

PTFE-lined centric Series 10e Control and Shut-off Butterfly Valve

Application:

Tight-closing, centric butterfly control valve with PTFE lining for process engineering and plants with industrial requirements, especially suitable for corrosive process media:

- Nominal size 2" to 16" and DN 50 to DN 400.
- Nominal pressure ANSI Class 150 and PN 10 /16.
- Temperatures -58°F to 392°F (-50°C to 200°C).

The valve consists of a PTFE-lined butterfly valve with a pneumatic rotary actuator or a hand-operated actuator. The valve is designed according to the modular-assembly principle and has the following features:

- Body style
 - Lug-Type or
 - Wafer-Type.
- Valve body made of spheroidal graphite iron EN-JS 1049 / A395 with min. 3mm thick PTFE-lining.
- Butterfly disc and shaft undivided made of 1.4313 with PTFE encapsulated.
- All wetted parts are PTFE coated.
- High kv value obtained by utilizing a disc designed to provide favorable flow.
- Good control characteristic.
- Trouble-free installation even in insulated lines due to the long collar on the body.
- Attachment options according to DIN ISO 5211.
- Face-to-face acc. to DIN EN 558-1, Series 20.
- Face-to-face acc. to API 609 Class 150.

Versions:

The Series 10e Butterfly Valve is available optionally in the following versions:

- Butterfly valve with lever and ratchet.
- Butterfly valve with hand-operated actuator.
- Shut-Off Butterfly valve with pneumatic quarter-turn actuator Series 31a.
- Control butterfly valve with pneumatic diaphragm multiturn actuator Series 30a.

Special versions:

- Electric rotary actuator,
- Valve disc of stainless steel, optionally polished.
- Valve disc of special material.
- Adjustable stuffing box
- Brine-execution



Fig. 1 - Series 10e PTFE-lined Lug-Type Butterfly Valve



Fig. 2 Serie 10e PTFE-lined Lug-Type Butterfly Valve with Series 31a Quarter-Turn Actuator

Butterfly valve Series 10e

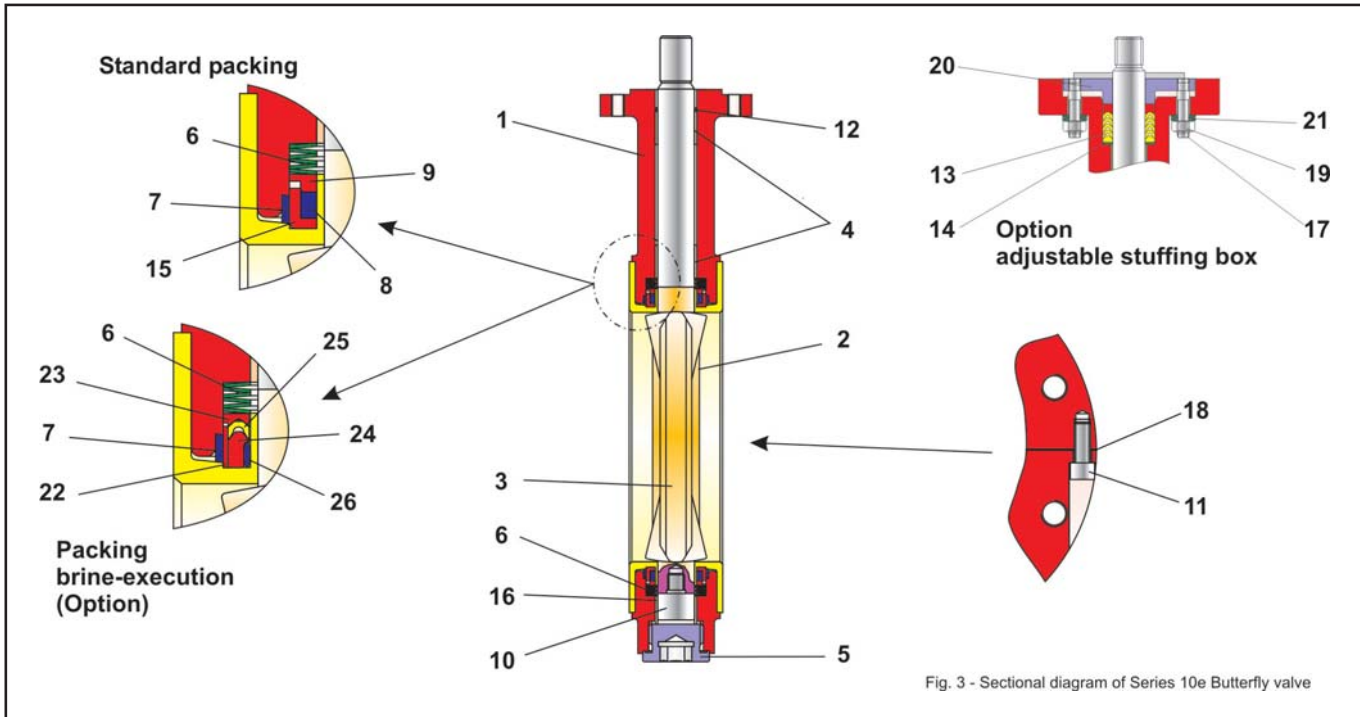


Fig. 3 - Sectional diagram of Series 10e Butterfly valve

Item	Description
1	Valve body
2	Liner
3	Butterfly disc
4	Bearing bushing
5	Screw plug
6	Belleville washer
7	Washer
8	Packing washer
9	Thrust ring

Item	Description
10	Bearing screw
11	Screw
12	O-ring
13	V-ring packing
14	Thrust washer
15	Bottom ring
16	Bearing bushing
17	Stud bolt
18	Distance plate

Item	Description
19	Nut
20	Stuffing box
21	Belleville washer
22	Outer ring
23	Thrust ring
24	Bottom ring
25	V-ring
26	O-ring

Table 1 - List of parts

Additional accessories:

The control valves are also available without any accessories or in combination with the following parts:

- Positioner
- Limit switch
- Solenoid valve
- Air sets
- Gauge block

Other special accessories are available on request.

General technical data:

Nominal size	2" to 16" or DN 50 to DN 400
Nominal pressure	ANSI Class 150 or PN 10 / 16 or
End connection	can be mounted between ANSI 150 lbs or PN 10 / 16
Temperature range	see Pressure-Temperature diagram
Rangeability	50 : 1
Leakage rate	Leakage rate A acc. to DIN EN 12266-1, P12 (Leakage rate 1 BO acc. to DIN 3230 Part 3)

Table 2 - technical data

Principle of operation:

The process medium can flow through the butterfly valve in either direction. The position of the butterfly disc (3) determines the flow rate through the free area between the disc and the liner (2). The shaft of the butterfly disc is sealed at both ends by spring washers (6) preloaded by self-adjusting PTFE-braided packing (7 and 8).

Elastomer inserted between the butterfly disc (3) and the liner (2) acts as a seal. The centric bearing design of the shaft and the butterfly disc designed for an optimal flow help achieve a good control characteristic and a high kv value.



Failure position: In dependence of mounting position of the actuator there are two failure positions, which take place by pressure relieving or on failure of air supply:

- **Butterfly valve with actuator " on failure closing "**
on failure of air supply the butterfly valve closes. The opening of the butterfly valve occurs on rising of air supply against the force of the springs.
- **Butterfly valve with actuator " on failure opening "**
on failure of air supply the butterfly valve opens. The closing of the butterfly valve occurs on rising of air supply against the force of the springs.



Note: Before using the butterfly valve in hazardous areas, check whether this is possible according to ATEX 94/9/EC.
See Operating Instructions <BA 10a>.

Materials:

Valve bod	EN-JS 1049 / A395 with PTFE-Liner
Elastomer	EPDM = -58°F to 302°F (-50°C to +150°C) Viton = -31°F to 392°F (-35°C to +200°C)
Disc and shaft	1.4313 / PTFE
Bushing	PTFE with 40% glass
Stuffing box packing	PTFE-EPDM / PTFE-Viton
Belleville washers	1.8159, Delta Tone coated
Coating	2-Components Pur-Varnish Colour: black, RAL 9005

Table 3 - Materials

Terms for noise level calculation:

z-values for noise level calculation acc. to VDMA 24422 and terms for control valve sizing acc. to DIN EN 60534.

Opening angle φ	10°	20°	30°	40°	50°	60°	70°	80°	90°
FL	0.95	0.95	0.92	0.83	0.73	0.65	0.58	0.53	0.50
xT	0.75	0.75	0.73	0.58	0.46	0.36	0.29	0.24	0.21
Z	0.35	0.30	0.25	0.20	0.17	0.14	0.12	0.11	0.10

Table 4 - noise level calculation and terms for control valve sizing

Correction terms:

with liquids $\Delta LF = 0$,
with gases and vapors $\Delta LG = 0$

Pressure-Temperature diagram:

The area of application is determined by the pressure-temperature diagram. Process data and the process medium can affect the values in the diagram.

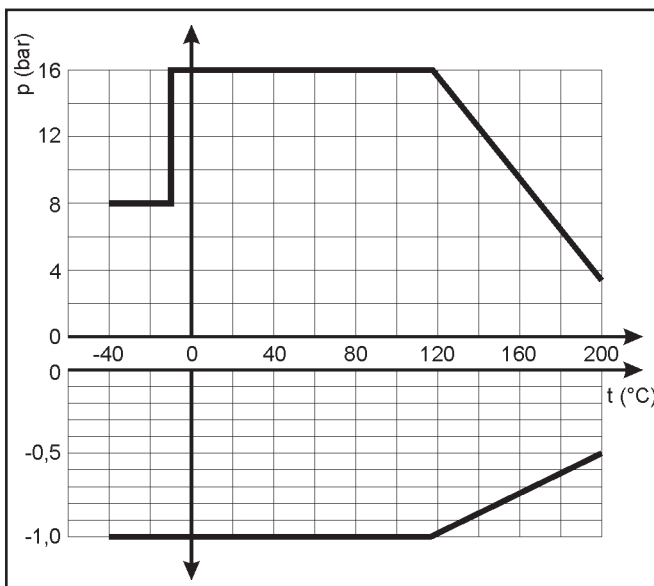


Fig. 4 - Pressure-Temperature diagram

Torque and breakaway torques:

DN	perm. Torque MDmax. in Nm	required Torque Md in Nm		
		(73 psi) (5 bar)	(145 psi) (10 bar)	(232 psi) (16 bar)
2" / 50	250	40	45	50
2 1/2" / 65	250	40	45	50
3" / 80	250	50	55	60
4" / 100	275	70	78	85
5" / 125	275	118	130	145
6" / 150	475	140	156	170
8" / 200	643	230	262	290
10" / 250	1026	300	337	375
12" / 300	1026	420	471	520
14" / 350	3270	670	720	765
16" / 400	3270	910	980	1060

Table 5 - max. permissible torque MDmax., required torque Md and breakaway torque MDI

The breakaway torques specified are average values which were measured with air at 68°F (20°C) with the corresponding differential pressures. Operating temperature, process medium and long operating times may affect the permissible torques and breakaway torques considerably. The maximum permissible torques listed apply to the standard materials specified in Table 3.

Functional diagram with opening angles:

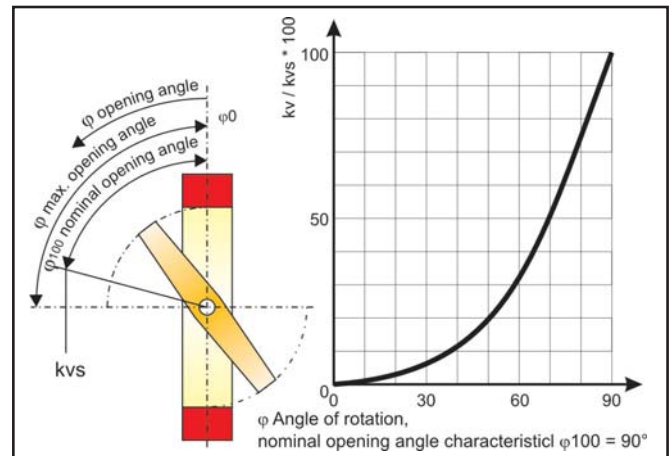


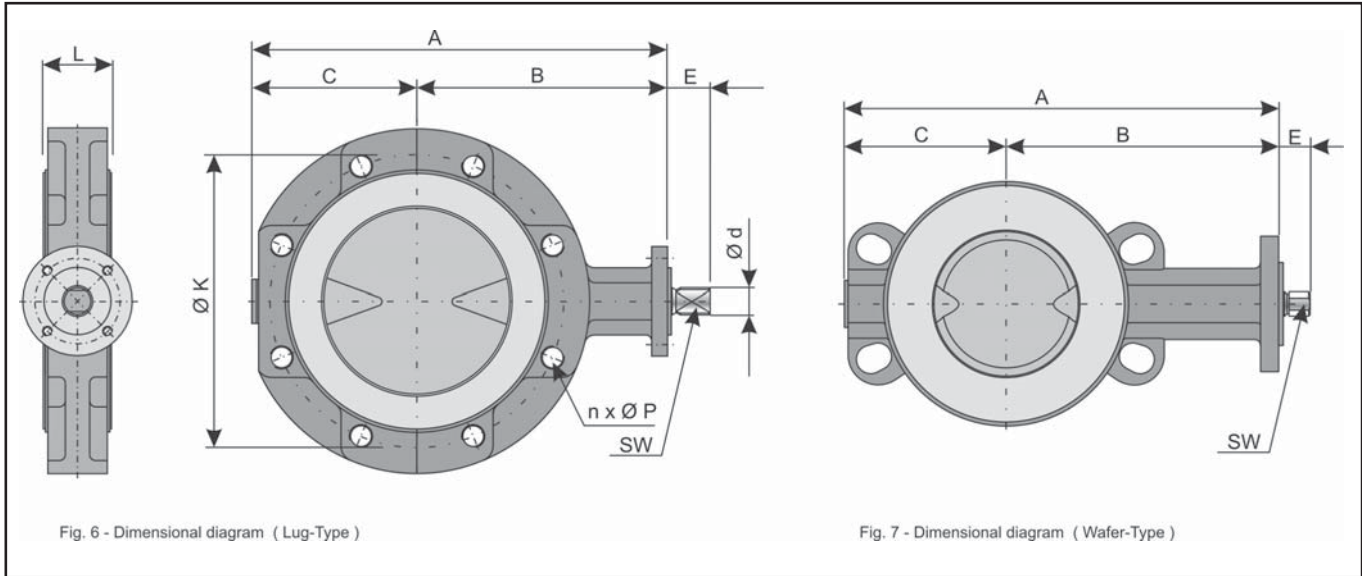
Fig. 5 - Functional diagram with opening angles

kv values and associated opening angles:

DN	Opening angle φ								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2" / 50	1.5	7	16	35	60	92	132	170	190
2 1/2" / 65	1.5	7	16	35	60	92	132	170	190
3" / 80	3.5	14	33	57	95	146	240	380	510
4" / 100	5.5	25	54	95	155	240	395	620	820
5" / 125	11.5	35	83	163	257	458	640	803	1019
6" / 150	14.5	52	120	215	342	547	940	1380	1800
8" / 200	20.5	95	215	376	590	940	1540	2400	3200
10" / 250	33	154	342	607	940	1540	2310	4000	5300
12" / 300	49	222	504	855	1455	2310	3760	6000	8000
14" / 350	69	345	620	1165	1835	2790	4560	7140	8690
16" / 400	103	515	960	1465	2450	4280	6523	9210	11420

Table 6 - kv values

Dimensions and weights:



DN	50 / 2"	65 / 2 1/2"	80 / 3"	100 / 4"	125 / 5"	150 / 6"	200 / 8"	250 / 10"	300 / 12"	400 / 16"	
L	Series 20 (PN10/16)	46	46	46	52	56	56	60	68	78	102
	API 609 H150 (Class 150)	46	46	48	54	56	57	64	71	81	102
A	215	232	253	289	325	339	401	463	533	665	
B	135	150	159	184	195	209	239	264	264	360	
C	80	82	94	105	130	130	162	199	269	305	
Ø K	PN 10	125	145	160	180	210	240	295	350	400	515
	PN 16	125	145	160	180	210	240	295	355	410	525
	Class 150	120.7	139.7	152.4	190.5	215.9	241.3	298.5	362	431.8	539.8
n	PN 10	4	8	8	8	8	8	8	12	12	16
	PN 16	4	8	8	8	8	8	12	12	12	16
	Class 150	4	4	4	8	8	8	8	12	12	16
Ø P	PN 10	M16	M16	M16	M16	M16	M20	M20	M20	M20	M24
	PN 16	M16	M16	M16	M16	M16	M20	M20	M24	M24	M27
	Class 150	5/8"	5/8"	5/8"	5/8"	3/4"	3/4"	3/4"	7/8"	1"	1 1/8"
E	18	18	18	21	19	24	24	29	29	29	
SW	11	11	11	14	17	17	17	22	22	27	
DIN ISO Connection	F05	F05	F05	F07	F07	F 07	F 07	F 10	F 10	F 12	
Weight ca. kg	3,5	4,5	9	12	12	17,5	29	40	60	95	

Table 7 - Dimensions in mm and weights in kg

Selecting and sizing the butterfly valve:

1. Calculate the appropriate kv value.
2. Select the nominal size and the kvs value from Table 6.
3. Comparing the operation conditions in acc. to the pressure-temperature diagram.
4. Select a suitable actuator.

Ordering text:

PTFE-lined butterfly valve Series 10e,
DN / PN , optional special version

Hand-operated actuator or actuator (brand name):
Supply pressure: bar,
fail-safe position:

Limit switch (brand name):
Solenoid valve (brand name):
Positioner:

Others:



Note: All relevant details regarding the version ordered, which deviate from the specified version in this technical description data, can be taken if required, from the corresponding order confirm.

Please contact our technical sales team for your special requirements

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Specifications subject to change without notice.