

## Pneumatic Butterfly Valve Type 3237-1 and Type 3237-7

### Swing-through or step-seated Butterfly Valve Type 3237

#### Application

Butterfly valve for use in process engineering and plants with industrial requirements

**Nominal sizes** DN 500 to 1000 · 20" to 40"

**Nominal pressures** PN 6 to 16 · ANSI Class 150

**Temperatures** -10 to 220 °C · 14 to 428 °F

The Type 3237 Butterfly Valve with

- Type 3271 Pneumatic Actuator (Type 3237-1 Control Butterfly Valve, see T 8310 EN) or
- Type 3277 Pneumatic Actuator (Type 3237-7 Control Butterfly Valve) for integral positioner attachment

Valve body material

- Cast steel or
- Cast stainless steel

Butterfly disc style

- Swing-through or
- Step-seated

The control valves can be equipped with various accessories: positioners, solenoid valves and other attachment devices according to IEC 60534-6 and NAMUR recommendation. Refer to Information Sheet T 8350 EN for more details.

#### Versions

**Standard version** with swing-through disc for temperatures from -10 to 220 °C (14 to 428 °F)

- **Type 3237-1** · Nominal sizes DN 500 to DN 1000 with Type 3271 Actuator (see Data Sheet T 8310 EN)
- **Type 3237-7** · Nominal sizes DN 500 with Type 3277 Actuator (see Data Sheet T 8311 EN)

#### Further versions with

- Step-seated butterfly disc
- Nominal sizes DN 50 to ≤500 and >DN 1000 to 2000
- Pressure ratings up to PN 160 or ANSI Class 900
- Version for higher temperatures up to 450 °C (840 °F)
- Extension for cryogenic applications for temperatures up to -196 °C (-320 °F) as well as high temperatures up to 1050 °C (1870 °F)
- Face-to-face dimensions acc. to DIN, EN 558-1 or API
- Flanged valve body or flange-mounted (lug type) body as well as body with welding ends
- Additional handwheel
- "TA-Luft" (German clean air act) packing with certification
- Double packing with seal gas connection
- Facing with groove
- Heating jacket for process media which crystallize

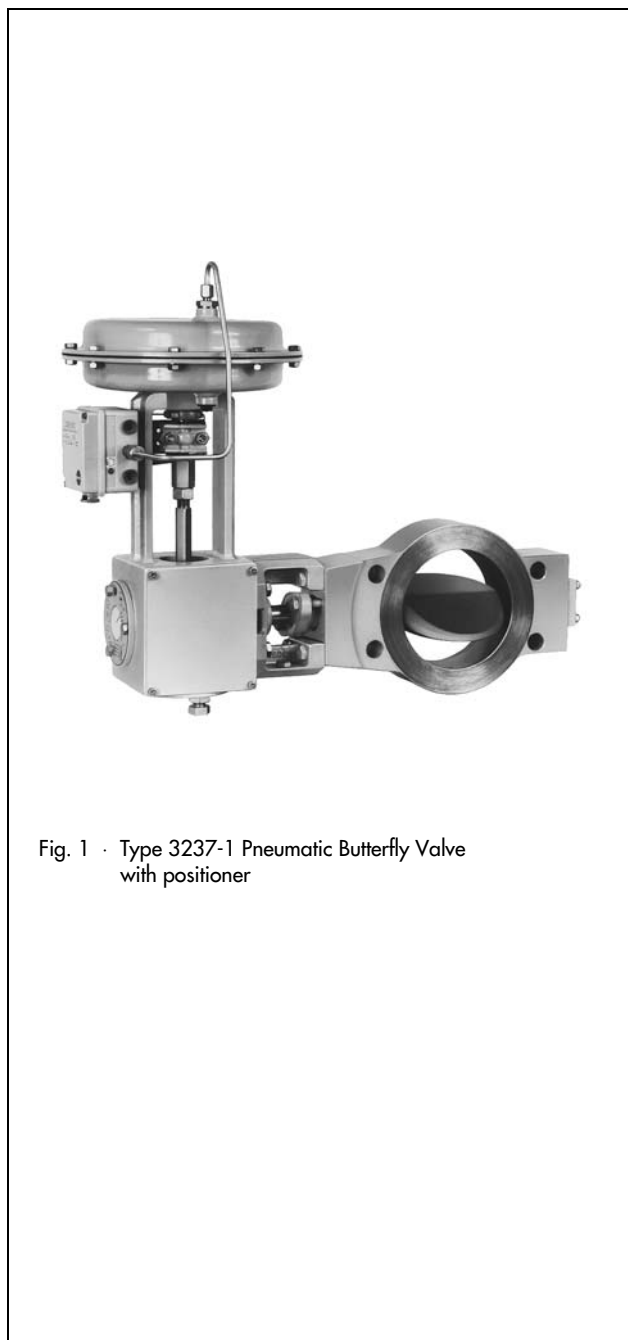


Fig. 1 · Type 3237-1 Pneumatic Butterfly Valve with positioner

### Principle of operation

The process medium flows through the valve. The flow coefficient is determined by the opening angle of the disc. The shaft with the attached disc is connected to the actuator over coupling elements. The shaft is sealed by a stuffing box.

### Fail-safe position

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

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

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

### Notes to Tables 4 and 5

The  $K_{VS}$  values specified apply to the nominal opening angle  $\varphi_{100} = 70^\circ$ ; in addition, the following applies:

$\Delta p_0$  Permissible differential pressure with the disc in closed position  
(valve CLOSED)

$\Delta p_{100}$  Permissible differential pressure with nominal opening angle  $\varphi_{100} = 70^\circ$   
(valve OPEN)

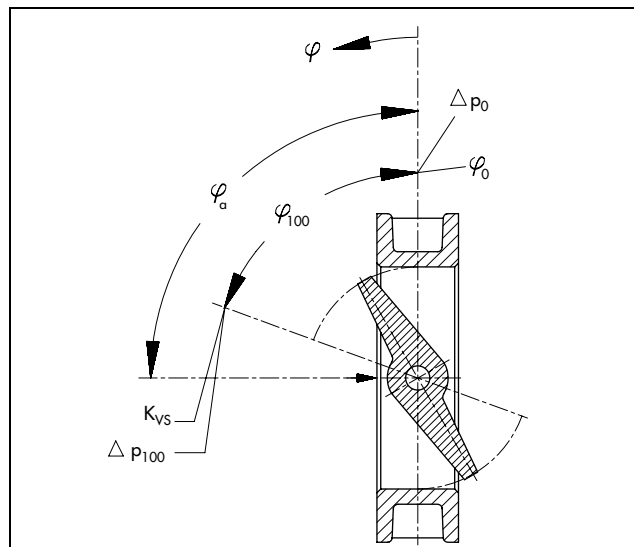


Fig. 3 · Swing-through butterfly valve

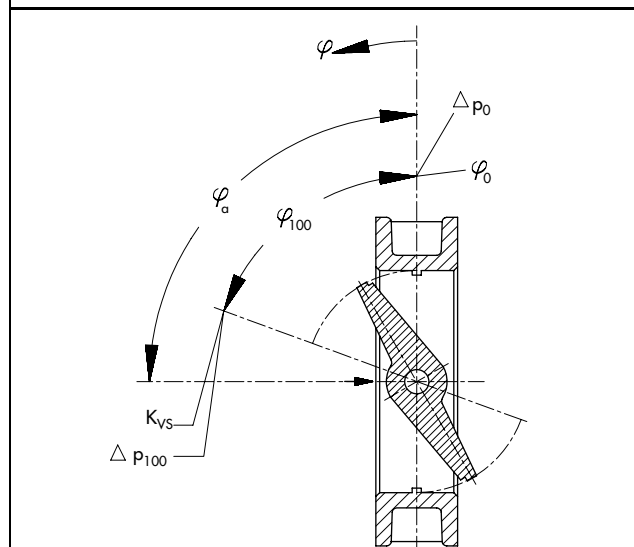
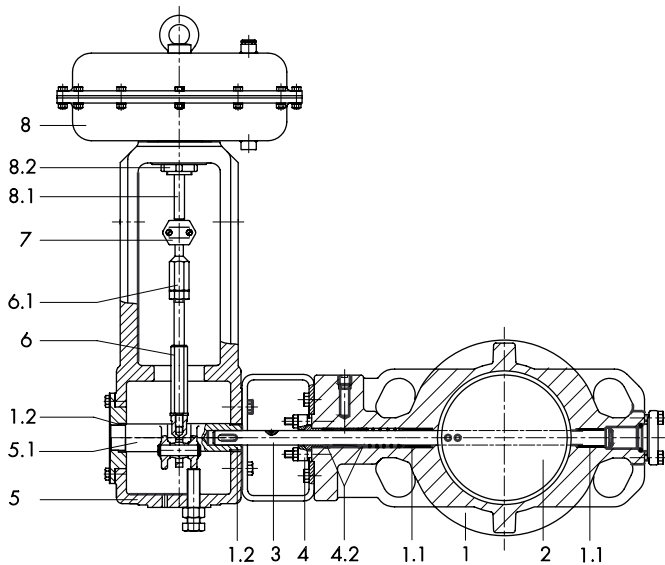


Fig. 4 · Step-seated butterfly valve



1. Body
- 1.1 Internal bearing
- 1.2 External bearing
2. Disc
3. Shaft
4. Gland flange
- 4.2 Packing
5. Bracket
- 5.1 Shaft with linkage
6. Link rod
- 6.1 Coupling and lock nut
7. Stem connector between actuator stem and link rod
8. Pneumatic actuator
- 8.1 Actuator stem
- 8.2 Nut for item 8

Fig. 2 Type 3237-1 Pneumatic Butterfly Valve with Type 3237 Butterfly Valve and Type 3271 Actuator

**Table 1 · Technical data for Type 3237 Butterfly Valve**

Nominal size	DN	500 ... 1000
Nominal pressure	PN	6 ... 16
Max. opening angle		70°
Temperature range	°C	-10 ... 220
Leakage rate with reference to the opening angle		
	Swing-through valve	≤ 0.5 % of the K <sub>v</sub> value when φ = 90°
	Step-seated valve	≤ 0.05 % of the K <sub>v</sub> value when φ = 90°
Rangeability		50 : 1

**Table 2 · Materials (material number according to EN DIN · Former material number in parentheses)**

Body and disc	Cast steel 1.0619 (GS-C25) or P265GH	Stainless cast steel 1.4581 or 1.4571
Shaft	1.4542	
Tapered pins	1.4057	1.4571
External bearing	PTFE compound bearing	
Packing	PTFE	
Packing follower	EN-JL1040 (GG-25)	1.4552
Bracket	EN-JS1049 (GGG-40.3)	

**Terms for control valve sizing and noise level calculation****Table 3a · K<sub>v</sub> values**

DN		Opening angle								
mm	in	10°	20°	30°	40°	50°	60°	70°	80°	90°
500	20"	180	660	1300	2300	3800	6000	8700	12000	13300
600	24"	270	990	2000	3500	5600	8800	13000	18000	19600
700	28"	380	1360	2700	4600	7600	12000	17500	24000	26000
800	32"	500	1770	3550	6100	9900	15700	22800	31400	35000
900	36"	610	2240	4500	7800	12700	20000	28800	40000	45000
1000	40"	790	2770	5500	9500	15800	24500	35600	49000	56000

**Table 3b · C<sub>v</sub> values**

DN		Opening angle								
mm	in	10°	20°	30°	40°	50°	60°	70°	80°	90°
500	20"	210	772	1521	2691	4446	7020	10 179	14 040	15 561
600	24"	315	1158	2340	4095	6552	10 296	15 210	21 060	22 932
700	28"	444	1591	3159	5382	8892	14 040	20 475	28 080	30 420
800	32"	585	2070	4153	7137	11 583	18 369	26 676	36 738	40 950
900	36"	713	2620	5265	9126	14 859	23 400	33 696	46 800	52 650
1000	40"	924	3240	6435	11 115	18 486	28 665	41 652	57 330	65 520

**Table 3c · Coefficients for noise level calculation**

Opening angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
F <sub>L</sub>	0.95	0.95	0.90	0.83	0.73	0.65	0.58	0.53	0.50
x <sub>T</sub>	0.75	0.75	0.68	0.58	0.46	0.36	0.29	0.24	0.21
x <sub>fz</sub>	0.35	0.28	0.24	0.20	0.17	0.14	0.11	0.09	0.09

## Permissible differential pressures

**Table 4a · Fail-safe position "valve CLOSED"**

DN		Shaft Ø in mm	Diaphragm area in cm <sup>2</sup>	Bench range	Operating range 70 °	Required supply pressure to keep disc open	Max. perm. supply pressure at		Disc 1.0619/ P265GH		Disc 1.4571/ 1.4581	
mm	in						20 °C 68 °F	220 °C 428 °F	Δp <sub>0</sub> <sup>1)</sup>	Δp <sub>100</sub>	Δp <sub>0</sub> <sup>1)</sup>	Δp <sub>100</sub>
500	20"	25	700	1.3 ... 1.8	1.3 ... 2.0	2.9	3.7	3.3	2.4	0.2	1.5	0.16
		40	1400	0.85...1.8	0.85...2.1	2.9	3.3	3.1	6.1	0.9	3.8	0.45
600	24"	40	1400	0.85...1.8	0.85...2.1	2.9	3.3	3.1	4.2	0.5	2.7	0.26
700	28"	40	1400	0.85...1.8	0.85...2.1	2.9	3.3	3.1	3.1	0.33	1.9	0.17
800	32"	40	1400	0.85...1.8	0.85...2.1	2.9	3.3	3.1	2.4	0.22	1.5	0.11
900	36"	40	1400	0.85...1.8	0.85...2.1	2.9	3.3	3.1	1.9	0.16	1.2	0.08

**Table 4b · Fail-safe position "valve OPEN"**

DN		Shaft Ø in mm	Diaphragm area in cm <sup>2</sup>	Bench range	Operating range 70 °	Required supply pressure to close disc	Max. perm. supply pressure at		Disc 1.0619/ P265GH		Disc 1.4571/ 1.4581	
mm	in						20 °C 68 °F	220 °C 428 °F	Δp <sub>0</sub> <sup>1)</sup>	Δp <sub>100</sub>	Δp <sub>0</sub> <sup>1)</sup>	Δp <sub>100</sub>
500	20"	25	700	1.3 ... 1.8	1.3 ... 2.0	2.9	3.7	3.3	2.4	0.2	1.5	0.16
		40	1400	0.7 ... 1.4	0.7 ... 1.6	2.4	3	2.8	6.1	0.9	3.8	0.45
600	24"	40	1400	0.7 ... 1.4	0.7 ... 1.6	2.4	3	2.8	4.2	0.5	2.7	0.26
700	28"	40	1400	0.7 ... 1.4	0.7 ... 1.6	2.4	3	2.8	3.1	0.33	1.9	0,17
800	32"	40	1400	0.7 ... 1.4	0,7 ... 1.6	2.4	3	2.8	2.4	0.22	1.5	0.11
900	36"	40	1400	0.7 ... 1.4	0.7 ... 1.6	2.4	3	2.8	1.9	0.16	1.2	0.08

Actuators for a shaft with a 60 mm diameter available on request

<sup>1)</sup> The pressure specified must be halved for step-seated valves.

**Table 5 · Permissible shaft, breakaway and dynamic torques in Nm**

DN		Shaft Ø in mm	Perm. shaft torque at Shaft 1.4542		Breakaway torque M <sub>dLos</sub> at Δp <sub>0</sub>				Dynamic torque at Δp <sub>100</sub>			
mm	in		20 °C 68 °F	220 °C 428 °F	Disc 1.0619/P256GH		Disc 1.4571/1.4581		Disc 1.0619/P256GH		Disc 1.4571/1.4581	
				M <sub>dLos</sub>	Δp <sub>0</sub>	M <sub>dLos</sub>	Δp <sub>0</sub>	M <sub>dDyn</sub>	Δp <sub>100</sub>	M <sub>dDyn</sub>	Δp <sub>100</sub>	
500	20"	25	502	436	160	2.4	115	1.5	160	0.2	115	0.16
		40	2244	1952	600	6.1	410	3.8	600	0.9	410	0.45
600	24"	40	2244	1952	580	4.2	410	2.7	580	0.5	410	0.26
		60	8712	7579	1910	9.7	1260	6.5	1910	1.8	1260	0.91
700	28"	40	2244	1952	600	3.1	410	1.9	600	0.33	410	0.17
		60	8712	7579	1910	7	1260	4.4	1910	1.14	1260	0.57
800	32"	40	2244	1952	600	2.4	410	1.5	600	0.22	410	0.11
		60	8712	7579	1910	5.3	1260	3.4	1910	0.76	1260	0.38
900	36"	40	2244	1952	600	1.9	410	1.2	600	0.16	410	0.08
		60	8712	7579	1910	4.2	1260	2.7	1910	0.54	1260	0.27
1000	40"	60	8712	7579	1910	3.5	1260	2.2	1910	0.39	1260	0.2

The pressure specified must be halved for step-seated valves.

**Table 6 · Dimensions in mm and weights for Type 3237-1 · Version without handwheel**

DN mm	in	Actuator cm <sup>2</sup>	A	B	C	∅-D <sub>i</sub>	E	H 6	H 5	H 2	∅-W	Weight apprx. kg <sup>1)</sup>
500	20	700	70	335	595	480	67	75	75	275	25	103
		1400	100	335	640	480	102	115	127.5	471	40	200
600	24	1400	100	395	690	580	102	115	127.5	471	40	265
700	28	1400	100	460	740	680	102	115	127.5	471	40	295
800	32	1400	100	510	790	780	102	115	127.5	471	40	325
900	36	1400	100	560	880	880	102	115	127.5	471	40	410

<sup>1)</sup> Weight without actuator

<b>Actuator</b>	cm <sup>2</sup>	700	1400
Diaphragm ∅ D	mm	390	530
Height H	mm	134	197
∅ d (thread)	mm	30 (M 30 x 1.5)	60 (M 60 x 1.5)
Weight	kg	22	70
Connection a		G 3/8	G 3/4

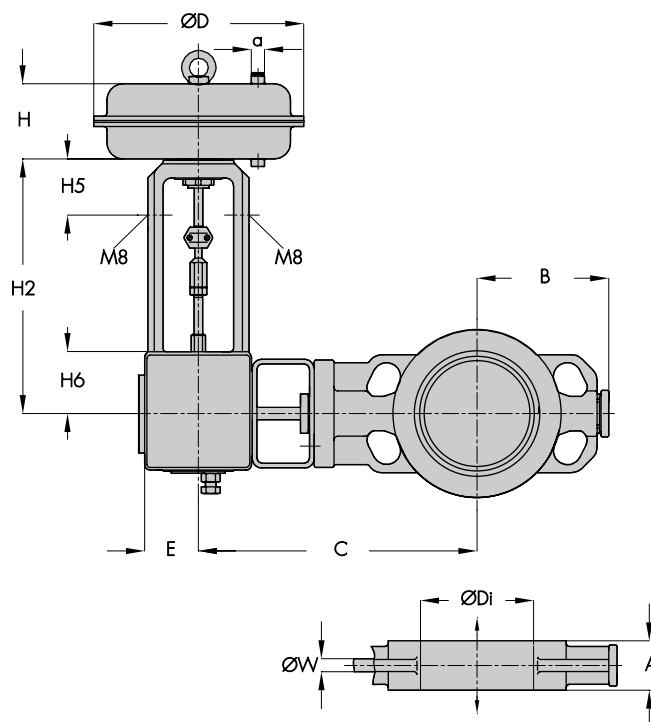


Fig. 5 · Dimension diagram for Type 3237-1 Butterfly Valve

### Selection and sizing the control valve

1. Calculate the appropriate  $K_v$  value
2. Select the nominal size and  $K_{vs}$  value according to Tables 4 or 5
3. Determine the permissible differential pressures  $\Delta p_0$  and  $\Delta p_{100}$   
Select the appropriate actuator from Tables 4 or 5
4. Select materials, pressure and temperature from Tables 1 and 2 and from the pressure-temperature diagram
5. Select accessories

### Ordering text

DN ... PN ...	
Butterfly valve	Swing-through or step-seated
Body material	According to Table 2
Fail-safe position	Valve OPEN or valve CLOSED
Process medium	Density in $\text{kg}/\text{m}^3$ and temperature in $^{\circ}\text{C}$
Flow rate	in $\text{kg}/\text{h}$ or $\text{m}^3/\text{h}$ under standard and operating conditions
Pressure	$p_1$ in bar (absolute pressure $p_{\text{abs}}$ ) $p_2$ in bar (absolute pressure $p_{\text{abs}}$ ) at minimum, standard and maximum flow rate
Accessories	Pneumatic or electropneumatic positioner and/or limit switches

Specifications subject to change without notice.

