

***Valtek ShearStream SB Control Valves***

Segmented V-port Ball Valves

VLEETB4152-03 11.02



### Primary characteristics

ShearStream SB is a ball sector valve with metal-to-metal or metal-to-PTFE seating. The ShearStream SB combines the best control characteristics of the ball valve and the butterfly valve. It can be used both as a control valve and as a shut-off valve. It is available as standard in stainless steel and carbon steel.

The valve has:

- a one-piece, leak-proof stainless steel body, with face-to-face lengths in acc. with IEC standards
- a ball sector with top and bottom bearings for low operating torque, so that low-torque actuators can be used
- a V-shaped sector that provides accurate control over a wide range, even at low flow rates and if used for viscous media with high concentrations of solid particles
- a spherical area of the ball sector which, with PTFE-seat gives tight closing. The Stellite seating, ensures excellent tightness at all differential pressures. The maximum leakage in the direction of flow is less than  $5 \times 10^{-6}$  of the Kv value in this case.
- PTFE lined bearings.
- Stem sealing set of 5 V-rings.
- Stem sealing according to ISO 15848-1.
- The standard Stellite seat can easily be converted to PTFE after turning the ball sector by 180 degrees, without the need to dismantle the valve.
- Flowserve standard for mounting the actuator, which simplifies installation and results in a compact valve/actuator unit.

**CE-marked** according to Pressure Equipment Directive (PED 97/23/EG) module H, category III.  
For module H1, category IV contact Flowserve Linköping.

### Applications

ShearStream SB can be used both as a control valve and as a shut-off valve, in a wide variety of applications and in different operating modes. The valve represents a concrete result of our product philosophy which is focused on functionality, high quality and low life cycle costs, and is based on concentrating our range to a limited number of valve types, but all of them suitable for a wide variety of applications.

Valtek ShearStream is recommended for applications in the following branches:

- Chemical and Petro Chemical
- Oil and gas

The excellent control characteristics of ShearStream SB are particularly beneficial under severe control conditions, in difficult media and under demanding pressure conditions in the process industry, such as:

- if the media contains solid particles
- if a wide control range is required
- in control applications involving high pressure drops
- if cavitation occurs

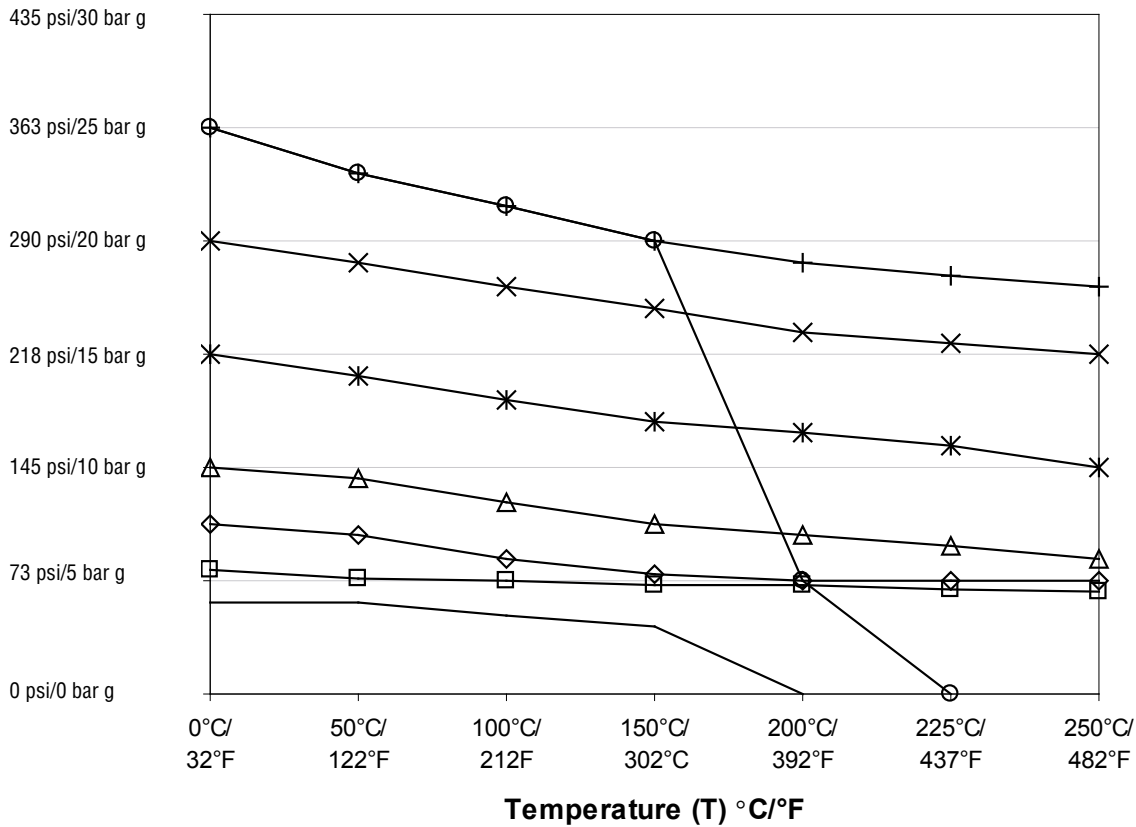
### Technical specification for standard design

Material:	EN 1.4408/CF8M EN 1.0619/WCB
Size range:	DN 25-500, 1-20"
Pressure ratings:	PN 10, 16, 25, 40 ANSI Class 150 and 300
Max. differential pressures:	
Valve closed	25 bar DN 25-400 20 bar DN 500
Control service	25 bar DN 25-80 15 bar DN 100-150 10 bar DN 200-250 8 bar DN 300-400 6 bar DN 500 See also page 3
Face-to-face lengths:	As per IEC 60534-3-2 ANSI/ISA-75.08.02
Valve design:	ANSI B 16.34, EN 12516
Installation methods:	Wafer type (DN 25-200) Flanged (DN 25-500)
Temperature range:	CF8M/1.4408: -30 - 250°C WCB/1.0619: -29 - 250°C
Test pressure:	1.5 x PN with valve open IEC 60534-4 Class IV-S1 with valve closed
Sealing class:	Testing medium is water. PTFE-seat EN 12266-1 Rate A Metal seat IEC 60534-4 Class IV-S1.

At requests for test fluid Air, contact consult your Flowserve representative.

**Figure 1. Max DP for control and shut off**

**Pressure (P)**



- +— Max dp closed valve DN25-400/1"-16"
- x— Max dp closed valve DN500/20"
- \*— Max dp control DN100-150/4"-6"
- △— Max dp control DN200-250/8"-10"
- ◇— Max dp control DN300-400/12"-16"
- Max dp control DN500/20"
- — — Max dp control PTFE Seat
- Max dp closed valve PTFE Seat

### Flow capacities and characteristics ShearStream SB (Table 1)

DN/ Norm. Bore	Cv at an opening angle of								
	15°	20°	30°	40°	50°	60°	70°	80°	90° *
25/05	0,05	0,1	0,28	0,46	0,65	0,87	1,09	1,38	1,76
25/10	0,05	0,12	0,35	0,81	1,39	2,09	3,02	4,06	6
25/15	0,58	0,81	1,39	2,32	3,83	5,1	6,5	9,63	13
25/20	0,23	0,35	1,04	2,7	4,8	8,2	11,6	17,4	26
40	1,16	2,44	5,9	11	17,4	27	38	61	75
50	1,86	3,71	9,5	17,4	29	44	61	99	119
65	2,9	4,6	9,3	20	31	51	75	114	168
80	4,6	9,3	21	37	60	90	128	174	284
100	10	17	36	61	96	144	209	295	481
150	29	46	90	157	246	360	516	713	1125
200	35	58	128	232	360	545	777	1067	1450
250	38	93	232	391	667	963	1334	1810	2877
300	101	201	452	760	1154	1636	2239	2993	4594
350	146	290	655	1096	1659	2361	3225	4304	6618
400	198	394	887	1491	2262	3213	4391	5858	9007
500	238	505	1148	1984	3016	4280	5852	7807	12006

$K_v = C_v / 1.16$

\* At demand for larger max Cv contact Flowserve.

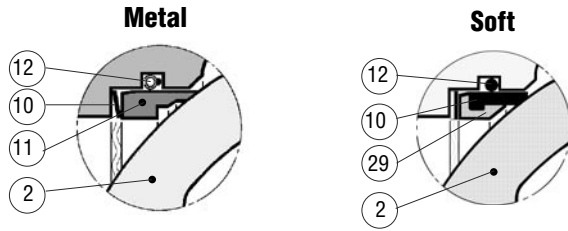
### Flow capacities and characteristics ShearStream SB with Z-trim (Table 2)

DN/ Norm. Bore	Cv at an opening angle of								
	15°	20°	30°	40°	50°	60°	70°	80°	90°
40	0,29	0,57	2,8	7,4	13	19	26	35	46
50	0,58	1,16	5,8	15	26	38	52	71	93
65	0,81	1,74	8,58	22	38	57	78	106	138
80	2,32	5,8	16,5	43	72	108	147	201	263
100	4,6	17	36	66	113	168	230	311	408
150	11,6	35	70	152	256	385	524	711	933
200	21	51	115	210	356	534	729	987	1295
250	38	93	209	380	644	966	1318	1786	2343
300	46	147	333	607	1028	1543	2104	2852	3741
350	67	213	480	878	1481	2223	3031	4110	5391
400	90	290	653	1191	2016	3025	4126	5594	7337
500	138	445	1001	1827	3092	4639	6328	8579	11252

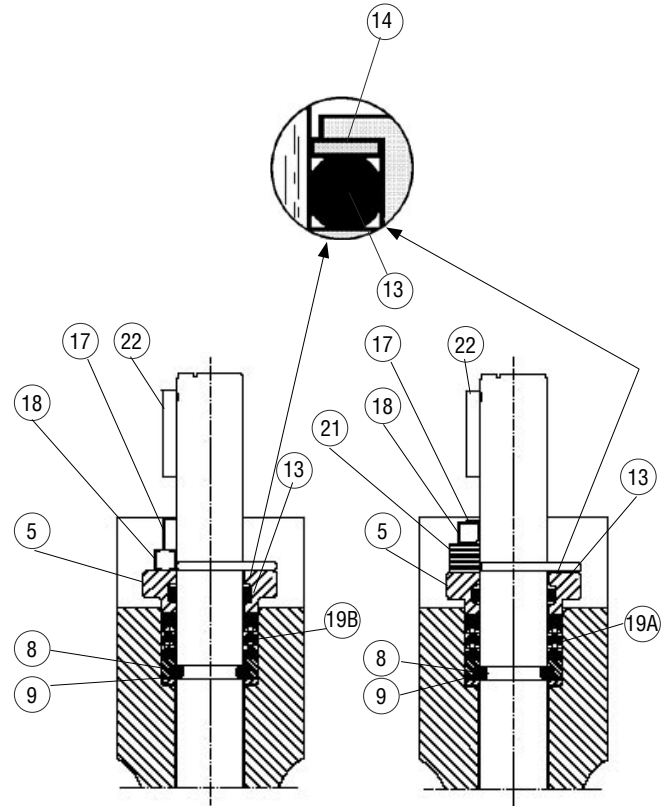
$K_v = C_v / 1.16$

\* At demand for larger max Cv contact Flowserve.

**Seat ring**



**Stem sealing**

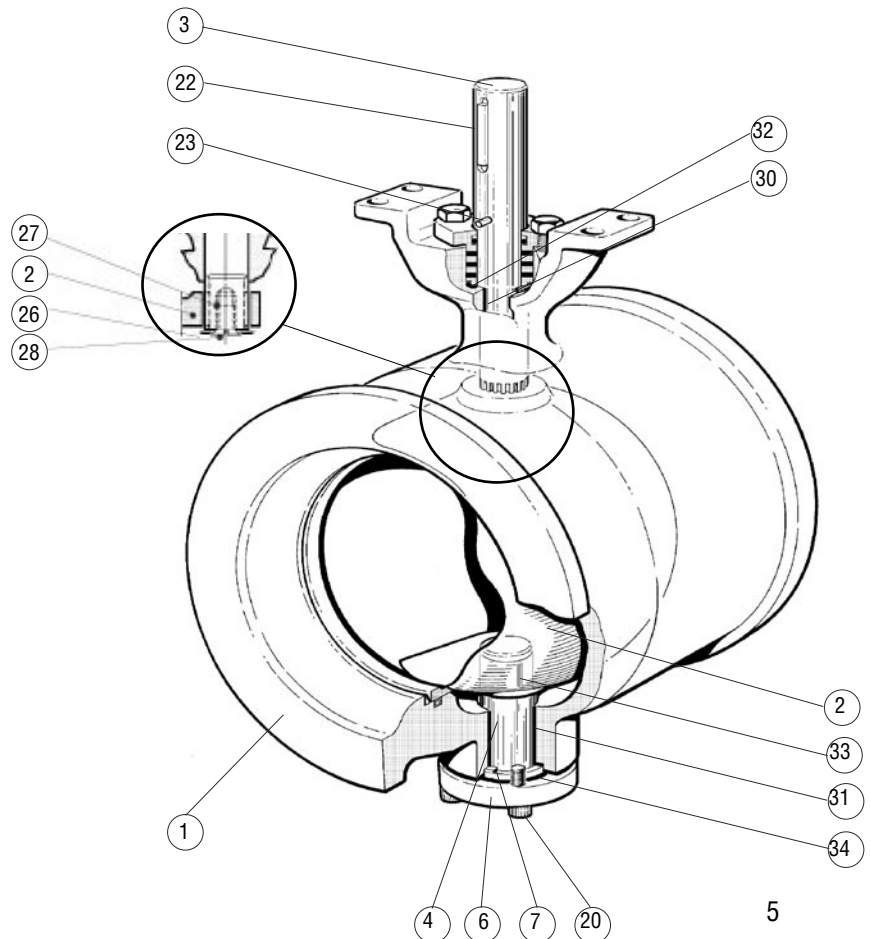


**(Table 3)**

Item	Qty	Part	Material
1	1	Body	EN1.4408/CF8M
1	1	Body	EN1.0619/WCB
2	1	Ball sector	EN1.4408/CF8M HCP
2	1	Ball sector	EN1.4408/CF8M
3	1	Stem, upper	EN1.4460 *
4	1	Stem, lower	EN1.4460 *
5	1	Gland cover	EN1.4408/CF8M
6	1	Bottom cover	EN1.4408/CF8M
7	1	Gasket	Graphite
8	1	Locking segment	EN1.4436 **
9	1	Bearing seat	EN1.4460 *
10	1	Wave spring	EN1.4436 **
11	1	Seat ring	Alloy 6
12	1	Seat seal	PTFE
13	1	O-ring	FPM
14	1	Backing ring	PTFE
17	2	Screw	A4
18	2	Nut	A4
19A	1	Boxpacking Safeguard	V-ring PTFE liveloaded
19B	1	Boxpacking Zebra-CL	V-ring PTFE
20	4	Bolt	A4
21	1	Cap spring	EN1.4310
22	1	Key	A4
23	1	Indicating pin	SS
26	1	Washer	A4
27	1	Thread insert	Stainless
28	1	Bolt	A4
29	1	Seat ring/Back-up ring	PTFE/SS
30	1	Stem bearing	PTFE lined
31	1	Stem bearing	PTFE lined
32	1	Washer	A4
33	1	Cylindrical pin	EN1.4460 *
34	1	Washer	PTFE lined

\* EN 1.4460 is approximately equal to ASTM 326.

\*\* EN 1.4436 is approximately equivalent to ASTM 316



### Operating torque, Nm (Table 4)

DN	Differential pressure bar				
	3	10	15	20	25
25	9	14	19	23	27
40	10	15	23	29	34
50	12	21	28	33	40
65	21	37	47	62	72
80	24	47	62	82	97
100	32	62	87	112	137
150	91	171	226	286	341
200	158	323	438	553	668
250	271	561	771	971	1181
300	454	910	1234	1560	1895
350	665	1360	1960	2355	2850
400	930	1865	2670	3205	3880
500	1155	2195	3025	3825	-

### Operating torque

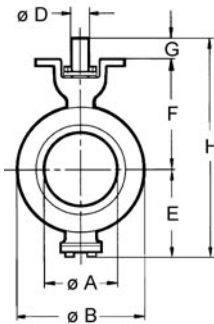
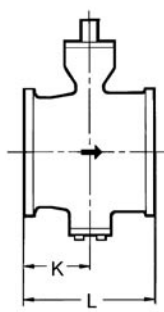
The minimum design torque for selecting the actuator is stated in the table for a differential pressure of 3 bar. The specified torques are for clean media. For steam increases the torque in above table with 20%. For other media containing solids consult your Flowserve representative.

### Sizing of control valves

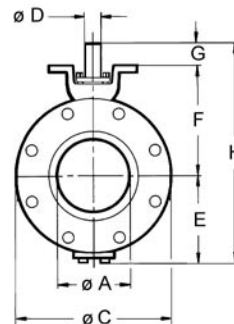
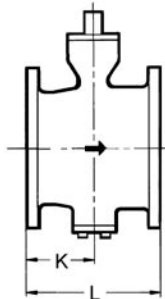
We have a valve sizing tool named Performance. This program can be ordered through your Flowserve representative. The program is based on calculating formula according to the standards IEC 60534 and ISA S75.01.

### Dimension and mass

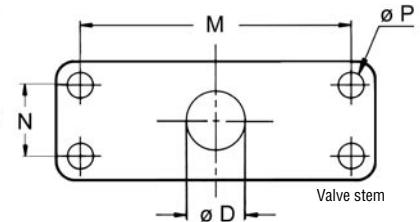
Wafer version



Flanged version



Actuator mounting



(Table 5)

DN	A	B	C <sup>1)</sup>	D	E	F	G	H	K	L	M	N	P	Mass, kg	
														Wafer	Flanged <sup>1)</sup>
25 <sup>3)</sup>	20	65	<sup>1)</sup>	20	60	120	43	225	51	102	115	30	11	4	7,2
40	32	86	<sup>1)</sup>	20	75	125	43	245	57	114	115	30	11	5,5	9,8
50	40	105	<sup>1)</sup>	20	90	131	43	265	62	124	115	30	11	6,5	13,0
65	50	122	<sup>1)</sup>	20	101	139	43	283	68	135	115	30	11	9	15,5
80	70	132	<sup>1)</sup>	20	110	145	43	300	83	165	115	30	11	11,5	18
100	85	162	<sup>1)</sup>	20	120	167	43	332	97	194	115	30	11	15,5	25
150	130	218	<sup>1)</sup>	25	155	195	50	400	115	229	115	30	11	26	41
200	170	273	<sup>1)</sup>	30	185	236	59	480	130	243	160	40	14	42	64
250	208	-	<sup>1)</sup>	35	230	295	65	590	155	297	160	40	14	-	100
300	258	-	<sup>1)</sup>	40	260	320	80	660	183	338	214	60	18	-	145
350	282	-	<sup>1)</sup>	50	290	360	93	742	200	400 <sup>4)</sup>	214	60	18	-	174
400	316	-	<sup>1)</sup>	50	308	383	93	784	224	400	214	60	18	-	211
500	400	-	<sup>1)</sup>	50	371	460	93	942	288	508	214	60	18	-	348

1) See respectively flange diameter according to Fk 90.20

2) PN 10

3) For DN 25/20, 25/15, 25/10 and 25/05

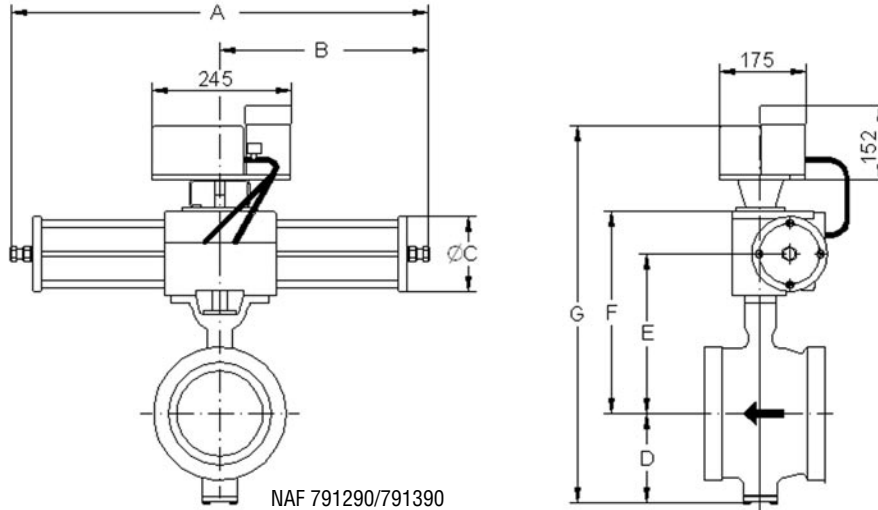
4) New face to face from variant 87xxEF

All dimensions in mm

## Actuators

ShearStream SB is available with pneumatic or electric actuators and accessories.  
Use the following tables for selecting the standard pneumatic actuators.

If other pneumatic or electric actuators are required, consult your Flowserve representative.



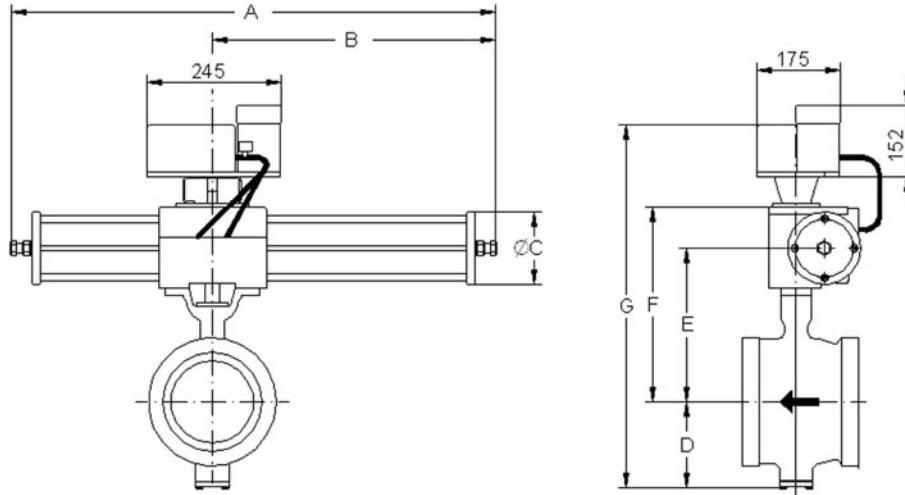
NAF 791290/791390

## ShearStream SB valves with pneumatic actuators (Table 6)

The below stated dP apply for clean media type water 20 °C.  
For other media contact Flowserve, see also page 6.

Size DN	Max dP bar at supply of			Part No.	Dimensions, mm								Mass kg <sup>2)</sup>
	4 bar	5 bar	6 bar		A	B	C	D	E	F	G 1)	H	
<b>Double-acting acc. to Fk 74.59</b>													
25	25	25	25	791390-0220	370	185	80	60	171	222	377	31	8
40	25	25	25	-0220	370	185	80	75	176	227	397	31	10
50	25	25	25	-0220	370	185	80	90	182	233	418	31	11
65	25	25	25	-0220	370	185	80	101	190	241	437	31	13
80	20	25	25	-0220	370	185	80	110	196	247	452	31	16
100	14	18	22	-0220	370	185	80	120	218	269	484	31	20
100	25	25	25	791290-1220	490	245	100	120	223	279	494	40	22
150	-	4	7	791390-0225	370	185	80	155	246	297	547	31	30
150	11	14	18	791290-1225	490	245	100	155	251	307	557	40	32
150	25	25	25	-2225	700	350	145	155	270	343	593	63	43
200	11	14	18	-2130	700	350	145	185	311	384	664	63	59
200	25	25	25	-2230	700	350	145	185	311	384	664	63	59
250	5	7	9	-2135	700	350	145	230	370	443	768	63	117
250	13	17	20	-2235	700	350	145	230	370	443	768	63	117
250	22	25	25	-3135	820	410	200	230	401	493	818	75	129
300	-	-	4	-2140	700	350	145	260	395	468	823	63	162
300	7	9	11	-2240	700	350	145	260	395	468	823	63	162
300	25	25	25	-3240	820	410	200	260	420	512	867	75	174
350	17	22	25	-3250	820	410	200	290	460	552	937	75	219
350	25	25	25	791390-4250	1110	555	260	290	488	591	976	100	219
400	11	15	20	791290-3250	820	410	200	308	483	575	978	75	240
400	25	25	25	791390-4250	1110	555	260	308	511	614	1017	100	256
500	8	11	13	791290-3250	820	410	200	371	560	652	1118	75	377
500	20	20	20	791390-4250	1110	555	260	371	588	691	1157	100	393

1) Including Flowserve XL90 valve positioner  
2) DN 25—200 Wafer version  
DN 250—500 Flanged version, PN 10.



NAF 791292/791392

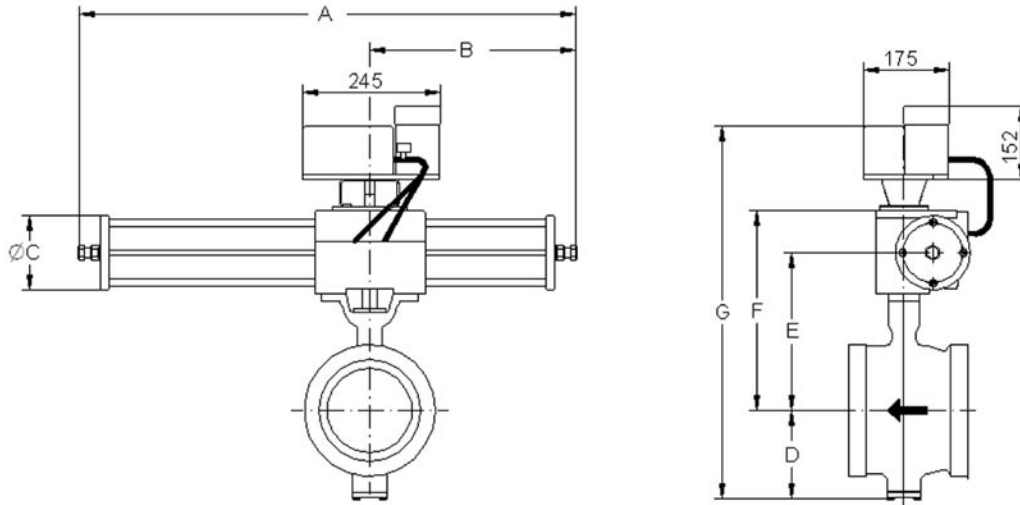
**ShearStream SB valves with pneumatic actuators (Table 7)**

 The below stated dP apply for clean media type water 20 °C.  
 For other media contact Flowserve, see also page 6.

Size DN	Max. dp at supply of			Part No.	Dimensions, mm								Mass kg <sup>2)</sup>
	4 bar	5 bar	6 bar		A	B	C	D	E	F	G <sup>1)</sup>	H	
<b>Single-acting, spring to close acc. to Fk 74.59</b>													
25	25	25	25	791392-0220	455	270	80	60	171	222	377	31	9
40	25	25	25	-0220	455	270	80	75	176	227	397	31	11
40	25	25	25	791292-1220	635	390	100	75	181	237	407	40	15
50	18	25	25	791392-0220	455	270	80	90	182	233	418	31	12
50	25	25	25	791292-1220	635	390	100	90	187	243	428	40	16
65	8	21	25	791392-0220	455	270	80	101	190	241	437	31	14
65	25	25	25	791292-1220	635	390	100	101	195	251	447	40	18
80	4	16	20	791392-0220	455	270	80	110	196	247	452	31	17
80	22	25	25	791292-1220	635	390	100	110	201	257	462	40	21
100	-	10	14	791392-0220	455	270	80	120	218	269	484	31	21
100	15	23	25	791292-1220	635	390	100	120	223	279	494	40	25
150	4	7	11	-1225	635	390	100	155	251	307	557	40	35
150	25	25	25	-2225	890	540	145	155	270	343	593	63	49
200	13	22	25	-2230	890	540	145	185	311	384	664	63	65
200	25	25	25	-3230	1050	640	200	185	336	428	708	75	85
250	6	10	14	-2235	890	540	145	230	370	443	768	63	123
250	24	25	25	-3235	1050	640	200	230	401	493	818	75	143
300	-	5	7	-2240	890	540	145	260	395	468	823	63	168
300	13	22	25	-3240	1050	640	200	260	420	512	867	75	188
350	6	13	18	-3250	1050	640	200	290	460	552	937	75	217
350	18	25	25	791392-4250	1520	965	260	290	488	591	976	100	274
400	4	8	12	791292-3250	1050	640	200	308	483	575	978	75	254
400	12	21	24	791392-4250	1520	965	260	308	511	614	1017	100	311
400	25	25	25	-5250	2210	1370	395	308	565	713	1116	150	696
500	-	6	10	791292-3250	1050	640	200	371	560	652	1118	75	391
500	9	16	20	791392-4250	1520	965	260	371	588	691	1157	100	448
500	20	20	20	791392-5250	2210	1370	395	371	642	790	1256	150	833

1) Including Flowserve XL90 valve positioner  
 2) DN 25—200 Wafer version  
 DN 250—500 Flanged version, PN 10.





NAF 791294/791394

**ShearStream SB valves with pneumatic actuators (Table 8)**

 The below stated dP apply for clean media type water 20 °C.  
 For other media contact Flowserve, see also page 6.

Size DN	Max. dp at supply of			Part No.	Dimensions, mm								Mass kg <sup>2)</sup>
	4 bar	5 bar	6 bar		A	B	C	D	E	F	G <sup>1)</sup>	H	
<b>Single-acting, spring to open acc. to Fk 74.59</b>													
25	20	25	25	791394-0220	455	270	80	60	171	222	377	31	9
25	25	25	25	791294-1220	635	390	100	60	176	232	387	40	13
40	14	25	25	791394-0220	455	270	80	75	176	227	397	31	11
40	25	25	25	791294-1220	635	390	100	75	181	237	407	40	15
50	11	25	25	791394-0220	455	270	80	90	182	233	418	31	12
50	25	25	25	791294-1220	635	390	100	90	187	243	428	40	16
65	4	17	23	791394-0220	455	270	80	101	190	241	437	31	14
65	14	25	25	791294-1220	635	390	100	101	195	251	447	40	18
80	-	11	11	791394-0220	455	270	80	110	196	247	452	31	17
80	9	25	25	791294-1220	635	390	100	110	201	257	462	40	21
100	6	18	24	-1220	635	390	100	120	223	279	494	40	25
100	25	25	25	-2220	890	540	145	120	242	315	530	63	39
150	-	5	8	-1225	635	390	100	155	251	307	557	40	35
150	13	25	25	-2225	890	540	145	155	270	343	593	63	49
200	5	17	22	-2230	890	540	145	185	311	384	664	63	65
200	21	25	25	-3230	1050	640	200	185	336	428	708	75	85
250	-	8	11	-2235	890	540	145	230	370	443	768	63	123
250	11	25	25	-3235	1050	640	200	230	401	493	818	75	143
300	-	4	6	-2240	890	540	145	260	395	468	823	63	168
300	6	18	18	-3240	1050	640	200	260	420	512	867	75	188
300	15	25	25	791394-4240	1520	965	260	260	448	551	906	100	245
350	-	6	11	791294-3250	1050	640	200	290	460	552	937	75	217
350	5	15	25	791394-4250	1520	965	260	290	488	591	976	100	274
350	25	25	25	-5250	2210	1370	395	290	542	690	1075	150	659
400	-	10	18	-4250	1520	965	260	308	511	614	1017	100	311
400	17	25	25	-5250	2210	1370	395	308	565	713	1116	150	696
500	-	8	15	-4250	1520	965	260	371	588	691	1157	100	448
500	14	25	25	-5250	2210	1370	395	371	642	790	1256	150	833

1) Including Flowserve XL90 valve positioner  
 2) DN 25—200 Wafer version  
 DN 250—500 Flanged version, PN 10.

### Accessories

Flowserve’s pneumatic actuator Turnex, see flowserve.com.

### Valve positioner

Digital valve positioner, see flowserve.com.

### Terminal box

The actuator can be equipped with a junction box (part No. 349 20 930) of cast aluminium containing terminal blocks for connecting the solenoid valve and position sensors.

### Fugitive emissions Approval, EN ISO15848-1

Flowserve has certified some of our valves with a new stem sealing, according to EN ISO 15848-1 (this new standard will replace the old TA-luft standard). The packing box solution is with a V-ring set. The new packing set is live loaded with spring cups and equipped with an o-ring above the stem packing. Following valves have been certified in the first test.

Classification according to test results is  
**ISO-FE BH - CC1 - SSA0 - t200°C PN25**

#### Classification classes:

BH Tightness class B, test fluid Helium  
 CC1 20000 mechanical cycles, 2 thermal cycles.  
 SSA0 Without shaft seal adjustments during test  
 T200°C Temperature Class  
 PN25 Endurance Class.

### Certified Products

Wafer:  
 DN80-DN200  
 Flanged :  
 PN10 DN200 to DN300  
 PN16 DN80 to DN300  
 ANSI150 1” to 12”  
 PN25 DN200 to DN300

For other sizes and pressure classes contact Flowserve.

**Product code:** i.g 8780EB-0100-BABABA

Code	Seat sealing	Stem sealing
<b>B</b>	PTFE	Safeguard

### Other versions

#### - Other material


CG8M	code 87E...
CF3M	code 87G...
CG3M	code 87F...
Duplex EN 1.4470	code 87D...
254 SMO	code 87S...

#### - Degreased version for oxygen

Before assembly, all valve parts are degreased in trichlorethylene vapour. The valve is assembled and packaged so that no oil or grease will enter the valve.

*Product code D*

#### - Explosive atmosphere according to Direktive 94/9/EC ATEX

ShearStream SB is certified according to ATEX 94/9/EC  II 2 G/D c

*Product code: XA*

#### - The valve design meets the fire-safe requirements according to BS6755 part 2.

Contact Flowserve for further information

**Product code ShearStream SB**

Example:

**87 8 0 E B -0100 - B A B A A A D**  
**Code 1 2 3 4 5 6 7 8 9 10 11 12 (13)**

**1. Valve type**

- 87** ShearStream SB  
**Z-87** ShearStream SB with Z-trim option <sup>5)</sup>

**2. Material <sup>1)</sup>**

- 6** 1.0619/WCB  
**8** 1.4408/CF8M

**3. Pressure rating**
**Wafer version <sup>2)</sup>**

- | EN                  | ANSI                                |
|---------------------|-------------------------------------|
| <b>0</b> DN 150-200 | Size 6"-8" PN 10-16/<br>ANSI150     |
| DN 80-100           | Size 3"-4" PN 10-25/<br>ANSI150     |
| DN 25-65            | Size 1"-2" PN 10-40/<br>ANSI150-300 |

**Flanged version**

- |                   |   |
|-------------------|---|
| <b>2</b> PN 10    | DN 200-500 <sup>3)</sup><br>(DN 80-150<br>choose PN 16) |
| <b>3</b> PN 16    | DN 80-500 <sup>3)</sup>                                 |
| <b>4</b> ANSI 150 | Size 1"-20" <sup>4)</sup>                               |
| <b>5</b> PN 25    | DN 200-400 <sup>3)</sup><br>(DN 80-150<br>choose PN 40) |
| <b>6</b> PN 40    | DN 25-400   |
| <b>7</b> ANSI 300 | Size 1"-16" <sup>4)</sup>                               |

**4. Stem bearing**

- | Body                        | Stem |
|-----------------------------|------|
| <b>E</b> PTFE lined bearing | -    |

**5. Body type**

- B** Wafer  
**F** Flanged

1) Other material see page 10

2) The valve can be mounted between all flanges mentioned for respectively sizes. The mark plate on the EN valves will include the highest pressure ratings in both PN and ANSI together with dimensions in both DN and size. Leakage test according to page 1.  
The ANSI valves are marked with the ANSI pressure class and size and are leakage tested according to ISA-75.19.01.

3) Size DN 25-65 have the same flange dimension in PN 10, 16, 25 and 40. Choose PN 40 for these valves.

4) Not available in size 2,5".

5) Trim available in DN 50 to 500

**6.**

Size EN wafer and flanged version DN	ANSI wafer and flanged version Size
<b>2505</b> 25/5	<b>1T05</b> 0.20"
<b>2510</b> 25/10	<b>1T10</b> 0.39"
<b>2515</b> 25/15	<b>1T15</b> 0.59"
<b>2520</b> 25/20	<b>1T20</b> 0.75"
<b>0040</b> 40	<b>01.5</b> 1,5"
<b>0050</b> 50	<b>0002</b> 2"
<b>0065</b> 65	- -
<b>0080</b> 80	<b>0003</b> 3"
<b>0100</b> 100	<b>0004</b> 4"
<b>0150</b> 150	<b>0006</b> 6"
<b>0200</b> 200	<b>0008</b> 8"
<b>0250</b> 250	<b>0010</b> 10"
<b>0300</b> 300	<b>0012</b> 12"
<b>0350</b> 350	<b>0014</b> 14"
<b>0400</b> 400	<b>0016</b> 16"
<b>0500</b> 500	<b>0020</b> 20"

**7.**

- Seat**  
**A** PTFE 10% Carbonfilled  
**B** Alloy 6

**8. Ball sector material**

- A** 1.4408/CF8M

**9. Ball sector surface**

- A** None  
**B** Hardchrome plated

**10. Seat seal**

- A** PTFE

**11. Stem seal**

- A** Zebra-CL™  
**B** Safeguard  
**G** Graphite box

**12. Stem material**

- A** 1.4460  
**B** UNS 17400/17-4PH NACE

**13. Other versions**

- D** Degreased version for oxygen  
**XA** ATEX certified

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