



INSTALLATION & MAINTENANCE INSTRUCTIONS - ORIGINAL VERSION

AVK BUTTERFLY VALVES, CENTRIC WITH LOOSE LINER

SERIES 820

1. INTRODUCTION

To guarantee the benefits of the butterfly valves, proper procedures and compliance with this installation instruction are essential. The installation must be carried out according to good installation practise and only by qualified personnel. AVK reserves the right to decline responsibility for damage or failure caused by non-compliance with the recommendations in this instruction.

Please note that fluid residues inside the butterfly valve may be dangerous to people and to the environment. The butterfly valve must be handled with the necessary precaution and must be carefully cleaned prior to maintenance.

Any kind of maintenance is performed on the user's own risk and must be executed by trained staff only. Only original spare parts must be used.

Dimensions, materials and application of the butterfly valves are according to series 820 datasheets.



2. MARKING



Label:

- Manufacturer
- Product specification
- Item number
- Material specification
- Internal order number

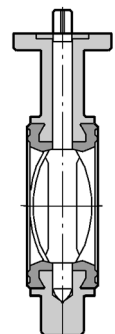
3. STORAGE

AVK butterfly valves must always be stored free from dust and humidity.

The valve is supplied with the disc slightly open and must remain so until the installation is completed (fig. 1).

Butterfly valves supplied with a single acting spring closing pneumatic actuator must be stored with disassembled actuator to avoid a permanent deformation of the liner. The actuator is mounted after installation of the valve in the piping.

FIG. 1



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4. PRECAUTIONS TO BE TAKEN PRIOR TO INSTALLATION

Please make sure that the valve is suitable for the prevailing service conditions. The plant manager is responsible for using the right valve (with regards to corrosion resistance, pressure, temperature, etc.) for the actual fluid. Contact your supplier or AVK if you need any assistance.

Please consider that turbulence (i.e. created by a pipe bend) generates hydro dynamic forces which increases the operating torque of the valve. We recommend to install the valve minimum 5 x DN after pipe fittings.

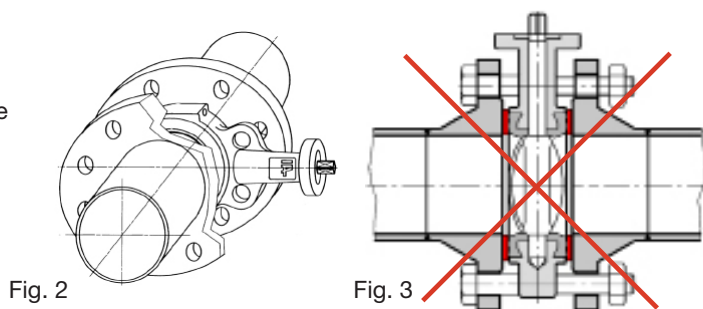
5. CHECK BEFORE INSTALLATION

Positioning:

In horizontal pipelines, we recommend that the valve is installed with its shaft in a horizontal position. Please ensure that the lower edge of the disc opens with the direction of the flow. This prevents residues and contamination in the shaft sealing area (fig. 2).

Gaskets:

Never use gaskets nor grease (fig. 3).



6. INSTALLATION

The flange face surfaces must be smooth and clean. Rust, welding slags, remains of paint, dirt etc. must be removed in order to prevent damage of the valve gasket.

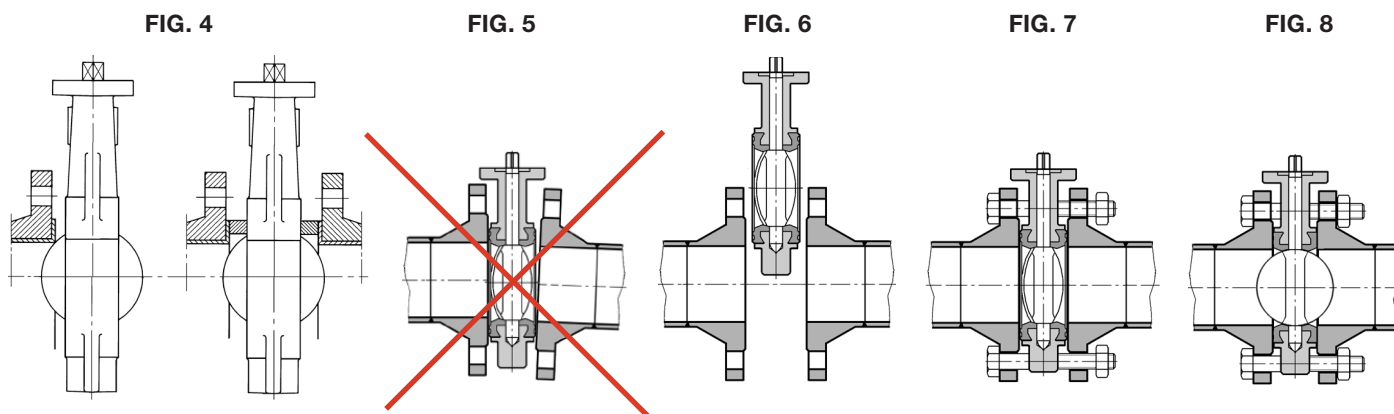
The wafer butterfly valves are suitable for installation between standard DIN PN10/16 or ANSI150 flanges. For installation of valves between flanges of other standards, please consult AVK or its authorised distributors.

The valve should not be mounted directly in pipes, where the actual bore dimension is smaller than the nominal bore dimension of the valve. In such cases, spacer rings should be fitted between flanges and valve to prevent damage to the disc when opening (fig.4). The valve should never be installed between flanges which are not parallel to each other. Make sure that pipes and valves are installed concentric as the disc of a misaligned valve may be damaged (fig.5). Furthermore, it is absolutely inadmissible to carry out any welding on the piping while the valve is mounted between the flanges. This would damage the liner of the valve.

For easy installation the flanges have to be positioned properly and the disc must be partially open (fig. 6). If the flanges are not positioned properly the liner may be damaged or rolled outside the body flanges.

Set all stay-bolts by keeping the disc slightly open and do not tighten the nuts (fig. 7). If the stay-bolts are tightened when the disc is closed, the liner will be compressed in a wrong position. This will result in a high closing torque and leakage.

Open the disc completely (fig. 8). Ensure that the piping is aligned. Tighten diagonally opposite the nuts.



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7. FUNCTION TEST

We recommend to make a function test before use. Therefore, the valve must be opened and closed at least once in order to check that the disc does not touch the flanges and that the valve is tight through the passage.
If a pressure test of the complete piping system is being carried out, it is very important that the testing pressure is not higher than the nominal pressure of the valve. An overpressure may damage the valve.

8. CLEANING OF THE PIPING

When cleaning the piping system, it is very important to ensure that the cleaning products and devices are harmless to the valve.

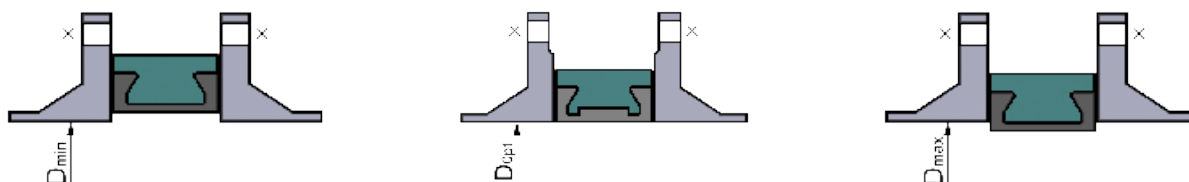
9. FLANGE INSIDE DIAMETER

The butterfly valve must be mounted between flanges without gasket. It has bidirectional tightness. It is centered by use of stay-bolts or screws. The diameter of the flange should be in accordance with the stated values "Dopt", "Dmin" and "Dmax".

Dmin: Minimum diameter of the flange enabling move of the disc (in case of a perfectly centered valve)

Dopt: Diameter of the flange for optimal mounting

Dmax: Maximum diameter of the flange



DN	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	1400	1600
Dmin	19	32	35	53	74	93	119	147	198	247	297	340	384	425	490	585	680	790	880	980	1175	1348	1560
Dopt	34	42	53	68	83	103	128	153	202	253	303	345	395	453	505	605	696	810	900	997	1195	1387	1602
Dmax	47	57	68	87	104	126	154	174	226	277	328	370	421	462	514	617	715	817	918	1019	1225	1430	1640

10. INSTALLATION END OF LINE

When mounting the valve at the end of a line, please note:

Valve type: Lug type possible without counter flange
U-section type only with counter flange

Medium: Only for liquids, 10÷30°C

Max. working pressure: DN 25-200 10 bar

(with 16 bar disc): DN 250-600 6 bar
DN 700-1400 2,5 bar

- no water hammer !!!

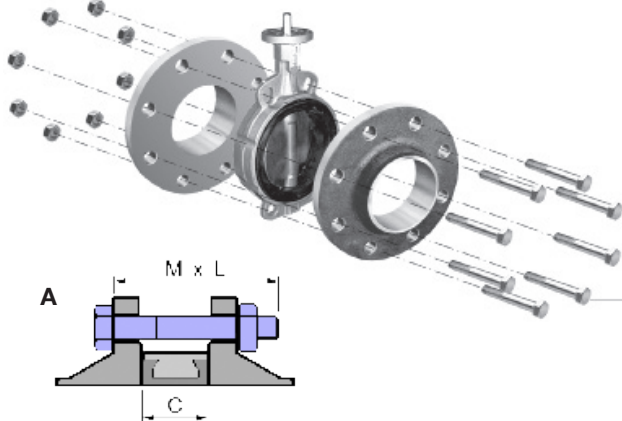
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11. BOLTING

Wafer and U-section body DN 25 - 400

A BOLT WITH NUT

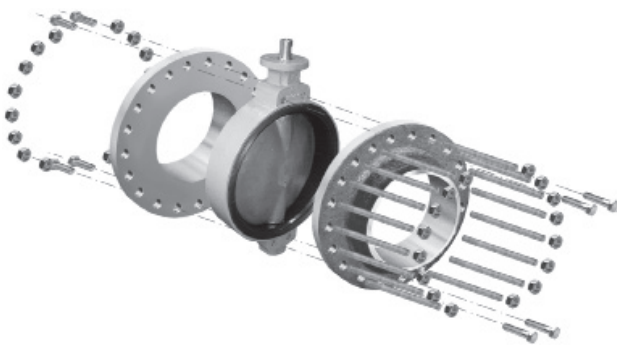


DN	C	PN 6		PN 10		PN 16	
		n	M x L	n	M x L	n	M x L
25	30	4	M10x 80	4	M12x 90	4	M12x 90
32	30	4	M12x 80	4	M16x100	4	M16x100
40	33	4	M12x 90	4	M16x100	4	M16x100
50	43	4	M12x100	4	M16x110	4	M16x110
65	46	4	M12x100	4	M16x110	8(4)	M16x110
80	46	4	M16x110	8	M16x120	8	M16x120
100	52	4	M16x120	8	M16x120	8	M16x120
125	56	8	M16x120	8	M16x130	8	M16x130
150	56	8	M16x120	8	M20x140	8	M20x140
200	60	8	M16x130	8	M20x150	12	M20x150
250	68	12	M16x140	12	M20x160	12	M24x170
300	78	12	M20x160	12	M20x170	12	M24x180
350	78	12	M20x160	16	M20x170	16	M24x190
400	102	16	M20x190	16	M24x200	16	M27x220

n = number of bolts for one valve

Wafer and U-section body DN 450 - 1600

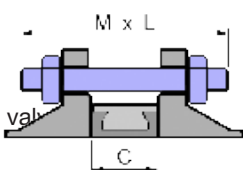
B STAY-BOLT WITH 2 NUTS AND C BOLT



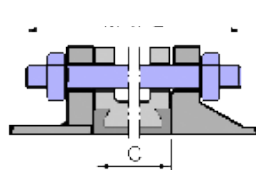
DN	C	n	PN 10		PN 16	
			B M x L	C M x L	B M x L	C M x L
450	114	16	M24x240	8 M24x60	16 M27x260	8 M27x 70
500	127	16	M24x260	8 M24x60	16 M30x290	8 M30x 80
600	154	16	M27x300	8 M27x70	16 M33x330	8 M33x 90
700	165	20	M27x320	8 M27x80	20 M33x340	8 M33x 90
800	190	20	M30x360	8 M30x80	20 M36x380	8 M36x100
900	203	24	M30x370	8 M30x80	24 M36x410	8 M36x100
1000	216	24	M33x400	8 M33x90	24 M39x450	8 M39x120
1200	254	28	M36x470	8 M36x110	28 M45x550	8 M45x150
1400	280	32	M39x530	8 M39x120	32 M45x580	8 M45x150
1600	318	40	M45x600	8 M45x140	40 M52x680	8 M52x180

n = number of bolts for one valve

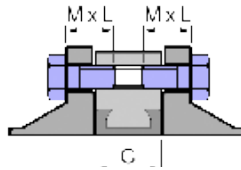
B WAFER



U-SECTION

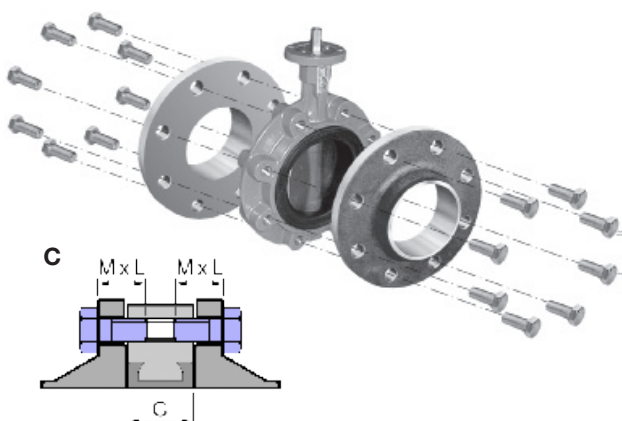


C



LUG type DN 50 - 400

C BOLT



DN	C	PN 10		PN 16	
		n	M x L	n	M x L
50	43	8	M16x30	8	M16x30
65	46	8	M16x40	8	M16x40
80	46	16	M16x40	16	M16x40
100	52	16	M16x40	16	M16x40
125	56	16	M16x50	16	M16x50
150	56	16	M20x50	16	M20x50
200	60	16	M20x50	24	M20x50
250	68	24	M20x60	24	M24x60
300	78	24	M20x60	24	M24x60
350	78	32	M20x60	32	M24x60
400	102	32	M24x70	32	M27x80

n = number of bolts for one valve

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12. MAX. OPERATING TORQUES

Incl. safety factor

DN	Top flange/shaft	Max. working pressure [bar]				
		2,5	6	10	16	20
25-40	F05-08 Diamond	-	-	-	23	28
50	F05-11 Diamond	-	-	-	41	53
65	F05-11 Diamond	-	-	-	45	58
80	F05-11 Diamond	-	-	53	69	89
100	F07-11 Diamond	41	-	76	88	113
125	F07-14 Diamond	61	-	92	153	197
150	F07-14 Diamond	73	-	122	165	213
200	F07-17 Diamond	108	-	203	294	382
250	F10-22 Diamond	188	-	265	354	461
300	F10-22 Diamond	276	-	448	529	687
350	F12-22 Diamond	369	506	800	972	1264
400	F12-27 Diamond	786	1071	1191	1488	1935
450	F14-45 round+key	1185	1659	1985	2454	3191
500	F14-45 round+key	1422	1850	1995	2732	3552
600	F16-70 round+key	2624	3113	3740	5468	7108
700	F25-70 round+key	2843	4010	5212	6197	-
750	F25-70 round+key	3281	4717	5832	7290	-
800	F25-70 round+key	3555	4739	6120	6738	-
900	F30-80 round+key	4648	5924	7564	9477	-
1000	F30-80 round+key	5924	7472	9477	11482	-
1100	F30-80 round+key	7655	9569	11846	14033	-
1200	F30-100 round+key	10024	12029	14216	17132	-
1400	F30-120 round+key	12575	18225	27724	-	-
1600	F35-130 round+key	16767	24239	44834	-	-

13. KV VALUES M3/H

Opening angle of the valve

DN	20°	30°	40°	50°	60°	70°	80°	90°
32	-	1,5	5	10	15	26	34	40
40	-	2,7	8,5	16	25	37	46	50
50	2	7	15	28	45	68	88	100
65	3	11	24	48	85	138	180	210
80	8	22	50	83	134	230	312	360
100	15	35	70	130	225	410	585	650
125	28	70	135	230	360	600	920	1050
150	33	95	205	320	580	980	1410	1620
200	60	175	355	580	910	1600	2450	2800
250	132	340	590	940	1480	2550	3950	4480
300	200	505	890	1450	2100	3800	5960	6800
350	280	680	1200	2050	3150	5050	8100	9200
400	365	860	1500	2490	3980	6600	10200	11700
450	465	1080	1900	3150	5050	8700	13300	15200
500	580	1200	2300	3740	6150	11000	16800	18900
600	820	1600	2780	5200	8940	14500	23500	26800
700	890	2050	3450	6050	11050	18800	31500	37100
800	1300	2550	4950	8750	14200	23500	39500	48500
900	1650	3300	6400	11800	19400	31500	52500	61300
1000	2150	4250	8200	15100	23500	39400	65500	80500
1200	4000	7500	12500	19800	34000	55400	98300	119200
1400	5200	10120	18200	32500	51500	89500	142000	162000
1600	7100	14210	26050	45000	71200	118500	196200	228500

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14. REMOVAL FROM THE LINE

Before removing the valve from the pipe it is very important to be aware that dangerous fluids may leak and that necessary precautions must be taken.

Be careful not to damage disc and liner when removing the valve from the pipe.

- 2.1 Do not close the valve completely.
- 2.2 Loosen all bolts.
- 2.3 Use flange spreaders and remove the valve.

15. DISASSEMBLY

- 3.1 Open the valve completely.
- 3.2 Remove the actuator.
- 3.3 Unlock screws and remove the retaining washer.
- 3.4 Remove the shaft (either by using an extractor or by tightening the square of the shaft in a vice).
- 3.5 Remove the disc.
- 3.6 Loosen the liner at a point, squeeze until it is heart-shaped and remove the liner.

16. REASSEMBLY

- 4.1 Clean all parts. If possible, use a silicone spray or similar to ease the handling.
- 4.2 Make sure that the liner is placed with the largest diameter on the top side of the valve (the shaft diameter is largest on the upper side).
- 4.3 Insert the heart-shaped liner. Place the upper side facing the shaft hole. Use the shaft to centre the liner. Then gently expand the liner and make it adapt with the body.
- 4.4 Replace the disc. The square must be placed at the lower part (opposite the top of the valve). Make sure the liner is not damaged.
- 4.5 Insert the shaft through the liner and disc by rotating the disc in an alternate movement to ease the operation.
- 4.6 The axis of the shaft square must be properly aligned with the axis of the disc. Then completely insert the shaft by evacuating air from the lower shaft housing (slightly lift the liner using a screwdriver).
- 4.7 Remount the actuator.

A tightness test has to be performed before the valve is taken into use in a pipe system and has to be carried out according to DIN 3230 part 3 or a corresponding test. The valve must also undergo a functional test. When the tests are completed, the disc is to be placed in a slightly open position to prevent the disc edge from surpassing the flange surface. This position must be kept until the valve has been installed.

17. PARTS LIST

1. Body
2. Disc
3. Shaft
4. Liner
5. O-ring
6. Retaining washer + 2 x screws

18. DISPOSAL

Please note that any remaining residues in the valve might be hazardous to humans or the environment. Therefore, the butterfly valve must be handled with caution. After its use, please apply the most environmentally friendly waste disposal methods.

