valve bodies are designed to help extend service life, by preventing impingement of particles on internal surfaces. Stagnant areas are minimized to prevent build-up of slurry or scale.

X-Flash – Type 74BS

These valves open into the downstream vessel to eliminate choking and cavitation. The "accelerating body" design prevents in-body flashing.

- High CV values (1 to 3000)
- Low wear and tear
- Disc opening eliminates plugging by sediments
- Best suited for vessel installation

Tough Flash - Type 74CS

If piping considerations prohibit a disc-opening valve, the 74CS accommodates flashing in the valve while **opening the disc into the body**. The effects of cavitation are minimised by the use of suitable trims.

- Hard material trim
- Flashing occurs in the protected seat / choke tube area
- Up to 180 bar let-down is possible in a single stage
- Customised and replaceable choke tube
- Suitable for pipeline or vessel installation







Type 74KS

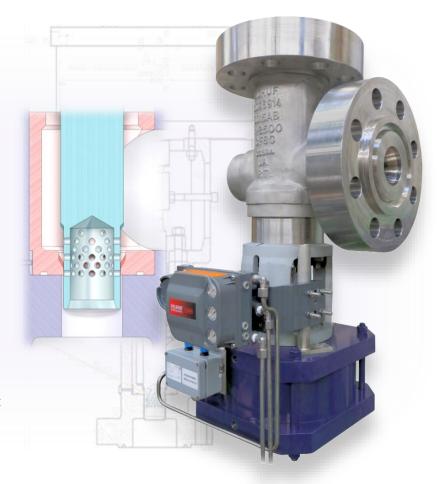
Angle 'Cage Release' Valve

Valve Details

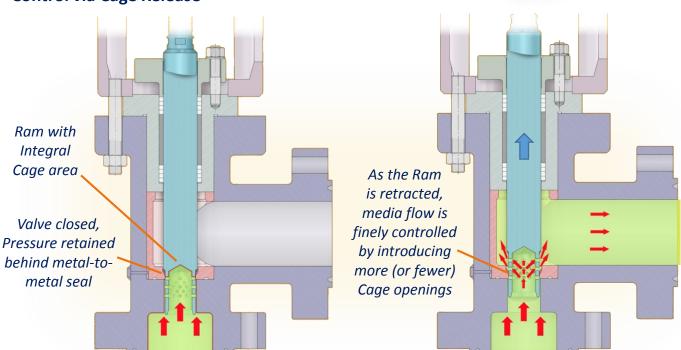
- 1"(DN 25) to 36"(DN 900)
- 2500 ANSI (PN420)
- Inlet Angle 45°, 60°, or 90°
- Flanges Threaded, BWE, RF, & RTJ
- Available Flow Characteristics:
 - ➤ Equal %,
 - **≻**Linear
 - ➤ SchuF-patented x³ bell curve
- Actuator & positioners as per client request

Trim Designs

- One piece Plug-Cage (1 stage)
- Multi-stage Cage (3-4 stages)
- Class VI (API598) shut-off
- Shut-off up to Class VI with soft-seat and Class V with metal-to-metal



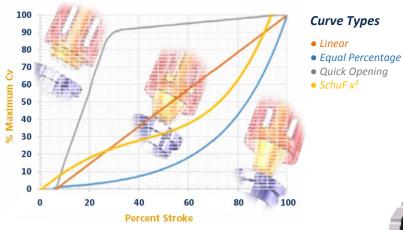
Control via Cage Release





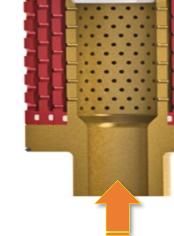
Trim Design: Multi-stage Cage Designs

- Can be installed in any type of body (angle, straight-through globe, Y-globe and Z-globe) including ASME Class 4500 (PN640) & API 15k
- A series of multi-hole 'cages' is utilised, providing a torturous flow path for the medium
- Suitable for liquids, gases and mixed-phase fluids
- Different designs reduce the fluid pressures by contracting, expanding & change of direction
- All trim materials are available
- Relatively Low cost
- Control Characteristics
 - Equal Percentage
 - Modulated Equal Percentage
 - Linear
 - Quick-Opening
 - SchuF's patented x³ Bell Curve
- Effective with up to 3 cages
- Anti-cavitation & low-noise configurations



Liquid Over-the-plug flow





Gas Under-the-plug flow

Below: Cage holes flow pattern



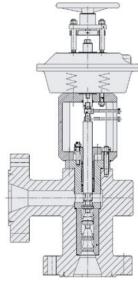


Trim Design: Axial Flow

- Angle or Globe body type
- ≤ ASME Class 4500 (PN640)
- High Cv values (1 to 3000)
- Large outlet chamber to reduce velocities
- True Equal Percentage characteristics
- Cast or single-block forged body available
- Quick-Change trim
- Cavitation elimination
- Pressure reduction method:
 - Expansion
 - Contraction
 - Directional change
 - Flow area increase
- Guiding along entire length of plug
- · Stages throttle together
- Large flow passages the size of particle which is allowed to pass will depend on the distance the seating surface is away from the seat. The larger the valve, the larger the trim, which means a greater distance between seating surfaces, which in turn dictates the size of the particle which is allowed to pass
- Effective for contaminated flows
- Up to 8 stages of pressure reduction
- Protected seats as the seating angle tends to be on the high-pressure side, there is less chance of cavitation occurring
- Shut-off up to Class VI with soft-seat sealing and up to Class V with metal-to-metal sealing can be achieved. Alternatively, testing to MSS-SP-61 (Manufacturers Standardization Society Standard Practice) can be considered.

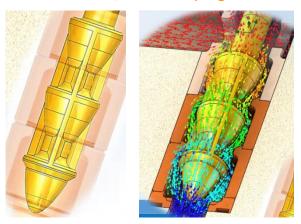
74MB trim, Under-the-plug flow







74MC trim, Over-the-plug flow



Velocity/Pressure Analysis ensuring optimized design

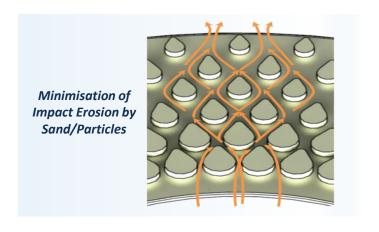
Valv	ve Size					Α.	Available trim Cv for Multi Stage Trims							
in	mm						vallab	ie uiiii c	.v 10	riviuiti	otage i	111115		
1	25													
1,5	40													
2	50	35												
3	80	70												
4	100		200											
6	150		300											
8	200			400										
10	250				600									
12	300					9	00							
14	350							1200						
16	400									1500				
18	450											2000		
20	500												3000	



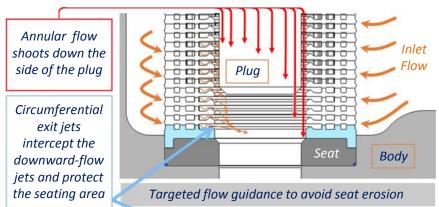
Trim Design: Patented SchuF disk stack technology can be installed in any body shape

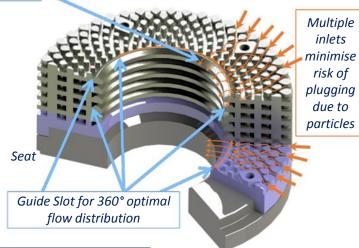
Features of Tortuous Path design:

- No recirculation zones
 - Reducing particle erosion and clogging
- Pressure Reduction Strategies
 - Largest passage friction
 - Contraction
 - Expansion
 - Fluid impact on itself
 - Change of direction
 - 90° turns without metal sharp corners
 - Expanding flow passage to reduce velocity
- Minimised fluid "angle of attack" material impact, reduces particle/sand impact erosion
- Fluid Pressure and Velocity calculations (CFD) are completed to ensure static pressure never drops below the fluid vapor pressure:
 - Eliminating cavitation, vibration
 - Reducing noise/erosion
 - Eliminating hydrate and condensate formation
- The circumferential-passage exit-flow intercepts the downward annular flow.
 - This protects the seating area from high-velocity impingement erosion.
 - The 360° Guide-Slot allows flow to spread around the outside diameter of the plug circumference. This circumferential flow
 - Helps to centre the plug and reduce risk of plug lateral vibration and/or instability
 - Intercepts all of the downward annular flow and redirects it to the centre of the seat-ring flow area.

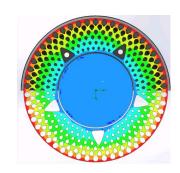


SchuF Disc Stack Flow











Type 70 Liquid-Throttling Service

Disk stack technology valve solutions

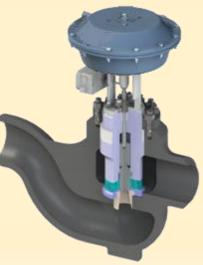


Z-Type Body 70GA with Electro-Mechanical Actuator & Manual Handwheel

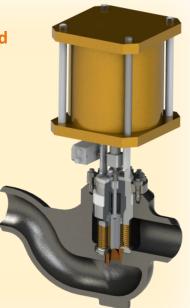


Double Acting Piston Actuator with Manual hand-wheel





Diaphragm actuator for shorter strokes



Double Acting Piston Actuator for longer strokes

Valve Details

- Size 1.2"(Din 15) up to 24(Din 600) inches
- 4500 ASME (PN640) & API 15k
- Trim options: 3-Stage Cage, Axial flow & Disk-stack >30 stages available
- Flanges: Threaded, BWE, RF, & RTJ

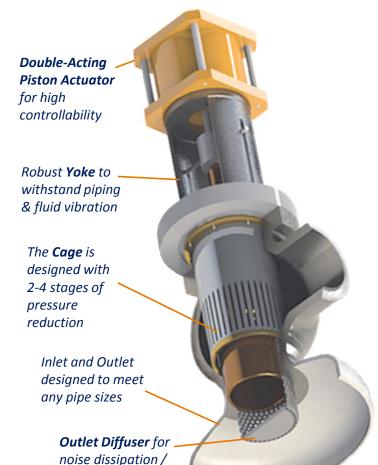
- Actuators and positioners as per client request
- Shut-off up to Class VI with soft-seat and Class V with metal-to-metal
- Actuator & positioners as per client request



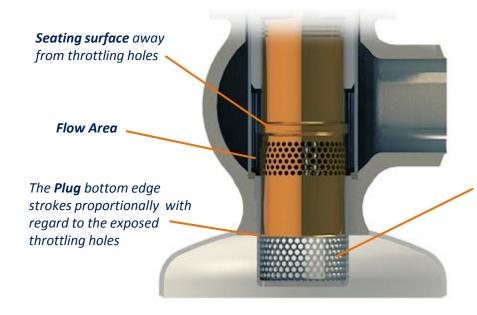
Type 27DR

Steam Application Solution

- One-piece Plug/Cage for improved resistance against vibration compared to a 2-piece plug-stem
- One-piece Body, no welded flanges
- Replaceable Seat and Pressure-Reduction Cages compressed securely between flanges.
- Class V shut-off
- Designs for All Steam Pressure-Reduction Applications
- Angle body, flow-to-close (a.k.a. over-the-plug flow)
- Pipe connection is butt-welded or flanged
- Actuation: Pneumatic, hydraulic or electromechanical
- Options: Transition Pieces for large pipe diameters and material compatibility
- Options: Pre-Warming and Drain connections available upon request
- Multi-Stage Cage or Disc-Stack available
- Can also be supplied with a flange at the outlet where the trim is exchanged through the outlet instead of through the bonnet.
- Body internal/external contours fully machined to ensure smooth transition for reduced thermal stress, resistance to thermal shock and fatigue



reduction



The **Diffuser Holes** take into consideration the attributes of the expanded steam

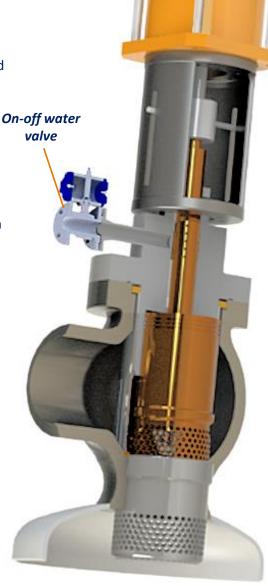
- Up to Four-Stage Cage or Disk Stack (>24 stages) with a Proportional Diffuser controlling steam expansion can be supplied
- +3 Outlet Cages are possible for sound control
- The Seat is not welded to the body, so the Seat can be removed easily for inspection
- Plug-Cage Holes/Passages are away from seating surface for better sealing compared to plug designs with no holes. Any erosion due to condensed steam could damage the holes, but here the Seating/Sealing angle face is protected.



Type 27DU

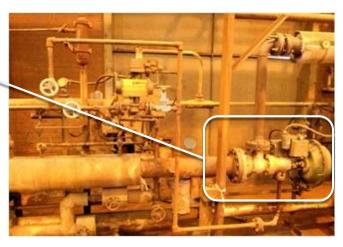
Steam Desuperheating Application

- One-piece Plug-Cage for improved resistance against vibration compared to a 2 piece plug-stem
- One-piece Body, no welded flanges
- Replaceable Seat and Pressure Reduction Cages compressed securely between flanges.
- Class V shut-off
- Design for all Steam Pressure-Reduction Applications
- Angle body, flow-to-close (a.k.a. over-the-plug flow)
- Pipe connection is butt-welded or flanged
- **Actuation**: Pneumatic, hydraulic or electro-mechanical
- Options: Transition Pieces for large pipe diameters and material compatibility
- Options: Pre-Warming and Drain connections available upon request
- Multi-Stage Cage or Disc-Stack available
- Can also be supplied with a flange at the **outlet** where the trim is exchanged through the outlet instead of through the **Bonnet**.
- Controlled Water Injection through the stem to control steam temperature











Type 27DS

Steam Desuperheating/Attemperation Application

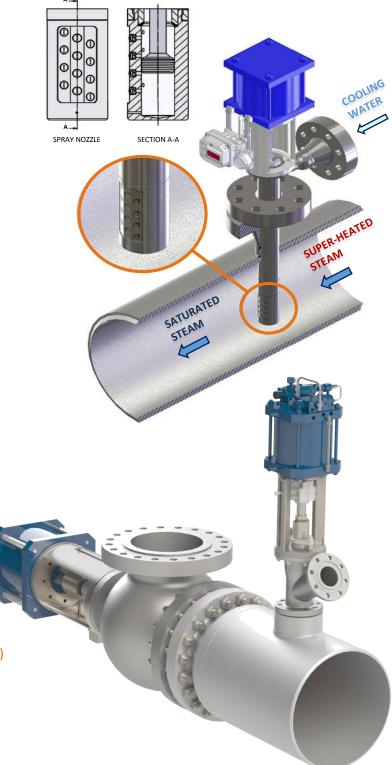
This is the SchuF basic design, and can be a **standalone installation** in a steam pipe. This would be used in **interstage attemperation** where no steam pressure reduction is needed.

It can also be used after our **27DR Model** where steam pressure reduction is required.

The typical nozzle diameter of each hole is 0.5 to 1 mm, and smaller sizes are possible.

Features:

- Counterflow Nozzles designed to ensure atomisation with a delta P as low as one bar.
- Valve Cv from 0.05 to 15 with 3,4,6,8,9 or 12 nozzles in the spray head.
- Nozzles are staggered, for linear flow characterisation.
- Piston Sealing Rings are titaniumnitrided for better sealing and smoother running.
- Graphite Packing and nitrided Spindle ensure perfect, leak-free sealing to the outside while maintaining the low packing friction important for good control.
- **Special materials available** for non water/steam applications.
- Available with Pneumatic Diaphragm or Piston Actuator, Air Motor, Hydraulic or Electric Actuators.
 Intelligent or standard positioners as per customer preference.



A **Type 27DS** Valve is shown here being used for water injection in a steam pipe. It is installed (on the right) after a **Type 27DR** Steam Pressure Reduction Valve (on the left)



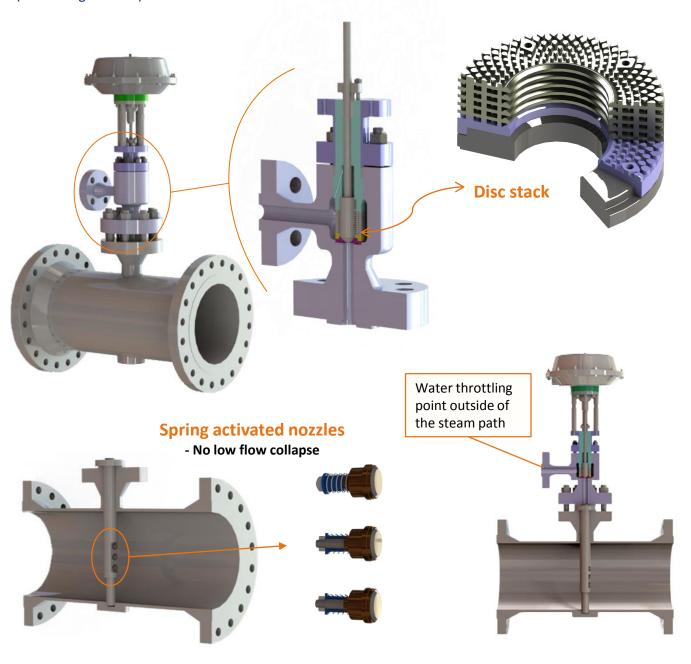
Type 27DC

Steam Desuperheating / Attemperation Application Disc-Stack design with spring-loaded spray nozzles

This design is used when the client needs better **attemperation**. In these applications, **spring-loaded nozzles** provide the solution.

The nozzles are spring-loaded to allow them to open according to a pressure controlled by the water control valve. This design will optimize the water injection velocity. The spring ensures that the nozzle opens to the absolute minimum opening, therefore providing the highest injection exit velocity- and this in turn increases the chances of the droplets breaking up at a faster rate, resulting in the formation of smaller droplet diameters more quickly.

The water throttling point is also moved away from **inside** the steam path (inside the probe) to **outside** of the steam path- therefore creating a reduced risk of **thermal shock** on the **Cage** (or **Disk-Stack**), **Plug and Seat Ring** (i.e. Seating surfaces).



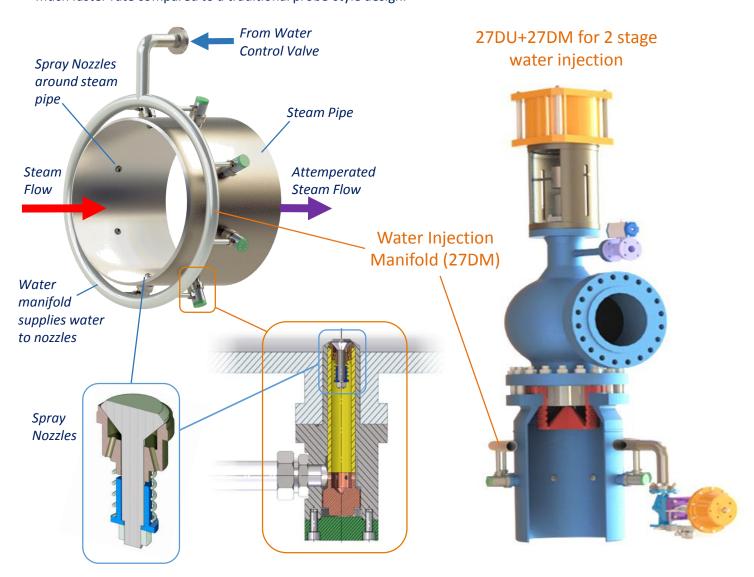


27DM

Water Injection Manifold with Spring-Loaded Nozzles

Steam Desuperheating / Attemperation Application

In order to improve on the **desuperheating** performance even further, we can install our **Manifold-style design**. This design has a **Manifold** around the steam pipe. Part of the water injection angle will be against the steam flow, therefore increasing the net impact vector between the water and steam flow, which means **more of the droplets will be reduced in size more quickly**. The steam itself will break up the water droplets at a much faster rate compared to a traditional probe-style design.



Existing designs often include the welding of the water manifold assembly to the steam pipe shown above. If there is damage to the nozzle-holder, the complete assembly, including the steam pipe section, has to be cut out. Next, the water manifold is repaired and then re-welded back into the steam pipe section. This steam pipe section is subsequently welded back into the main steam pipe.

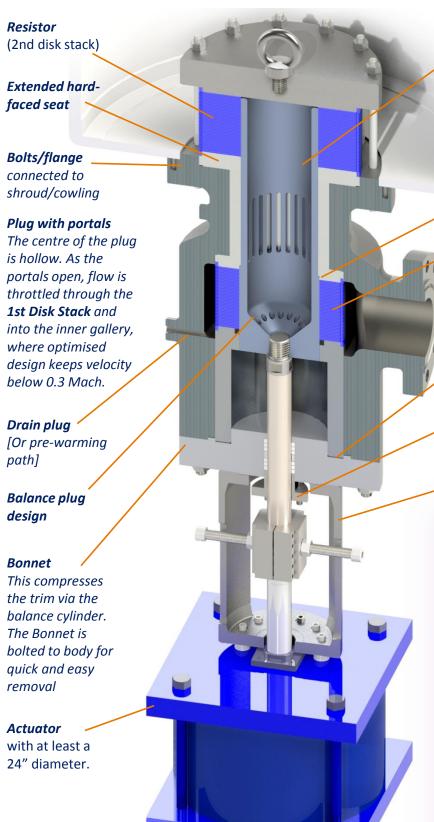
In contrast, the SchuF design has a 'Replaceable Nozzle Holder' Body. In this design, the holder body can be removed and replaced/repaired, providing huge savings in maintenance costs over the welded version. SchuF can also supply a welded water manifold design if requested.



Type 27SV

Sky valve (Steam Vent)

Noise & vibration reduction using a double disk-stack solution



Long plug (extended cage)

The end of the plug covers the entrance to the **2**nd **Disk Stack**. When the plug opens, it opens both disk stacks at same time, with only the appropriate number of passages being opened.

Seating area

Metal-to-metal sealing edge

1st Disk Stack

This prevents unbalanced turbulence and pressure waves/fluctuations from entering the inner gallery

2nd **Drain Connection in the Bonnet here** (not shown)

Stuffing Box Seal to Atmosphere (choice of packing available)

Actuator Yoke

2nd Disk Stack

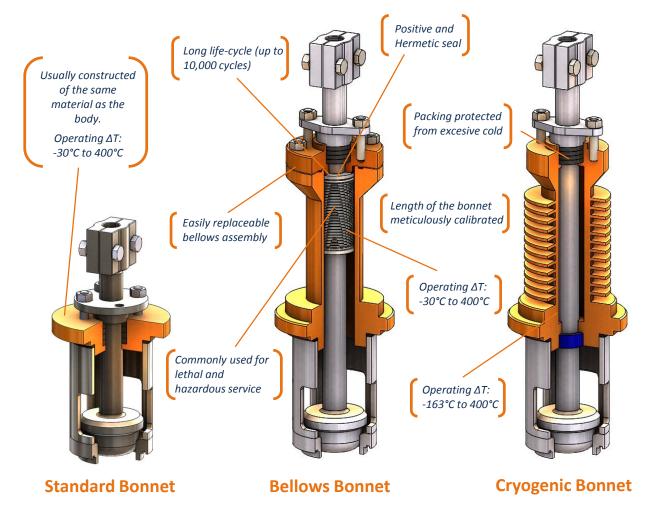
1st Disk Stack

- The two **Disk Stacks** are created differently, as the **2**nd **Disk Stack** will be designed to allow for expansion of the steam after the first pressure drop through the **1**st **Disk Stack**.
- Since pressure is now lower and steam volume much larger, the 2nd
 Disck Stack is carefully designed to ensure that the steam velocity remains at safe levels.



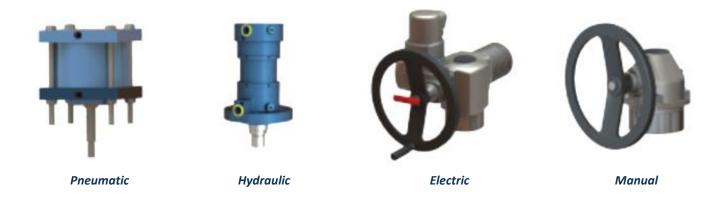


Bonnet & Packing Arrangements



Standard packing and Chevron rings available, spring-loading and test connections on request

Control Globe Valve Actuators





Materials of Construction 70SC & 70GA, 74KS/MB/MC

Globe, Angle & Z Control Body & Bonnet Materials for liquid applications											
Pressure Rating	Standard ASME 150 to ASME 4500 Other Pressure applications are possible										
Temperature Rating	Standard -29°C to 593°C Other temperature applications are possible										
Shut-Off Class		ANSI/FO	CI 70-2 Class V/ Class VI A API 598 / EN1022-1	vailable							
Trim Material	STANDARD	STAINLESS	TITANIUM	ALLOYS	SPECIALS						
Recommended Service	-	Corrosive	Highly Corrosive	Highly Corrosive	Abrasive						
Body	Carbon Steel ● DIN 1.0619 • A216 (WCB)	Duplex ◆DIN 1.4462 / A479 (S31803) Stainless Steel ◆DIN 1.4401 / A182 (316) DIN 1.4404 / A182 (316L) ◆DIN1.4552 / A351 (CF8C)	Titanium Grade 2	Hastalloy®Incolloy®Inconel®Monel®	Cladded with Alloy Steel						
Trim	Carbon Steel	Duplex • DIN 1.4462/A479 (S31803) Stainless Steel • DIN 1.4401 / A182 (316) DIN 1.4404 / A182 (316L) • DIN1.4541 / A182 (347) • Nitronic	Titanium Grade 2 or 5	Hastalloy®Incolloy®Monel®Inconel®	Cladded with Alloy Steel Ceramic Tungsten Carbide Proprietary coatings						

Bold text above: Materials used in water applications

Materials of Construction Type 27DR, 27DU, 27SV, 27DS* & 27DC*

Body	Plug / Stem Cage	Outlet Cage	Seat
A182 F22/A217WC9 (<540°C/1005°F)	X19CrMoV121, A182-F22 with Stellite & 10CrMo910 (<540°C/1005°F)	10CrMo910/A182-F22 (<600°C/1132°F)	10CrMo910, A182-F22 with Stellite (<540°C/1005°F)
A182 F91/A217 C12A (540-600°C/1005°-1132°F)	Inconel 718, X20CrMoV121 (540-600°C/1005°-1132°F)		X20CrMoV121 (540-600°C/1005°-1132°F)
		*27DS & 27DC Nozzle housing (probe) into steam pipe A182 F22/F91	

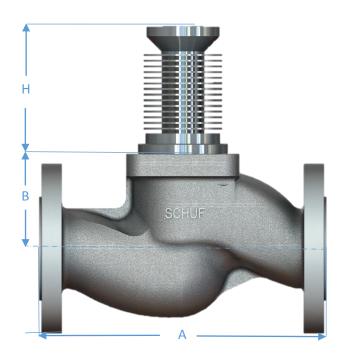
Water injection manifold (27DM)

Nozzle Plug	Spring	Noz	zzle body	Steam pip	e / liner	Water pipes	
X19CrMoVNb11.1	Heat-resistant spring ste NIMONIC 90 (Boiler applications)	el, X19CrMo\	/Nb11.1, AISI 616	10CrMo910, A3. F11, A335-P22 13CrMo44, A33 (A105) or A335-F	2/A182-F22, 5-P12, St35.8	13CrMo44, A335-P12 or St35.8 (A105)	
Pressure Class	Steam pip	e sizes	Water pipe sizes			Ratings	
ASME 150-2500, PN 16-320		6" to 44" (DN150 to DN1100)		1" to 6" (DN025 to DN150)		ASME B31.1, ASME VIII Div I, Job-rated, ASME 1500 (PN250)	



Globe Control Valve Standard Dimensions

- ¹ Additional sizes, connections, and configurations are available upon request; dimensions are subject to change.
- ² Threaded, BWE, RF, RTJ, API, BX, and PE connections are available for all sizes and configurations.
- ³ ASME RF flanged dimensions are shown. Threaded, BWE, RTJ and ISO flanged dimensions are available upon request.

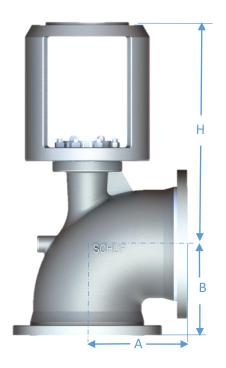


ASME/ANSI RF Flanged Globe Control Valve Dimensions ¹²										
			A/B (ı			H (mm)				
Body Size			Integra	В	a					
(Din)	Class 150 PN10/16	Class 300 PN25/40	Class 600 PN100	Class 900 PN100	Class 1500 PN	Class 2500 PN100	(mm)	Std. Bonnet	Ext. Bonnet	
½" (15)	108	140	165	216	-	264	38	97	212	
¾" (20)	117	152	190	229	229	273	38	97	212	
1" (25)	127	165	216	254	254	308	44	97	212	
1½" (40)	165	190	241	305	305	384	59	132	246	
2" (50)	203	216	292	368	368	451	59	138	252	
3" (80)	241	282	356	381	470	578	86	172	312	
4" (100)	292	305	432	457	546	673	133	214	354	
6" (150)	406	403	559	610	705	914	146	311	451	
8" (200)	495	419	660	737	832	1022	190	365	505	
10" (250)	622	457	787	838	991	1270	227	359	524	
12" (300)	698	502	838	965	1130	1422	318	413	578	
14" (350)	787	762	889	1029	1257	-	330	622	908	
16" (400)	914	838	991	1130	1384	-	400	721	1013	
18" (450)	978	914	1092	1219	1537	-	407	714	1020	
20" (500)	978	991	1194	1321	1664	-	489	902	1082	
24" (600)	1295	1143	1397	1549	1943	-	508	864	1180	



Angle Control Valve Standard Dimensions

- ¹ Additional sizes, connections, and configurations are available upon request; dimensions are subject to change.
- ² Threaded, BWE, RF, RTJ, API, BX, and PE connections are available for all sizes and configurations.
- ³ ASME RF flanged dimensions are shown. Threaded, BWE, RTJ and ISO flanged dimensions are available upon request.



ASME/ANSI RF Flanged Angle Control Valve Dimensions ¹²									
Body Size (Din)		H (mm)							
	Class 150 PN10/16	Class 300 PN25/40	Class 600 PN100	Class 900 PN100	Class 1500 PN	Class 2500 PN100			
½" (15)	51	76	83	-	108	132	229		
¾" (20)	57	89	95	114	114	137	234		
1" (25)	70	102	108	127	127	154	251		
1½" (40)	83	114	121	152	152	192	324		
2" (50)	102	133	146	184	184	226	364		
3" (80)	121	159	178	190	235	289	461		
4" (100)	146	178	216	178	273	337	551		
6" (150)	203	222	279	305	353	457	768		
8" (200)	248	279	330	368	416	511	876		
10" (250)	311	311	394	419	495	635	994		
12" (300)	349	356	419	483	565	711	1124		
14" (350)	394	457	490	514	629	-	-		
16" (400)	457	536	555	660	-	-	-		
18" (450)	536	605	627	737	-	-	-		
20" (500)	605	627	763	826	-	-	-		
24" (600)	694	770	801	991	-	-	-		



Control Globe Standards

Flange Standards

ASME B16.5 ASME B16.5

Additional Testing **Standards**

Testing Standards

EN 10204 ISO 15848-1 ASME FCI 70-2

Design **Standards**

Pressure Equipment Directive (PED)

ASME B16.10

Quality **Standards**

API PSL 1,2,3 & 3G



Sour Service Standards

Nace MR0103



Add. Standards

EN ISO 9001 TR-CU























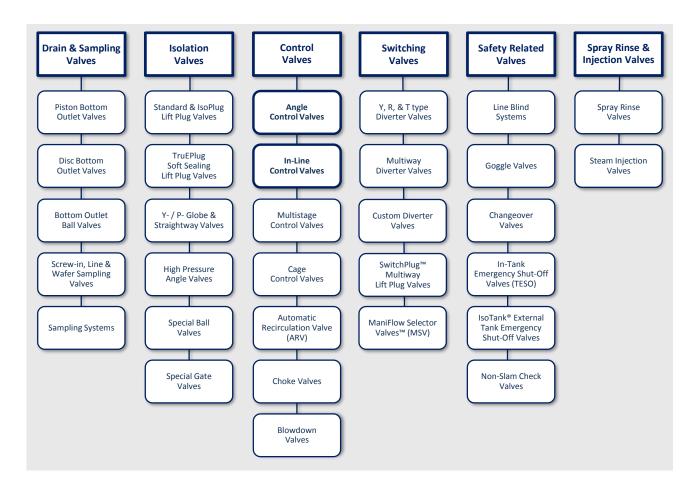


Product Portfolio Overview

The SchuF Group has delivered over one million valves during its 100 year history, to a wide variety of industries in over 50 countries worldwide.

Headquartered near Frankfurt, Germany, the company has additional design and manufacturing centres in India, Ireland, Italy, UK, and the USA.

The SchuF Group has sales and agent offices servicing virtually every country in the world. We manufacture valve products that control, isolate, divert, and sample liquids, gases, powders, and slurries. Our extensive product range of engineered, customized valves includes:



Control Valve Client List:

- Aluminium Pechiney
- Auriga Polymers
- BASF
- CEPSA
- Chang Chun Petrochemical
- China Textile
- CTCI Corp.
- Formosa Chemicals & Fibre Corp.
- Far Eastern New Century Corp.
- Hengli Petrochemical
- Hebi Huashi United Energy
- Ignite Energy Resources

- Jiangsu HAILUN Petrochemical
- KBR Technology
- Lenzing AG
- Lurgi GmbH
- Nanjing Chemical
- OPTC
- Reliance Industries
- Renmatix
- SABIC Innovative Plastics
- Samsung Petrochemical
- Technip
- Uhde-Inventa-Fischer GmbH





SchuFI Worldwide

www.schuf.com

www.schuf.de



Fetterolf Corporation phone: +1 610 584-1500 info@fetterolfvalves.com

SchuF (USA) Inc. phone: +1 843 881 3345 sales@schuf.us



SchuF Valve Technology GmbH phone: +353 21 4837000 sales@schuf.ie



SchuF-Armaturen und Apparatebau GmbH phone: +49 6198 571 100 sales@schuf.com

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Your Sales Channel:

SchuF Benelux B.V. phone +31 25 12 34 448 rklink@schuf.com

SchuF Middle East F.Z.C. phone: +971 4 35 28 095 ecalnan@schuf.com

SchuF South East Asia Pte. Ltd. phone +31 620 62 66 64 mmulder@schuf.com

SchuF Valves China Ltd. phone +86 27 83 316 569 schufchina@schuf.com



La Tecnovalvo S.r.l. phone: +39 023 503 508 info@latecnovalvo.com



phone: +44 203 355 2012 sales@schuf.co.uk

UNITED



SchuF Speciality Valves India Pvt. Ltd. phone: +91 421 226 4600 sales@schuf-india.com

Your Local Agent: