



## Type 14b eco+ · High-performance Shut-off and Control Butterfly Valve PTFE or metal seat ring · DIN and ANSI version

### Application

Wafer-type and lug-type body versions for reliable shut-off or control of the medium flow in critical applications

### Technical features

- Valve size: DN 50 to 500 (NPS 2 to 20)
- Flange pressure rating: PN 10 and 16 (Class 150)
- Temperature range: -60 to +300 °C (-76 to +572 °F)
- Face-to-face: EN 558-1 Series 20/  
API 609 Class 150 Table 1
- Flange type: EN 1092 B1, ASME B16.5  
Raised face
- Marking: EN 19
- Leakage testing: Soft-seated:  
DIN EN 12266-1 leakage rate A  
Metal-seated:  
ANSI FCI 70-2-2006 leakage rate IV
- Packing: Loaded by spring washers,  
TA-Luft (VDI/VDE 2440)
- Valve flange: EN ISO 5211

### Further properties

- Double offset design ensures low wear and long service life as a result
- Bolt-free facing (DN 300/NPS 12 and smaller)
- Double seal between body and retaining ring
- Self-adjusting packing
- Extended valve neck for installation in insulated pipelines and easy access to the actuation element



Type 14b Butterfly Valve with Type 31a Rotary Actuator



Type 14b Butterfly Valve with manual gear

## Principle of operation

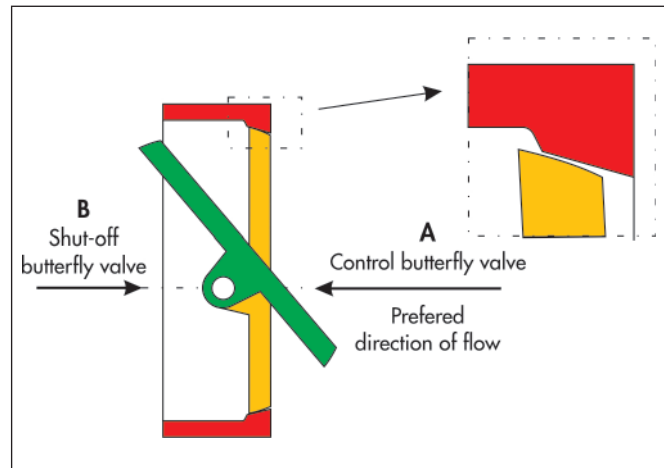
The process medium can flow through the valve in both directions.

Butterfly valves are sealed between the disc ( 3 ) and seat ( 4 ). The shaft ( 2 ) is sealed by a V-ring packing ( 9 ) made of PTFE (optionally graphite), which is loaded by the spring washers ( 10 ) located in the top part of the packing chamber. The packing is maintenance free.

The offset design and the resulting reduced friction between the butterfly disc and seat help minimize wear and the operating torque.

The preferred direction of flow depends on whether the valve is used as a shut-off valve or control valve. The direction of flow and the differential pressure determine the breakaway torque to open the butterfly valve.

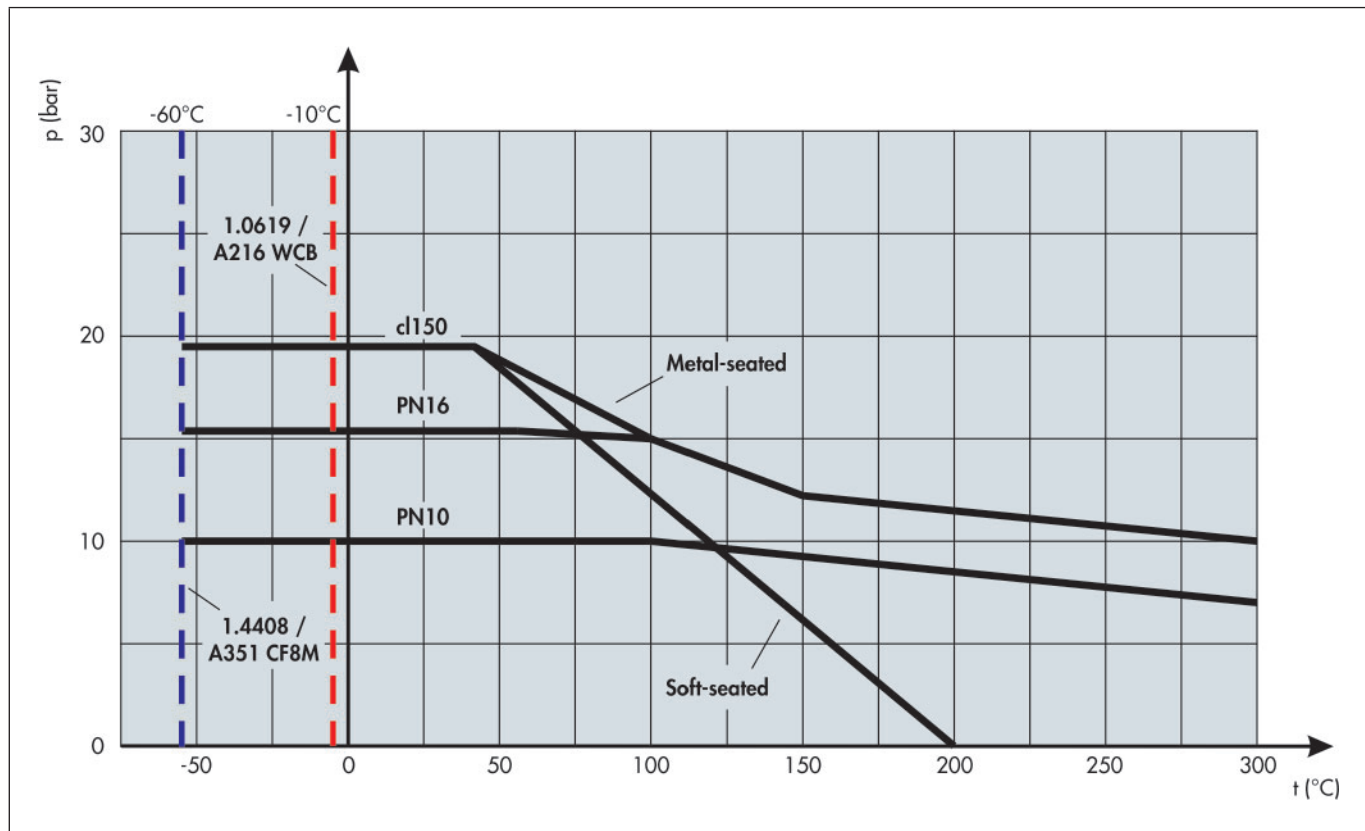
## Directions of flow



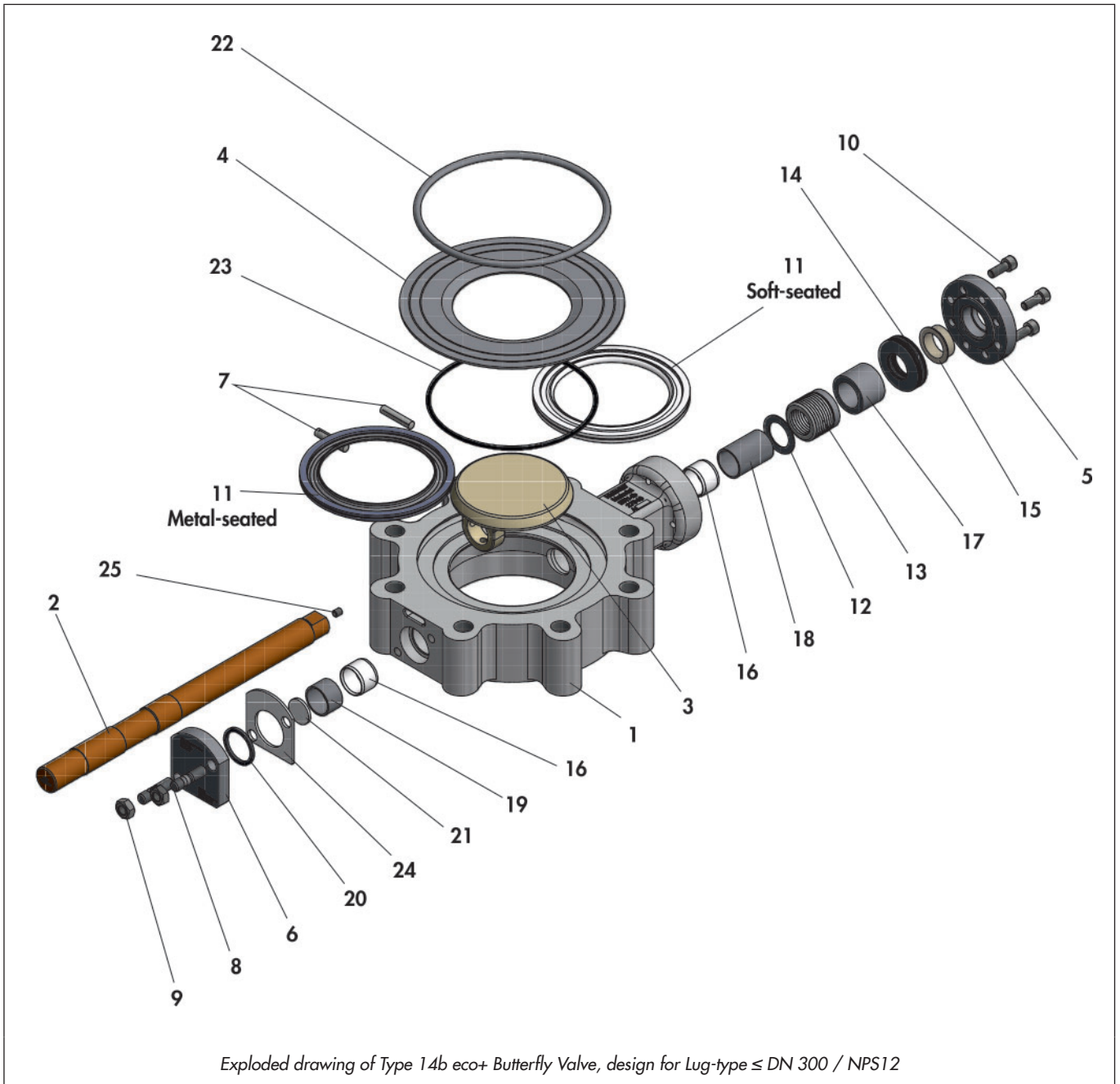
## Technical data

Seat ring		Soft-seated, PTFE, spring-loaded	Metal-seated, 1.4571/graphite
Leakage rate	Direction of flow A	Leakage rate A according to DIN EN 12266-1, test P12	Leakage rate IV according to ANSI FCI 70-2-2006
	Direction of flow B		-
Valve size		DN 50 to 500 or NPS 2 to 20	
Pressure rating		PN 10 and 16 or Class 150	
Body type		Lug-type or wafer-type	
Temperature range		-60 to +200 °C	-60 to +300 °C
Rangeability		50:1	
FTF	DIN	DIN EN 558, Series 20	
	ANSI	API 609 Class 150, Table 1	
Perm. operating pressures		See pressure-temperature diagram	

## Pressure-temperature diagram



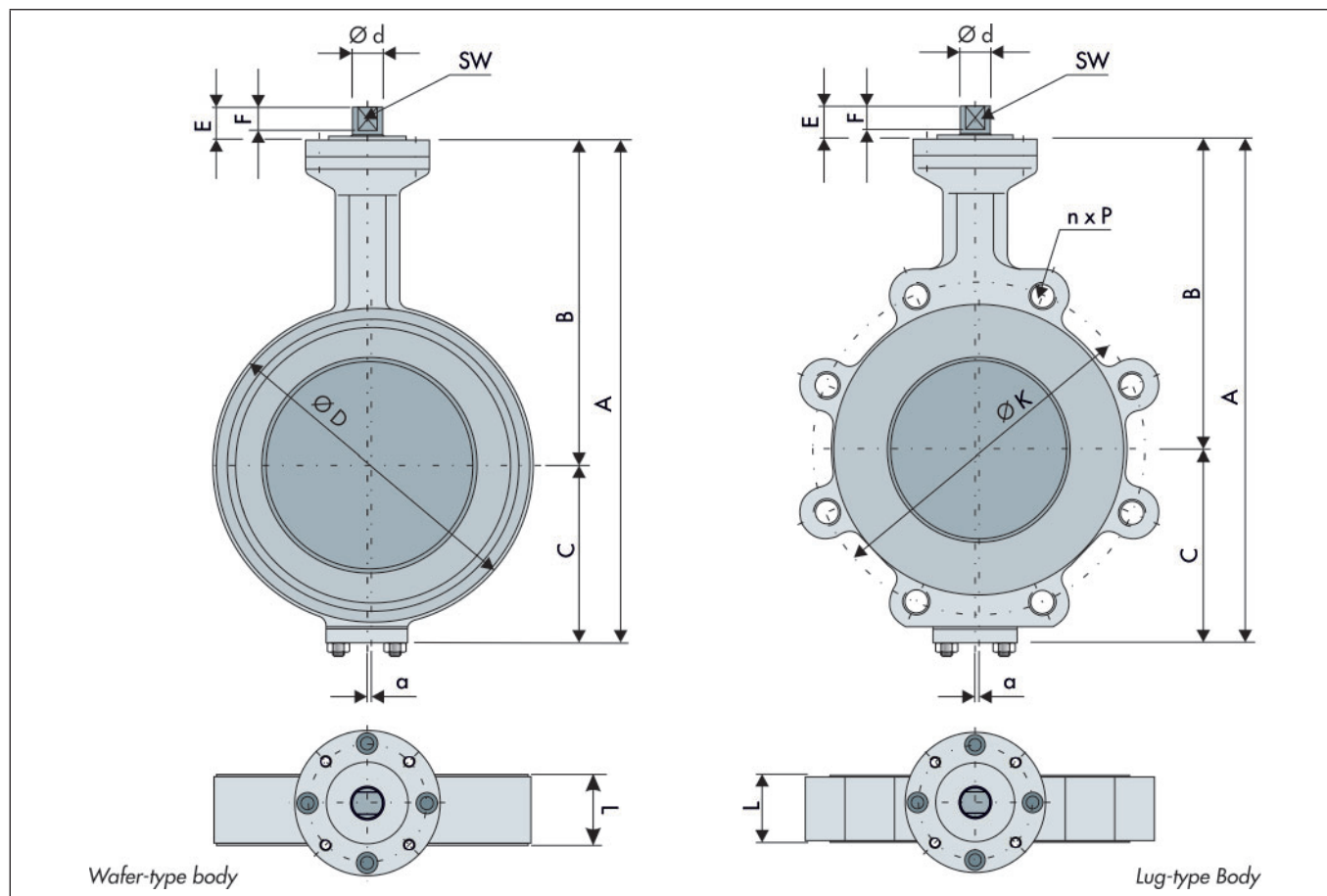
## Exploded drawing, parts list and material



Pos.	Designation	Material DIN	Material ASTM
1	Valve body	1.0619/ 1.4408	A216 Gr. WCB/ A351 CF8M
2	Valve shaft	1.4462	A182 F51
3	Disc	1.4408	A351 CF8M
4	Fastening ring	1.4571	
5	Packing flange	1.4408	A351 CF8M
6	Bonnet	1.4408	A351 CF8M
7	Grooved pin	1.4462	A182 F51
8	Stud	A2-70 (with steel body) A4-70 (with stainless steel body)	
9	Nut		
10	Bolt		
11	Seat ring	PTFE, spring-loaded 1.4571/carbon-graphite	
12	Thrust washer	1.4571	

Pos.	Designation	Material DIN	Material ASTM
13	V-ring packing	PTFE/graphite	
14	Set of spring washers	1.8159 coated	
15	Bearing bushing	PTFE with carbon	
16	Bearing bushing	PTFE mit VA / 1.4571 HSB	
17	Retainer	1.4571	
18	Spacer bushing	1.4571	
19	Spacer bushing	1.4571	
20	Body gasket	PTFE/graphite	
21	Lock washer	PTFE/graphite	
22	Tension spring	1.4571	
23	O-ring	FKM/graphite	
24	Bonnet gasket	PTFE with glass/graphite	
25	Threaded pin	1.4301	

## Dimensions and weights



DN	50	80	100	150	200	250	300	400	500		
NPS	2	3	4	6	8	10	12	16	20		
L	43	46	52	56	60	68	78	102	127		
A	190.5	255	278	366	441	496	572	687	869.5		
B	123	160	170	225	277	262	300	377	445		
C	67.5	95	108	141	164	234	272	310	424.5		
a	1	1.6	2	3	4	5	6	8	10		
E	14	19	19	22	26	26	31	37	43		
F	9	14	14	17	19	19	24	30	34		
Ø d	13	18	18	22	26	26	33	42	54		
SW	9	14	14	17	19	19	24	30	34		
DIN ISO Connection	F04	F05	F05	F07	F10	F10	F12	F14	F16		
Weight in kg	6	7	10	18	28	42	66	120	220		
Wafer type	PN 10	n x Ø P	4x18	8x18	8x18	8x22	8x22	12x22	12x22	16x26	20x26
		Ø K	125	160	180	240	295	350	400	515	620
		Ø D	104	142	162	218	272	326	372	490	594
	PN 16	n x Ø P	4x18	8x18	8x18	8x22	12x22	12x26	12x26	16x30	20x33
		Ø K	125	160	180	240	295	355	410	525	650
		Ø D	104	142	162	218	272	326	382	490	615
	d150	n x Ø P	4x19.1	4x19.1	8x19.1	8x22.4	8x22.4	12x25.4	12x25.4	16x28.4	20x1 1/8"
		Ø K	120.7	152.4	190.5	241.3	298.5	362	431.8	539.8	635
		Ø D	104	134	162	217	272	326	382	490	594
Lug type	PN 10	n x Ø P	4xM16	8xM16	8xM16	8xM20	8xM20	12xM20	12xM20	16xM24	20xM24
		Ø K	125	160	180	240	295	350	400	515	620
	PN 16	n x Ø P	4xM16	8xM16	8xM16	8xM20	12xM20	12xM24	12xM24	16xM27	20xM30
		Ø K	125	160	180	240	295	355	410	525	650
	d150	n x Ø P	4x 5/8"	4x 5/8"	8x 5/8"	8x 3/4"	8x 3/4"	12x 7/8"	12x 7/8"	16x1"	20x1 1/8"
		Ø K	120.7	152.4	190.5	241.3	298.5	362	431.8	539.8	635

## K<sub>Vs</sub> coefficients and associated opening angle

DN	NPS	φ opening angle								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
50	2	0.9	2.7	9	18	27	39	54	86	89
80	3	4.5	23	45	68	93	118	133	147	150
100	4	7	36	72	108	149	190	214	235	240
150	6	21	105	210	315	434	553	623	686	700
200	8	42	208	417	625	862	1098	1237	1362	1390
250	10	68	341	681	1022	1407	1793	2020	2224	2270
300	12	100	501	1002	1503	2071	2639	2973	3273	3340
400	16	183	915	1830	2745	3782	4819	5429	5978	6100
500	20	289	1443	2886	4329	5964	7600	8562	9427	9620

## C<sub>v</sub> coefficients and associated opening angle

DN	NPS	φ opening angle								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
50	2	1.1	3.2	11	21	32	46	63	101	104
80	3	5.3	27	53	80	109	138	156	172	176
100	4	8	42	84	126	174	222	250	275	281
150	6	25	123	246	369	508	647	729	803	819
200	8	49	243	488	731	1009	1285	1447	1594	1626
250	10	80	399	797	1196	1646	2098	2363	2602	2656
300	12	117	586	1172	1759	2423	3088	3478	3829	3908
400	16	214	1071	2141	3212	4425	5638	6352	6994	7137
500	20	338	1688	3377	5065	6978	8892	10018	11030	11255

## Torques and breakaway torques

Soft-seated version		Perm. torque M <sub>dmax</sub> . in Nm with shaft made of 1.4462		Breakaway torque M <sub>d1</sub> in Nm with differential pressure Δp in bar				
DN	NPS	-60°C	RT	0	5	10	16	20
50	2	148	197	22	29	36	41	45
80	3	318	424	43	44	45	51	55
100	4	318	424	49	54	59	67	73
150	6	577	770	72	75	94	102	108
200	8	895	1194	117	153	189	241	276
250	10	895	1194	177	230	283	329	360
300	12	1822	2429	354	466	578	654	705
400	16	3679	4905	525	746	967	1111	1207
500	20	6715	8953	641	953	1265	1491	1642

Metal-seated version		Perm. torque M <sub>dmax</sub> . in Nm with shaft made of 1.4462		Breakaway torque M <sub>d1</sub> in Nm with differential pressure Δp in bar Direction of flow A (control butterfly valve)				
DN	NPS	-60°C	RT	0	5	10	16	20
50	2	148	197	33	35	37	41	44
80	3	318	424	57	60	63	66	68
100	4	318	424	82	87	92	98	102
150	6	577	770	91	99	107	115	121
200	8	895	1194	169	187	205	220	230
250	10	895	1194	300	325	350	380	400
300	12	1822	2429	429	497	565	620	657
400	16	3679	4905	866	1078	1290	1480	1607
500	20	6715	8953	1106	1443	1780	2044	2220

The specified breakaway torques are average values measured using air at 20 °C with the corresponding differential pressures. Operating temperature, process medium and longer periods of use may change the torques and breakaway torques.



## Functions and benefits

