

CONTROL VALVE & ACTUATOR PRODUCT GUIDE



All the products of S&W Controls are based on engineering experience and are designed to ensure customer satisfaction.

S&W Controls is a fast-growing valve manufacturing company.

Our wide range of superior quality valves is specifically designed to control water, gas, steam, air, and oil.

The perfect blend of deep domain knowledge, technological expertise, and high-quality valves has enabled us to become a leading company in the valve industry.

Our quality team and proficient engineers ensure that we deliver high-standard products in the market.

Our skilled professionals and technological competence, combined with a reliable manufacturing process, allow us to provide end-to-end flow solutions tailored to the user's needs and requirements.

PRODUCT OVERVIEW

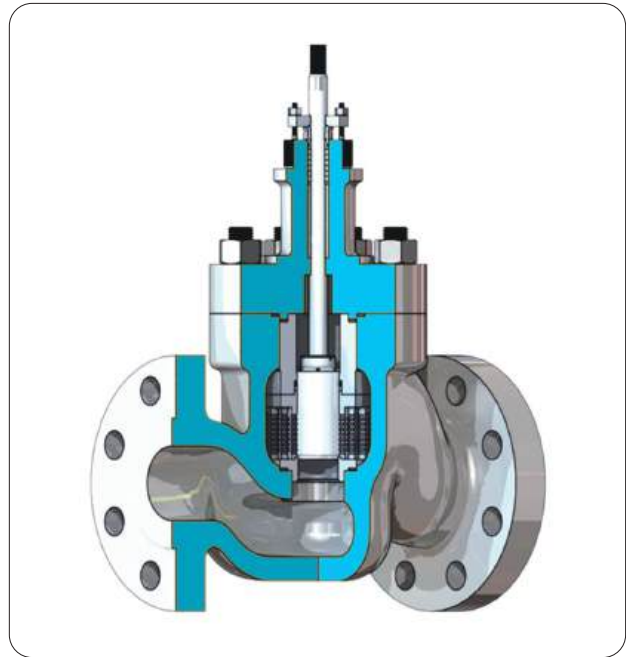
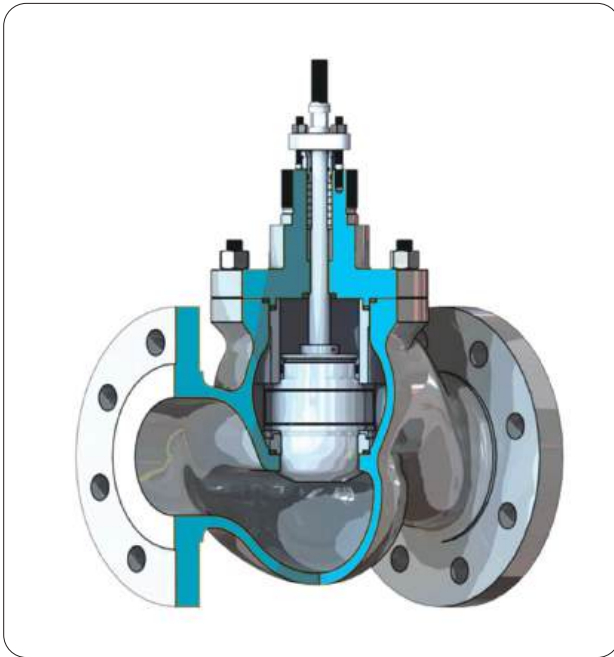


	Valve Type	Model No.	Feature	Size	Rating
01	Globe Control Valve	SC-10	General & Severe Service	0.5"-20"	ANSI 150 ~ 2500
02	3-Way Control Valve	SC-20	Converging & Diverging	0.5"-20"	ANSI 150 ~ 2500
03	Butterfly Valve	SC-50	High-Performance	3"-36"	ANSI 150 ~ 600
04	Ball Valve	SC-60	V-Notch / Metal & Soft	3"-24"	ANSI 150 ~ 1500
05	Blow Down Valve	SC-70	Quick Opening	0.5"-4"	ANSI 150 ~ 1500
06	Linear Actuator	SWL	Long Service Life & Compatibility	150-1,200	
07	Quarter-Turn Actuator	SWR	Long Service Life & Reliable Torque Output	100-1,200	
08	Hydraulic Actuator	SWRH	Long Service Life & Smooth Operation	100-500	
09	Diaphragm Actuator	SWD	Compact & Lightweight	250-550	

GLOBE CONTROL VALVE

SC-10 Series

The SC-10 single seated control valves have compact design and simple structured. They are usable in a broad scope of applications on liquids, steam and gases.



STANDARD BODY SPECIFICATION

Body Style	2-Way Globe, Angle Globe
Bonnet Style	Plain(Standard), Bellows Seal, Fin & Extension
Size Range	0.5" to 20" (DN15 to DN500)
Pressure Rating	ANSI 150lb to 2500lb, JIS 10K to JIS 180K, PN 20 to PN 420
Operating Pressure Range	Up to 4,000 psi(g), Up to 280 bar(g)
Operating Temp. Range	• 58 °F to 1,050 °F • 50 °C to 565 °C
End Connection	• Socket Weld: ANSI B16.11 • Butt Weld: ANSI B16.25 • FF/RF/RTJ Flange: ANSI B16.5 • JIS & DIN Flange, NPT/PT Screw
Materials	• Carbon Steel : WCB, WCC, A105 • Chrome-moly Steel: WC6, WC9, C12A, F11, F22, F91, F92 • Stainless Steel: CF8, CF8M, CF3, CF3M, F304, F304L, F316L • Duplex, Monel, Inconel, Other Alloy
Actuator	Pneumatic Diaphragm & Cylinder Electric Actuator, Hydraulic

BODY DESIGN FEATURE



- **Globe Valve**

Suitable for controlling water, steam, gas and most other fluids, JSA-10 & 20 Series globe valves deliver a high standard of versatility, rugged dependability and cost effectiveness.

SC valves are ideally suited for non-severe flow control of most liquids, steam and gases.

- **Angle Valve**

Except for the body, the angle valve is completely interchangeable with the globe valve all other valve parts and remain the same.

- **3-Way Valve**

Flow Mixing Type and Divert Type.

BONNET DESIGN FEATURE



- **Standard Bonnet**

The standard bonnet with deep packing box and a long guide housing which can apply Water Seal, Vacuum configuration etc.

It assembled with valve body so that can providing a robust and vibration resistant.

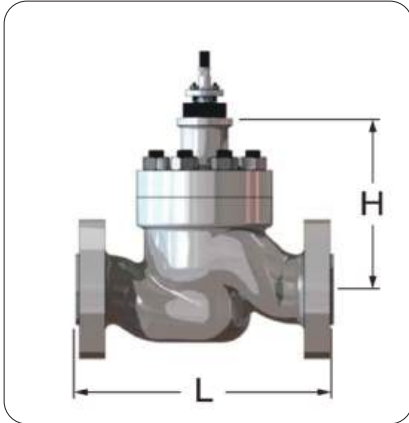
- **Extension Bonnet**

Standard Long Bonnet Which apply to high temperature.

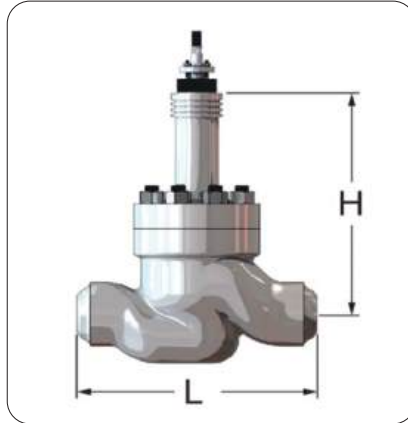
- **Bellows Extension Bonnet**

Extension Bonnet for combination of bellows seal and valve.

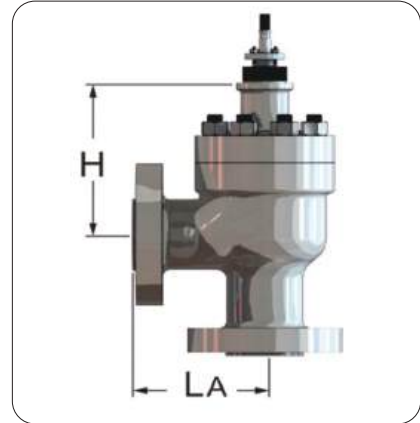
DIMENSIONS



Standard Bonnet



Extended Bonnet



Angle Valve

■ 2-Way Globe Body "L"

* RF : Raised Face Flange Type * BW : Butt Weld Type * SW : Socket Weld Type * CF : Consult Factory

Valve	Inch	0.5"	0.75"	1"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
Size	DN	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500
L (RF)	150LB	184	184	184	222	254	276	298	352	451	543	673	737	889	1016	1143	1460
	300LB	190	194	197	235	267	292	318	368	473	568	708	775	927	1057	1184	1500
	600LB	203	206	210	251	286	311	337	394	508	610	752	819	972	1108	1660	CF
	900LB	292	292	292	333	375	410	441	511	714	781	864	1016	CF	CF	CF	CF
	1500LB	292	292	292	333	375	410	460	530	768	838	991	1130	CF	CF	CF	CF
	2500LB	318	318	318	381	400	441	498	575	819	1022	1270	1321	CF	CF	CF	CF
L (BW)	150LB																
	300LB		187		222	254	292	318	368	451	543	673	737	851	1016	1143	CF
	600LB																
	900LB		194	197	235	292	292	318	368	508	610	762	914	1257	1422	CF	CF
	1500LB															CF	CF
	2500LB		216	260	318	318	381	406	610	762	1016	1118	CF	CF	CF	CF	CF
L (SW)	150LB																
	300LB		135		197	235	267	318	368								
	600LB																
	900LB		194	197	235	292	292	318	368								
	1500LB																
	2500LB		216		260	318	318	381	406								

■ Angle Body "LA"

Valve	Inch	0.5"	0.75"	1"	1.5"	2"	2.5"	3"	4"	6"
Size	DN	15	20	25	40	50	65	80	100	150
LA (RF)	150LB	92	92	92	111	127	-	149	176	272
	300LB	95	97	99	117	133	-	159	184	284
	600LB	101.5	103	105	125	143	-	168	197	305
	900LB	-	-	-	-	187.5	-	230	265	-
	1500LB	-	-	-	-	187.5	-	230	265	-
	2500LB	-	-	-	-	187.5	-	330	368.5	-
L (BW)	150LB							159	184	284
	300LB							159	184	284
	600LB							168	197	305
	900LB							230	265	-
	1500LB							230	265	-
	2500LB							330	368.5	-

■ 2-Way Globe & Angle Body "H"

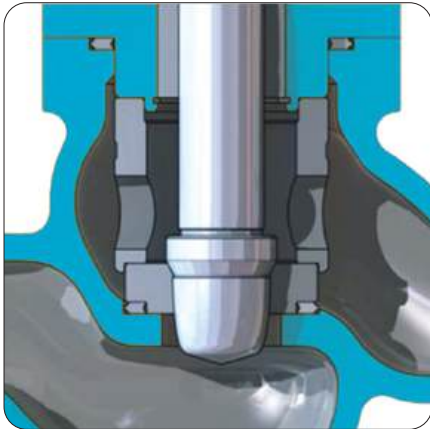
* CF : Consult Factory

Valve	Inch	0.5"	0.75"	1"	1.5"	2"	2.5"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
Size	DN	15	20	25	40	50	65	80	100	150	200	250	300	350	400	450	500
Standard Bonnet	150LB																
	300LB						230	245	345	390	455	560	570	CF	CF	CF	CF
	600LB					220											
	900LB						280	270	360	450	490	600	610	CF	CF	CF	CF
	1500LB																
	2500LB					250	295	325	390	495	530	635	645	CF	CF	CF	CF

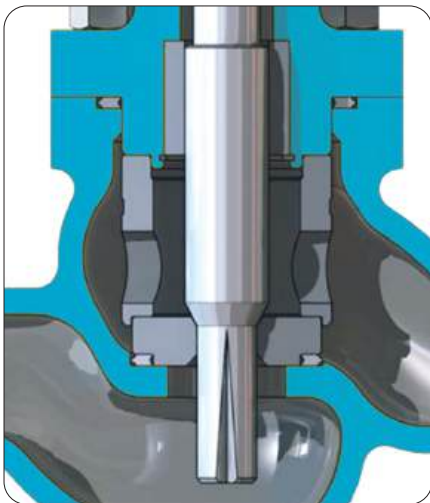
TRIM DESIGN

TRIM DESIGN FEATURE

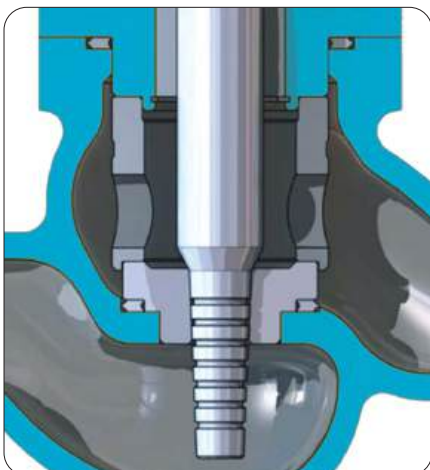
■ Contoured Plug Design



- The contour trim is suitable for most flow applications and is provided as standard in most valves. The Flow characteristic is determined by the contour of the plug head.

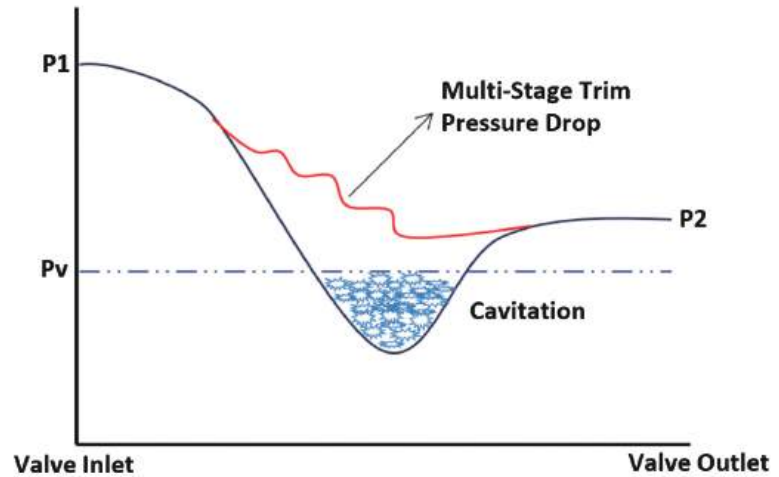
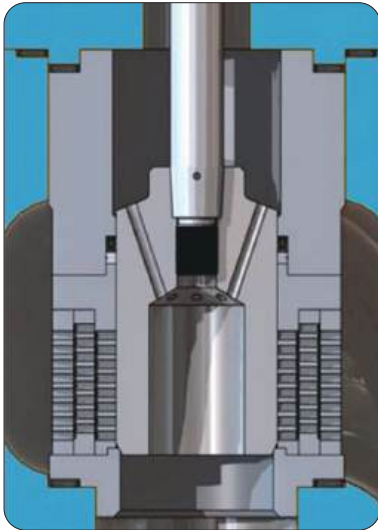


- Micro Trim Design is designed specifically for accurate control of very small flows. The design consists of a long paralleled plug with a accurately cut "V" notch cut down the center.
- The linear movement of the valve plug exposes a variable amount of flow by notch. The actual characteristic derived from the "V" notch is modified equal percentage.



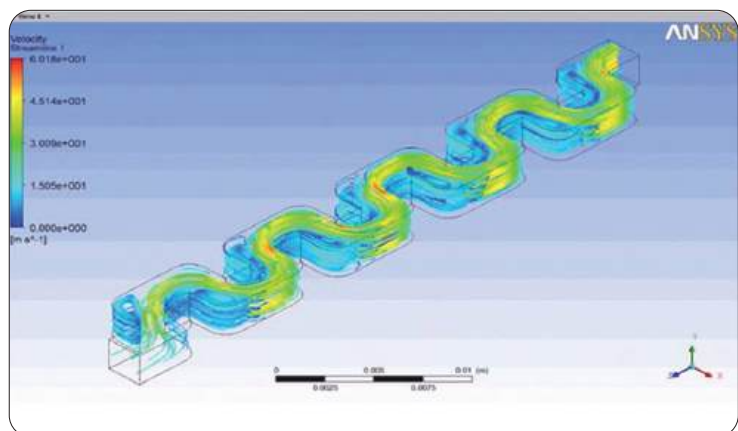
- Cascade trim features pressure reduction in stages along the plug and seat taper to limit the pressure drop of each stage to a fraction of the total pressure.
- This is most effective when throttling close to the seat and diminishes as the valve open. This is accomplished through the use of several grooves and lands in the plug which help to extend the trim life under severe operating.

■ Multi-Stage Design



- Multi-Stage trim design consists of several drilled hole cage. This trim features pressure reduction in each stage.
- In case of Multi-Stage Trim, the number of stages will be determined by pressure drop and potential of cavitation. In case of Low noise Trim, the number of stages will be determined by noise level and fluid velocity.

■ Disk Stack Design



- The Labyrinth Disc Stack assembly consists of a number of discs, forming a labyrinth path for the flow. It provides multiple turns as the flow passes through the disc labyrinth.
- This trim features pressure reduction in each turns. The number of turns will be determined by the pressure drop.

FLOW CHARACTERISTIC

The control characteristic is the relationship between flow rate through the valve and stem / plug travel when constant pressure drop is maintained across the valve.

■ Modified Parabolic

- Modified Parabolic is the most common characteristic for SC valves. It combines the advantages of both of linear and equal percentage while avoiding their disadvantages. Modified parabolic has a low flow rate gain near the seat similar to equal percentage, but more closely resembles linear during the remainder of travel. Modified Parabolic is obtainable with Port throttling trim in Maximum of valve rated Cv.

■ Equal Percentage

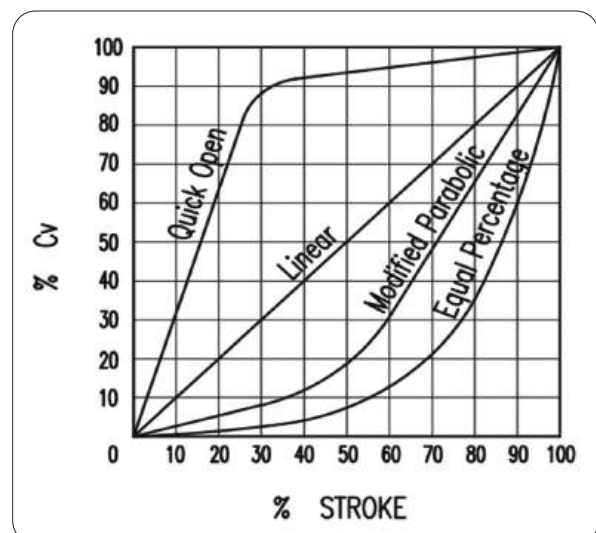
- Equal Percentage is an inherent flow characteristic which, for equal increments of rated travel. The change in flow per unit of valve stroke is directly proportional to the flow occurring just before the changes. This characteristic has a very low flow gain near the seat that produces fine control in the first half of travel, but has a high flow gain in the top half of travel that results. Equal percentage is obtainable with plug throttling trim in smaller of valve rated Cv.

■ Linear

- Linear is an inherent flow characteristic that can be represented by a straight line on a rectangular plot coefficient Cv versus rated travel.

■ Quick Opening

- Quick Opening trim has no control contour and is used only an on-off isolation type trim and not as a modulating trim. Maximum flow coefficient is achieved with minimal plug travel.



VALVE SIZING PROGRAM

Smart Valve Sizing – Our proprietary program with integrated AI modules ensures precision, reliability, and continuous updates for the solution of flow control.

Delivers real-operation performance with automatic trim sizing and 3D modeling output.

The image displays the S&W Controls Valve Sizing Program interface, which includes several key components:

- Define Stack Combination:** A section for setting flow characteristics, design Cv, and body/trim sizes. It includes a table for flow rate (kg/s), Cv, and Required Turn.
- Design Results Table:** A table showing the results of the sizing process, including Row, Stroke, Name, Turn, Stack Cv, Trim Cv, and Total Cv.
- 3D Modeling:** A 3D model of a valve assembly, showing the internal components and the flow path.
- Graphs:** A graph showing the relationship between Cv and Stroke, with a curve for Total Cv and a line for Ideal Cv.
- Design Details:** A section for specifying design parameters such as Valve Size, P Rating, Hole ID, and Cage ID.
- Result and Export:** A section for exporting the design results, including a table for Design Results and a table for Design Results and Export Design.
- MPMS Trim Design:** A section for defining MPMS design parameters, including Inlet Path Width, Inlet Path Depth, Stack ID, and Stack OD.
- Optimization:** A section for optimizing the design, including Min Inlet Width, Required Turn, and Max Inlet Width.
- Design Results and Export Design:** A section for exporting the design results, including a table for Design Results and a table for Design Results and Export Design.

LINEAR ACTUATOR

SERIES : SWL TYPE



SWL SERIES PNEUMATIC

MEDIA	Dry Compressed Air / Inert Gas / Natural Gas
PRESSURE RANGE	40 to 150 Psig/2.8 to 10 Barg
TEMPERATURE RANGE	• Standard: -20°C to 80°C • Low: -40°C to 80°C • High: -20°C to 180°C
ADJUSTABLE STROKE	Within 20% of the valve stroke
THRUST OUTPUT	Double Acting: 100 Kgf to 300,000 Kgf
SPRING END THRUST	50 to 30,000 Kgf
MOUNTING BASE	ISO 5211
ENCLOSURE PROTECTION	IP67

QUATER TURN ACTUATOR

SERIES : SWR TYPE, SWRH TYPE



SWR SERIES PNEUMATIC

MEDIA	Dry Compressed Air / Inert Gas / Natural Gas
PRESSURE RANGE	40 to 150 Psig / 2.8 to 10 Barg
TEMPERATURE RANGE	•Standard : -20°C to 80°C •Low : -40°C to 80°C •High : -20°C to 180°C
ADJUSTABLE STROKE	90 Degree standard adjustable - 5° ~ +5°(Travel Stopper)
TORQUE OUTPUT	Double Acting : 100 Nm to 150,000 Nm
SPRING END TORQUE	50 to 55,000 Nm
MOUNTING BASE	ISO 5211
INGRESS PROTECTION	IP67

SWRH SERIES HYDRAULIC

MEDIA	Hydraulic Fluid Oil
PRESSURE RANGE	500 to 3,000 Psig / 35 to 207 Barg
TEMPERATURE RANGE	•Standard : -20°C to 80°C •Low : -40°C to 80°C •High : -20°C to 180°C
ADJUSTABLE STROKE	90 Degree standard adjustable - 5° ~ +5°(Travel Stopper)
TORQUE OUTPUT	Double Acting : 100 Nm to 150,000 Nm
SPRING END TORQUE	50 to 55,000 Nm
MOUNTING BASE	ISO 5211
ENCLOSURE PROTECTION	IP67

DIAPHRAGM ACTUATOR

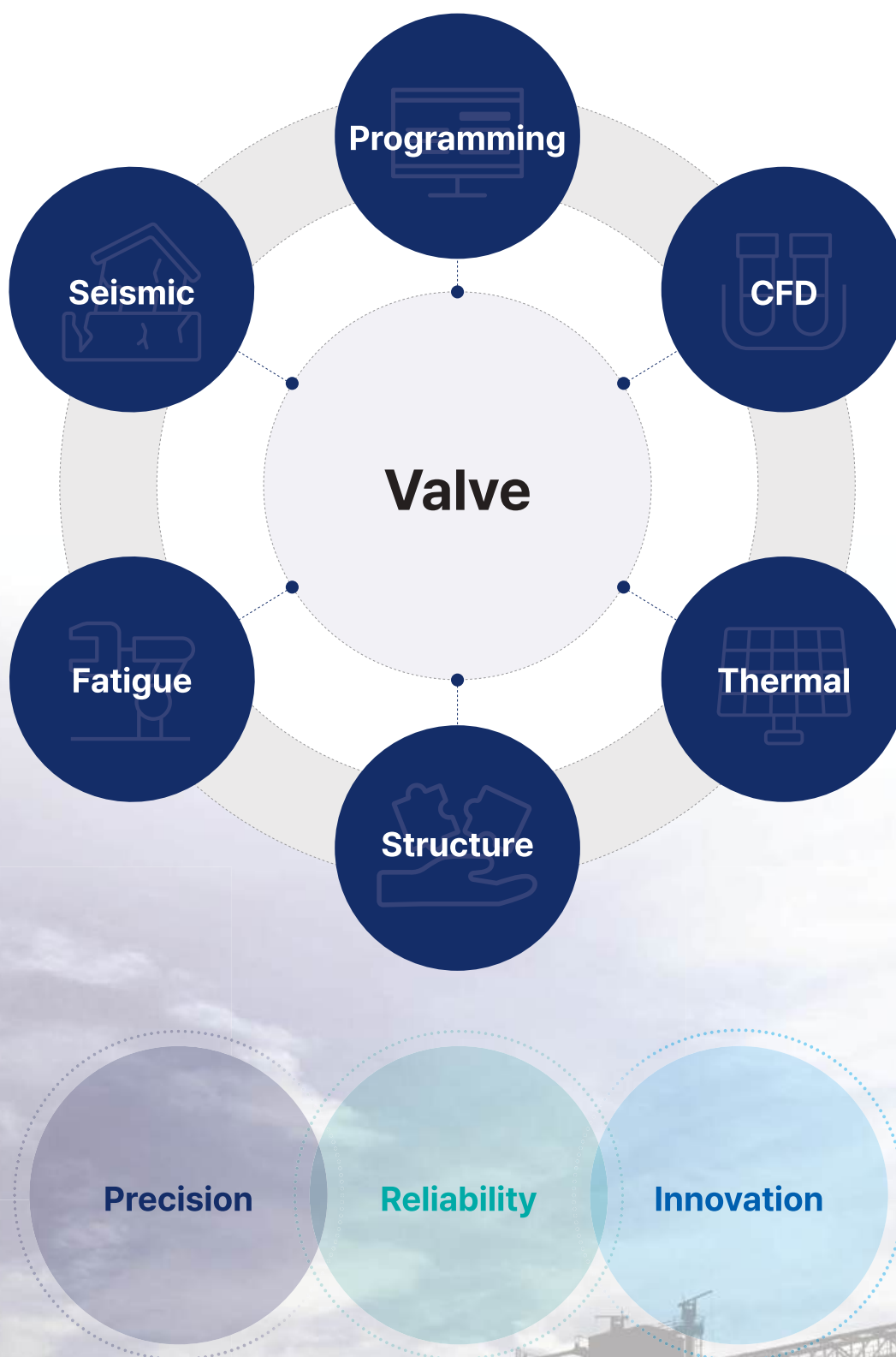
SERIES : SWDP TYPE



SWDP SERIES DIAPHRAGM

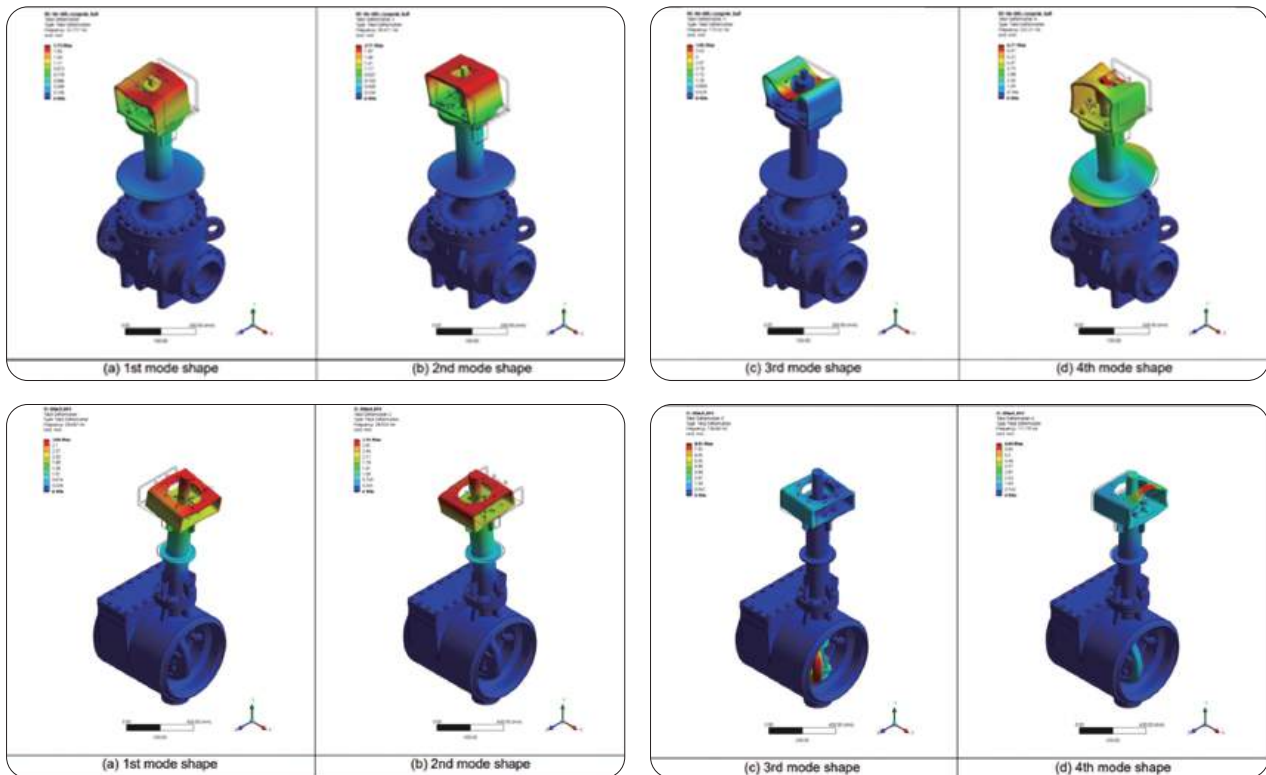
MEDIA	Dry Compressed Air
PRESSURE RANGE	40 to 60 Psig / 2.8 to 4.2 Barg
TEMPERATURE RANGE	• Standard : -20°C to 80°C • Low : -40°C to 80°C • High : -20°C to 180°C
ADJUSTABLE STROKE	Within 10% of the valve stroke
SPRING END THRUST	220 to 3,300 Kgf
MOUNTING BASE	ISO 5211
ENCLOSURE PROTECTION	IP67

ENGINEERING SERVICE



SEISMIC

SEISMIC ANALYSIS

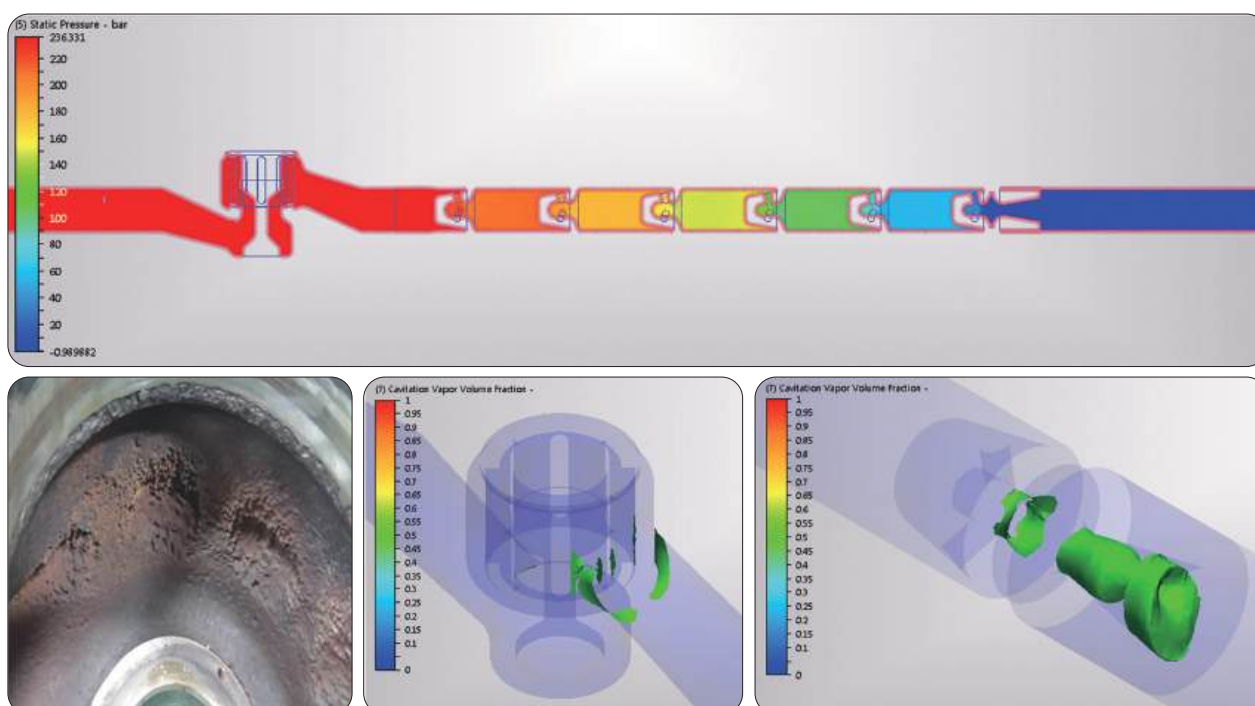
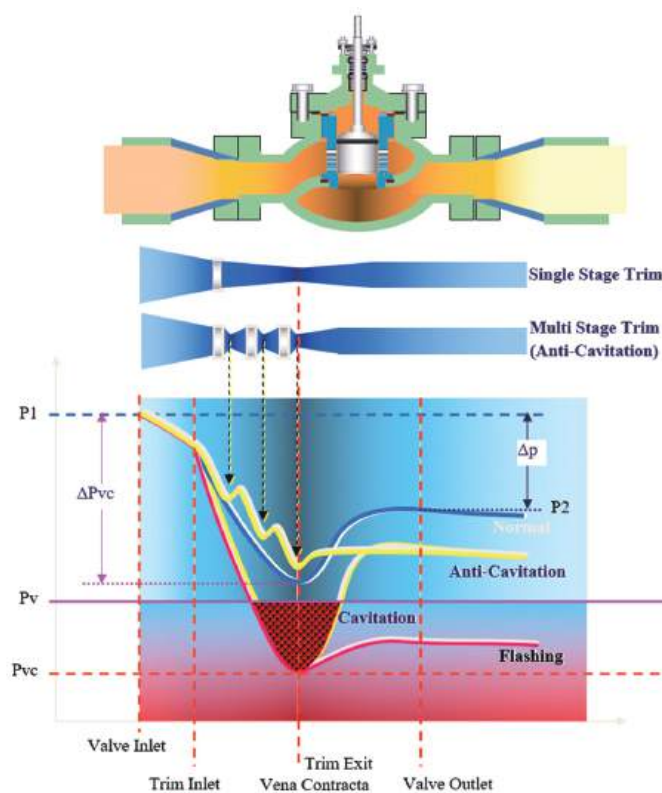


- To check the structure integrity through modal analysis based on the local seismic loading condition
- IEEE 60980-344, 2020 Nuclear Facilities - Equipment Important to Safety
 - Seismic Qualification
- ASME BPVC Sec. 8 Div. 2, 2019 Rules for Construction Pressure Vessels
 - Alternative Rules
- ASME BPVC Sec. 2 Part D, 2019 Material - Properties (Metric) - ASME B16.34, 2020 Valves - Flanged, Threaded and Welding End

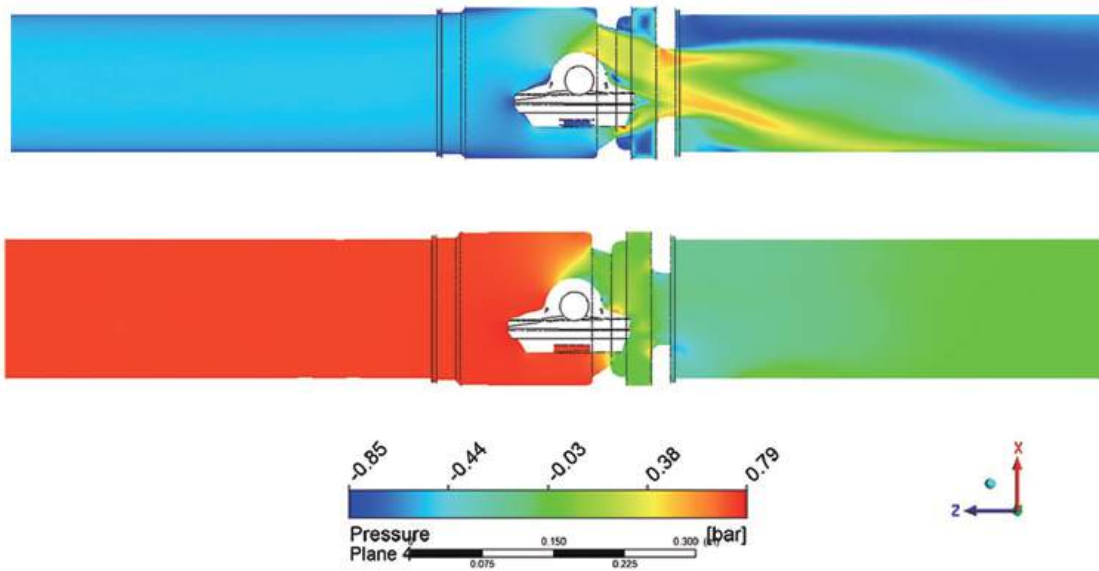
CFD

CAVITATION ANALYSIS

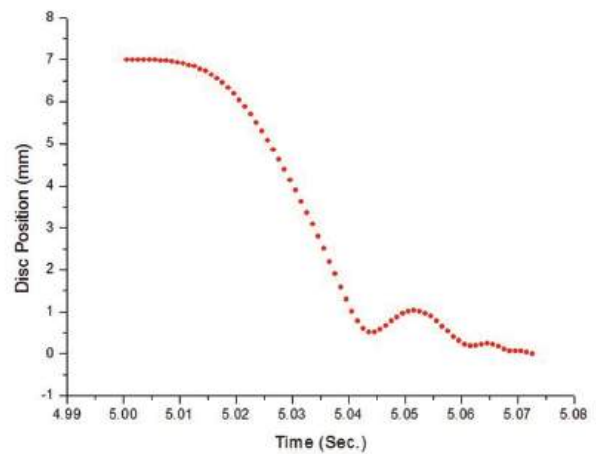
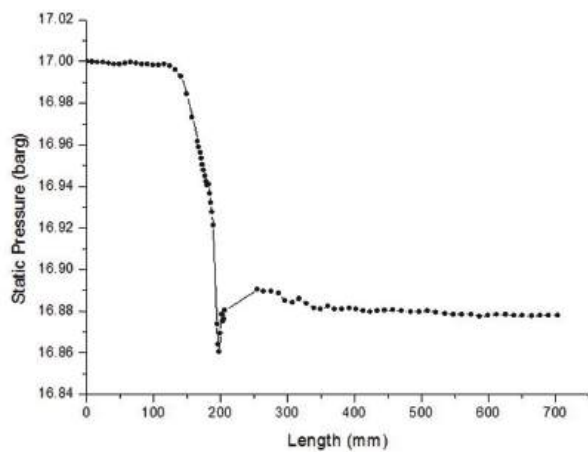
- To prevent cavitation phenomenon damage in valve



CFD(PRESSURE & VELOCITY FIELD)



CFD(MOTION ANALYSIS)



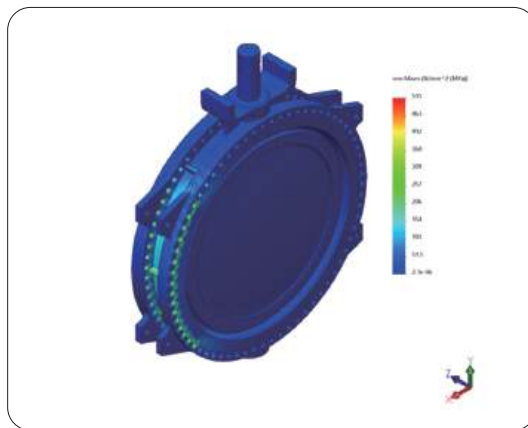
STRUCTURE

STRUCTURAL ANALYSIS

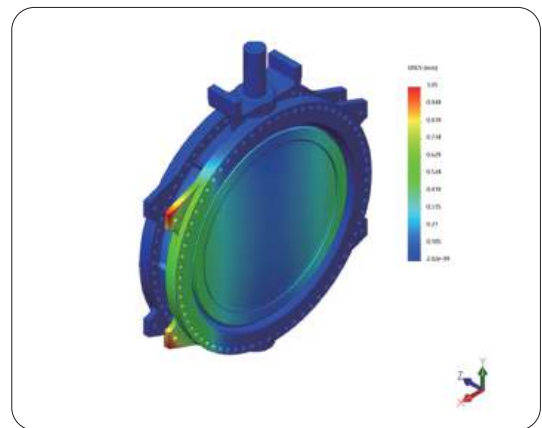


To review the stress and deformation of the valve shaft and seat, which directly affect valve operation, in order to assess structural integrity and operational performance under abnormal installation conditions.

Overall

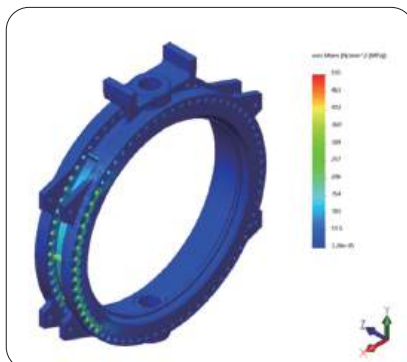


Equivalent Stress

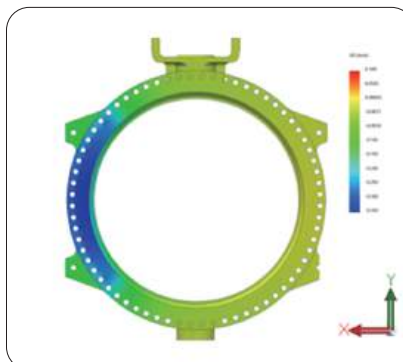


Total Deformation

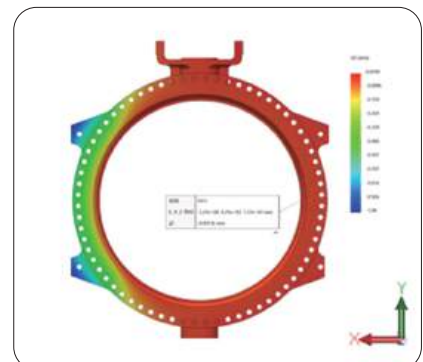
Body (with body seat)



Equivalent Stress

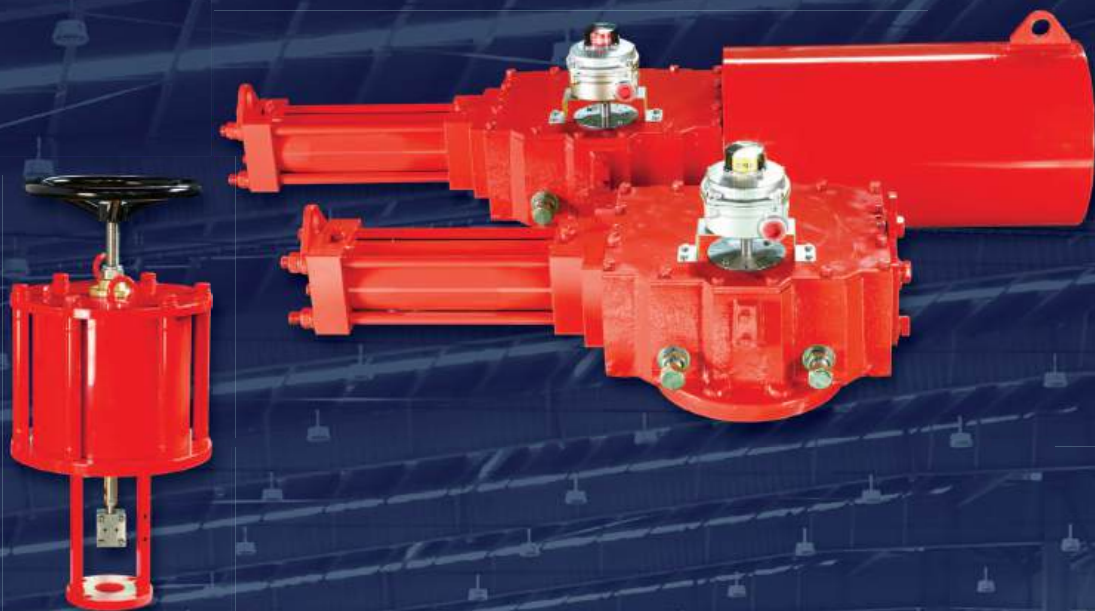


X-direction Deformation



Z-direction Deformation

As part of S&W,
we are dedicated to delivering excellence
in control and special valve solutions.



HEADQUARTERS

184-30, Cheonbuksandan-ro, Cheonbuk-myeon, Gyeongju-si, Gyeongsangbuk-do, Republic of Korea

ENGINEERING DEPARTMENT

62 Hyemnyeok-ro Siheung-si, Gyeonggi-do, Republic of Korea

TEL. 82-54-772-6341

FAX. 82-54-772-1441

E-mail. sales@snwcontrols.com