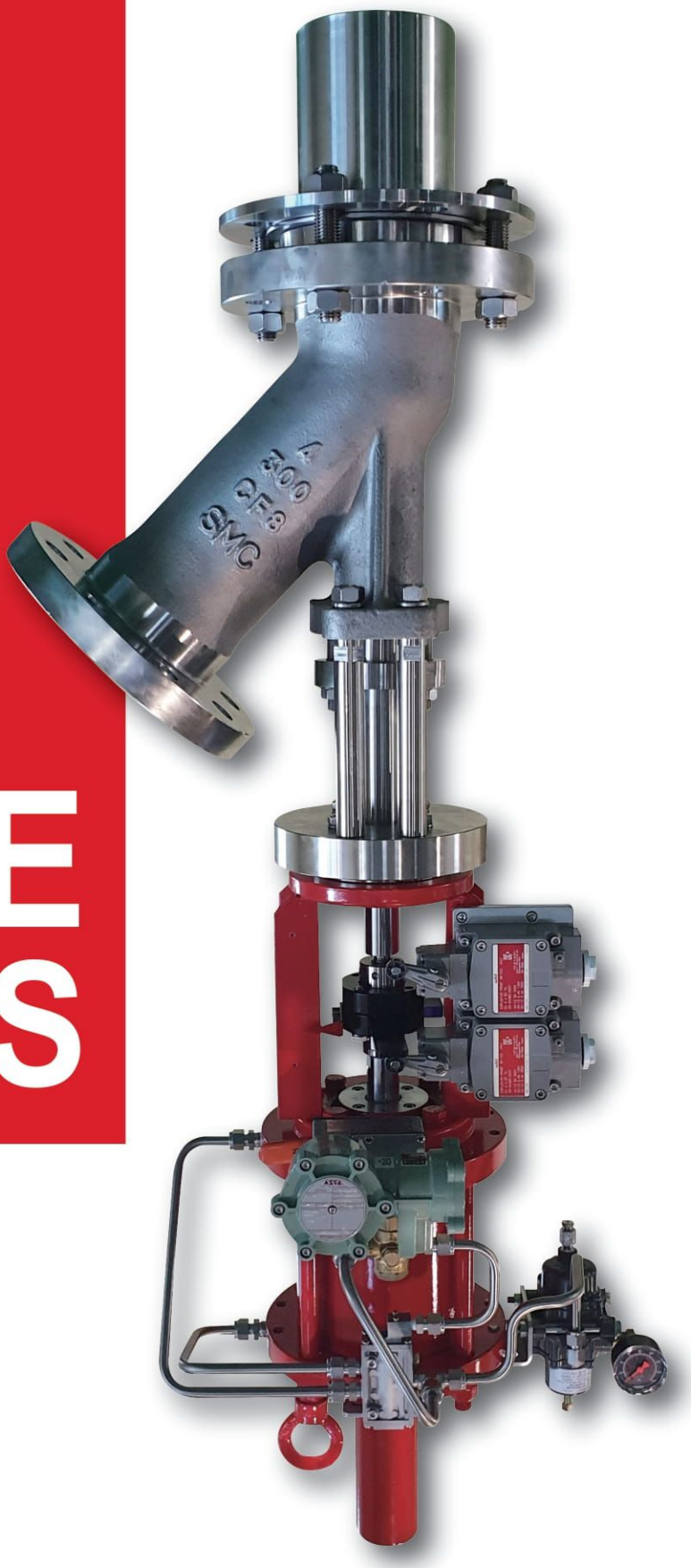
ANGLE VALVES



SMC AUTOMATION

TÜV SÜD ISO 9001 14001 45001 SIL Applicable PVQI

Product Picture









Product Picture









Product Picture









Applications



Flush Bottom Valves are special purpose valves used in piping and vessels to drain out any product or slurry left in the pipe or vessel. These valves are mostly used for dead space free draining or feeding of vessels and pipelines.

They are also suitable for various mediums including highly viscous materials but also for vessels where rapid drainage is important. The Control Flush Bottom Valves are available from ½“ up to and including 24” and from 150lbs up to 2500lbs.

The Flush Bottom Valves are not only used in the petrochemical industry but are also widely used in the Pharmaceutical and Fine Chemicals, Polymer, and Mineral Processing industries.








- PE/PP Process Line
- PTA/PIA Process Line
- PS Process Line
- ABS/SAN Process Line
- PC Process Line

Construction of SRP Model

Model – SRP
(Ram Piston Type Angle Valve)

SRP Model Standard Seat design is "Interchangeable Seat Type"

*Seatless design piston angle valve is also available upon request

The valve bodies are designed to allow full bore and high rigidity lantern ring.

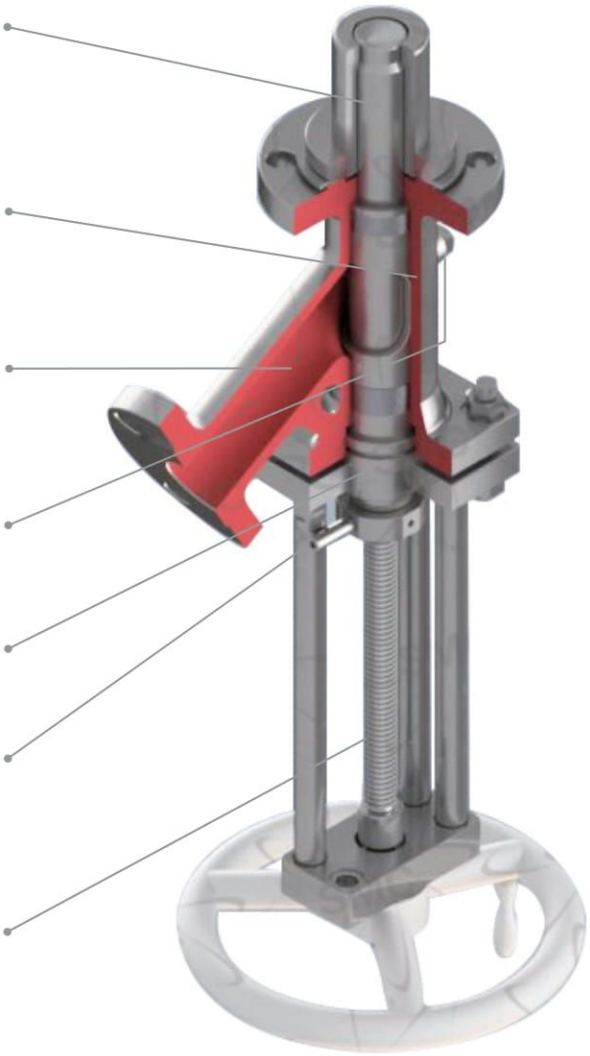
Standard Branch angles 45˚, 60˚, 90˚ and specific angle Upon requrest.

Lantern Ring positioning screw with Lantern Ring (optional)

Extended stuffing box to eliminate dead space and to improve piston alignment as standard

Mechanical position indicator

Large size valves have Non-rising stem to Minimize overall length





Packing rings can be ordered in PTFE or Graphite (High Temperature / FIRE SAFE) Forms or even in a mix of boughs.



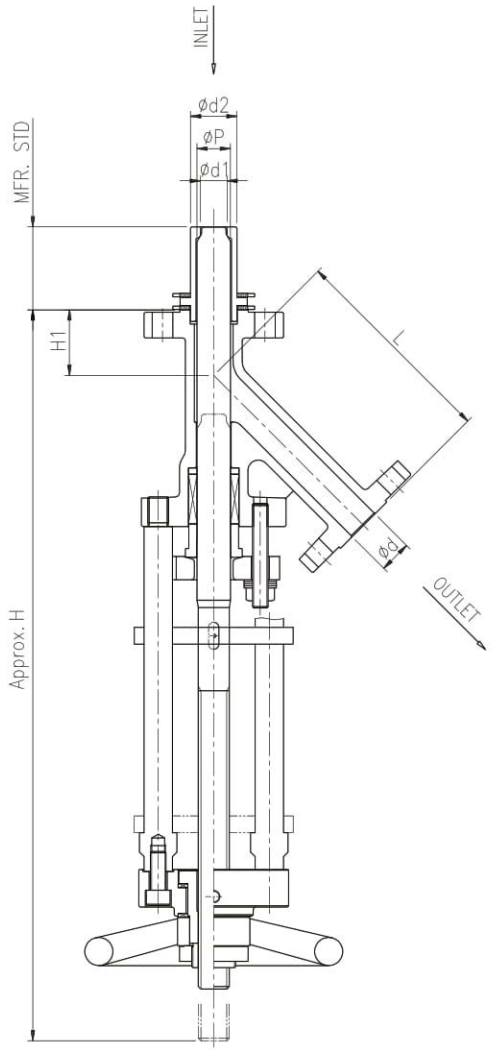
Greater hardness on body seat Stellite#6, #11, #12, #20 Overlay on Body & Disc Seat

Ram Piston Type Angle Valve (Model : SRP)

STANDARD CODE	
Test	API 598
Design	ASME B16.34
Wall Thickness	ASME B16.34
Mat'l Certification	EN10204-3.1

※ Flange Dimension ASME B16.5 (150# RF)

Product Range	
Rating	150lbs~2500lbs
Size	1" ~ 12"
Branch	45˚, 60˚, 90˚
Connection	RF, BW, RTJ, etc.



※ Materials Specifications Carbon Steel, Stainless Steel, Titanium, Hastelloy, Inconel, Others

SIZE	H (Approx)	H1	L	Inlet		Outlet
				Ød1	Ød2	Ød
1"	700	49	164	20	36	25.4
1-½"	770	60	180	23	39	38.1
2"	880	64	215	30	50	50.8
2-½"	930	70	243	45	62	63.5
3"	1050	90	260	60	76	76.2
4"	1300	101	312	68	102	101.6
6"	1350	120	390	110	145	152.4
8"	1500	132	450	150	200	203.2
10"	1750	140	520	198	250	254

※ Any specifications as below are availabe upon reguest : JIS / DIN Standard, Specification Branch Angle

Construction of SFBD Model

Disc Type Angle Vavle(Rising)

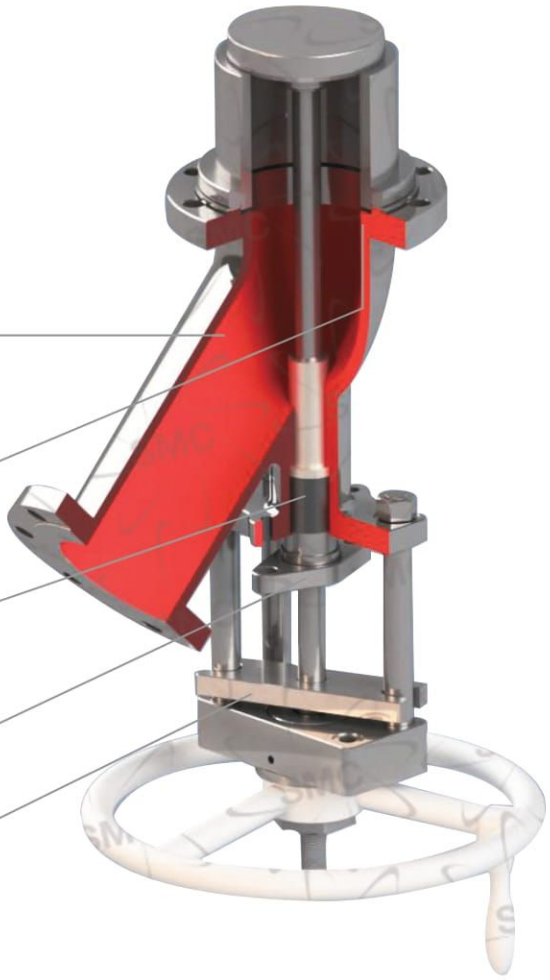
Standard Branch angles 45˚, 60˚, 90˚ and specific angle Upon requrest.

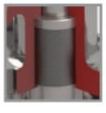
Optional Purge connections are possible to flush the valve and to clean downstream

Live loades packing arrangement included as a standard

Extended stuffing box to eliminate dead space and to improve piston alignment is standard

Mechanical position indicator





Packing rings can be ordered in PTFE or Graphite (High Temperature / FIRE SAFE) Forms or even in a mix of boughs.



Greater hardness on body seat Stellite#6, #11, #12, #20 Overlay on Body & Disc Seat

Y-Type Disc Angle Valve

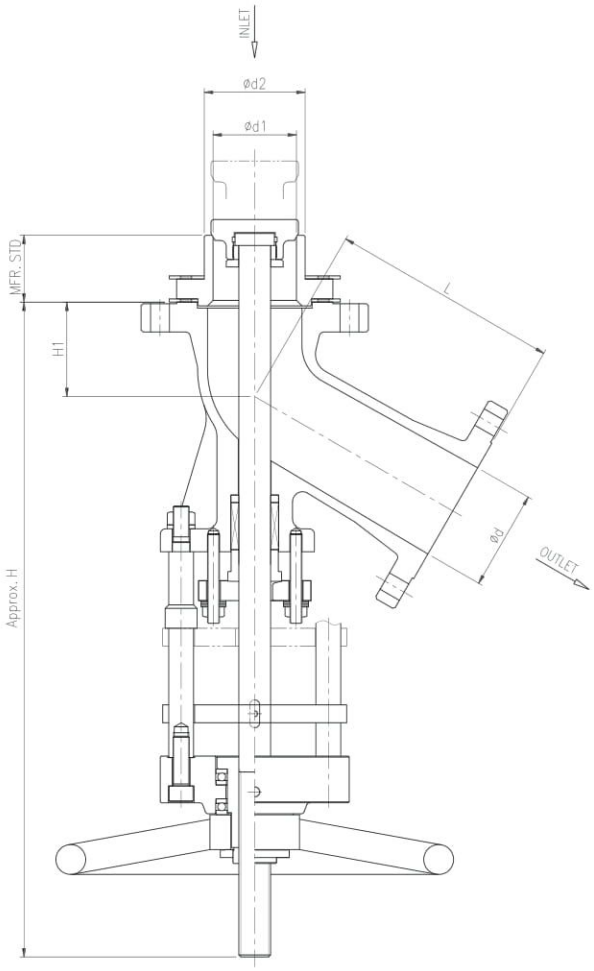


Manual Y-Type



On-Off Y-Type

Valve Dimension SFBD Model



Rising Disc Angle Valve (Model : SFBD)

STANDARD CODE	
Test	API 598
Design	ASME B16.34
Wall Thickness	ASME B16.34
Mat'l Certification	EN10204-3.1

※ Flange Dimension ASME B16.5

Product Range	
Rating	150lbs ~ 2500lbs
Size	1" ~ 26"
Branch	45˚, 60˚, 90˚
Connection	FF, RF, BW, RTJ, Others

※ Materials Specifications Carbon Steel, Stainless Steel, Titanium, Hastelloy, Inconel, Others

SIZE	H (Approx)	H1	L	Inlet		Outlet
				Ød1	Ød2	Ød
¾"	260	39	160	19.1	34	19.1
1"	280	45	180	25.4	50	25.4
1-½"	300	48	195	38.1	63	38.1
2"	390	61	210	50.8	75	50.8
2-½"	420	65	230	63.5	88	63.5
3"	550	70	260	76.2	100	76.2
4"	600	95	300	101.8	125	101.6
6"	680	109	350	152.4	175	152.4
8"	850	130	390	182.4	205	203.2
10"	1000	160	400	216.4	239	254

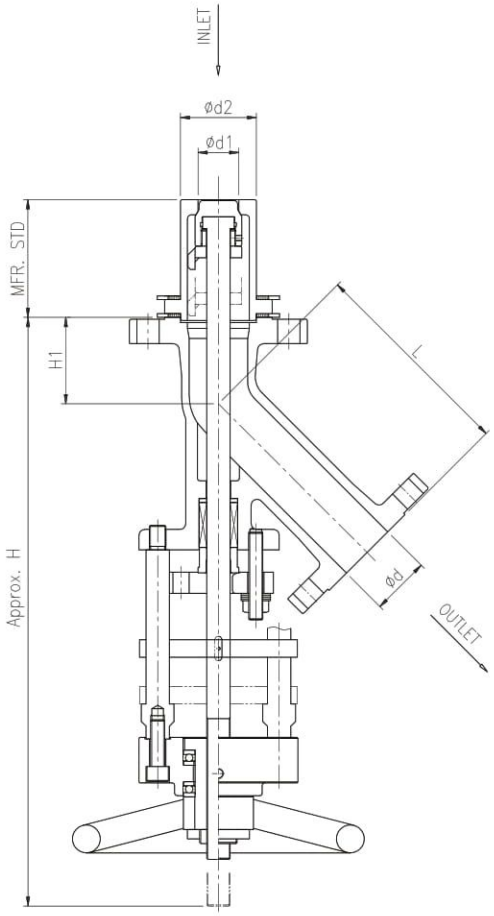
※ Any specifications as below are availabe upon reguest : JIS / DIN Standard, Specification Branch Angle

Lowering Disc Angle Valve (Model : SFBD)

STANDARD CODE	
Test	API 598
Design	ASME B16.34
Wall Thickness	ASME B16.34
Mat'l Certification	EN10204-3.1

※ Flange Dimension ASME B16.5

Product Range	
Rating	150lbs ~ 2500lbs
Size	1" ~ 26"
Branch	45˚, 60˚, 90˚
Connection	FF, RF, BW, RTJ, Others



※ Materials Specifications Carbon Steel, Stainless Steel, Titanium, Hastelloy, Inconel, Others

SIZE	H (Approx)	H1	L	Inlet		Outlet
				Ød1	Ød2	Ød
1"	440	49	150	20	38	25.4
1-½"	490	60	165	25	53	38.2
2"	540	65	180	35	65	50.8
2-½"	560	71	195	45	754	63.5
3"	630	77	210	58	110	76.2
4"	735	95	250	75	126	101.6
6"	840	103	330	98	161	152.4
8"	930	142	370	150	240	203.2
10"	1100	168	420	200	320	254

※ Any specifications as below are availabe upon reguest : JIS / DIN Standard, Specification Branch Angle

Construction of SSP Model

SSP Model
Sampling Angle Valve





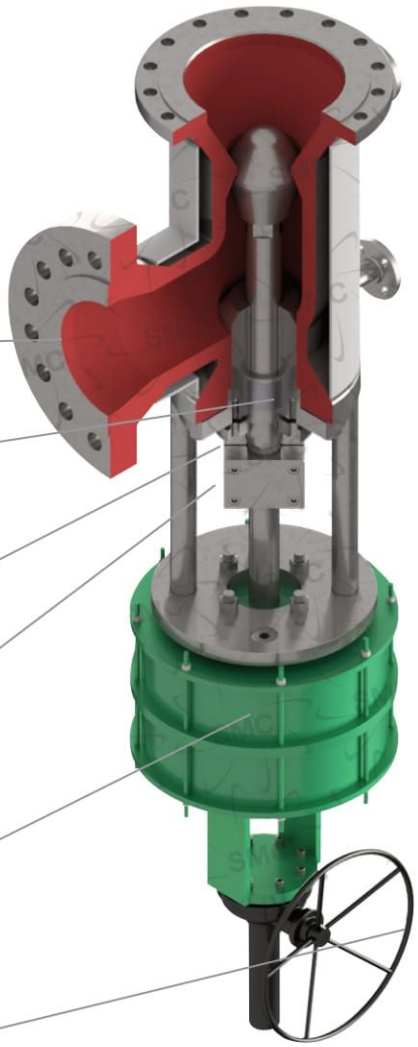
Packing rings can be ordered in PTFE or Graphite (High Temperature / FIRE SAFE) Forms or even in a mix of boughs.



Greater hardness on body seat Stellite#6, #11, #12, #20 Overlay on Body & Disc Seat

SAOO Model
On-Off Control Angle Valve

*Optional Heating Jacket
*Jacket connections customized to actual valve position



Standard Branch angles 45˚, 60˚, 90˚ and specific angle Upon requrest.

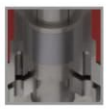
Extended stuffing box to eliminate dead space and to improve piston alignment is standard

Live loaded packing arrangement included as a standard

Mechanical position indicator

Actuator model & maker can be chosen upon request

Optional geared hand wheel



Packing rings can be ordered in PTFE or Graphite (High Temperature / FIRE SAFE) Forms or even in a mix of boughs.



Greater hardness on body seat Stellite#6, #11, #12, #20 Overlay on Body & Disc Seat

Titanium Angle Valve

WORLD LEADER IN TITANIUM VALVES

SMC Automation is one of the world's leading manufacturers of industrial titanium valves, offering a full range of forged and cast titanium valves in a wide range of critical applications for chemical, petrochemical, aluminum and mining industries. The core competence of SMC Automation is its capability to deliver titanium valves that would add value to the customer's process industry





Multi-way diverter Angle Valve

SMC Multi-way diverter Angle Valve is specially designed to divert one main flow in two separate flows.
The valves are designed to minimize retention areas, They are often used as reactor isolation valves in, for example, polyester process. Equipped with the vacuum package they are often used for full vacuum applications in combination with our maximized port sizes this design offers maximum flow capacity.



Glass Lined Flush Bottom Valve

SMC glass-lined flush valve is specially used as the flush bottom valve or bottom outlet valve for glass-lined reactors.
The valve body is fabricated from cast steel, and both the inner surface of valve body and outer surface of valve core are lined with our high performance glass.
The valve core is sealed by compressing the PTFE seal ring.



Specification

Size : DN 80/50, DN100/80, DN150/100
Flange : ANSI150#/KS 10K/JIS10K
Temp : -25℃ ~ 200℃
Pressure : ~10Bar.g

Option : Bellows Seals
C.I.P(Clean In Place) Capability
Temperature Sensor(PT100 RTD)

Model SCA Series

Since the use fluid of the tank or vessel is mainly a chemical Fluid, such as PTA(Purified Terephthalic Acid), the body/trim material consists of high corrosion resistant materials such as CF8M/316L, CF3M/316L, Titanium/Titanium, Etc. The Shape of the trim is also possible according to the required function, Quick open, Linear, EQ-%, Modified-%. According to the required seat tightness, the application of Metal or soft seat is also possible and supports the fulfillment of the seat leakage class IV, V. The body has an angle shape structure, which has low fluid resistance and sufficient space around the trim. This model can apply Spring-diaphragm, Cylinder and Electric motor type actuators. Solenoid Valve & Limit S/W, Modulating features with traditional E/P, Smart and HART Positioners.



Performance

* Fast draining
* Full way area through valve body with minimum pressure drop.
* No dead area in the body

Features

* Jacket body option available.
* Body angle can be 45°, 60°, 90°
* Applicable to the latest smart positioners as well as traditional P/P and E/P Positioners with other Instruments.
* A flushing port can be provided (Option)
* Gland-purge construction can be provide (Option)

Model SCA Series

The one-piece plug and stem design eliminates troublesome mechanical joints.
The guiding is both top and port.
The top guiding is through a stem bearing,
While the port guiding is with the full stroke length flutes on the plug head,
thus eliminating vibration and fatigue



<Close>

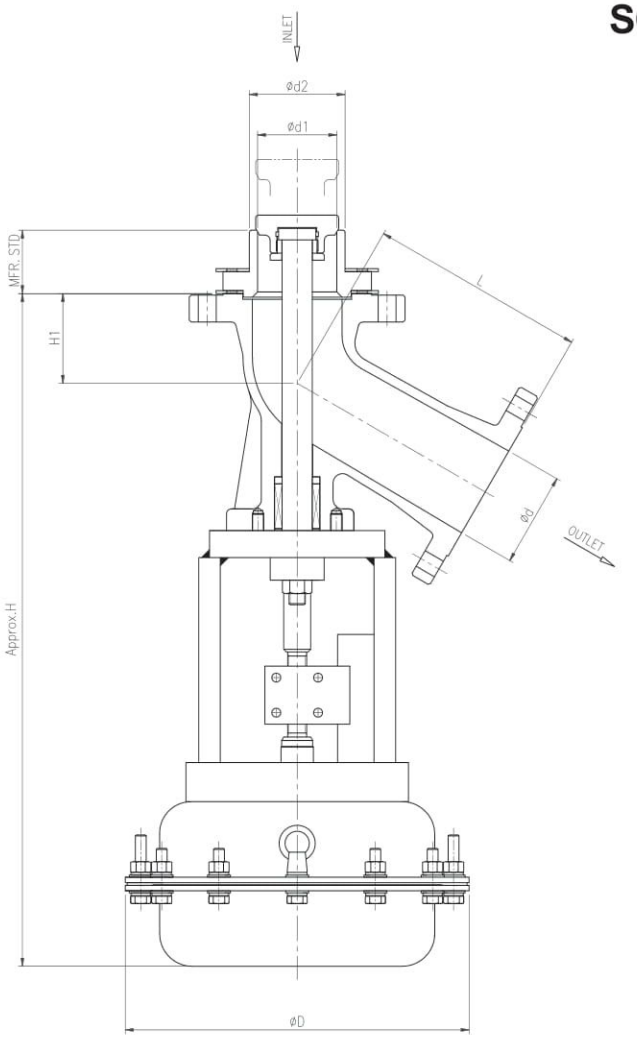


<Open>





SCA Series for Control Valve



size	H (Aprrox)	H1	L	Inlet		Outlet
				ød1	ød2	ød
1"	545	45	180	25.4	50	25.4
1 ½"	553	48	195	38.1	63	38.1
2"	600	61	210	50.8	75	50.8
3"	650	70	260	76.2	100	76.2
4"	685	95	300	101.8	125	101.6
6"	750	109	350	152.4	175	152.4
8"	1350	130	390	182.4	205	203.2
10"	1500	160	400	216.4	239	254
12"	1800	200	450	261	302.8	304.8

The above data is only our standard, and the dimension table for each size shall be follow the detailed DWG. and/or customer spec.

Tank Bottom Angle Control Valve

General Specifications

Size Range	1” ~ 12” (Other size are available)
Pressure Range	ASME 150# ~ 2500#
Temperature Range	-29°C ~ 260°C (other ranges are available)
Body Materials	A351-CF8, CF8M, CF3M, Duplex, Inconel, Titanium, Others
Trim Materials	Un-balanced, Dual-seated, Others
Trim Characteristics	EQ-%, Modified-%, Linear, Quick-open, Others
Cv Ratio	50 : 1 (Standard)
Seat Leakage Class	ANSI/FCI 70-2, Class IV, V According to the spec.
Applicable Actuators	Pneumatic Diaphragm, Cylinder, Electric motor, Others
Applicable Instruments	P/P & E/P & Smart Positioners, SOV & Other relays
Options	Handwheel, Limit S/W, Jacket body, Flushing Connection, Others

Applicable Material Combinations

Services & Fluids	**Material Combinations**	
	Body	**Trim**
Corrosive Fluids	CF8(F304) / CF8M(F316)	304SS(L) / 316(L) SS
	CF3M(F316L)	316L SS
	CF8C	321 or 347SS
Fairly High Corrosive Fluids	Duplex SS	Duplex SS
Very High Corrosive Fluids	Titanium Gr.-2	Titanium Gr.-2 or 5
	Hastelloy	Hastelloy or Titanium Gr.-2 or 5
	Inconel 718	Inconel 718

- Special Coatings are available on the body & trim surface.

Flow Coefficients – Rated Cv

Valve Size (Inch/mm)	**Max. Rated Cv (Full Bore)**								
	1”	**1-1/2”**	**2”**	**3”**	**4”**	**6”**	**8”**	**10”**	**12”**
1” (25)	16								
1-1/2”(40)		44							
2”(5)			80						
3”(80)				162					
4”(100)					305				
6”(150)						595			
8”(200)							985		
10”(250)								1380	
12”(300)									2050

Body Arrangements

Seal, Ring Seal, Control and Dual Seal piston valves use the following figures.

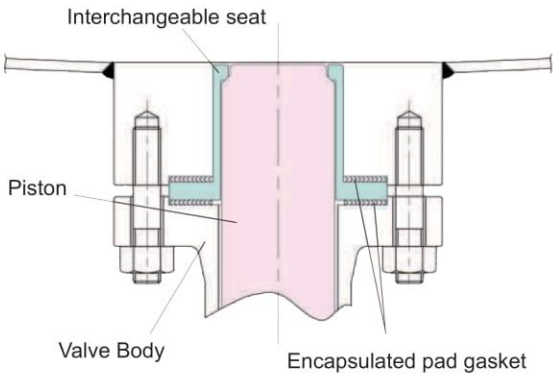
- ▸ Small sizes : Valves have rising stem design.
- ▸ Large sizes : Valves have non-rising stem design For dimensional drawings ask our representatives or sales engineers or visit www.smcautomation.co.kr

Interchangeable Seat

As an option the body seat can be dismountable. This is an attractive option when the process is corrosive during the reaction time only. Parts directly in contact with process(seat and trim) are then made of sophisticated alloys while valve body and piping uses regular materials.

Warning; The closing effort is transferred to the pad bolting and the body flange. This requires a stress calculation to check the correct sizing of the bolting section and the flange thickness. This to insure proper sealing of the seat gaskets.

The SMC engineering department will be pleased to make these calculations when required.



Technical & General Information

Design code & Construction

- ▸ Design flexibility due to fabricated construction
- ▸ Design according to ASME B16.34 as a standard.
- ▸ SMC also designs to international standards like; ANSI,DIN,JIS,API etc.
- ▸ For product development, SMC uses tools like finite element calculations, in-house design and testing facilities and recognized material and mechanical research laboratories.
- ▸ Fire Safe Design Available(API 6FA)

Customer support

SMC provides customer support in the following areas :

- ▸ Design : Specific recommendation can be made for valve selection, sizing in polymer control, reactor cleaning and high viscosity flow capacity.
- ▸ On site service : plant start-up support by trained engineers
- ▸ After sales service : SMC's after sales department and worldwide agent network are committed to our 3 days reaction time policy.

Materials

- ▸ Wide range of exotic material selections ; Stainless Steel / Titanium / Hastelloy / Inconel etc.

Product method

- ▸ Integrited casting or Forged design
- ▸ Fabricated or bar stock design
- ▸ Combinations of fabricated and bar stock design

Quality Assurance & Tests

- ▸ ISO 9001
- ▸ ISO 14001
- ▸ ISO 45001
- ▸ API 598

ACTUATOR



SIL
Applicable

ISO 9001 14001 45001

SMC PD Series

SMC PD is a complete line of linear pneumatic actuators purposely designed for the operation of angle valves. The product range includes both double acting and spring return units avaiable several sizes which cab deliver a force up to 18,510Kg. These actuators can assure an extremely smooth valve operation and do not require any maintenance

Standard Specification

PD Series		
Air supply		4Bar ~10 Bar
Travel Range(mm)		30 to 500 above
Temp. Range		• Standard operating temperature range : -23℃ to +74℃ (-10℉ to +165℉) • Low temperature option available: -46℃ to +65℃(-50℉ to +150℉) • High temperature option available: -17 ℃ to +204℃°(-1℉ to +400℉)
Spring Range		Available application
Operating Derection		Direct, Reverse, Double Acting
Air Connection		PT 1/4" ~ 1" Female Tap
Material	**Cylinder**	Amalgam, Carbon Steel
	Cover	Carbon Steel
	Piston	AL, Alloy, Stainless Steel
	Shaft	SUS410(Cy-Plating)
Hand wheel		No Hand wheel, Top Mounted, Top-side Mounted Hand wheel
General Application		All linear valves
Design		EN 15714-3



Cylinder Type Actuators - PD Series

1. Single Acting
2. Reverse Acting
3. Double Acting
4. Double Acting with Top Mounted Hand Wheel
5. Tandem Type

① 

② 

③ 

④ 

⑤ 

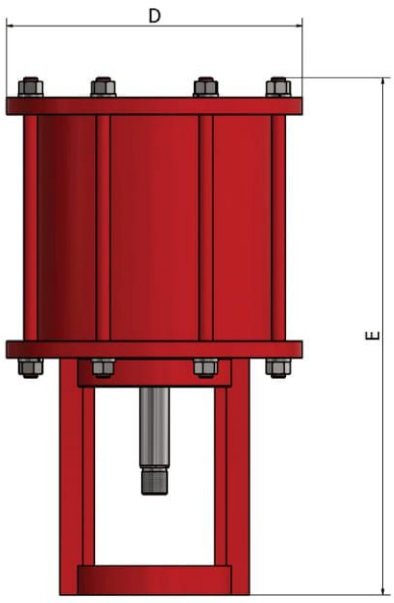
Consult factory for proper selection.

Dimensions

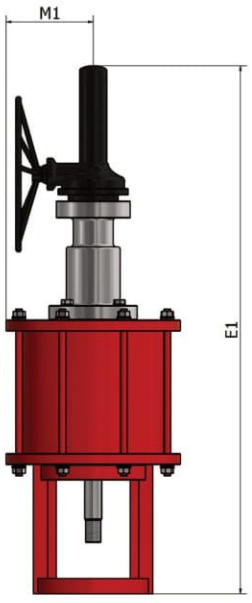
Actuator	Diameter D		Length E		Length M1		Length E1	
Size	in	mm	in	mm	in	mm	in	mm
200	10.23	260	15.74	400	10.62	270	35.43	900
250	12.20	310	19.68	500	10.62	270	39.37	1000
300	14.56	370	27.55	700	10.62	270	43.30	1100
400	19.68	500	27.55	700	14.56	370	47.24	1200
500	23.62	600	35.43	900	14.56	370	59.05	1500

Thrust

ACTUATOR SIZE	THRUST MINIMUN AIR PRESSURE(bar)						VOLUME
	3	3.5	4	5	5.5	6	m^3
	kg	kg	kg	kg	kg	kg	-
PD 200	890	1040	1190	1490	1640	1790	0.01
PD 250	1400	1630	1860	2330	2560	2800	0.02
PD 300	2010	2350	2680	3360	3690	4030	0.03
PD 400	4040	4710	5390	6740	7410	8080	0.06
PD 500	5050	5890	6730	8410	9250	10100	0.11

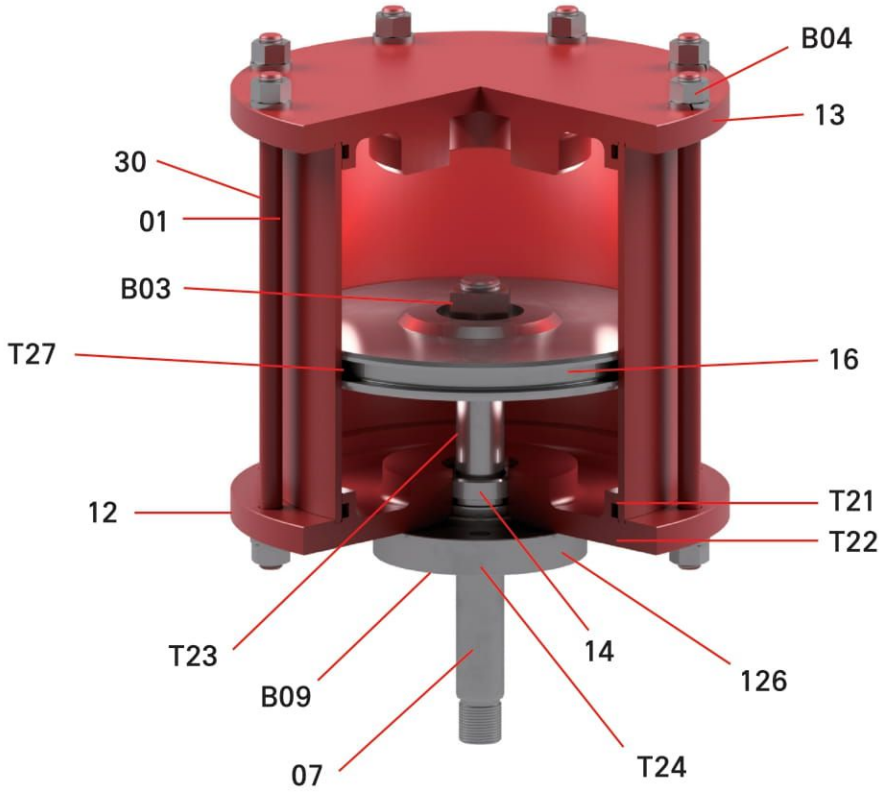


dimensions



Top mounted hand wheel dimensions

Typical SMC PD



Item	Description	Materials	Q`ty
01	CYLINDER	STKM13C or ALUMINIUM	1
07	SHAFT	410SS	1
12	LOWER PLATE	SS400	1
13	UPPER PLATE	SS400	1
14	BUSH	BRASS	1
16	PISTON	ALUMINIUM	1
30	STUD BOLT	SS400	8
B03	HEX NUT,S/W(SHAFT)	304SS	1/1
B04	HEX NUT,S/W,P/W(STUD BOLT)	10.9, STEEL, STEEL	14/8/16
B09	W/BOLT,S/W,P/W(YOKE FLANGE)	12.9, STEEL, STEEL	4
126	YOKE FLANGE	SS400	1
T21	O-RING	NBR	1
T22	O-RING	NBR	2
T23	O-RING	NBR	1
T24	O-RING	NBR	2
T27	O-RING	NBR	1

Example : Ram Piston Type / 45˚ Branch / 1" x 1" – 150# / BODY A351-CF8M
TRIM 316SS / MANUAL OPERATION (HANDLE) / FULL JACKET



SRP4-C1C1-M33-H-JF

Valve Type	Inlet Size Rating	Outlet Size Rating	Material Body Trim	Operation	Option
SRP 4	C 1	C 1	M3 3	H	JF

Type	Code
Rampsiton	SRP
Disc	SFBD
Sampling	SSP
ON-OFF	SAOO
Glass Lined	SGL
Multiway	SMW
Control	SCA

Branch	Code
45˚	4
60˚	6
90˚	9
Y-Type	Y
Other Angle	X

Port Size	In
1/2"	A
3/4"	B
1"	C
1 1/2"	D
2"	E
2 1/2"	F
3"	G
4"	H
5"	I
6"	J
8"	K
10"	L
12"	M
14"	N
16"	O
18"	P
20"	Q
24"	R

Rating	In
150LB	1
300LB	2
600LB	3
900LB	4
1500LB	5
2500LB	6

Port Size	Out
1/2"	A
3/4"	B
1"	C
1 1/2"	D
2"	E
2 1/2"	F
3"	G
4"	H
5"	I
6"	J
8"	K
10"	L
12"	M
14"	N
16"	O
18"	P
20"	Q
24"	R

Rating	Out
150LB	1
300LB	2
600LB	3
900LB	4
1500LB	5
2500LB	6

Material	BODY	TRIM	GRADE
A216-WCB / A105	0	0	WCB
A351-CF8 / A182-F304	1	1	304SS
A351-CF3 / A182-F304L	2	2	304LSS
A351-CF8M / A182-F316	3	3	316SS
A351-CF3M / A182-F316L	4	4	316LSS
A351-CF8C / A182-F347	5	5	347SS
A351-CG8M / A182-F317	6	6	317SS
A351-CG3M / A182-F317L	7	7	317LSS
A564-630 (17-4PH)	-	8	630 SS
A217-CA15 / 13Cr	-	9	410SS
A890-1A(CD4Mcu)Body Only	S1	-	1A
A890-4A / A182-F51(S31803)	S2	S2	4A
A890-5A / A182-F53(S32750)	S3	S3	5A
A890-6A / A182-F55(S32760)	S4	S4	6A
HASTELLOY C 276 / B574 N01276	H	H	Alloy C
B381-F2 / B381-F5	T	T	Titanium
S20C / Glass Lined	G	G	Steel

*In case of Forging, "F" will be added in front of CODE			
EX) A182-F304	F1	F1	304SS
EX) A182-F316	F3	F3	316SS

Operation	Code
Manual	H
Gear Box	G
Pneumatic	P
MOV	M

Option	Code
Buffing 300	B
Jacket (Semi)	J
Jacket (Full)	JF

※ Any specifications as below are availabe upon reguest : JIS / DIN Standard, Specification Branch Angle



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