

## NELES SOFT SEATED BUTTERFLY VALVE SERIES MAPAG BA FOR PSA PLANT ON/OFF AND CONTROL SERVICE

Series Mapag BA is a wafer type butterfly valve with a one piece body and soft seat. It is specially designed for industrial gas applications and PSA (Pressure Swing adsorption) plants, featuring fast stroking time and high cycle capability combined with long lasting tightness. Fully rated from PN 40 and PN 63 (ASME 300, 600) makes the series BA reliable control or shut-off valve.

### Excellent on-off capabilities

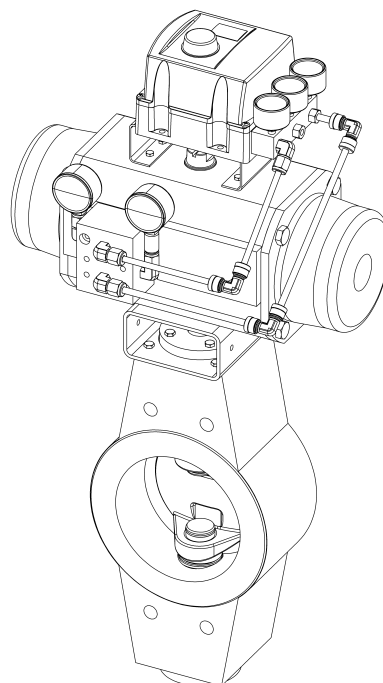
- Unique soft seat design assures tightness over extended number of operating cycles.
- Internal tightness does not rely on differential pressure.
- Bi-directional long term tightness is maintained even in high cycle applications.
- Tightness is not affected by thermal cycling.
- Low friction and excellent wear resistance.
- Low operational torque reduces actuator size.
- Heavy-duty stem and bearings extends service life and is insensitive to thermal cycles and impurities.
- Clear marking of the disc position.

### Low cost of ownership

- Extremely high life cycle minimizes the need for maintenance.
- High Mean Time Between Failure rate (MTBF).
- Easy and fast to maintain
  - Interchangeable seat without disassembling the disc and shaft. - Seat replacement does not require any special tools.
  - Modular design of bearing cartridge enables easy maintenance without disassembling the valve.

### Increased safety and minimized emissions

- Field proven single piece seat design guarantees a reliable operation during the valve life time.
- Double packing minimizes the emissions.
- Double bearing construction for both the drive and the bottom shaft minimizes the bearing load and extends the valve life time.
- Anti-blow out shaft construction as a standard.
- ATEX approval.



### Reliable long term operation

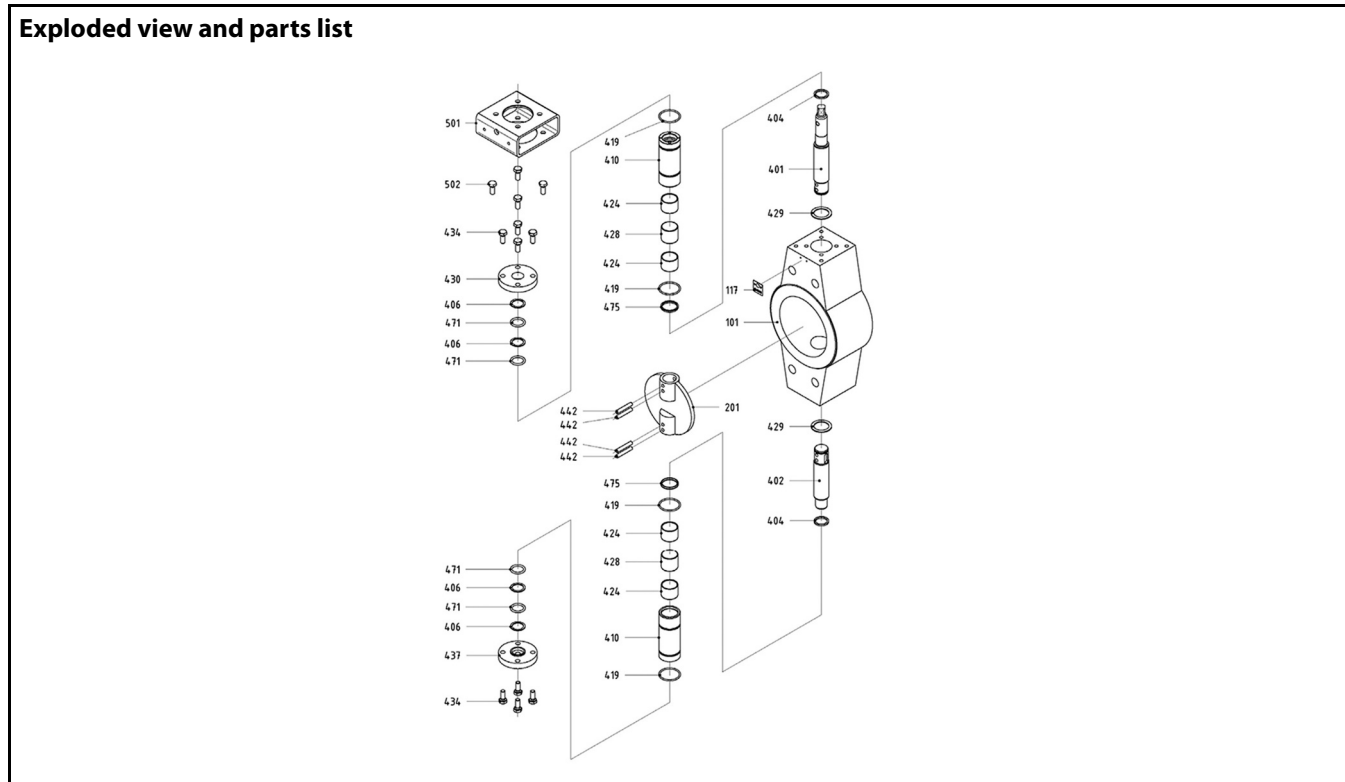
- Eccentric disc:
  - No seat/disc contact in the open or intermediate position
  - Eliminates wear points at top and bottom of seats for higher life cycle.
  - Reduced torque requirement, smaller actuators.
- Actuator specially designed for high cycling applications.
- Two piece shaft design maximizes valve capacity.

### Maintenance

#### Cleaning and maintenance intervals

High-performance control valves of the type BA are largely maintenance-free.

For maintenance intervals, please follow preventive maintenance recommendation in chapter 10.2.

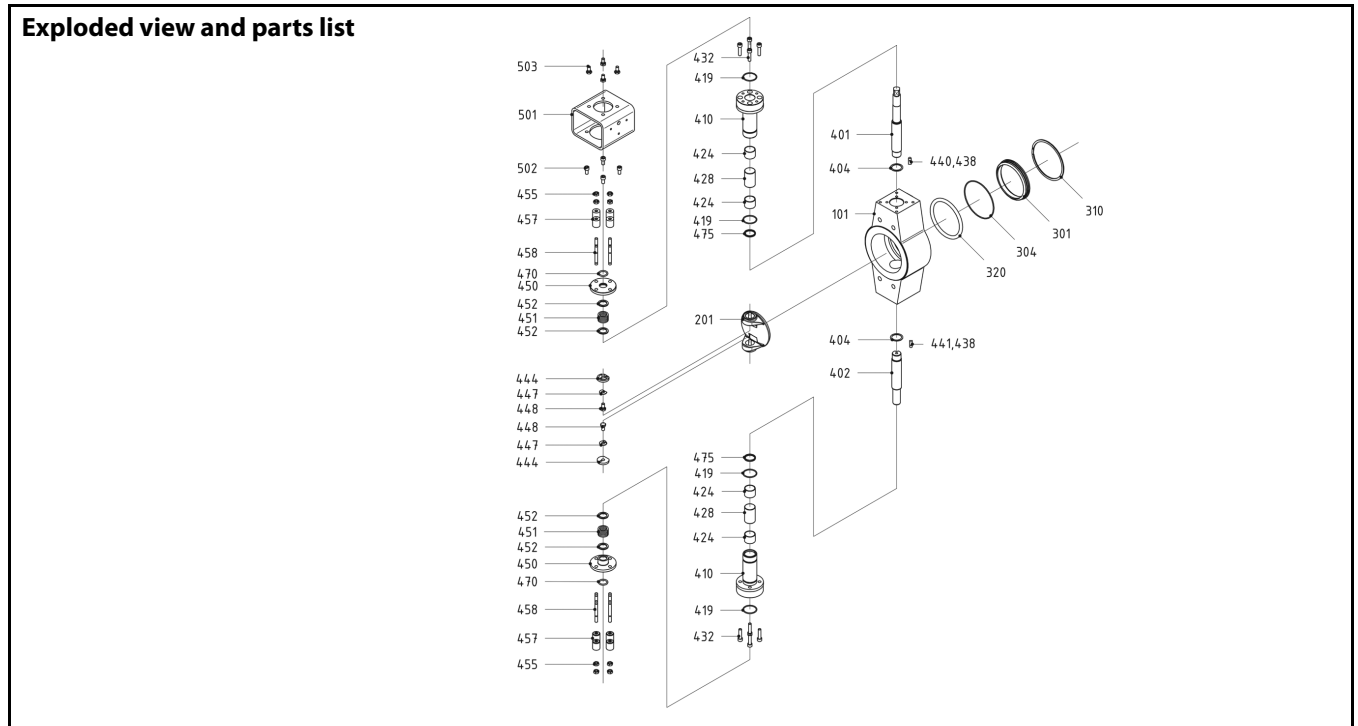


Item	Description	Materials	Spare Set No.
101	Body	1.0566 / A516 GR. 60/70*	-
117	"Closed" sign	Al	-
201	Disc	1.4571	-
401	Shaft	1.4313	-
402	Shaft	1.4313	-
404	Thrust washer	DU	1, 2
406	Support ring	PTFE	1, 3
407	Thrust washer	1.4571	-
410	Bearing sleeve	1.4313	1, 2
419	O-ring	FKM	1
424	Bearing bushing	DU	1, 2
428	Spacing sleeve	1.4301	1, 2
429	Spacer ring	PTFE	1
430	Cover	1.4021	-
434	Hexagon screw	A2-70	-
437	Cover	1.4021	-
440	Pin	1.4571	-
471	O-ring	FKM	1, 3
475	Seal	PTFE	1
501	Bracket	1.0037-Zn	-
502	Hexagon bolt	A2-70	-
503	Hexagon bolt	A2-70	-
600	Quarter turn actuator	---	-

Spare	Set No.
1	Spare parts set "complete bearing set"
2	Spare parts set "mounting"
3	Spare parts set "shaft seals"

## Gland packing design

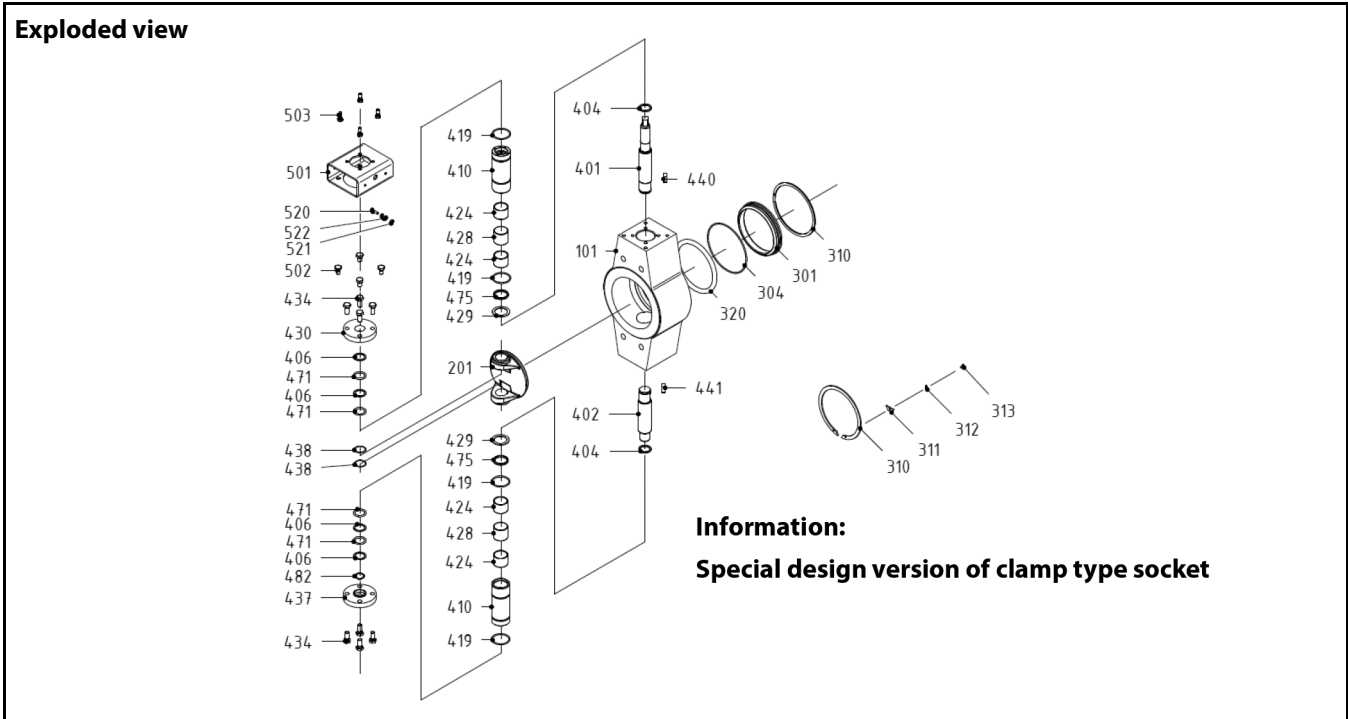
For maintenance intervals, please follow preventive maintenance recommendation in chapter 10.2.



Item	Description	Materials	Spare Set No.
101	Body	1.0566 / A516 GR. 60/70*	-
201	Disc	1.4313-B	-
301	Sealing ring	1.4301	-
304	O-ring	FKM	1, 2
310	Retaining ring	1.4571	1, 2
320	Sealing element	FKM	1, 2
401	Shaft	1.4313	-
402	Shaft	1.4313	-
404	Thrust washer	DU	1, 3, 4
410	Bearing sleeve	1.4313	1, 3, 4
419	O-ring	FKM	1, 3
424	Bearing bushing	DU	1, 3, 4
428	Spacer ring	1.4313	1, 3, 4
432	Cylinder head screw	A2-70	-
438	Coiled spring pin	spring steel	-
440	Key	1.4571	-
441	Key	1.4571	-
444	Clamping disc	1.4571	1, 3
447	Locking shim	A2	1, 3
448	Hexagon screw	A4-70	1, 3
450	Gland	1.4021	-
451	Gland packings	9650 T3	1, 3, 5
452	Ring	PTFE+25%GF	1, 3, 5
455	Hexagon nut	A2-70	1, 3, 5
457	Disc springs	9650/BS	1, 3, 5
458	Stud	A2-70	1, 3, 4
470	O-ring	FKM	1, 3, 5
475	Seal	PTFE	1, 3
501	Bracket	1.0037-Zn	-
502	Hexagon bolt	A2-70	-
503	Hexagon bolt	A2-70	-
600	Quarter turn actuator	---	-

Spare Set No.	Naming
1	Spare parts set "complete"
2	Spare parts set "seal"
3	Spare parts set "complete bearing set"
4	Spare parts set "mounting"
5	Spare parts set "shaft seals"

**Exploded view and parts list**



Item	Description	Materials	Spare Set No.
101	Body	1.0566 / A516 GR. 60/70*	-
201	Disc	1.4313-B	-
301	Sealing ring	1.4301	-
304	O-ring	FKM	1, 2, 3, 4
310	Retaining ring	1.4571	1, 3
310(A)	Retaining ring	1.4301	2, 4
311(A)	Clamp type socket	1.4301	2, 4
312(A)	Tab disc	1.4301	2, 4
313(A)	Hexagon bolt	A2-70	2, 4
320	Sealing element	FKM	1, 2, 3, 4
401	Shaft	1.4313	-
402	Shaft	1.4313	-
404	Thrust washer	DU	1, 2, 5, 6
406	Support ring	PTFE	1, 2, 5, 7
410	Bearing sleeve	1.4313	1, 2, 5, 6
419	O-ring	FKM	1, 2, 5
424	Bearing bushing	DU	1, 2, 5, 6
428	Spacing sleeve		1, 2, 5, 6
429	Shaft seal ring		1, 2, 5
430	Cover	1.4021	-
434	Hexagon screw	A2-70	-
437	Cover	1.4021	-
438	O-ring	FKM	1, 2
440	Key	1.4313	-
441	Key	1.4313	-
470	O-ring	FKM	-
471	O-ring	FKM	1, 2, 5, 7
475	Seal	PTFE	1, 2, 5
476	Thrust disc	PTFE	-
501	Bridge	1.0037-Zn	-
502	Hexagon bolt	A2-70	-
503	Hexagon bolt	A2-70	-
600	Quarter turn actuator	---	-

Spare Set No.	Naming
1	Spare parts set "complete"
2	Spare parts set "complete(A)"
3	Spare parts set "seal"
4	Spare parts set "seal(A)"
5	Spare parts set "complete mounting"
6	Spare parts set "mounting"
7	Spare parts set "shaft seals"

## TECHNICAL SPECIFICATION

### Product type

High performance butterfly valve  
Soft seated  
AR/AC: Wafer, Lug, Double flange

### Pressure ratings:

Body: PN 40-63,  
ASME 300, 600  
Trim: Sizes DN 80 - DN 500 / NPS 3"-20"  
PN 40-63  
ASME 300, ASME 600

### Size range

DN 80 - DN 500 / NPS 3" - 20"

### Temperature range

-10 °C ...+60 °C

### Design standards

In accordance with ASME B16.34 and DIN 3840  
PED 97/23/EC according to AD2000  
- ASME 16.34  
- DIN EN 1092

### Standard materials

Body: Carbon steel (plates ASME A516  
Gr. 60/70 and DIN/EN 1.0566 castings  
ASME A352LCC and DIN/EN 1.6220  
Disc: DIN 1.4313 / ASME A487 CA6NM  
Shafts: DIN 1.4313  
Sealing element code A:  
FKM  
Bearings: DU

### Material and test certification

EN 10204-3.1 material certificates for body and disc. Tightness test certificate.

### Approvals

Emission: TA-Luft

### Valve tightness (bi-directionally)

Standard seat: DIN 3230 / DIN EN 12266  
DIN EN 1349, API 598

API 598 (bubble tight)  
DIN 3230 Rate 1 / DIN EN 12266 Rate A  
FCI 70-2 ANSI Class V  
ANSI Class VI

ISO 5208 rate B, standard  
ISO 5208 rate A (air)  
Other tightness on request

### Options

ATEX, GOST, CSA, NACE MR 0103

### Flow Data

Size		ANSI 300 & 600, PN40, PN63	
DN	Inch	Cv 90°	Kv 90°
80	3"	253	220
100	4"	405	350
150	6"	1 355	1 170
200	8"	2 431	2 100
250	10"	3 537	3 060
300	12"	5 080	4 390
400	16"	9 310	8 050
500	20"	19 087	16 510

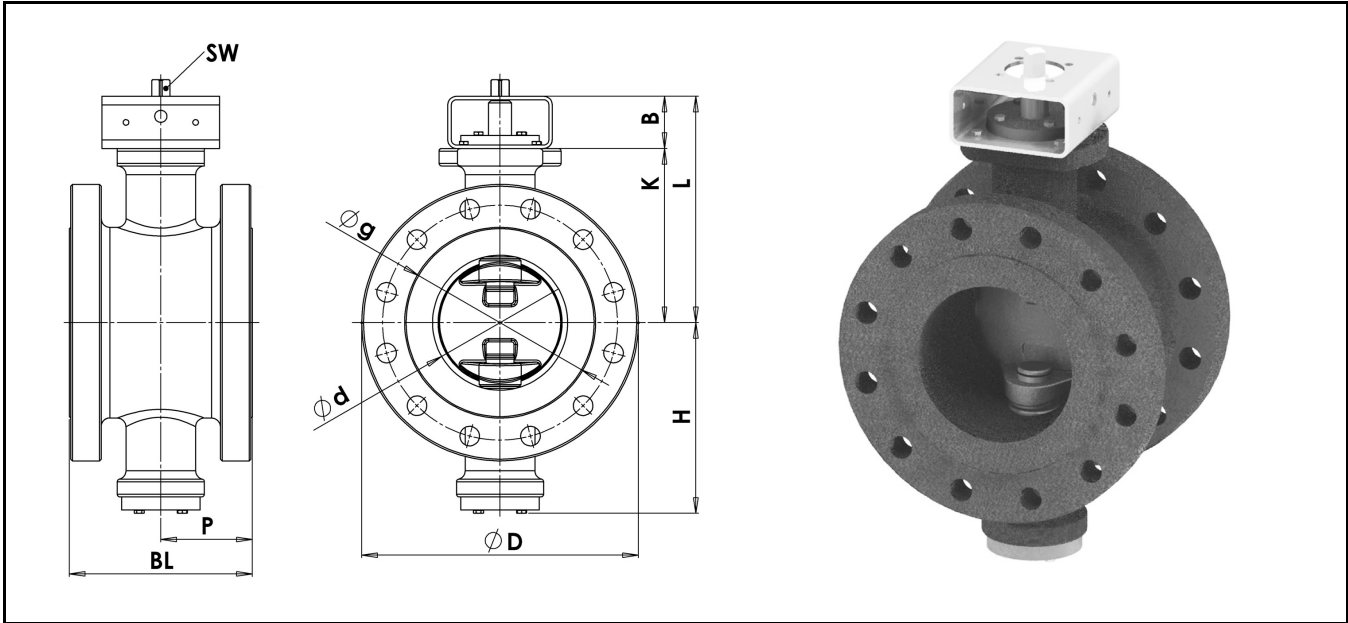
$K_v = C_v / 1,156$

### Actuator selection

Size		F mounting face	double acting	single acting
NPS	DN			
3"	80	F07	A30-K	F30-K
4"	100	F07	A30-K	F30-K
6"	150	F10	A60-K-R	F60-K-R
8"	200	F12	A120-K-R	F120-K-R
10"	250	F12	A120-K-R	F120-K-R
12"	300	F14	A250-K-R	F250-K-R
16"	400	F16	A250-K-R	F250-K-R
20"	500	F16	A500-K-R	

**DIMENSIONS**

**BA series, double flanged**

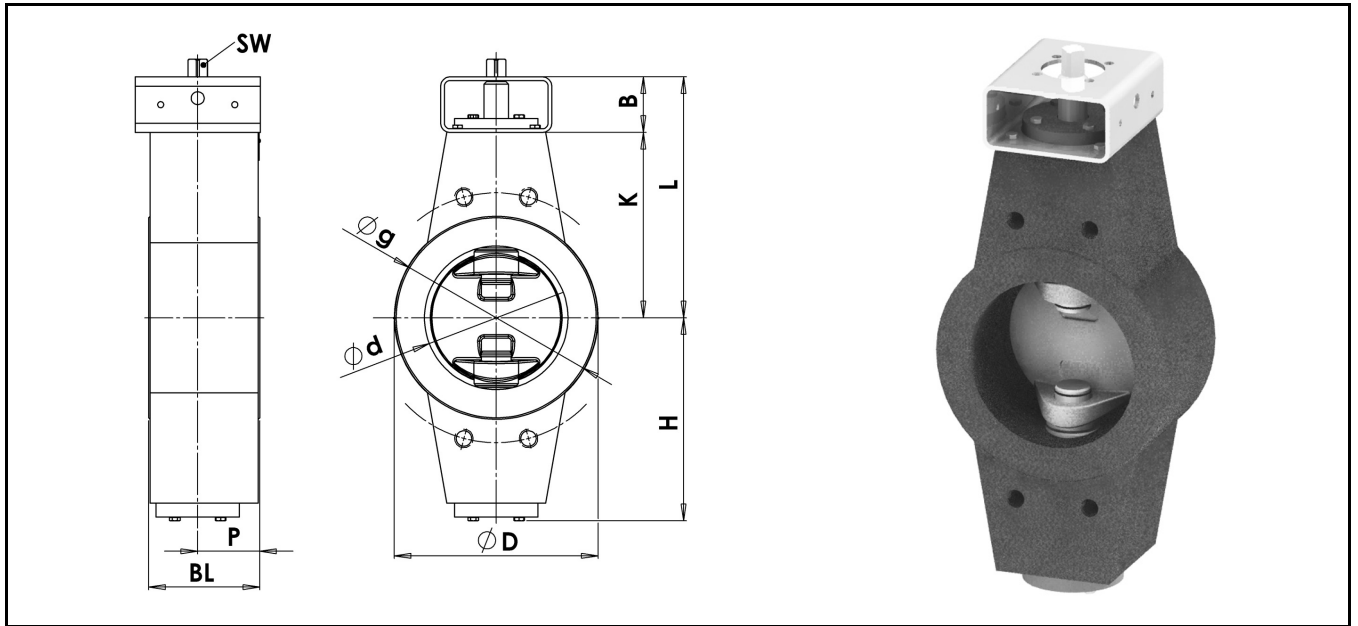


DN	NPS	Dimensions [mm]							
		BL	P	H	K	B	L	ød	SW
80	3	180	90	167,5	150	60	210	100	17
100	4	190	95	172,5	155	60	215	110	17
150	6	210	105	222	200	60	260	155	22
200	8	230	115	253	230	100	330	210	27
250	10	250	125	287	260	100	360	255	27
300	12	270	135	328	300	100	400	302	36
400	16	310	155	402	370	150	520	405	36
500	20	350	175	452	420	150	570	500	36

DN	DIN EN 1092-1 - PN40		DIN EN 1092-1 - PN63		Weight [kg]
	ØD	Øg	ØD	Øg	
80	210	138	215	138	36
100	254	162	254	162	38
150	318	218	356	218	60
200	381	285	419	285	90
250	445	345	470	345	135
300	521	410	530	410	200
400	648	535	686	535	330
500	775	615	---	615	510

NPS	ASME B 16.5 - CI300		ASME B 16.5 - CI600		Weight [kg]
	ØD	Øg	ØD	Øg	
3	210	127	210	127	36
4	254	157,2	273	157,2	38
6	318	215,9	356	215,9	60
8	381	269,7	419	269,7	90
10	445	323,9	508	323,9	135
12	521	381	560	381	200
16	648	469,9	686	469,9	330
20	775	584,2	---	584,2	510

## BA series, wafer

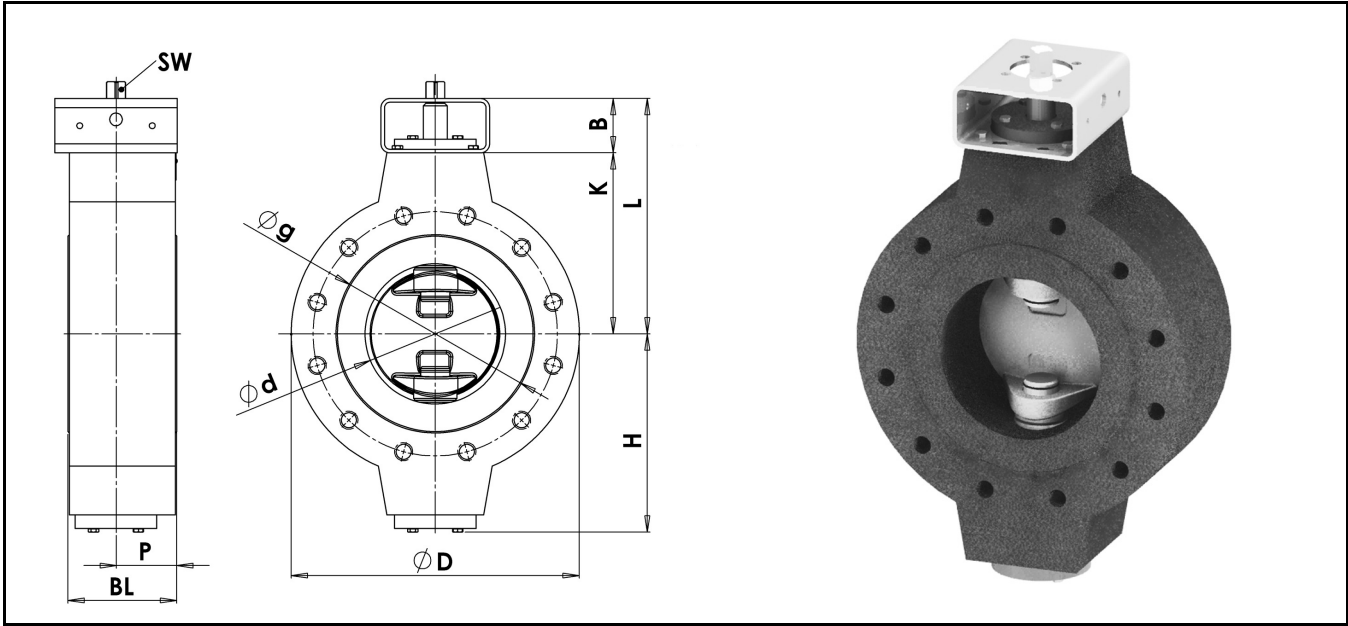


DN	NPS	Dimensions [mm]							
		BL	P	H	K	B	L	$\varnothing d$	SW
80	3	100	58	167,5	150	60	210	100	17
100	4	100	55	172,5	155	60	215	110	17
150	6	120	67	222	200	60	260	155	22
200	8	130	72	253	230	100	330	210	27
250	10	150	80	287	260	100	360	255	27
300	12	170	90	328	300	100	400	302	36
400	16	230	115	402	370	150	520	405	36
500	20	230	115	452	420	150	570	500	36

DN	DIN EN 1092-1 - PN40		DIN EN 1092-1 - PN63		Weight [kg]
	$\varnothing D$	$\varnothing g$	$\varnothing D$	$\varnothing g$	
80	140	138	140	138	21
100	170	162	170	162	23
150	220	218	220	218	42
200	290	285	290	285	72
250	350	345	350	345	118
300	390	410	390	410	145
400	490	535	490	535	294
500	590	615	590	615	398

NPS	ASME B 16.5 - Cl300		ASME B 16.5 - Cl600		Weight [kg]
	$\varnothing D$	$\varnothing g$	$\varnothing D$	$\varnothing g$	
3	140	127	140	127	21
4	170	157,2	170	157,2	23
6	220	215,9	220	215,9	42
8	290	269,7	290	269,7	72
10	350	323,9	350	323,9	118
12	390	381	390	381	145
16	490	469,9	490	469,9	294
20	590	584,2	590	584,2	398

BA Series, lug



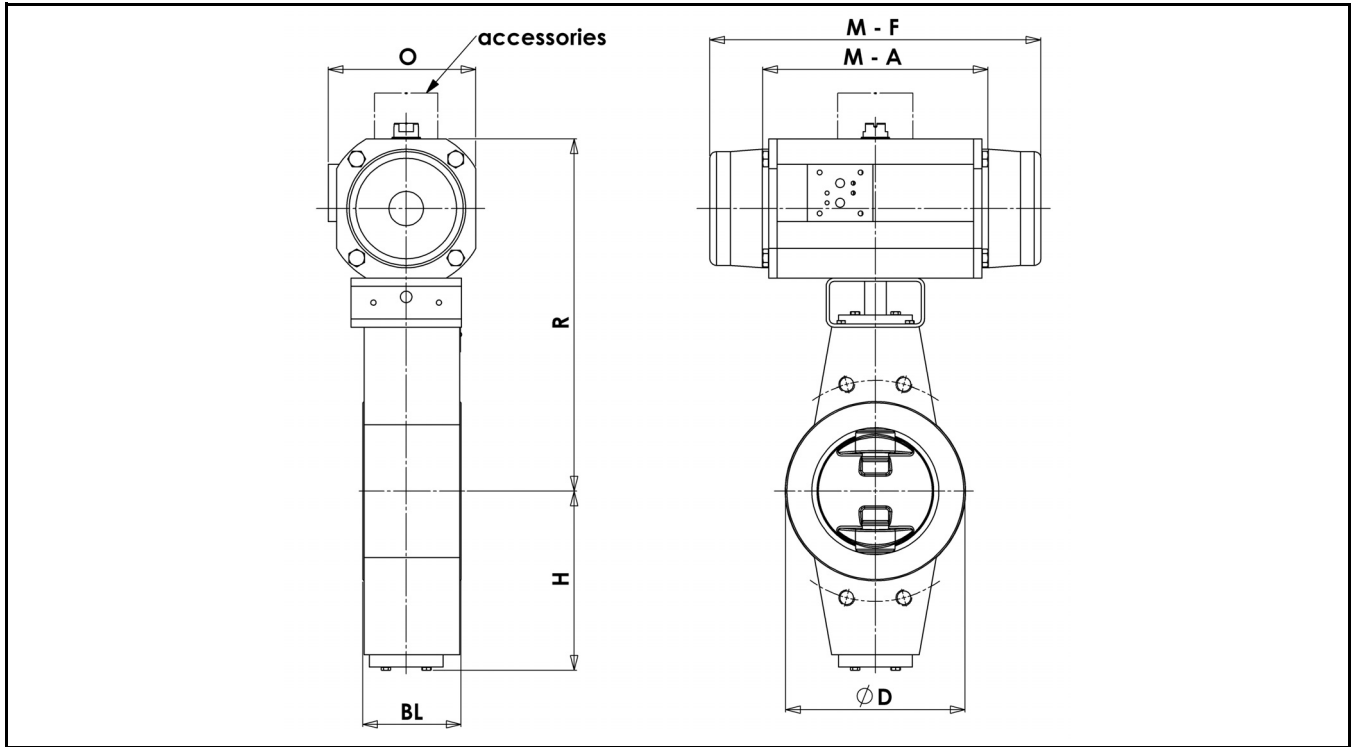
DN	NPS	Dimensions [mm]							
		BL	P	H	K	B	L	ød	SW
80	3	100	58	167,5	150	60	210	100	17
100	4	100	55	172,5	155	60	215	110	17
150	6	120	67	222	200	60	260	155	22
200	8	130	72	253	230	100	330	210	27
250	10	150	80	287	260	100	360	255	27
300	12	170	90	328	300	100	400	302	36
400	16	230	115	402	370	150	520	405	36
500	20	230	115	452	420	150	570	500	36

DN	DIN EN 1092-1 - PN40		DIN EN 1092-1 - PN63		Weight [kg]
	ØD	Øg	ØD	Øg	
80	210	138	215	138	43
100	254	162	254	162	47
150	318	218	356	218	72
200	381	285	419	285	114
250	445	345	470	345	172
300	521	410	530	410	305
400	648	535	686	535	495
500	775	615	---	615	608

NPS	ASME B 16.5 - CI300		ASME B 16.5 - CI600		Weight [kg]
	ØD	Øg	ØD	Øg	
3	210	127	210	127	43
4	254	157,2	273	157,2	47
6	318	215,9	356	215,9	72
8	381	269,7	419	269,7	114
10	445	323,9	508	323,9	172
12	521	381	560	381	305
16	648	469,9	686	469,9	495
20	775	584,2	---	584,2	608



## VALVE + PNEUMATIC ACTUATOR



DN	NPS	Dimensions [mm]					Actuator type A			Actuator type F		
		BL	ØD <sup>1)</sup>	H	R	O	Size	M - A	Weight [kg]	Size	M - F	Weight [kg]
80	3	100	140	167,5	345	145	A30-K	270	38	F30-K	390	41
100	4	100	170	172,5	350	145	A30-K	270	40	F30-K	390	43
150	6	120	220	222	395	145	A30-K	270	59	F30-K	390	62
150	6	120	220	222	430	180	A60-K-R	280	64	F60-K-R	410	69
200	8	130	290	253	500	180	A60-K-R	280	88	F60-K-R	410	93
200	8	130	290	253	538	205	A120-K-R	390	100	F120-K-R	660	128
250	10	150	350	287	530	180	A60-K-R	280	134	F60-K-R	410	139
250	10	150	350	287	568	205	A120-K-R	390	146	F120-K-R	660	174
300	12	170	390	328	608	205	A120-K-R	390	173	F120-K-R	660	201
300	12	170	390	328	676	270	A250-K-R	430	196	F250-K-R	720	230
400	16	230	490	402	796	270	A250-K-R	430	345	F250-K-R	720	379
500	20	230	590	452	875	300	A500-K-R	600	498	---	---	---

<sup>1)</sup> ØD depending on type of body

## NELES BUTTERFLY VALVE, SERIES MAPAG BA

Standard selection:  
Standard temperature valve for PSA plants

Example for a standard BAR valve, PN40, lugged, std BAR design with O-ring packing design, drive shaft with square profile SW17

1	2	3	4	5	6	7	8	9.	10.	11.	12.
-	BA	R	M	A0	4	100	E	N	-	-	S1

1. sign	RESERVED FOR FUTURE USE
-	

2. sign	PRODUCT SERIES
BA	Standard temperature soft seated valve -10°C...+60°C with single eccentric disc, double flanged, Lug or Wafer type, soft seated Neles butterfly valve for PSA applications. <b>BA valves are exclusively for LINDE only!</b>

3. sign	DESIGN VERSION
C	Version C (valve AC)
R	Version R (valve AR, "RaCy")

4. sign	BODY PRESSURE RATING
C	ASME class 150 type BAC <b>Note:</b> Only available for type BAC
D	ASME class 300
F	ASME class 600
L	DIN PN25
M	DIN PN40
N	DIN PN63

5. sign	BEARING AND BODY DESIGN
A0	Soft bearings, shaft material EN 1.4313 or equal ( <b>types BAC, BAR</b> )
Y	Special, to be specified

6. sign	BODY CONSTRUCTION, FACE-TO-FACE LENGTH
3	Flanged for PN40, PN63, ASME cl.150, ASME cl.300, ASME cl. 600 (BAC, BAR)FtF length acc. Metso PFIN-3105GB
4	Lug, Mono flange or single flange forPN40, PN63, ASME cl.150, ASME cl.300, ASME cl. 600 (BAC, BAR) FtF length acc. Metso PFIN-3105GB
6	Wafer for PN40, PN63, ASME cl.150, ASME cl.300, ASME cl. 600 FtF length acc. Metso PFIN-3105GB
Y	Special, to be specified

7. sign	SIZE
	<b>Note:</b> Pressure rating = ASME -> inch sizes Pressure rating = DIN -> metric sizes
	<b>Inch:</b> 03, 04, 06, 08, 10, 12, 16 <b>Metric:</b> 080, 100, 150, 200, 250, 300, 400

8. sign	BODY & DISC MATERIAL
E	<b>Standard version BAC and BAR</b> Body: EN 1.0566/SA516 GR.70 3.2 (Double certified) or equal plate material Disc: A487 gr. CA6NM / EN 1.4317 (Double certified) if sign 10 = 0 or 1 Disc : 1.4541 or equivalent
Y	Special, to be specified

9. sign	SEAT TYPE
N	For version BAC and BAR Shaft sealing: FKM (VITON) O-ring Sealing Element: FKM T = -10 °C ... 60 °C if sign 10 = 0 or 1 no Sealing Element
T	For version BAC and BAR Shaft sealing: PTFE Packing acc. TA Luft Sealing Element FKM, T = -10 °C ... 60 °C
Y	Special, to be specified

10. sign	SEAT TYPE
-	Standard soft seat for shut-off purpose
0	Control disc with <b>No</b> seat Only sizes NPS 3,4,6 / DN 80,100,150
1	Control disc with <b>Step</b> seat Only for size NPS 3,4,6 / DN 80,100,150
Y	Special, to be specified

11. sign	FLANGE Rating - flange face finish
-	without sign according to valve body pressure rating EN1092-1 B1 (Ra 3.2 - 12.5) ASME B 16.5 sizes up to 16" (Ra 3.2 - 6.3)
Y	Special, to be specified

12. sign	Drive connection	
S1	Square profile SW17	for BAC and BAR valve type only
S2	Square profile SW22	
S3	Square profile SW27	
S4	Square profile SW36	
S5	Square profile SW46	

Subject to change without prior notice.

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