

ABO valve

Industrial Valve Manufacturer

PALM
Tecnologia em Alta Pressão

+55 21 2518-2555

+55 21 99972-3948

admin@palmtecnologia.com.br

www.palmtecnologia.com.br



DOUBLE OFFSET BUTTERFLY VALVES

Body design

WAFER type with through holes
LUG type with threaded holes
DN50 - DN600

Nominal size

16 bar / 25 bar / 40 bar / 50 bar
PN6 / PN10 / PN16 / PN25 / PN40

Working pressure

Class 150 / Class 300
-55°C / +325°C *)

Flange connection

Waste / Supply water
Potable water
Hot industrial water

Working temperature

Crude oil
Petroleum products

Working media

Fuel / Oil / Oil derivatives
Pulp / Paper stock
Natural gas
Coke oven gas
Stack gas
Steam / Condensate
Air
Bitumen (asphalt)
Class A **)

Tightness

Features

Excentric seat design
Bi directional tightness
(RS design)
SIL2 / SIL3*)**
certifi cation
ATEX performance*)**
TA-Luft stuffingbox*)**

*) higher working temperatures
upon request according to
the material performance
of the valve body

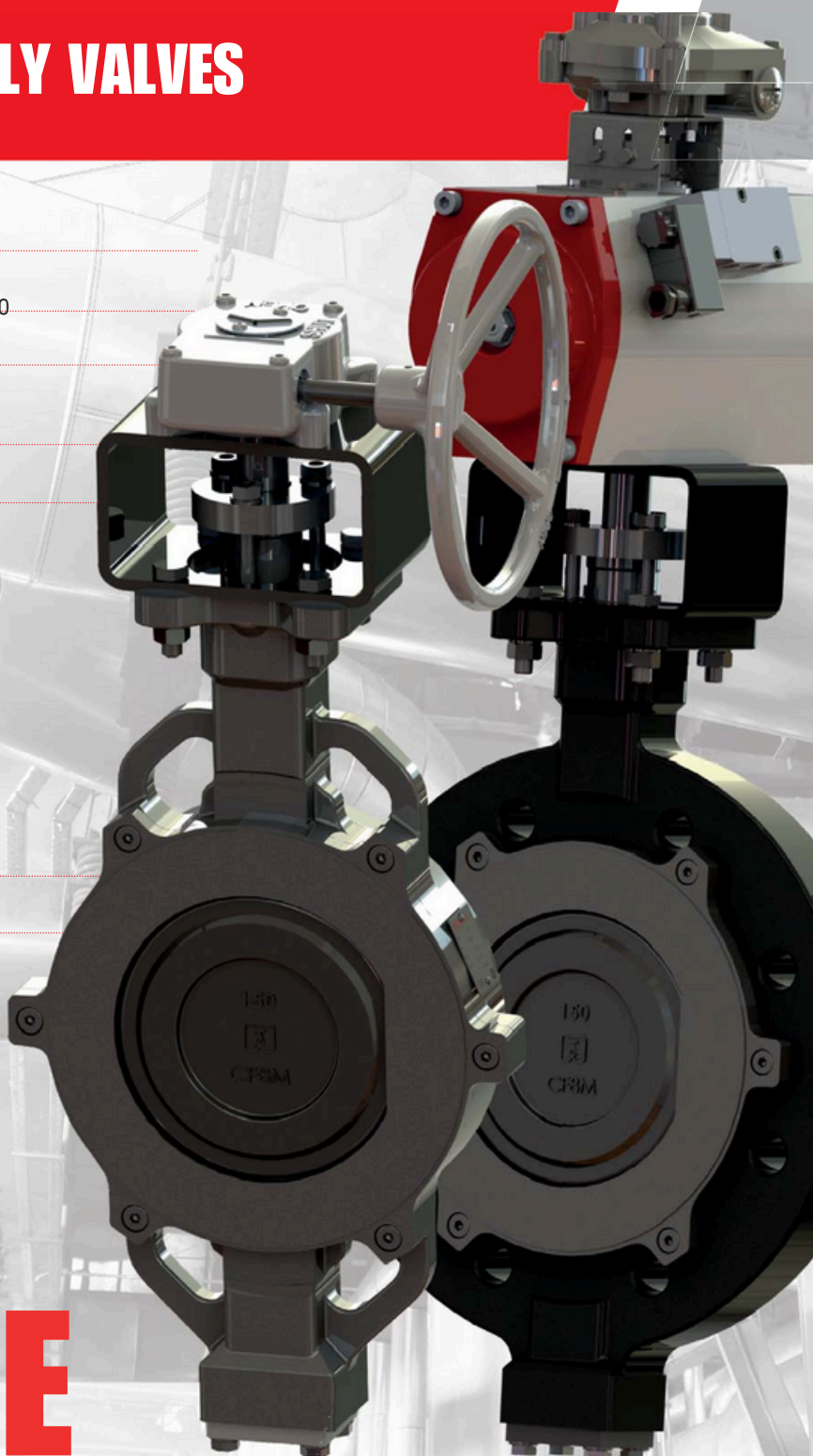
**) Metal-Metal seat tightness
Class C

***) upon request

SERIES 2E

energy line

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GENERAL VALVE DESCRIPTION

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The 2E-series double offset butterfly valves

are industrial fittings intended for full opening or closing flow. They may be also used for a rough flow control. The valves are designed for operation with very hard industrial conditions demanding safety, reliability and minimum maintenance like for example:

- nuclear energy industry
- water treatment
- gas pipe-works
- chemical industry
- metallurgy

(and heavy industry in general)

- pulp and paper-making industry
- shipbuilding industry
- oil and petrochemical industry
- heat recovery, steam heating
- processing hydrocarbons
- fuel storage in aviation industry

Basic properties

- double offset design
- eccentric disc position in the body, precise connection of the disc with the stem and pivot, exact shaft and pivot bearing in the slide bushings
- split sealed stem - bigger Kv
- high efficiency of opening and closing valve
- easy operation
- easy assembly and installation
- vacuum max. 0,01 bar abs.
(version R-PTFE)
- standardized top flange according to EN ISO 5211 enabling mount various types of actuator (electric, pneumatic, hydraulic)
- ATEX certified for explosive atmosphere
- option: TA-Luft sealed valve - stem is sealed with a special graphite gland



Type designation

5 5 9 0 B 100

Nominal size (DN)

Body design

B - AFER W body type with th holes readed
T - LUG body type with tapped holes

Disc material

0 - stainless steel 1.4408 (CF8M)
stainless steel 1.4409 (ASTM A351 CF3M)
stainless steel 1.4027 (ASTM CA-40)

Seat material

9 - R-PTFE (PTFE reinforced by 25% glass fibre)
8 - FIRE SAFE (R-PTFE + INCONEL)
7 - INCONEL 718 2.4668

Body material

6 - lowcarbon steel 1.1156 (A352 LCC)
5 - carbon steel 1.0625 (A216 WCB)
4 - stainless steel 1.4408 (A351 CF8M)

Series designation

Series 2E

Standards

Leak test

Design „R-PTFE”
Design „Fire Safe”

EN 12266-1, Class A
ISO 5208, Class A
API 598

Design „Metal-Metal”

DN 50-DN125
EN 12266-1, Class C
ISO 5208, Class C
API 598
EN 558, Series 20
ISO 5752, Series 20
API 609, Table 3

Face to face length

ATEX performance

according to 2014/34/EU

Flange connection

EN 1092-1, 2

Top flange

EN ISO 5211

Working standard

EN 593

Marking

EN19

VALVE MODELS



ABO valve

B
WAFER
DESIGN



T
LUG
DESIGN



Standard line
DN50-DN400
Bi-directional
line (RS design)
DN50-DN600

B
WAFER
DESIGN



T
LUG
DESIGN



DN50-DN125

DN150-DN600

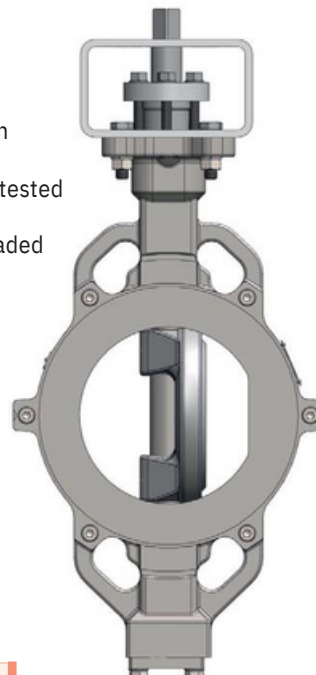
Advantages of double offset valves

- split stem allows higher Kv/Cv values
- lower pressure loss
- gas pipe-works
- guaranteed tightness in both directions at nominal working pressure (RS version)
- sealing ring and seat come to contact only nearly after the valve is entirely shut
- low closing torque
- the seal guarantees perfect upper stem tightness
- water and air tightness
- actuator connection can be done by bracket or the stem can be extended if connected to special actuator types

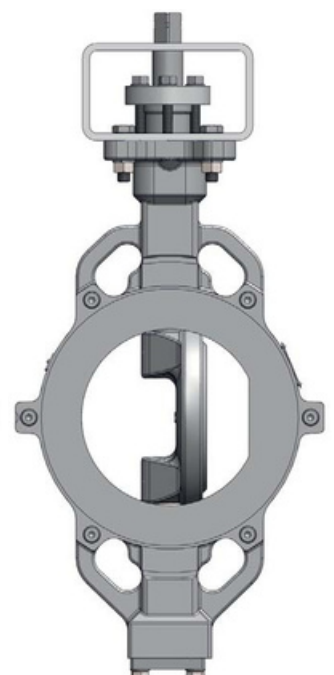
Quality control

- ABO valve production facilities are certified in accordance with ISO 9001:2015 (14001, 45001) quality control standards
- tightness test procedures according to standards EN 12266-1, ISO 5208, ANSI/FCI 70-2, API 598
- production in accordance with the Pressure Equipment Directive 2014/68/EU (Module H)
- the possibility of issuing inspection certificate 3.1, 3.2
- all the actuators are adjusted and tested while assembled
- all the certificates can be downloaded at www.abovalve.com

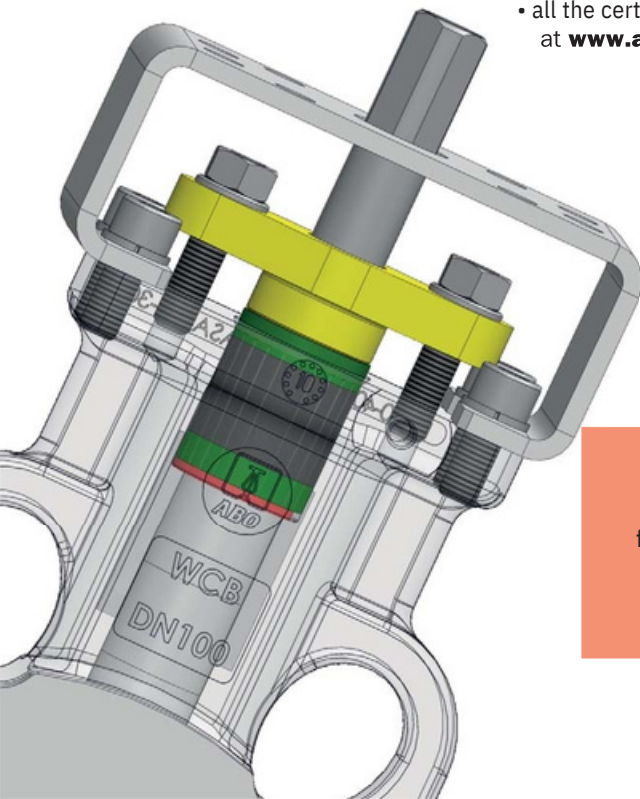
Split stem/
Better
flow rate



One piece design



ABO design



The stem seal with TA-LUFT certification
for perfect tightness
of pollutants
into the ambient air
(upon request)

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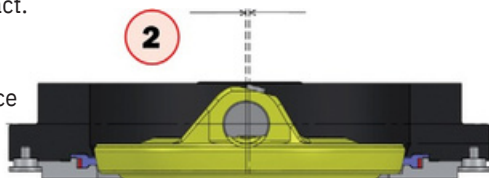
DESIGN ADVANTAGES

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Double offset

- the double offset design provides a safe function and tightness even after a sudden temperature or pressure change. It reduces seat wear and ensures perfect tightness. The first offset (1) shifts the axis of the rotation off the sealing surface and thus provides tightness between the seat and the sealing ring around the entire disc circumference. The second offset (2) moves the axis of the disc rotation off the valve (pipeline) axis and thus releases the ring from the seat after a few degrees of opening movement. The reason of the second offset is to quickly relieve the seal from compression between the disc and the seat
- the design extends the seal lifetime and the torques are lower. When shutting valve, the rotating movement is changed to the linear one and the disc is effectively pressed into the seal. The design also prevents undesirable agglomerating e. g. undissolved substances in the area of disc and seal contact.

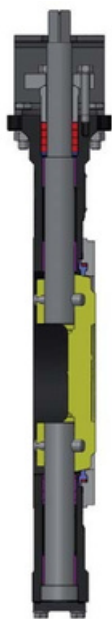
- (1) - stem axis
is off the sealing surface
(2) - stem offset
off the pipeline axis



1

Stem and seal (3)

- **two-piece stem** - thanks to the split stem the valve attains higher values of Kv/Cv and related low pressure loss
- **adjusting seal according to the customers' requirements** - the seal can be tightened to the parameters prescribed by customers. Thus maximum tightness can be achieved around the stem and the actuation torque for low-pressure applications can be decreased.
- **adjustable seal** - enables easy access to final adjustment of the seal without dismantling the actuator
- **stem assembly** - upper and lower bushings made from TP Igus provides high abrasion resistance and prolongs valve lifespan



3

- **extended neck** - enables to insulate piping incl. the valve
- **easy service and seal replacement** - easy assembly and replacement
- **top flange according to ISO 5211** - enables to directly install a manual handle or an actuator

Seal design

- **R-PTFE** - suitable seal geometry ensures full tightness and a high number of cycles. The PTFE seal is reinforced with 25% glass fibres, reducing wear and increasing valve thermal stability. Longer lifespan of the valve and lower maintenance demand are guaranteed.
- **end-stops** - are designed to avoid overrunning the maximum allowable position of the disc. Thus the seal is not damaged nor overloaded and the valve lifespan is extended (4) (5).

4

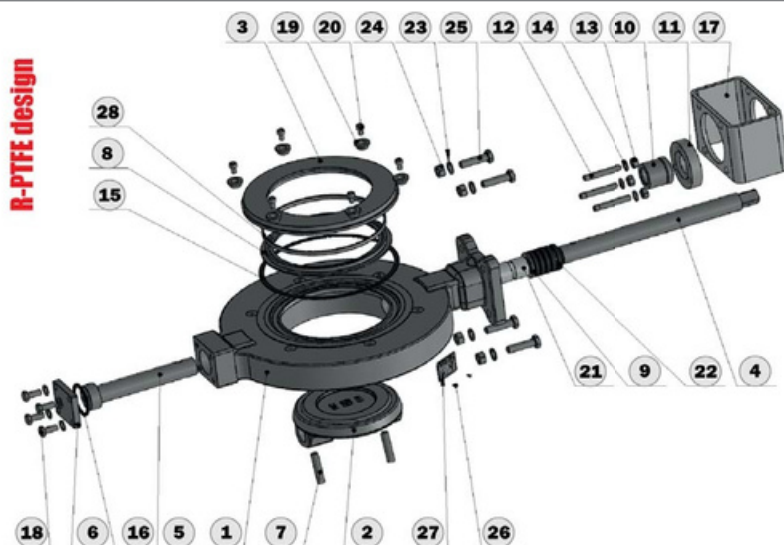
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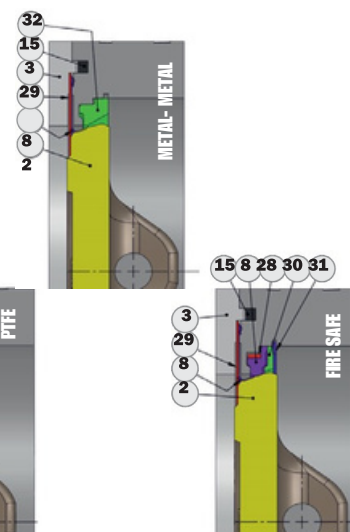
4 / ABO Valve Czech



MATERIAL PERFORMANCE



Seat details



Item	Name	Material
1	Body	6 - low carbon steel 1.1156 (A352 LCC) 5 - carbon steel 1.0625 (A216 WCB) 4 - stainless steel 1.4408 (A351 CF8M)
2	Disc	DN50-125: stainless steel 1.4409 (ASTM A351 CF3M / CF8M) DN150-600: 55xx: stainless steel 1.4027 (ASTM CA-40) 54xx, 56xx: stainless steel 1.4408 (ASTM A351 CF8M)
3	Pressure flange	Carbon steel 1.0425 Stainless steel 1.4404 (AISI 316L)
4	Stem	54XX, 56XX: stainless steel 1.4462 55XX: stainless steel 1.4021 (AISI 420) DN50-125: stainless steel 1.4404 (AISI 316L)
5	Pivot	DN150-600: stainless steel 1.4021 (AISI 420)/1.4462 DN50-125: -
6	Cover	DN150-600: carbon steel 1.4025 / stainless steel 1.4401 (AISI 316) DN50-125: -
7	Pin	DN50-125: - 54XX, 56XX DN150-600: stainless steel 1.4462 55XX DN150-600: stainless steel 1.4021 (AISI 420)
8	Seat	XX70 DN50-125: INCONEL 718 2.4668 XX80: FIRE SAFE (R-PTFE + INCONEL) XX90: R-PTFE (PTFE reinforced by 25% glass fiber) Stainless steel 1.4404 (AISI 316L)
9	Washer	DN50-125: - 54XX, 55XX DN150-600: stainless steel 1.4401 (AISI 316) 56XX DN150-300: stainless steel 1.4401 (AISI 316) 56XX DN350-600: stainless steel 1.4404 (AISI 316L) 54XX, 55XX, 56XX DN50-125: stainless steel 1.4308 (CF8)
10	Stuffing box	54XX, 55XX, 56XX DN150-600: stainless steel 1.4301 (AISI 304) Stainless steel A4
11	Sealing flange	54XX, 55XX, 56XX DN150-600: stainless steel 1.4301 (AISI 304) Stainless steel A4
1	Bolt	Stainless steel A4
2	Nut	

Item	Name	Material
14	Washer	Stainless steel A4
15	Flange sealing	Graphite min. 98%
16	Cover seal	Graphite
17	Bracket	DN50-125, 500, 600: carbon steel 1.0553 DN150-400: carbon steel 1.0576
1	Bolt	Stainless steel A4
8	Retaining sleeve	Stainless steel 1.4404 (AISI 316L)
1	Bolt	Stainless steel A4 Xx70, Xx80: stainless steel 1.4404 (AISI 316L) + nickel plated XX90: TP IGUS Graphite min. 98%
2	Bushing	Stainless steel A4
1	Sealing	Stainless steel A4
2	Washer	Stainless steel A4
2	Nut	Stainless steel A4
3	Bolt	Stainless steel
2	Rivet	Stainless steel 1.4404 (AISI 316L) - only for „R-PTFE“ and „FIRE SAFE“ version INCONEL - only for „METAL-METAL“ and „FIRE SAFE“ version
4	Label	
2	Seat O-ring	
5	Sealing	
2	Support ring	Stainless steel 1.4404 (AISI 316L)
9	Retaining	
3	ring	Stainless steel 1.4401
31	Support	
0	ring	
32	ring	Stainless steel 1.4404 (AISI 316L)

Other material performance on request. To select a suitable material solution please contact ABO valve company. Maximum temperatures for each seats are only permitted for specific media and short-term use.

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Working pressure max. **Temperature rating *)**
R-PTFE seat - tightness A -29°C to 200°C (R-PTFE) - 5590
 DN50-DN100: 50 bar 55°C to 325°C (Inconel) - 5470
 DN125-DN200: 40 bar
 DN250-DN450: 25 bar
Coating
Metal-Metal RAL 9005 - standard
seat - tightness C Coating resistant to high
Fire Safe seat - tightness A temperatures (up to +600°C)
 DN50-DN125: 25 bar upon request
 *) depending on the material performance
 of the valve body (will be specified - please consult with ABO)

OPERATING TORQUES / FLANGE CONNECTION

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Operating torques (Nm) vs. working pressure (bar)

R-PTFE seat (standard line DN50-DN400)

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
NPS	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
PS 16 bar	19	35	50	77	110	145	278	567	650	1378	2248	2569	3090	4300
PS 25 bar	22	45	58	79	120	185	366	732	900	1900	3483	3925	5340	6250
PS 40 bar	32	53	62	90	150	242	485				-			
PS 50 bar	25	60	65	105										

Operating torques are mentioned without safety reserve.

Metal-metal seat and Fire Safe seat

DN	50	65	80	100	125
NPS	2"	2 1/2"	3"	4"	5"
PMAX 16 bar	50	70	100	150	220
PMAX 16 bar	50	70	100	150	220

Operating torques are mentioned without safety reserve

Installation between flanges DN50 - DN600

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
NPS	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
PN6	●	●		●	●	●	●	●	●	●	●	X	X	X
PN10														
PN16														
PN25														
PN40													X	X
ANSI150														
ANSI300										X	X	X	X	X
JIS 10K			●		●		●		●	X	●	●		
JIS 16K		●	●			●				●				

For Lug type (T) installation, please specify in the inquiry

Standard

●

Upon request

X

Impossible

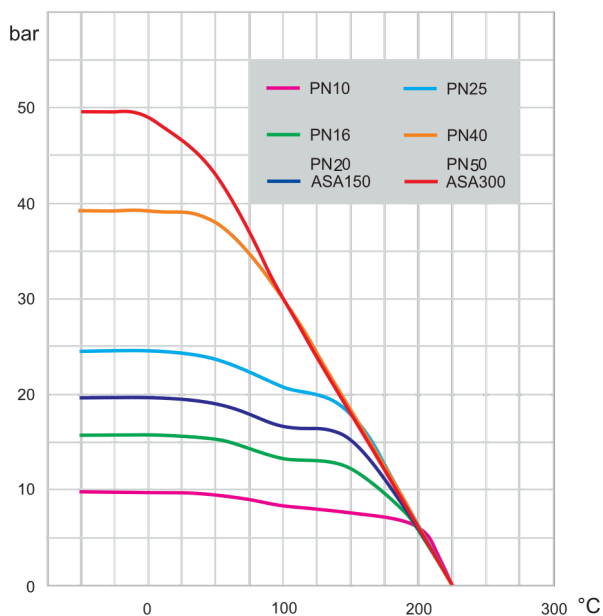
KV (CV) coefficient

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
NPS	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
KV	87	148	312	456	750	1125	1950	3100	4510	6120	8605	9419	11674	16914
CV	102	173	364	532	876	1313	2277	3619	5265	7145	10046	10926	13542	19620

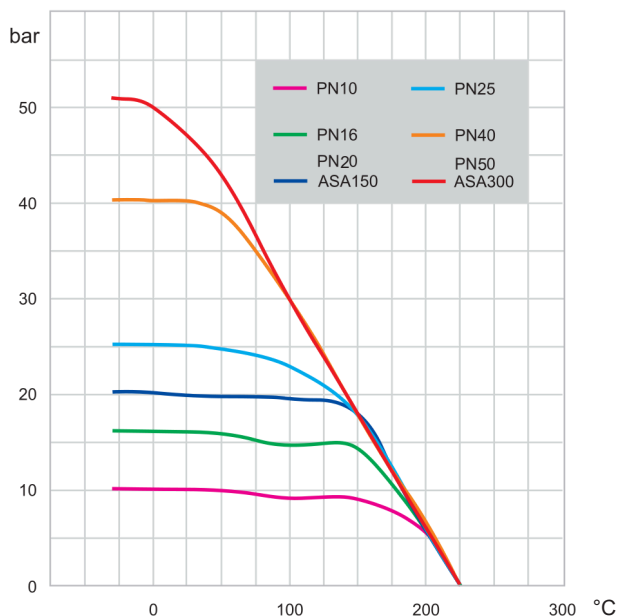
PRESSURE AND TEMPERATURE CURVES



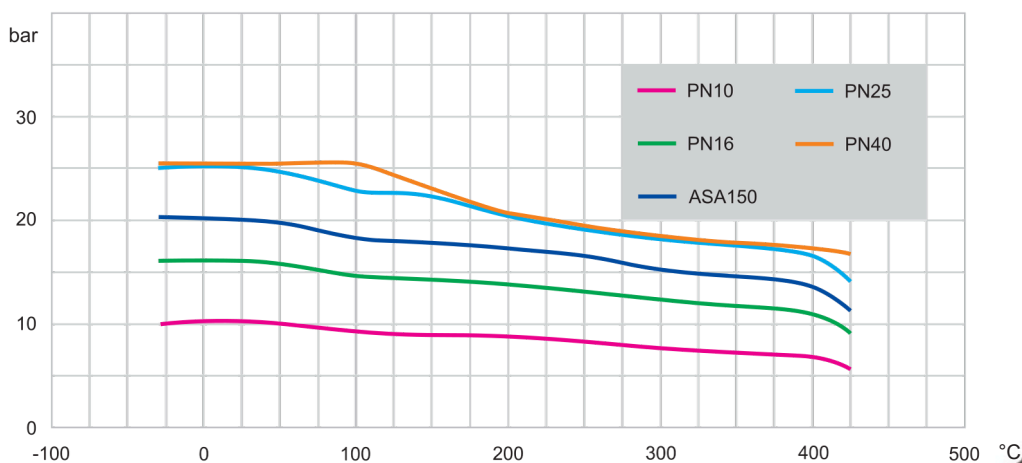
Body A351 CFM / PTFE seat



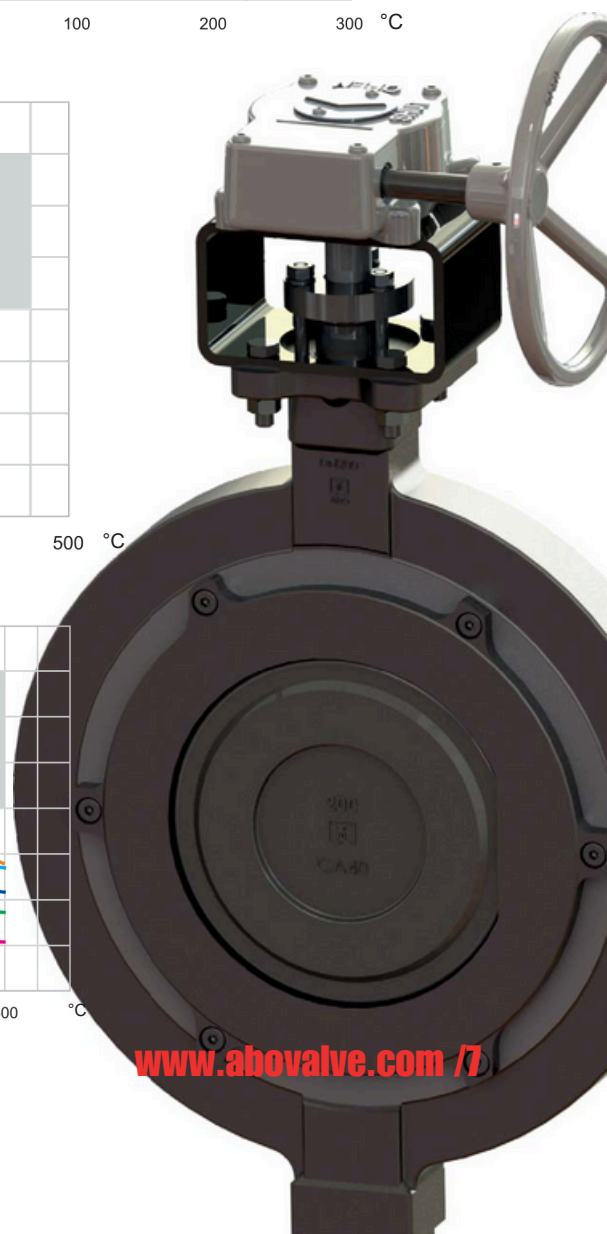
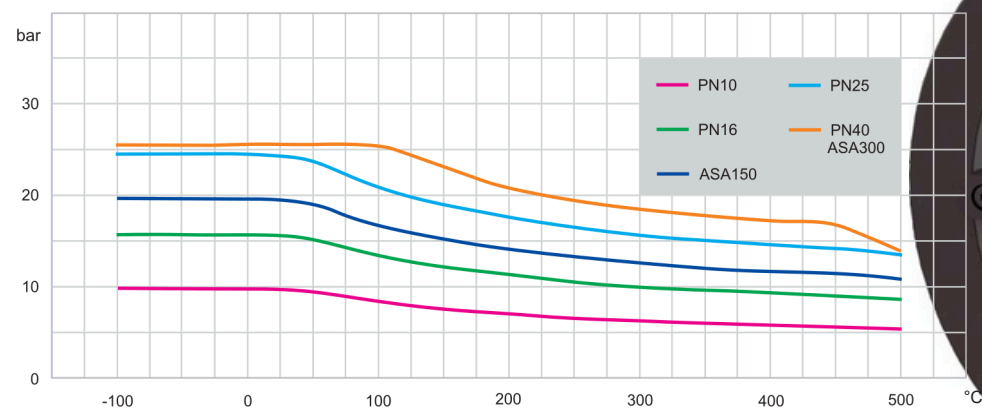
Body A216 WCB / PTFE seat



Body A216 WCB / Metal-Metal seat



Body A351 CFM / Metal-Metal seat

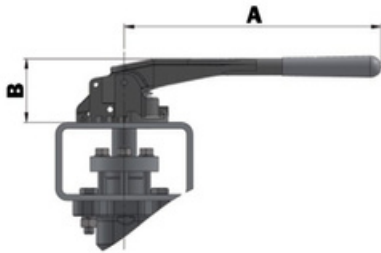


VALVE ACTUATION

All the ABO valves can be equipped with hand levers (up to DN150), worm gears, pneumatic and electric actuators. The upper flange design according to the standard ISO 5211 enables to directly assemble actuators on valves.

Handlelever

For manual actuation ABO valve offers carbon steel lever suitably painted to improve resistance to corrosion and abrasion. Stainless lever on request. Top flange connection according to ISO standards F07 for DN50 to DN125 and F10 for DN150. Controlled lever on request. The levers can be equipped with a padlock to ensure an optimized position, can be equipped with end position sensors.



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DN	50-100	125	150*)
A	270	270	362
B	75	80	90
Weight	1,26	1,26	1,40

Wormgearwithhandwheel

Manual gearbox housing is made from cast iron with suitable surface treatment and protection degree class IP 67. Self-locking design of the worm gear enables both to adjust basic positions open/shut and to control (throttle) media flow. The worm gearbox is simply actuated by means of a handwheel of a suitable diameter. End-limit positions of the worm gearbox are set by means of stop screws. The gearbox can be equipped with a lockable system secured by a padlock. Another way how to handle worm gearbox is using a chain. The worm gearbox as well as the hand lever can be completed with end-limit position sensors



DN	PS	ISO FLANGE	SHAFT	A	B	C	D	E	F	Kg
50	50	F07	14x14	127	46	139	59	141	200	2,9
65	50	F07	14x14	127	46	139	59	141	200	2,9
80	50	F07	14x14	127	46	139	59	141	200	2,9
100	50	F07	14x14	127	46	139	59	141	200	2,9
125	40	F07	14x14	127	46	139	59	141	200	2,9
150	40	F10	17x17	133	59	154	60	155	200	2,9
200	40	F10	17x17	133	59	154	62	155	200	2,9
250	25	F12	22x22	287	67	275	181	319	500	10
300	25	F14	27x27	287	67	275	181	319	500	10
350	25	F16	27x27	352	78	275	219	381	600	13
400	25	F16	36x36	398	110	346	245	454	700	24,6
450	25	F16	Ø55	408	142	400	120	480	700	50
500	25	F25	Ø64	255	142	378	142	330	400	40
600	25	F25	Ø75	363	175	429	175	440	500	50

Actuators

Pneumatic actuators

Pneumatic actuators ABO Series 95 can be assembled to valves in two options: single-acting or double-acting.

Pneumatic actuators

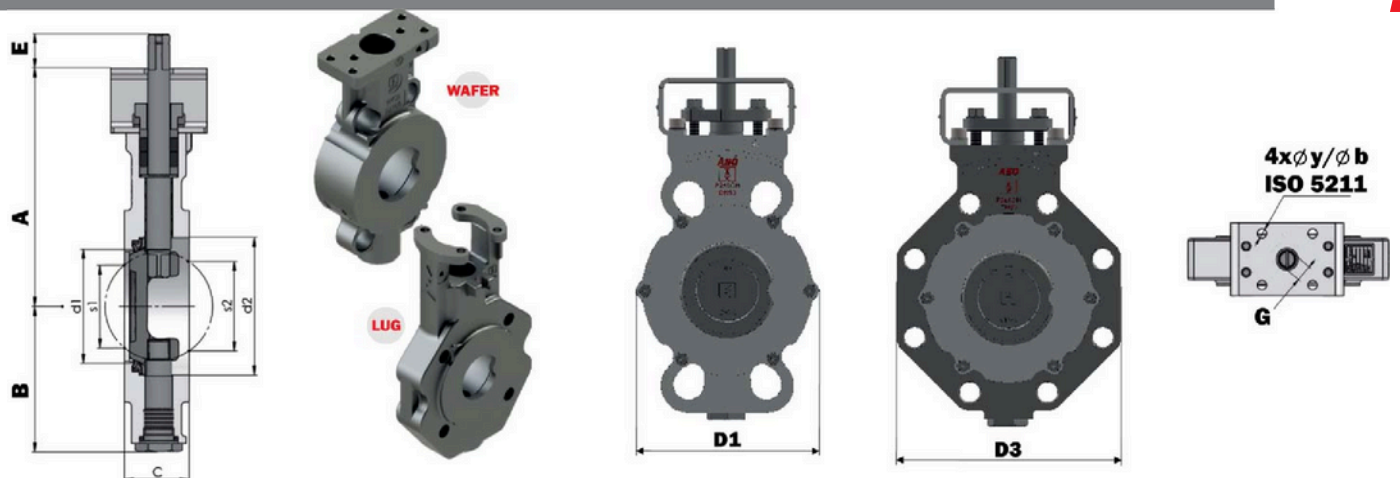
Electric actuators ABO Series 97 are designed quarter-turn. Electric actuators can be installed on ABO valves for voltages of 24 V, 230 V or 400 V.

Special actuators types

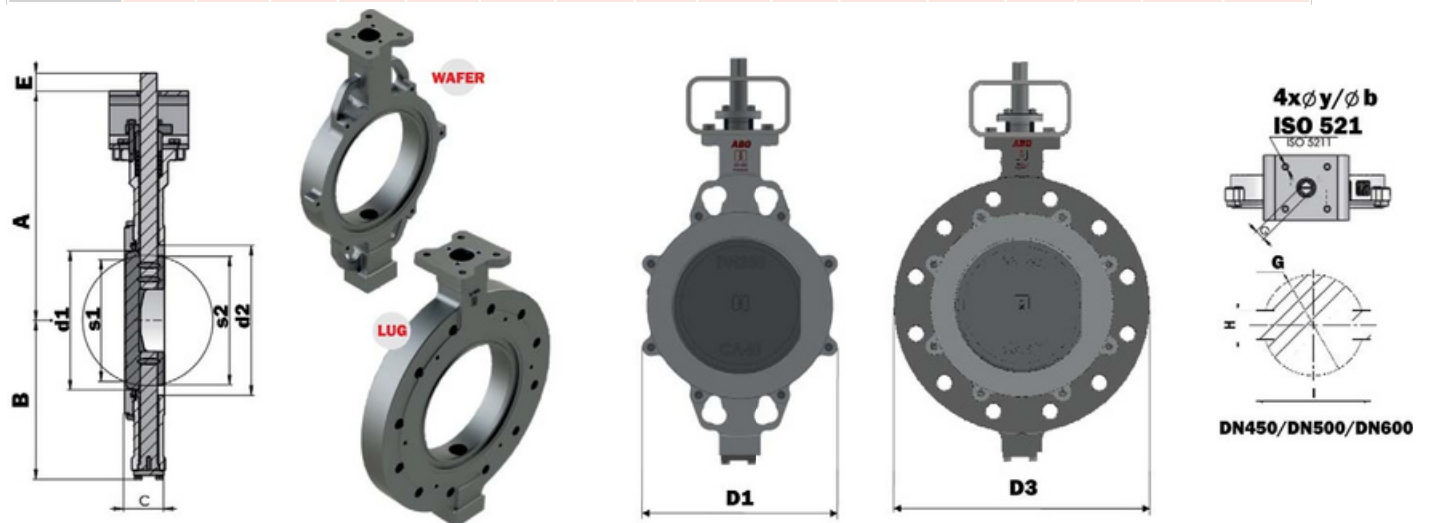
Valves are equipped with special actuator types from major world suppliers (Auma, Regada, Valpes, etc.).



BASIC DIMENSIONS



DN	d1	d2	A	B	C	D1	D2	s1	s2	E	G	ISO FLANGE	y	b	DESIGN B (kg)	DESIGN T (kg)
50	49	68	163	93	44	104	154	12	37	25	14	F07	9	70	5,1	7,3
65	65	82	170	100	47	123	178	39	55	25	14	F07	9	70	5,8	9,0
80	81	100	174	106	47	140	196	65	72	25	14	F07	9	70	6,8	10,1
100	100	123	206	123	53	163	225	85	91	25	14	F07	9	70	8,5	12,2
125	123	146	215	137	57	193	260	113	110	25	14	F07	9	70	11,8	16,5



DN	d1	d2	A	B	C	D1	D2	s1	s2	E	G	ISO FLANGE	y	b	DESIGN B (kg)	DESIGN T (kg)
150	146	155	307	214	57	252	318	136	143	25	17	F10	11	4	21	28
200	194	204	339	246	61	307	381	185	193	31	22	F10	11	4	29	41
250	240	259	395	275	69	349	450	224	236	31	22	F12	13	4	46	70
300	287	309	460	313	79	393	521	270	284	31	27	F14	17	4	67	105
350	313	342	508	355	92	448	577	300	308	45	27	F16	22	4	91	140
400	364	405	556	402	103	542	657	342	360	58	36	F16	22	4	132	211
450	420	450	567	395	114	565	-	400,2	419	80	55/16 /62,6	F16	22	4	165	-
500	452	500	625	431	127	593	707	434	454	100	64/18 /72,4	F25	17,5	8	241	282
600	547	600	698	491	154	695	830	524	546	110	75/20 /84,2	F25	17,5	8	367	

BIDIRECTIONAL TIGHTNESS / -RS- VERSION (DN50-DN600)

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Butterfly valves of 2E series (RS version) are delivered in nominal sizes of DN50 to DN600. Their make provides bidirectional tightness of the valve. On the circumference the valve is sealed with a special RTFE seal filled with 25% glass fibres and silicone filling.

Body material

- carbon steel 1.0625 (A216 WCB)
/ 1.0425 (P265 GH)
- low carbon steel 1.1156 (A352 LCC)
/ 1.0566 (P355 NL1)
- stainless steel 1.4409 (CF3M)
/ 1.4401 (AISI 316)

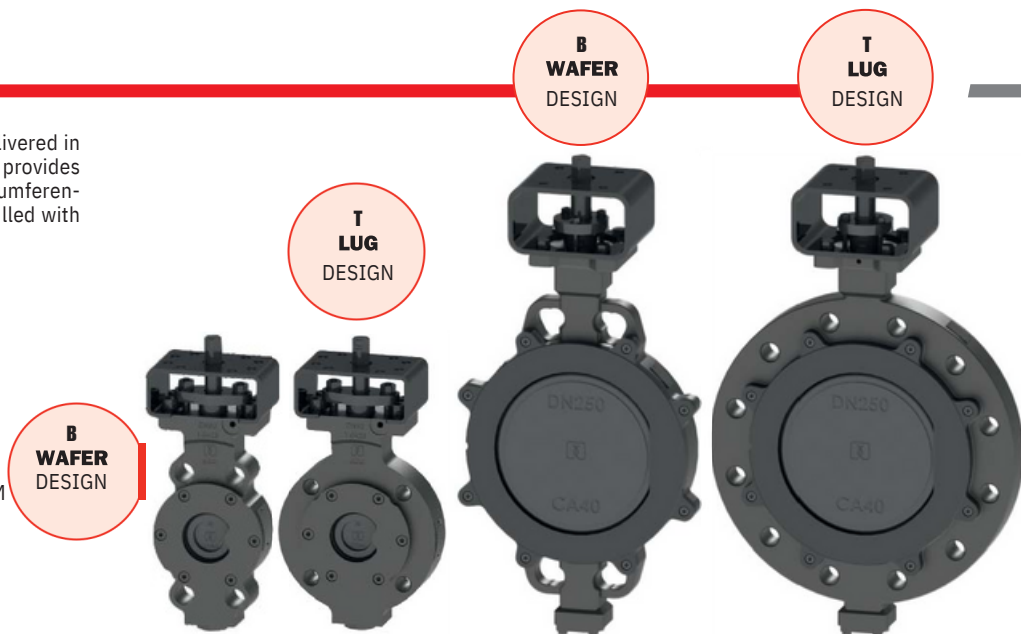
Disc material:

- DN50-DN125
stainless steel 1.4409 (ASTM A351 CF3M / CF8M)
- DN150-600:
55xx: stainless steel 1.4027 (ASTM CA-40)

54xx, 56xx: stainless steel 1.4408
(ASTM A351 CF8M)

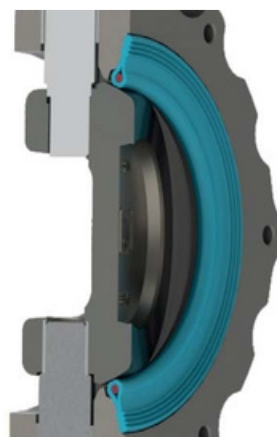
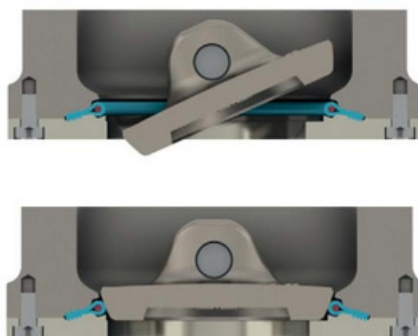
Valve features

- bidirectional tight and control butterfly valve with all-stainless disc
- double offset design
- sizes DN50 to DN600
- tightness class A (EN 12266-1)
- better flow rate due to split stem
- the seat is adapted to large temperature changes
- delivered for manual, electric or pneumatic control
- suitable for heat and power plants, steam and hot water pipework systems
- the valves may be delivered with a special surface protection



DN50-DN125

DN150-DN600



Czech Republic

ABO valve, s.r.o.

Dalimilova 285/54
783 35 Olomouc
tel.: +420 585 224 087
sales@abovalve.com

Slovak Republic

ABO Slovakia, s.r.o.

Banská Bystrica
tel.: +421 484 145 633
sales.sk@abovalve.com

Germany

ABO Armaturen GmbH

Essen
tel.: +49 (0)152 262 29501
sales.de@abovalve.com

USA

ABOControls LLC

Houston
tel.: +(1) 832.291.4929
sales.us@abovalve.com

Ukraine

ABOUkraine LLC

Dnipro
tel.: +38 056 733 95 70
sales.ua@abovalve.com

Turkey

ABO Armaturen LTD STI

Istanbul
tel.: +90 216 527 36 34
sales.tr@abovalve.com

Russia

ABO Armatura LLC

Smolensk
tel.: +7 (4812) 240 020
sales.ru@abovalve.com

India

ABOControls Pvt. Ltd.

Mumbai
tel.: +91 99 2002 9994
sales.in@abovalve.com
Singapore

ABO Valve Pte. Ltd.

Singapore
tel.: +65 9169 4562
sales.sg@abovalve.com

China

ABO Flow Control

Shanghai
tel.: +86 136 01 522 831
sales.cn@abovalve.com

United Arab Emirates

Salesrepresentation

Abu Dhabi
tel.: +971 56 9207964
bhar ti@abovalve.com

Bahrain

Salesrepresentation

Manama
tel.: +973 3444 9065
jim michen@abovalve.com



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