

Pneumatic Shut-off Butterfly Valve Type 3335/BR 31a-SRP or BR-31a-DAP



Application

Tight-closing butterfly valve for process engineering and plants with industrial requirements

Nominal size DN 50 to 300 · NPS 2 to 12
Nominal pressure PN 10 and PN 16
Temperatures max. operating pressure 10 or 16 bar
-10 to 150 °C · 14 to 302 °F

Type 3335/BR 31a Butterfly Valve with

- Type 3335 Butterfly Valve and single-acting BR 31a-SRP Pneumatic Rotary Actuator

Valve body material

- Cast iron or
- Spheroidal graphite iron

Seat ring

- EPDM or
- PTFE

Butterfly disc material

- Spheroidal graphite iron or
- Cast stainless steel
- PTFE jacketing

Attachment of control valve accessories, such as pneumatic or electropneumatic positioners, electrical or pneumatic limit switches or solenoid valves according to VDI/VDE 3845.

Throttling service

The Type 3335 Butterfly Control Valve can also be used for continuous control applications in the rotation range from 25° to 60°.

Versions

Standard version · Nominal size DN 50 to DN 300

- Type 3335/BR 31a (Fig. 1) · Tight-closing Type 3335 Butterfly Valve with single-acting BR 31a-SRP Pneumatic Rotary Actuator

Further versions with

- Double-acting DAP Rotary Actuator
- Larger nominal sizes available on request
- Emergency manual override for Pfeiffer BR 31a-SRP and BR 31a-DAP Rotary Actuators
- Single-acting Type 3278 Rotary Actuator (Fig. 2)
- Special materials



Fig. 1 · Type 3335/BR 31a Pneumatic Butterfly Valve



Fig. 2 · Type 3335/3278 Pneumatic Butterfly Valve

Principle of operation

The process medium flows through the butterfly valve. The flow coefficient is determined by the opening angle of the disc (4) and, as a result, the cross-sectional area between the disc and the body (2). The disc is connected to the actuator by the shaft and coupling elements.

The disc and the seat ring (3) come into contact with the process medium. The seat ring also functions as a flange seal.

Fail-safe position

Depending on how the rotary actuator is attached, the butterfly valve has two different fail-safe positions which become effective when the pressure is reduced or when supply air fails:

Valve **CLOSED** without supply air, the butterfly valve is closed when the supply air fails.

Valve **OPEN** without supply air, the butterfly valve is opened when the supply air fails.

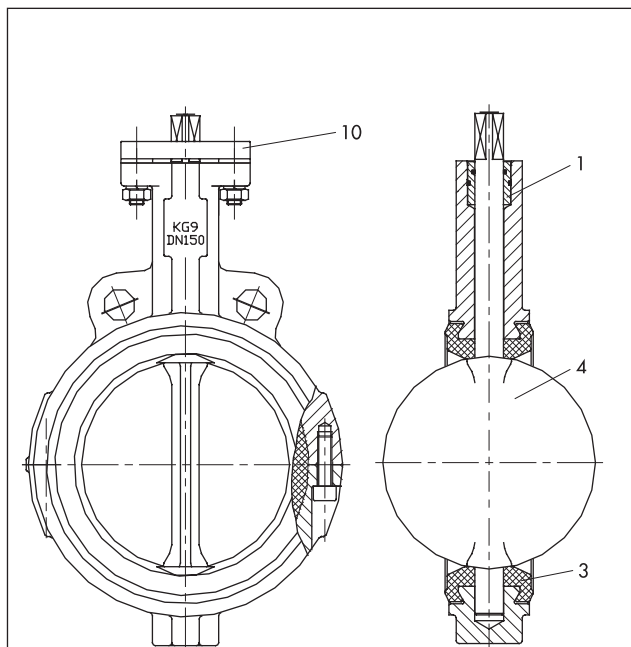


Fig. 3 · Type 3335 Pneumatic Butterfly Valve
Version with EPDM seat ring

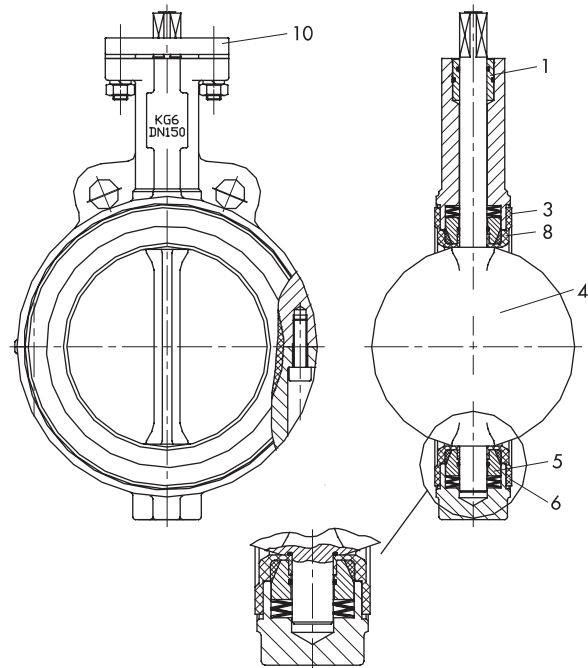


Fig. 4 · Type 3335 Pneumatic Butterfly Valve
Version with PTFE seat ring

Legend

- 1 Bearing bushing with O-ring
- 3 Seat ring
- 4 Disc with shaft
- 5 Retainer
- 6 Belleville washer
- 8 Elastomer
- 10 Mounting plate

Table 1 · Technical data

Nominal size ¹⁾	DN 50 to 300 · NPS 2 to 12		DN 50 to 150 · NPS 2 to 6	
Nominal pressure	PN 10		PN 10 · PN 16 on request	
Valve body style	Wafer-type · Lug-type on request			
Face-to-face dimensions	EN 558-1 Series 20 (DIN 3202 K1)			
Mounted between flanges	PN 10, PN 16 or Class 150			
Temperature range				
Seat ring	EPDM	-10 to 120 °C (14 to 248 °F)		
	PTFE	-10 to 150 °C (14 to 302 °F)		
Permissible operating pressures				
Seat ring ²⁾	EPDM	10 bar · 9.5 bar at 120 °C		16 bar only with body made of EN-JS1049
	PTFE	10 bar		
Leakage class acc. to EN 12266-1	Test P12 - Leakage rate "A"			

¹⁾ Larger nominal sizes on request

²⁾ Special version for vacuum service (100 mbar abs.)

Table 2 · Materials

Body	Cast iron EN-JL1040	Spheroidal graphite iron EN-GJS-400-18-LT	Spheroidal graphite iron EN-GJS-400-18-LT	
Seat ring	EPDM · Others (e.g. silicone on request)		PTFE	
Elastomer	-		Silicone	
Disc	DN 200/NPS 8 and larger EN-JS1040	CrNiMo steel	CrNiMo steel	PTFE-jacketed
Shaft	DN 200/NPS 8 and larger 1.4021	CrNiMo steel	CrNiMo steel	1.4462
Retainer	-		1.4305	
Bearing bushing with O-ring	POM/NBR		POM/NBR	
Belleville washer	-		Spring steel	

Table 3 · K_v coefficients

Nominal size		Opening angle								
DN	NPS	10°	20°	30°	40°	50°	60°	70°	80°	90°
50	2	1.8	7	16	26	44	70	115	175	210
65	2½	2.8	10	23	39	60	95	155	280	340
80	3	3.5	14	33	57	95	146	240	380	510
100	4	5.5	25	54	95	155	240	395	620	820
125	5	8.6	38	86	155	240	385	635	950	1200
150	6	14.5	52	120	215	342	547	940	1380	1800
200	8	20.5	95	215	376	590	940	1540	2400	3200
250	10	33	154	342	607	940	1540	2310	4000	5300
300	12	49	222	504	855	1455	2310	3760	6000	8000

Differential pressure tables for Type 3335 Butterfly Valve for on/off service · Pressures in bar
Table 4a · Permissible differential pressures for fail-safe position CLOSED

Nominal size DN	size NPS	Shaft Ø	Size Type SRP	Springs n=	Required signal pressure ¹⁾	Differential pressure ²⁾	Max. perm. supply pressure · Shaft made of:		
							1.4021	CrNiMo	1.4462
50	2	14	150	3	2.5	16	-	4.1	6.0
			100	4/5	4	16		6	6.0
65	2½	14	220	2/3	2.5	16		2.8	4.6
			150	4	3.5	16		4.5	6.0
			100	5/6	5	16		6	6.0
80	3	14	220	3	2.5	16		2.9	4.8
			150	4/5	4	10		4.7	6.0
			100	6	5.5	10		6	6.0
100	4	16	300	3	2.5	5		3.3	5.4
			220	4/5	4	16		4.4	6.0
			150	6	5.5	5	6	6.0	
125	5	19	450	3	2.5	16	3.4	5.7	
			300	4/5	4	5	5.3	6.0	
			220	6	5.5	16	6	6.0	
150	6	19	600	3	2.5	5	2.9	4.7	
			450	4/5	4	10	-	-	
			300	6	5.5	5	6	6.0	
200	8	22	1200	3	2.5	10	3.7	3.4	5.7
			900	4/5	4	16	5.1	4.7	6.0
			600	6	5.5	10	6	6	6.0
250	10	29	2000	3	2.5	16	3.3	3.1	5.1
			1200	4/5	4	10	5.6	5.1	6.0
			900	6	5.5	10	6	6	6.0
300	12	29	3000	2/3	2.3	10	2.6	-	3.7
			1200	5/6	5	5	6	5.5	6.0

1) Required signal pressure to open the butterfly disc

2) When the disc is closed, the differential pressure is restricted depending on the version of the butterfly valve (see Table 1).

Table 4b · Permissible differential pressures for fail-safe position OPEN

Nominal size mm	size NPS	Shaft Ø	Size Type SRP	Springs n=	Required signal pressure ¹⁾	Differential pressure ²⁾	Max. perm. supply pressure · Shaft made of:		
							1.4021	CrNiMo	1.4462
50	2	14	150	2	2.5	16	-	3.8	6.0
			100	3/4	4	16		5.5	6.0
65	2½	14	220	2	2.5	16		2.6	4.4
			150	3/4	4	16		4.3	6.0
			100	5	5.5	16		6	6.0
80	3	14	220	2	2.5	16		2.6	4.4
			150	3/4	4	16		4.3	6.0
			100	5	5.5	5		6	6.0
100	4	16	300	2	2.5	10		2.9	5.1
			220	3	3.5	16		3.8	6.0
			150	5	5.5	10	6	6.0	
125	5	19	450	2	2.5	16	3	5.3	
			300	3/4	4	16	4.9	6.0	
			220	5	5.5	16	6	6.0	
150	6	19	600	2	2.5	10	2.6	4.3	
			450	3/4	3.5	5	3.6	5.8	
			300	5	5.5	10	5.6	6.0	
200	8	22	1200	2	2.5	10	3.4	3	5.3
			900	3/4	4	16	4.9	4.5	6.0
			600	5	5.5	16	6	6	6.0
250	10	29	2000	2	2.5	16	3	2.7	4.8
			1200	3/4	4	10	5.2	4.8	6.0
			900	5	5.5	10	6	6	6.0
300	12	29	2000	2/3	3	10	3.2	-	4.9
			1200	5	5.5	10	5.7	-	6.0

1) Required signal pressure to close the butterfly disc

2) When the disc is closed, the differential pressure is restricted depending on the version of the butterfly valve (see Table 1).

A differential pressure of at least 10 bar is required for a seat ring made of PTFE.

Table 5 · Shaft torque, opening and closing torques in Nm

Nominal size		Perm. shaft torque (up to 20 °C/68 °F) with shaft made of			Opening and closing torques at Δp of		
DN	NPS	1.4021	CrNiMo	1.4462	5 bar ¹⁾	10 bar	16 bar
50	2	-	79	158	28	29	29
65	2½		79	158	33	34	36
80	3		79	158	39	44	47
100	4		118	236	59	64	69
125	5		198	396	83	98	98
150	6		198	396	123	137	157
200	8	552	480	960	206	235	275
250	10	814	703	1406	314	363	412
300	12	814	703	1406	441	530	589

¹⁾ With a seat ring made of PTFE, the higher torque specified in the column for 10 bar applies for a differential pressure of 5 bar.

Table 6 · Dimensions and weights for Type 3335/BR 31a Butterfly Valve

Valve	DN	50	65	80	100	125	150	200	250	300
	NPS	2	2½	3	4	5	6	8	10	12
Length L	mm	43	46	46	52	56	56	60	68	78
Shaft Ø d	mm	14	14	14	16	20	20	22	28	28
B	mm	60	67	75	94	113	126	158	191	222
A	mm	145	160	175	195	210	225	258	288	318
Flange	DIN 3337	F07	F07/F10	F07/F10	F07/F10	F10/F12	F10/F12	F12/F14	F14/F16	F14/F16
SW	mm	17	17/22	17/22	17/22	22/27	22/27	27/36	36/46	36/46
C (mounting plate)		12	12	12	12	12	12	12	12	12
Weight	Approx. kg	2.8	3.3	3.8	5.5	7.5	9.3	15	22	33

Type SRP Actuator	Size	100	150	220	300	450	600	900	1200	2000	3000
H3	mm	248	269	315	345	409	438	487	543	621	684
E	mm	135	147	175	187	207	226	271	295	349	380
Connecting flange DIN 3337		F07	F07	F10	F10	F12	F12	F14	F14	F16	F16
SW	mm	17	17	22	22	27	27	36	36	46	46
Weight											
Type SRP	kg	4.5	6.5	10	13	18.5	24	32	46	65	103

Ordering text

DN ... PN ...

Materials listed in Table 2 for

- Body
- Disc
- Seat ring

Actuator	Pfeiffer Type BR 31a or Type 3278
Supply pressure	... bar
Fail-safe position	Valve CLOSED or valve OPEN
Max. differential pressure	Δp_0 in bar (closed position)
Temperature of process medium	°C or K
Vacuum service	No/ yes (... mbar _{abs})
Valve accessories	

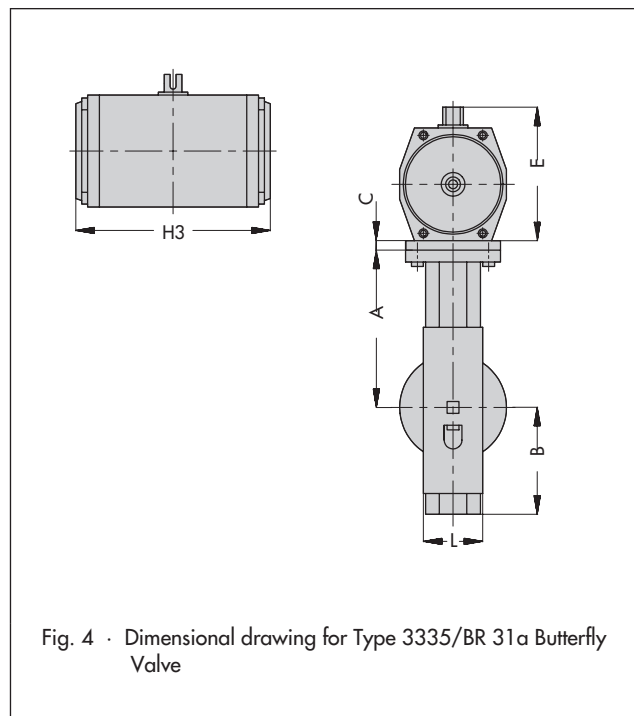


Fig. 4 · Dimensional drawing for Type 3335/BR 31a Butterfly Valve

