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ChemValve®
Valve Technology

ChemBall | CSB

PFA Lined Ball Valve

Installation & Operating Instructions

Company Overview

ChemValve-Schmid AG develops and manufactures high quality valves which are sold and distributed through a carefully developed network of long-standing partners in more than 50 countries all over the world.

We have been developing Check Valves and PTFE Lined Butterfly Valves in close cooperation with the most important European PTFE manufacturers since the 1980s. As a result, we have over 30 years of expertise in valve production. Our private and therefore independent company has shown consistent and healthy growth since then.

„Innovative – proficient – reliable", that's our motto. Thanks to years of investment in state-of-the-art production technologies and highly qualified employees, we offer unprecedented product and service quality in this sector. We creatively develop on-time solutions that are focused on our customers' needs. Thanks to our process reliability, which covers the entire value chain through to warehousing and has evolved over many years, standard products are delivered within only a few days in line with customer-controlled assembly requirements. Existing products are continuously improved and new products are developed based on customer requirements.

We deliver what we promise. And we naturally assume full responsibility for our orders and obligations.

Give us a try!

Zertifiziertes Managementsystem SQS ISO 9001

CE 1250

To ensure that the valve functions correctly, it is important to follow these installation and operating instructions. Only qualified personnel who have been instructed in the installation, fitting, commissioning, operating and maintenance of the device are permitted to install the valve. ChemValve-Schmid AG assumes no liability for faults resulting from improper installation.

Warnings and Precautions

- During installation and maintenance work, suitable protective clothing, including gloves and protective goggles, must be worn.
- Prior to installation and maintenance work, the pipe must be depressurised and emptied. If the valve operates with dangerous flow media, the pipe has to be emptied completely and flushed with an appropriate cleaning fluid. Inappropriate cleaning products can harm the valve!
- If flange connections or locking screws are detached, hot water, steam, caustic fluids or toxic gases can be emitted. Severe scalding, burns and poisoning are possible!
- During operation the valve may become very hot or very cold. Installation and maintenance work should only be carried out if the valve's temperature is the same as the ambient temperature.
- Prior to dismounting the valve, preventative measures against the possible leakage of dangerous media should be made.
- When removing the valve from the pipeline, it is important to ensure that the PFA lining, ball and seals are not damaged. Damaged parts may only be replaced by genuine ChemValve-Schmid AG parts.
- Only suitable cleaning products may be used.

Personnel Requirements

The improper handling of shut-off valves can lead to injury and material damage! Only trained specialists with the requisite qualifications and experience may dismantle, assemble and test the valves.

Protective Equipment

To minimise the likelihood of injury, the wearing of personal protective equipment is required. Company guidelines must be strictly followed. Each worker is responsible for their own safety.

All workers must wear the following:

Protective work clothing is tight-fitting clothing with good tear resistance, tight arms and no protruding parts. Such clothing protects against abrasion, puncture wounds, corrosive substances and burns from hot surfaces, liquids and gases

Helmets protect against falling and flying objects, as well as liquids and gases

Safety shoes to protect against heavy objects, hot surfaces, corrosive liquids and gases and to minmise slips and falls on unstable surfaces

Safety Gloves to protect hands from abrasion, puncture wounds, corrosive substances and burns from hot surfaces, liquids and gases

Safety Glasses to protect the eyes from corrosive or liquids and gases

Further protective equipment, such as ear protection, should be worn, depending on the environment or company guidelines.

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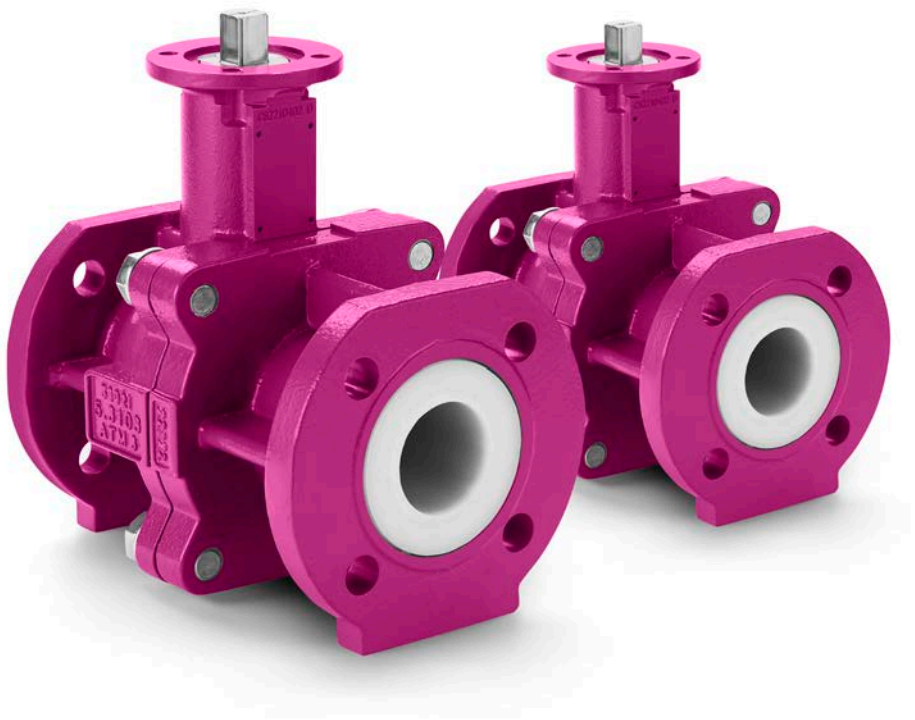
Features



Our patented TrueFloat® technology makes the **ChemBall | CSB** the most innovative PFA lined ball valve available on the valve market today, offering long service life while securely handling aggressive media

Patented TrueFloat® Technology

- Worldwide patented design combines the advantages of both floating and trunnion ball valves
- A single-piece PFA coating encloses the dynamic, metallic connection between ball and stem
- Reduced abrasion prevents age-related wear and tear

Security²

- For safety-critical applications, an optional, second chevron seal ensures increased security requirements are met
- An further optional leak detection port between the chevron seals offers integration with plant monitoring systems
- The sophisticated labyrinth seal tightly and reliably seals the two body halves for maximum security

Multicultural & flexible!

- Flange & face-to-face dimensions available in EN, ASME & JIS
- Three stem designs available for maximum actuator compatibility
- Head flange according to ISO 5211

Clever & Maintenance-friendly

- The bayonet mount makes replacing chevron seals effortless
- The integrated stand makes maintenance easier
- Maintenance-free bearings for uninterrupted operation

FFF — Form Follows Function

- Full bore design for maximum flow rate
- Axial grooves improve flow behaviour
- Capable of sustained operation in vacuum applications

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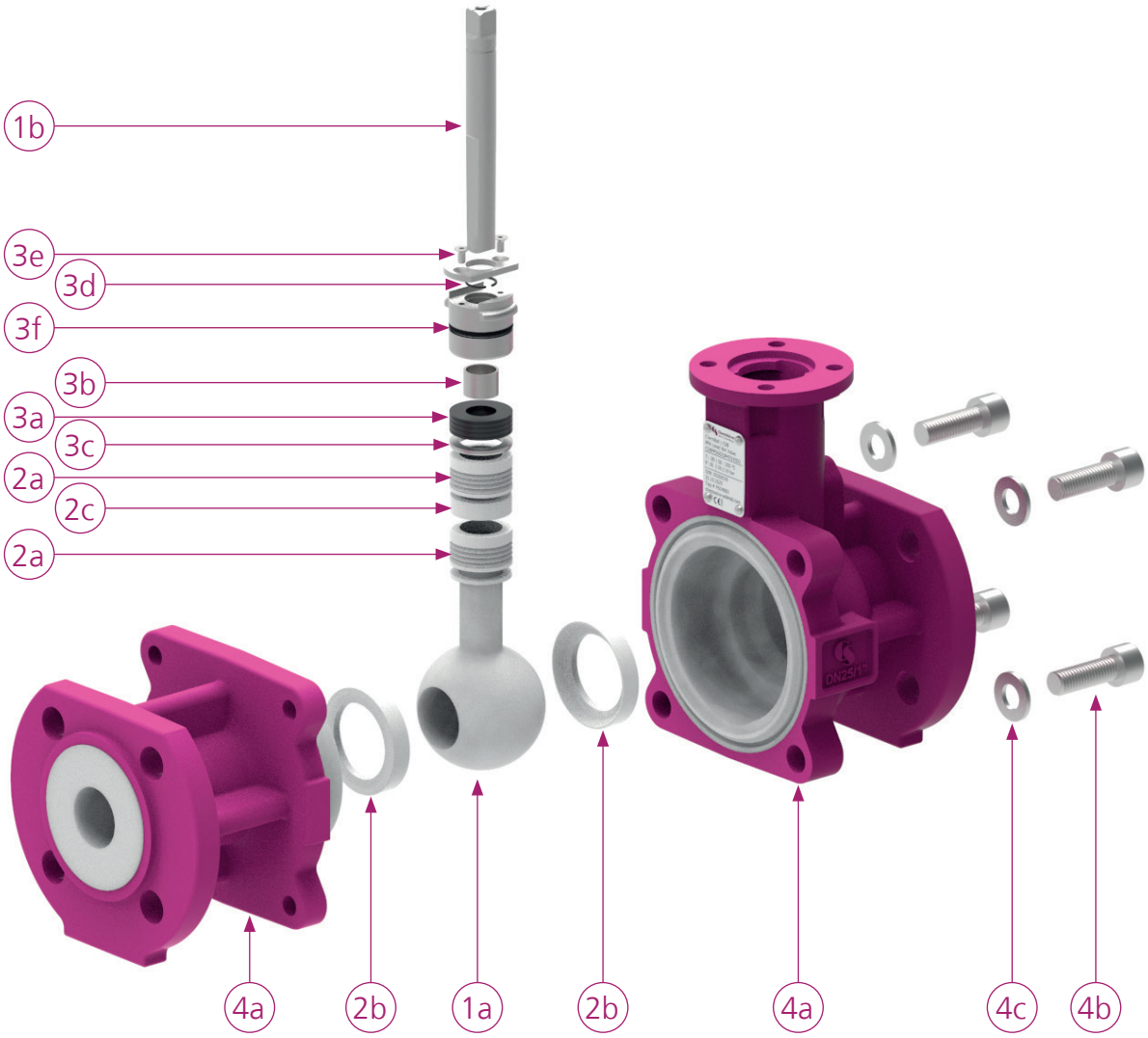
Components



Item #	Description	Materials
1a	Ball	PFA/1.4404
1b	Stem	1.4404
2a	Chevron Seals	PTFE
2b	Ball Seals	PTFE
2c	Spacer	PTFE
3a	Belleville Springs	Carbon Steel
3b	Shaft Bushing	PTFE/Steel

Item #	Description	Materials
3c	Pusher	1.4301
3d	Spring-lock Washer	1.4301
3e	Locking Plate & Screws	1.4404
3f	Bayonet Coupling	1.4404
4a	Valve Body	PFA/5.3103
4b	Body Bolts	Stainless Steel
4c	Washers	Stainless Steel

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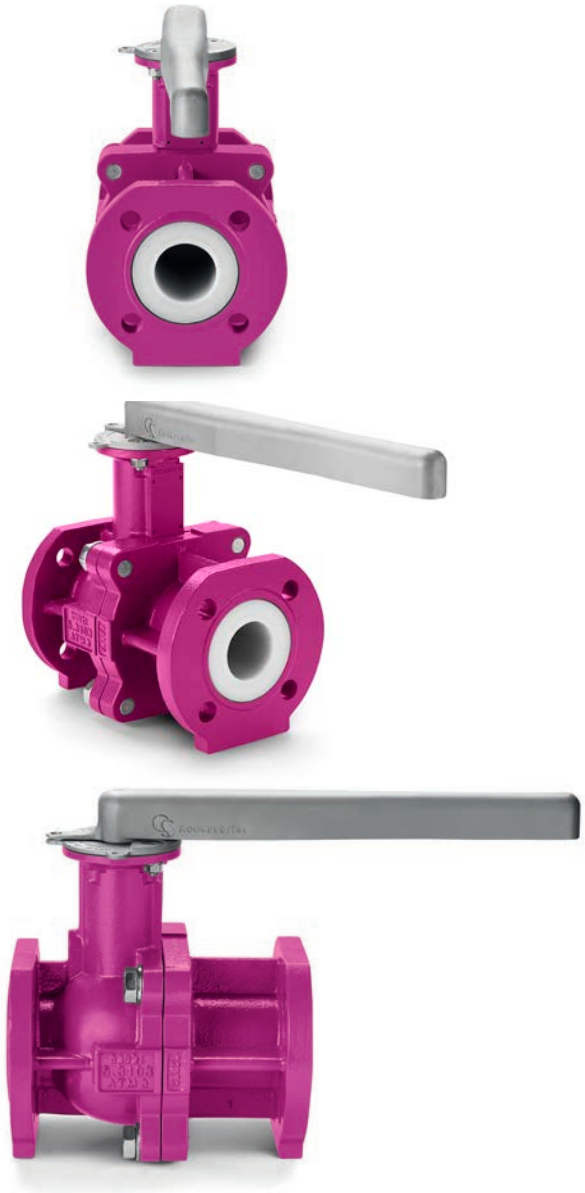
Specifications & Industry Standards

Nominal Diameter	• DN 15–200 | 1/2"–8"
Flange Connection	• EN 1092-1, PN 10–16 • ASME B16.5, Class 150 • JIS 10K
Top Flange	• ISO 5211
Max Working Pressure	• 16 bar
Operating Temperature p-T	• -20° C to 200° C
Face-to-Face Length L	• EN 558, Row 1 • ASME B16.10, Class 150, Row 19
Conformity CE 1250	• PED 2014/68/EU • ATEX 2014/34/EU • Food (EC) Nr. 1935/2004 | FDA • TA-Luft | ISO 15848-1
Pressure Test	• EN 12266-1



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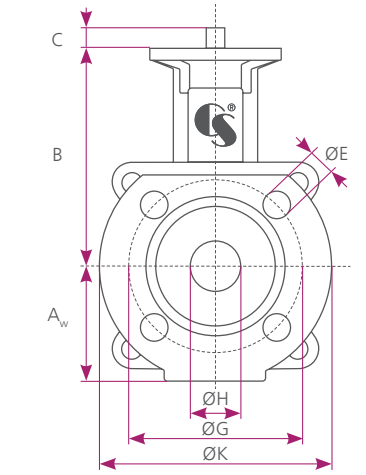
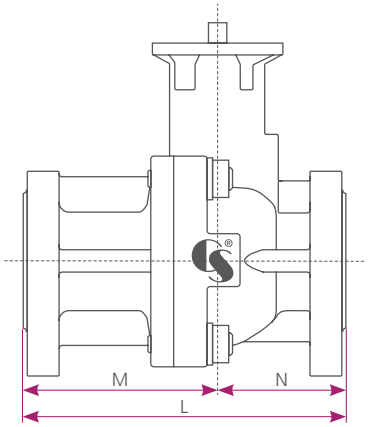
Dimensions | ANSI

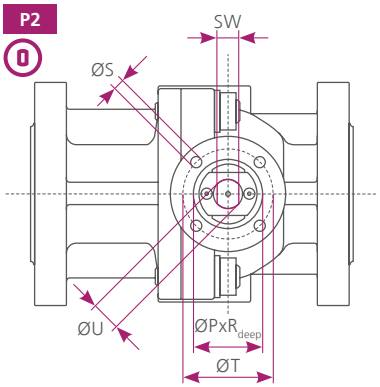




DN [Inch]	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"
ØH [mm]	15	20	25	32	40	50	65	80	100	125	150	200
L [mm][1]	108	117	127	140	165	165	190	203	229	210	267	457
ØG	60.3	69.9	79.4	88.9	98.4	98.4	139.7	152.4	190.5	215.9	241.3	298.4
ØE	4x 15.9	4x 15.9	4x 15.9	4x 15.9	4x 15.9	4x 15.9	4x 19	4x 19	8x 19	8x 22.2	8x 22.2	8x 22.2
ØK	90	100	110	115	125	125	180	190	230	255	280	345
M	58.5	62	66.5	73	86	86	100	104.5	117.5	109	129.5	152
N	49.5	55	60.5	67	79	79	90	98.5	111.5	101	137.5	140
A	50	52.5	57.5	61	75	75	95	105	121	135	157	182
B	103	105.5	107.5	115	151	151	182	197	214	239	281.5	285
C_{P2}	16	16	16	16	30	30	39	39	39	39	48	48
$C_{D4/P4}$	10	10	10	10	19	19	24	24	24	24	29	29
MOT [Nm][3]	18	18	18	22	78	78	80	168	168	170	240	360
$MAST_{P2}$ [Nm][4]	40	40	40	32.5	208	208	447	447	447	447	878	878
$MAST_{D4/P4}$ [Nm][4]	50	50	50	24.6	166	166	359	359	359	359	665	665
kg	3.5	4.1	4.8	-	9.9	13.5	-	25.1	35.9	-	59.9	-

1) Acc. to ASME B16.10 Class 150 Row 19 "Short Pattern"
2) Acc. to ASME B16.10 Class 150 Row 18 "Long Pattern"
3) Maximum Occuring Torque
4) Maxium Allowable Stem Torque: 1.4404, inc. 1.2 Safety Factor

P2



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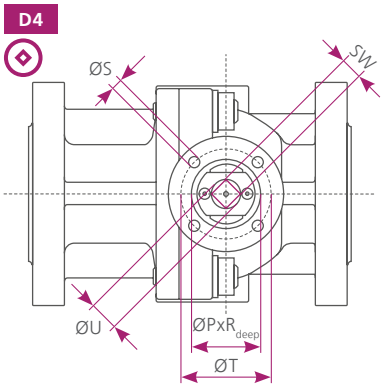

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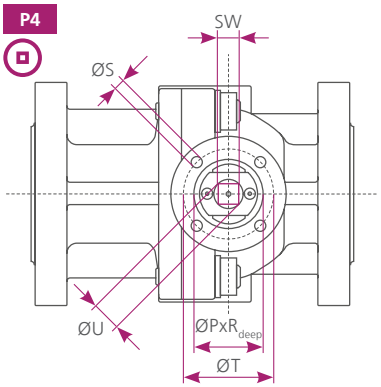

DN [inch]	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"	8"
SW	9	9	9	9	17	17	22	22	22	27	27
ØU	12	12	12	12	22	22	28	28	28	36	36
ISO_{5211}	F05	F05	F05	F05	F07	F07	F10	F10	F10	F12	F12
ØT	50	50	50	50	70	70	102	102	102	125	125
ØS	4x7	4x7	4x7	4x7	4x9	4x9	4x11	4x11	4x11	4x13	4x13
ØP x R_{DEEP}	36x3.5	36x3.5	36x3.5	36x3.5	56x3.5	56x3.5	71x3.5	71x3.5	71x3.5	86x3.5	86x3.5

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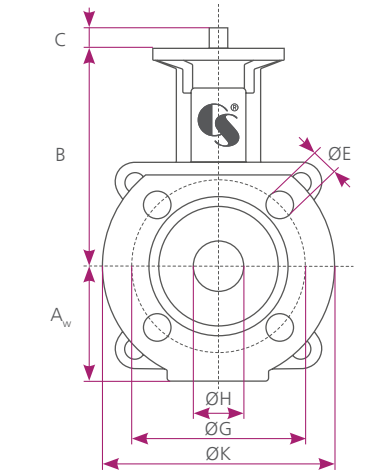
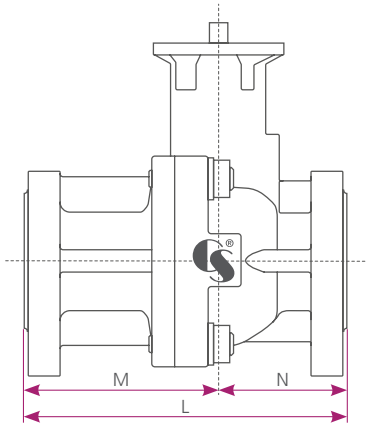
Dimensions | EN

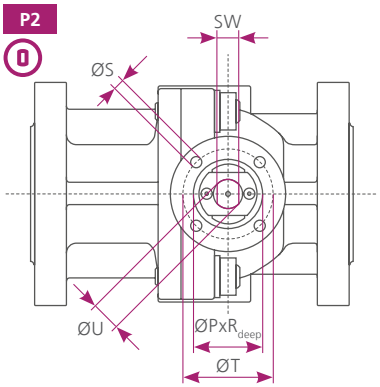




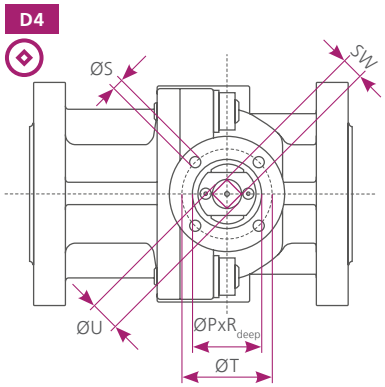
DN [mm]	15	20	25	32	40	50	65	80	100	125	150	200
ØH [mm]	15	20	25	32	40	50	65	80	100	125	150	200
L [mm][1]	130	150	160	180	200	230	290	310	350	400	480	600
ØG	65	75	85	100	110	125	145	160	180	210	240	295
ØE	4x 14	4x 14	4x 18	4x 18	4x 18	4x 18	8x 18	8x 18	8x 18	8x 18	8x 22	8x22 (PN10) 12x22 (PN16)
ØK	95	105	115	140	150	165	185	200	220	250	285	340
M	76	91	98.5	-	121	144	-	185	205	-	270	-
N	54	59	61.5	-	79	86	-	125	145	-	210	-
A	50	52.5	57.5	-	75	82.5	-	105	122	-	157	-
B	103	105.5	107.5	-	151.5	156	-	197	214	-	281.5	-
C_{P2}	16	16	16	16	30	30	39	39	39	39	48	48
$C_{D4/P4}$	10	10	10	10	19	19	24	24	24	24	29	29
MOT [Nm][2]	18	18	18	18	78	78	120	120	168	204	240	360
$MAST_{P2}$ [Nm][3]	40	40	40	40	208	208	447	447	447	447	878	878
$MAST_{D4/P4}$ [Nm][3]	50	50	50	50	166	166	359	359	359	359	665	665
kg	3.9	4.8	5.4	-	11.8	15.2	-	28	39.7	-	76.7	-

1) Acc. to EN 558, Row 1
2) Maximum Occuring Torque
3) Maxium Allowable Stem Torque: 1.4404, inc. 1.2 Safety Factor

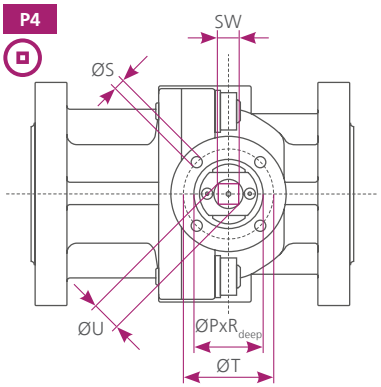
P2



D4



P4



DN [mm]	15	20	25	32	40	50	65	80	100	150	200
SW	9	9	9	9	17	17	22	22	22	27	27
ØU	12	12	12	12	22	22	28	28	28	36	36
ISO_{5211}	F05	F05	F05	F05	F07	F07	F10	F10	F10	F12	F12
ØT	50	50	50	50	70	70	102	102	102	125	125
ØS	4x7	4x7	4x7	4x7	4x9	4x9	4x11	4x11	4x11	4x13	4x13
ØP x R_{DEEP}	36x3.5	36x3.5	36x3.5	36x3.5	56x3.5	56x3.5	71x3.5	71x3.5	71x3.5	86x3.5	86x3.5

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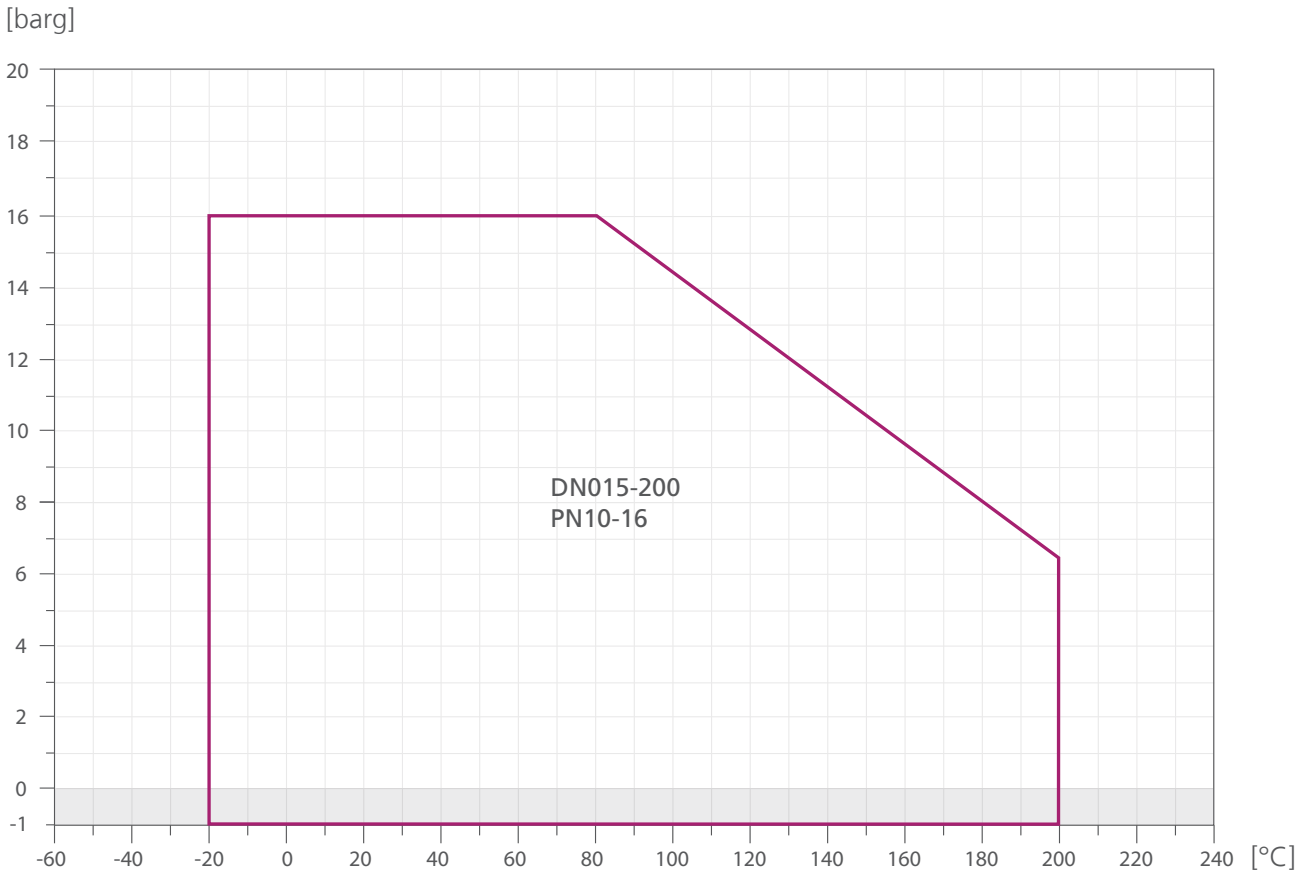
Pressure/Temperature Diagram | Flow Rate



Flow Rate/Kv Values [m³/h]												
Opening Angle	DN [mm]											
	15	20	25	32*	40	50	65*	80	100	125*	150	200*
0°	0	0	0	-	0	0	-	0	0	-	0	-
10°	0	0	0	-	0	0	-	0.7	0.8	-	8.2	-
20°	0	0	0	-	0	1.3	-	5.4	11.8	-	38.7	-
30°	0	0	0.5	-	1.5	5.4	-	18.3	30.3	-	87.8	-
40°	0.05	0.2	1.6	-	5.2	12.2	-	37	61.3	-	158.6	-
50°	0.2	0.8	3.9	-	11.4	23.3	-	66.7	107.2	-	267.6	-
60°	0.7	2	7.9	-	22.2	40.8	-	112	182.7	-	429.6	-
70°	1.8	4	13.9	-	38	65	-	170.8	284.4	-	651.2	-
80°	3.4	6.1	19.2	-	51.6	85.8	-	218.4	386	-	782.6	-
90°	3.8	7	20.8	-	57.3	93	-	237.3	392	-	847.2	-

*Calculations for these flow rates are pending

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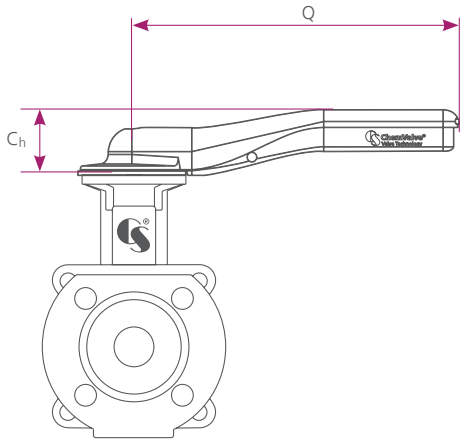
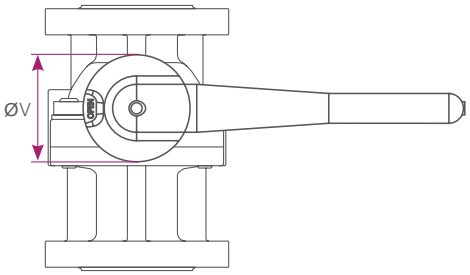
Actuation | Handlever





Material	
Grip	Stainless Steel
Ratchet Disc	Stainless Steel

DN [mm]	15	20	25	32	40	50	65	80	100	125	150	200
DN [inch]	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"
C_h	46	46	46	46	55	55	55	55	55	55	64.5	64.5
Q	232.5	232.5	232.5	232.5	272.5	272.5	350	350	350	350	700	700
V	65	65	65	65	90	90	125	125	125	125	186	186
kg	1	1	1	1	1.5	1.5	2.7	2.7	2.7	2.7	6.6	6.6

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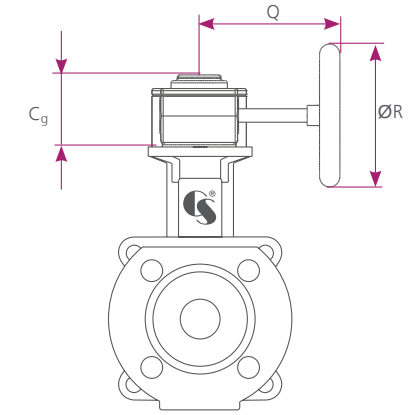
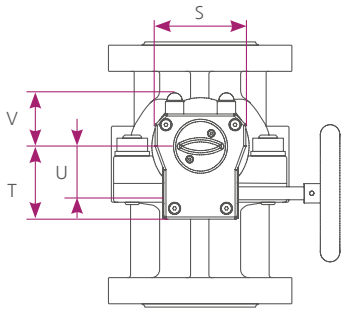
Actuation | Manual Gearbox | Standard

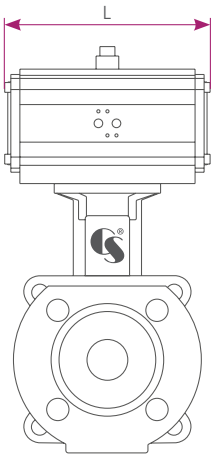


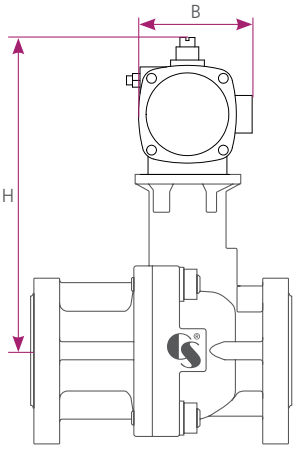


Configuration	
Valve Size	DN025–700
Protection Rating	IP67
Stem Connection	P4

Materials	
Gearcase and Cover	Cast Iron
Quadrant	Ductile Iron
Worm	Carbon Steel
Input Shaft	Carbon Steel
Seals	Nitrile Rubber
Fasteners	Zinc Plated Alloy Steel
Indicator	Stainless Steel
Handwheel | DN025–300	Cast Iron
Handwheel | DN350–700	Carbon Steel

DN [mm]	15	20	25	32	40	50	65	80	100	125	150	200
DN [inch]	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"
C_g	40	40	40	40	40	40	50	50	50	50	60	60
Q	9	9	9	9	9	9	139	139	139	139	212	212
ØR	101	102	103	104	105	106	200	201	202	203	300	301
S	66	66	66	66	66	66	92	92	92	92	115	115
T	52	52	52	52	52	52	63	63	63	63	84	84
U	34	34	34	34	34	34	41	41	41	41	55	55
V	30	30	30	30	30	30	38	38	38	38	48	48
kg	1.3	1.3	1.3	1.3	1.3	1.3	2.4	2.4	2.4	2.4	4.7	4.7





Double-acting pneumatic actuator*						
DN [mm]	DN [inch]	Code	L [mm]	B [mm]	H [mm]	W [kg]
15	½"	ADA40	158	91	217.5	2.1
20	¾"	ADA40	158	91	220	2.1
25	1"	ADA40	158	91	222.5	2.1
32	1¼"	ADA40	158	91	230	2.1
40	1½"	ADA80	177	111	288	3
50	2"	ADA80	177	111	293	3
65	2½"	ADA130	196	122	349	3.8
80	3"	ADA130	196	122	349	3.5
100	4"	ADA300	273	153	396	8.5
125	5"	ADA300	273	153	421	8.5
150	6"	ADA850	372	191.5	481	16.9
200	8"	ADA850	372	191.5	506	16.9

***Control Pressure** 6.0 bar

Single-acting pneumatic actuator*						
DN [mm]	DN [inch]	Code	L [mm]	B [mm]	H [mm]	W [kg]
15	½"	ADA40	158	91	217.5	2.1
20	¾"	ADA40	158	91	220	2.1
25	1"	ADA40	158	91	222.5	2.1
32	1¼"	ADA40	158	91	230	2.1
40	1½"	ADA80	177	111	288	3
50	2"	ADA80	177	111	293	3
65	2½"	ADA130	196	122	349	3.8
80	3"	ADA130	196	122	349	3.5
100	4"	ADA300	273	153	396	8.5
125	5"	ADA300	273	153	421	8.5
150	6"	ADA850	372	191.5	481	16.9
200	8"	ADA850	372	191.5	506	16.9

***Control Pressure** 6.0 bar

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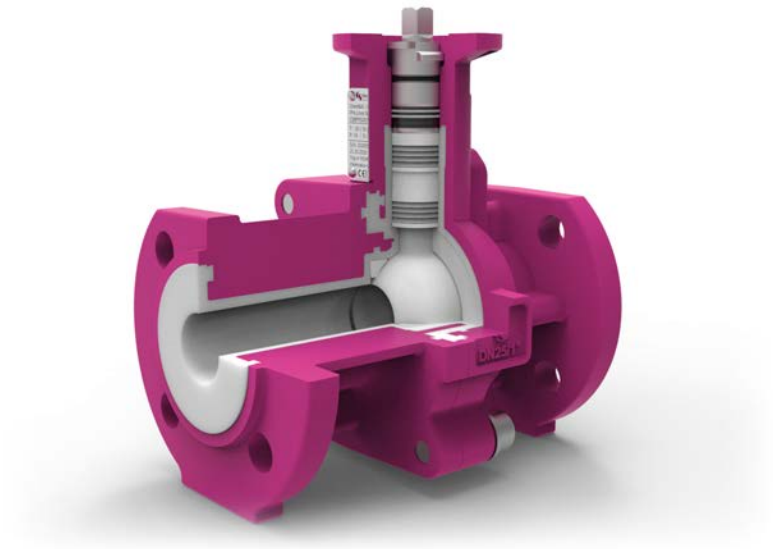
Order Code



Order Code

Code Example: CSBPBSPPSI----25P4F05EEA

Design		Actuation		Ball		Chevrons & Ball Seals		Pressure Package		Body		Size	Stem End		F2F Length		Flange	
Code	Model	Code	Device	Code	Material	Code	Material	Code	Material	Code	Material	mm/ inch	Code	Shape	Code	Standard	Code	Pressure Class
P	Premium	BS	Bare Shaft	P	PFA/ 1.4404	P	PTFE	S	PTFE/ Steel	I	PFA/ 5.3103	015-200 / ½"-8"	P4	Square Parallel	E	EN	E1	PN10
S	Standard	HP	Hand Lever										P2	Double D	A	ANSI	E2	PN16
		GP	Gearbox Premium										D4	Square Diagonal			EA	PN 10-16
		GS	Gearbox Standard														A1	ANSI 150
																	J0	JIS10K

1 Intended Use

The operation of the valve is the responsibility of the system operator. The ChemBall | CSB may only be used within the pressure-temperature limits shown in the Technical Data on page 10. The pressure, temperature and corrosion & media resistance of the valve must be checked for the specific operating conditions!

2 Storage and Transportation

The ChemBall | CSB is delivered ready for use. It must be transported and stored in its original packaging and must be handled with care. The valve must always be protected from dust and moisture.

3 Dismounting an existing valve

Warnings & Precautions

- During installation and maintenance work, suitable protective clothing, including gloves and protective goggles, must be worn.
- Prior to installation and maintenance work, the pipe must be depressurised and emptied. If the valve operates with dangerous flow media, the pipe has to be emptied completely and flushed with an appropriate cleaning fluid. Inappropriate cleaning products can harm the valve!
- If flange connections or locking screws are detached, hot water, steam, caustic fluids or toxic gases can be emitted. Severe scalding, burns and poisoning are possible!
- During operation the valve may become very hot or very cold. Installation and maintenance work should only be carried out if the valve's temperature is the same as the ambient temperature.
- Prior to dismounting the valve, preventative measures against the possible leakage of dangerous media should be made.
- When removing the valve from the pipeline, it is important to ensure that the PFA lining, ball and seals are not damaged. Damaged parts may only be replaced by genuine ChemValve-Schmid AG parts.

3.1 Procedure

Pipeline medium may remain in the dead space of the valve

1. Secure the valve against falling
2. Close the valve
3. Loosen and remove the flange screws
4. Spreads the flanges with an appropriate tool
5. Remove valve from the pipeline

4 Preparing for Installation

Warnings & Precautions

- During installation and maintenance work, suitable protective clothing, including gloves and protective goggles, must be worn.

4.1 Flange and Pipe Connection

The ChemBall | CSB is designed exclusivelyto be mounted between weld neck flanges according to DIN EN 1092-1, Typ 11, PN 10–16 and ASME ANSI B16.5/B16.47 Class 150.

4.2 Valve Orientation and Positioning

In horizontal pipes, the ChemBall | CSB should be installed in a standing position with the actuation device at the top. Ensure that there is enough room around and above the valve to carry out maintenance work.

4.3 Flange Seal

The ChemBall | CSB requires no extra seals when mounted between flat-faced flanges.

4.4 Before Installation

Prior to installation, open and close the valve using a position indicator to test the opening and closing limits and that the movement is smooth.

5 Valve Installation

Warnings & Precautions

- During installation and maintenance work, suitable protective clothing, including gloves and protective goggles, must be worn.
- Prior to installation and maintenance work, the pipe must be depressurised and emptied. If the valve operates with dangerous flow media, the pipe has to be emptied completely and flushed with an appropriate cleaning fluid. Inappropriate cleaning products can harm the valve!
- Under no circumstances should the ChemBall | CSB be installed between flanges which are not parallel. The axes of the pipes and valve must be aligned. Furthermore, it is absolutely prohibited to weld on the pipe while the valve is mounted between the flanges, as this would destroy the liner. Finally, when installed at the end of a piping system, it is mandatory to mount a blind flange to cap the piping system!

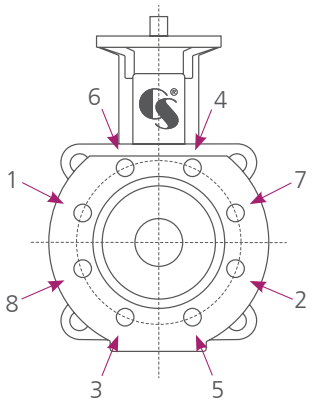
5.1 Procedure

1. Clean flange and sealing surfaces in order to protect the PFA lining.
2. Remove the protective cover from the valve.
3. Place the valve carefully between the two flanges.
4. Centre the valve with lubricated bolts or screws accordingly before hand-tightening.
5. Adjust the position of the valve, pipe and seal to ensure they are fully aligned.
6. Slowly open the valve to the fully-open position.
7. Tighten the screws and nuts according to the following recommended bolting pattern using the bolting torques shown in the following table. Using larger torques can damage the body and liner!

5.2 Bolting

Bolts must be tightened in a star pattern

1. Tighten each bolt to 10% of recommended torque
2. Tighten each bolt to 30% of recommended torque
3. Tighten each bolt to 60% of recommended torque
4. Tighten each bolt to 100% of recommended torque



Recommended Bolting Torques		
DN [mm]	DN [Inch]	Locked Torque [Nm]
15*	½"	-
20*	¾"	-
25	1"	12
32*	1¼"	-
40	1½"	25
50	2"	35
65	2½"	40
80	3"	45
100	4"	50
125	5"	60
150	6"	70
200	8"	85

*Calculations for these bolting torques are pending

5.3 Cleaning

After installation, the ChemBall | CSB must be fully opened and the pipe flushed before closing the valve. Cleaning products and tools must be compatible with the valve. The use of incompatible products or tools can damage the valve.

5.3 Function Test

Prior to active use in the piping system, the ChemBall | CSB should be opened and closed several times to check its freedom of movement.

6 Maintenance

Periodical Servicing

The ChemBall | CSB muss must be regularly checked for faultless operation (at least one every six months). The checks can take place while mounted in the pipeline and in most cases without interrupting operation.

- Check flanges for leaks and tighten bolts if necessary
- Check seal between body parts for leaks and tight the body bolts if necessary
- Check valve for any corrosion or steam damage
- Clean valve and re-paint if necessary
- If possible, open and close the valve, ensuring that the movement is smooth and the maximum opening angle can be reached. The valve must be replaced if the movement is found to be impaired.

7 Decommissioning

Warnings & Precautions

- During installation and maintenance work, suitable protective clothing, including gloves and protective goggles, must be worn.
- Prior to installation and maintenance work, the pipe must be depressurised and emptied. If the valve operates with dangerous flow media, the pipe has to be emptied completely and flushed with an appropriate cleaning fluid. Inappropriate cleaning products can harm the valve!
- If flange connections or locking screws are detached, hot water, steam, caustic fluids or toxic gases can be emitted. Severe scalding, burns and poisoning are possible!
- During operation the valve may become very hot or very cold. Installation and maintenance work should only be carried out if the valve's temperature is the same as the ambient temperature.
- Prior to dismounting the valve, preventative measures against the possible leakage of dangerous media should be made.
- When removing the valve from the pipeline, it is important to ensure that the PFA lining, ball and seals are not damaged. Damaged parts may only be replaced by genuine ChemValve-Schmid AG parts.

8.1 Procedure

Pipeline medium may remain in the dead space of the valve

5. Secure the valve against falling
6. Close the valve
7. Loosen and remove the flange screws
8. Spreads the flanges with an appropriate tool
9. Remove valve from the pipeline

8 Disposal

It is possible that residues can remain inside the valve, which are harmful to human and environment. Therefore the valve has to be treated with adequate precaution. Parts of the valves which are no longer serviceable have to be disposed of professionally and in an environmentally friendly manner.

ChemBall | CSB

Appendix | Declaration of Conformity according to Pressure Equipment Directive 2014/68/EU

Directive	Pressure Equipment Directive 2014/68/EU
Name and Address of the Manufacturer	ChemValve-Schmid AG | Duennernstrasse 540 | 4716 Welschenrohr quality@chemvalve-schmid.com | chemvalve-schmid.com
Pressure Equipment & Object of the Declaration	ChemBall | CSB PFA Lined Ball Valve | DN032–200 | 1¼"–8" | all PS | up to category III
Intended Use	Fluids of groups 2 and 1, excluding unstable gases
Conformity Assessment Procedure	Categories I, II, & III: Annex III, point 11, module H
Applied Technical Specifications	EN 13445-2:2018 | DIN EN 12516-1:2018 DIN EN 12516-2:2015 | EN 12266-1:2012
Notified Body	Swiss Association for Quality and Management Systems (SQS) Identification Number 1250 Bernstrasse 103 | 3052 Zollikofen | Switzerland | www.sqs.ch
Certificate Registration Number	39660
CE Marking	CE 1250

This declaration of conformity is issued under the sole responsibility of ChemValve-Schmid AG. The object of the declaration described above complies with the relevant European Union harmonisation legislation.

Welschenrohr, 26.08.2021

Pascal Willi
Quality Manager