

Neles™ BO series butterfly valve

For recovery of oxygen in vacuum pressure swing adsorption (VPSA) plants

Neles BO series butterfly valve is designed for use in vacuum Pressure Swing Adsorption plants (VPSA), under extreme demanding conditions due to the high cycle and high tightness requirement. The series BO valve is a wafer type, soft seated, high performance, single eccentric disc valve. The valve is designed to last huge amounts of fast cycles, maintaining the internal tightness.

Additionally it provides long lasting tight shut off with excellent flow characteristics and high capacity. The BO series fulfils the requirements of both ASME and EN/DIN standards.

Series BO valve is field proven and the maintenance capabilities of the valve are be tuned to the top. The valve, combined to Neles smart valve controller together with easy access online diagnostic capabilities ensures a secure operation and a fast maintenance operation during plant shutdowns.

Features and benefits

Fast operation

The optimized aluminum disc design minimizes the disc inertia and gives the valve extremely short opening and closing times.

Reliable construction

The connection of the disc and drive shaft is secured with an innovative stainless steel bushing design, giving a reliable torque transfer from the shaft to the disc. The light aluminum disc is hard anodized to withstand also aggressive environment.

This type of coating is suitable for flow media e.g. in a molecular sieve applications where dust and catalyst particles can generate problems.

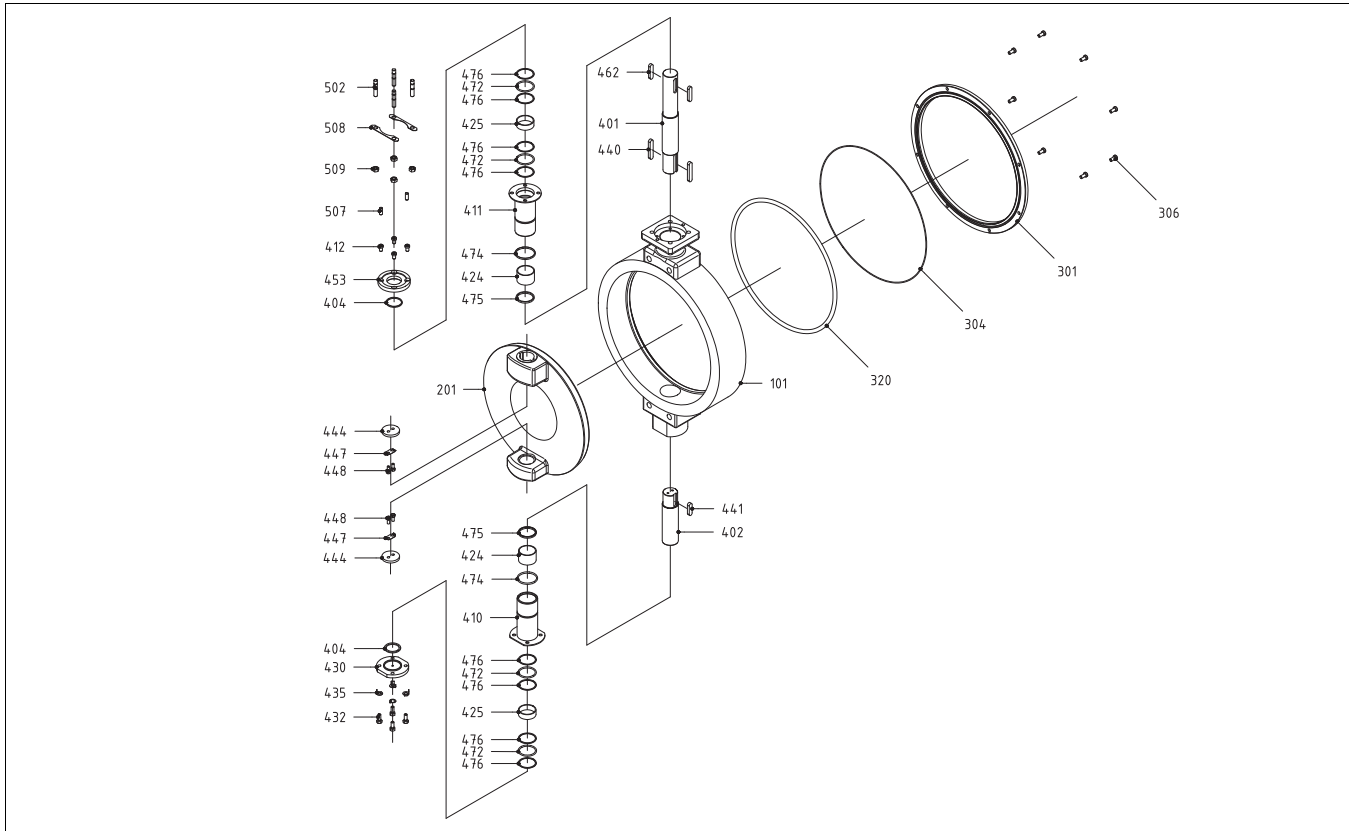


Shaft and drive shaft design

The Series BO butterfly valve has a two piece shaft design which gives a high flow coefficient. Both shafts have two pairs of bearings. The axial bearings ensure the correct alignment of the disc. The axial bearings are located at the bottom and top of the valve body and protected from the flow media.

High safety factor has been included to bearing design. The bearing bushings are open to the outside at both ends, giving a pressure balance preventing any axial forces on the butterfly valve. The three independent seals on the bottom and drive shaft protect the valve against emissions. The first seal protects the bearings and the O-rings from solid particles. The other two seals provide the actual seal.

Exploded view



Parts list

Part no.	Qty.	Description	Material	Spare part
101	1	Body	Carbon Steel	
201	1	Disc	Aluminium hard coated	3
301	1	Sealing Ring	Stainless Steel	3
304	1	O-ring seal	FKM	1
306	8	Cylinder head screw	Stainless Steel	
320	1	Seat	FKM	2
401	1	Drive shaft	Stainless Steel	3
402	1	Shaft	Stainless Steel	3
404	2	Thrust bearing	Metal + PTFE coating	1
410	1	Bearing bushing	Stainless Steel	3
411	1	Bearing bushing	Stainless Steel	3
412	8	Cylinder head screw	Stainless Steel	
424	1	Bearing	Metal + PTFE coating	1
425	1	Bearing	Metal + PTFE coating	1
430	1	Cover	Stainless Steel	
432	4	Hexagon screw	Stainless Steel	
435	4	Wascher, Retaining plate	Stainless Steel	
440	2	Key	Stainless Steel	3
441	1	Key	Stainless Steel	3
444	2	Clamping disc	Stainless Steel	3
447	2	Lock Washer, Retaining plate	Stainless Steel	3
448	4	Hexagon screw	Stainless Steel	3
453	1	Packing Gland, Flange	Stainless Steel	
462	2	Key	Stainless Steel	
472	4	O-ring packing	FKM	1
474	2	O-ring packing	FKM	1
475	2	Sealing	PTFE	1
476	8	Bearing protection, Back up ring	PTFE	1
502	4	Hexagon head screw	Stainless Steel	
507	2	Pin	Stainless Steel	
508	2	Retaining plate	Stainless Steel	
509	4	Hexagon nut	Stainless Steel	

1&2) Maintenance after 750 000 cycles or every 1 year

3) maintenance after 1500 000 cycles or every 2 year

Technical specification

Product type

High performance wafer type butterfly valve with a single eccentric disc

Valve ratings

Class 150 with 2 bar disc

PN 10, PN16 with 2 bar disc

Design standards and face to face

- AD2000
- EN 558 - / series 25 (e.g. ASME B16.10 table 9) size ≤ DN 600 (24")
- EN 558 - / series 20 (e.g. ASME B16.10 table 9) size > DN 600 (24")

Sizes and end connection types

ASME cl. 150 valves are available in sizes 8"-24" (DN 200-600).

PN10 valves are available in sizes DN 200-600 (8"-24").

PN16 valves are available in sizes DN 200-600 (8"-24").

Flanges:

- ASME B16.5 for 8"-24" (DN 200-600) valves
- ASME B16.47 series A for 28"-40" (DN 700-1000) valves
- DIN 2501, PN10, PN16

Standard materials

Body: EN1543 - ENGJS-400-18-LT, EN 10250 - 1.0570

Disc: EN 10088-aluminium / ASTM A Aluminium + hard anodization

Shaft: AISI 329-EN1.4021

Seat: FKM

Inherent flow characteristic

Standard: Equal percentage

Shut-off classifications

Replace all 3 Shut-off classification values by:

- EN12266 rate C
- ANSI FCI 70.2 class V

Temperature range

- 10° to + 200 °C

Safety features

- Fugitive emission control with O-ring seal
- Rugged single piece body eliminates potential leak paths associated with multiple piece bodies.
- Anti-blow out shaft.

Flow data

Size		PN10, PN16, ANSI cl. 150	
DN	inch	Cv 90°	KV 90°
200	8	2893	2503
250	10	3912	3384
300	12	6447	5577
350	14	10383	8981
400	16	14318	12386
450	18	19292	16689
500	20	24266	20991
600	24	38095	32954
700	28	52286	45230
750	30	62287	53881
800	32	72288	62533
900	36	89789	77672
1000	40	110363	95470

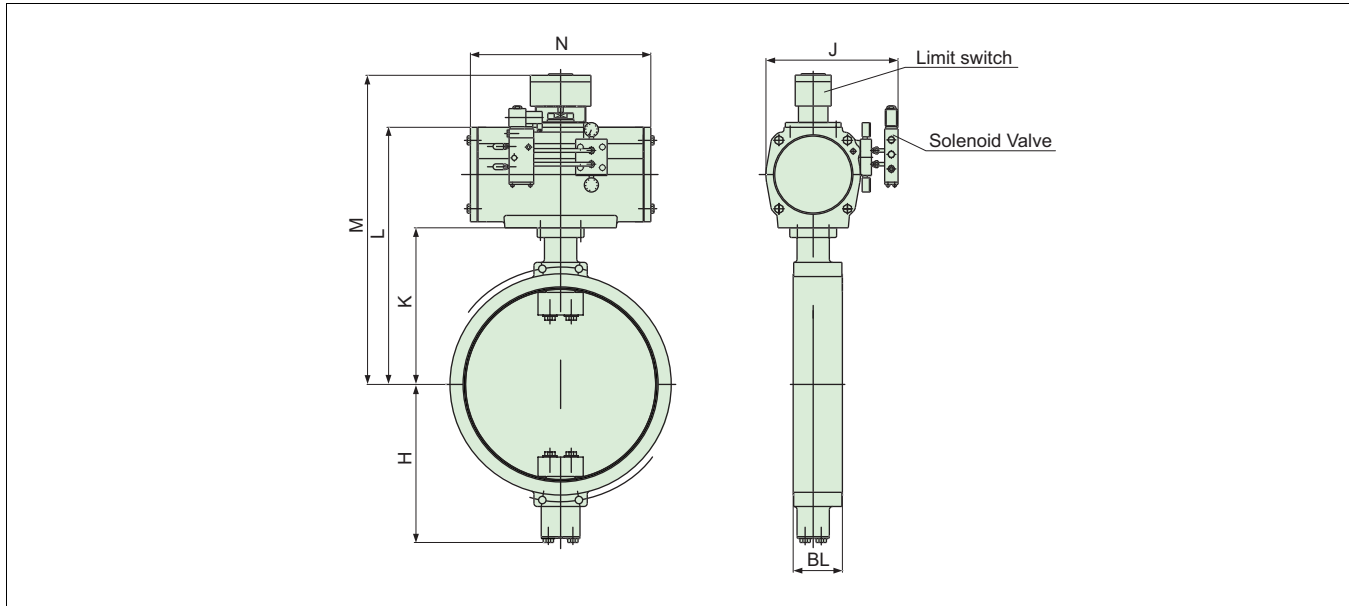
Table 1: Flow coefficients of series BO Neles single eccentric valves.

Actuator selection

DIN PN 10, PN16 / ASME 150		Max Shut off pressure, bar	Mounting face	A, on-off	B1C on-off
Size DN/inch	*)Dp 70° in control bar			Supply air, 5 bar	Supply air, 5 bar
200/8"	1,0	2	F10	A60-K	B1CU11
250/10"	1,0	2	F10	A60-K	B1CU11
300/12"	1,0	2	F10	A60-K	B1CU11
350/14"	1,0	2	F12	A120-K	B1CU13
400/16"	1,0	2	F12	A120-K	B1CU13
450/18"	1,0	2	F12	A120-K	B1CU13
500/20"	0,5	2	F12	A120-K	B1CU13
600/24"	0,5	2	F14	A250-K	B1CU17
700/28"	0,5	2	F16	A500-K	B1CU20
750/30"	0,5	2	F16	A500-K	B1CU20
800/32"	0,2	2	F16	A500-K	B1CU25
900/36"	0,2	2	F16	A500-K	B1CU25
1000/40"	0,2	2	F16	A500-K	B1CU25

Table 2: Actuator selection with mounting face.

Dimensions



Type BO + A, DN 80 – 1000

Size DN/inch	Actuator	Main dimensions									Weight	
		BL	H	K	L	N	B	C	J	M	Actuator kg	Valve kg
200/8"	A60-K	71	250	245	435	300	170	85	320	885	16	28
250/10"	A60-K	76	265	260	450	300	170	85	320	915	16	34
300/12"	A60-K	83	290	285	475	300	170	85	320	965	16	49
350/14"	A120-K	92	325	330	570	390	195	120	345	1095	28	58
400/16"	A120-K	102	355	350	590	390	195	120	345	1145	28	72
450/18"	A120-K	114	385	380	620	390	195	120	345	1205	28	108
500/20"	A120-K	127	405	400	640	390	195	120	345	1245	29	134
600/24"	A250-K	154	490	485	795	430	260	155	410	1485	51	187
700/28"	A500-K	165	545	535	880	595	290	175	490	1625	100	262
750/30"	A500-K	190	570	560	905	595	290	175	490	1675	100	310
800/32"	A500-K	190	585	580	925	595	290	175	490	1710	100	360
900/36"	A500-K	203	655	650	1075	750	400	215	600	1930	100	460
1000/40"	A500-K	216	725	720	1145	750	400	215	600	2070	100	620

How to order

1.	2.	3.	4.	5.	6.	7.	8.	9.
-	BO	6	C	-	16	F1	N	-

1. sign	
-	

2. sign	PRODUCT SERIES / DESIGN
BO	Single eccentric high cycle, soft seated Mapag butterfly valve

3. sign	BODY CONSTRUCTION
6	Wafer
Y	Special, to be specified

4. sign	BODY PRESSURE RATING
C	ASME class 150
J	DIN PN 10
K	DIN PN 16

Note: max. dp = 1,8 barg

5. sign	BEARING AND DESIGN
-	Standard: Soft bearings
Y	Special design

6. sign	SIZE
	Note: Pressure rating = ASME -> inch sizes Pressure rating = DIN -> metric sizes
-	Inch: 08, 10, 12, 14, 16, 20, 24, 28, 32, 36, 40 Metric: 200, 250, 300, 350, 400, 500, 600, 700, 800, 900, 1000

7. sign	
F	Body: DIN 1693 – 0.7043 (GGG40.3) / EN1543 - EN-GJS-400-18-LT Disc: F-AL70, hardcoated
F1	Body: DIN 1693 – 0.7043 (GGG40.3) / EN1543 - EN-GJS-400-18-LT + coating (ENP) Disc: F-AL70, hardcoated
G	Body: EN 10250 – 1.0570 (S355)2G3 Disc: F-AL70, hardcoated
G1	Body: EN 10250 – 1.0570 (S355)2G3) + coating (ENP) Disc: F-AL70, hardcoated
Y	Special, to be specified

8. sign	SEAT, PACKING & SHAFT MATERIAL
N	Shaft sealing: FKM (VITON) Sealing Element: FKM (VITON) Shaft: EN 1.4021 or equal, T = -10 ... 200 °C
Y	Special, to be specified

9. sign	FACE-TO-FACE AND FACING
	With sign "Y" always check suitability from factory
-	Without sign valve facing according to the valve body pressure rating DIN-rating: EN1092-1 ASME-rating: - ASME B 16.5 sizes 4" – 24" - ASME B 16.47 Series A #150 - 600 sizes 26"
Y	Special, to be specified

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