

High - Performance Butterfly valve

BR 14b / BR 14c

Application:

Tight-closing, double-eccentric butterfly control valve especially for the chemical industry where aggressive media's are used, for example in steam pipelines:

- Nominal sizes 2" to 32" as well as DN 50 to DN 800
- Nominal pressure ANSI 150 / 300 lbs and PN 10 to 40
- Temperatures -76°F to 662°F (-60°C to 350°C)

Our newly developed high performance shut-off and control butterfly valve, which has its own patent and has the following special features:

- **Valve body made of**
 - Steel or
 - Stainless steel
- **Body style**
 - Wafer-Type or
 - Lug-Type
- **Sealing**
 - **Type WTD**, soft sealing with PTFE V-ring packing, pre-loaded with belleville washers
 - **Type MTD**, metallic sealing with PTFE V-ring packing, pre-loaded with belleville washers
 - **Type WNS**, soft sealing with adjustable stuffing box flange
- **Further features**
 - Low breakaway torque and low amount of wear due to the double eccentric bearing design of the shaft
 - „Long neck“ versions which allows an easier installation in pipelines with insulation
 - TA-Luft (German clean air act) packing
 - A continuous raised face is assured through our patent protected screw less fastening ring
 - Anti blow out valve shaft
 - Soft seat rings can be replaced with metal seat rings on site
 - Face-to face acc. to API 609 Class 150
 - Face-to face acc. to DIN EN 558, series 20, 25, 16
 - Face-to-face dimensions can be changed by using different fastening rings
 - Attachment options acc. to DIN ISO 5211



Fig. 1 - Series 14b Butterfly Valve with Manual Gear Actuator



Fig. 2 - Series 14b Butterfly Valve with Series 31a AT-Actuator

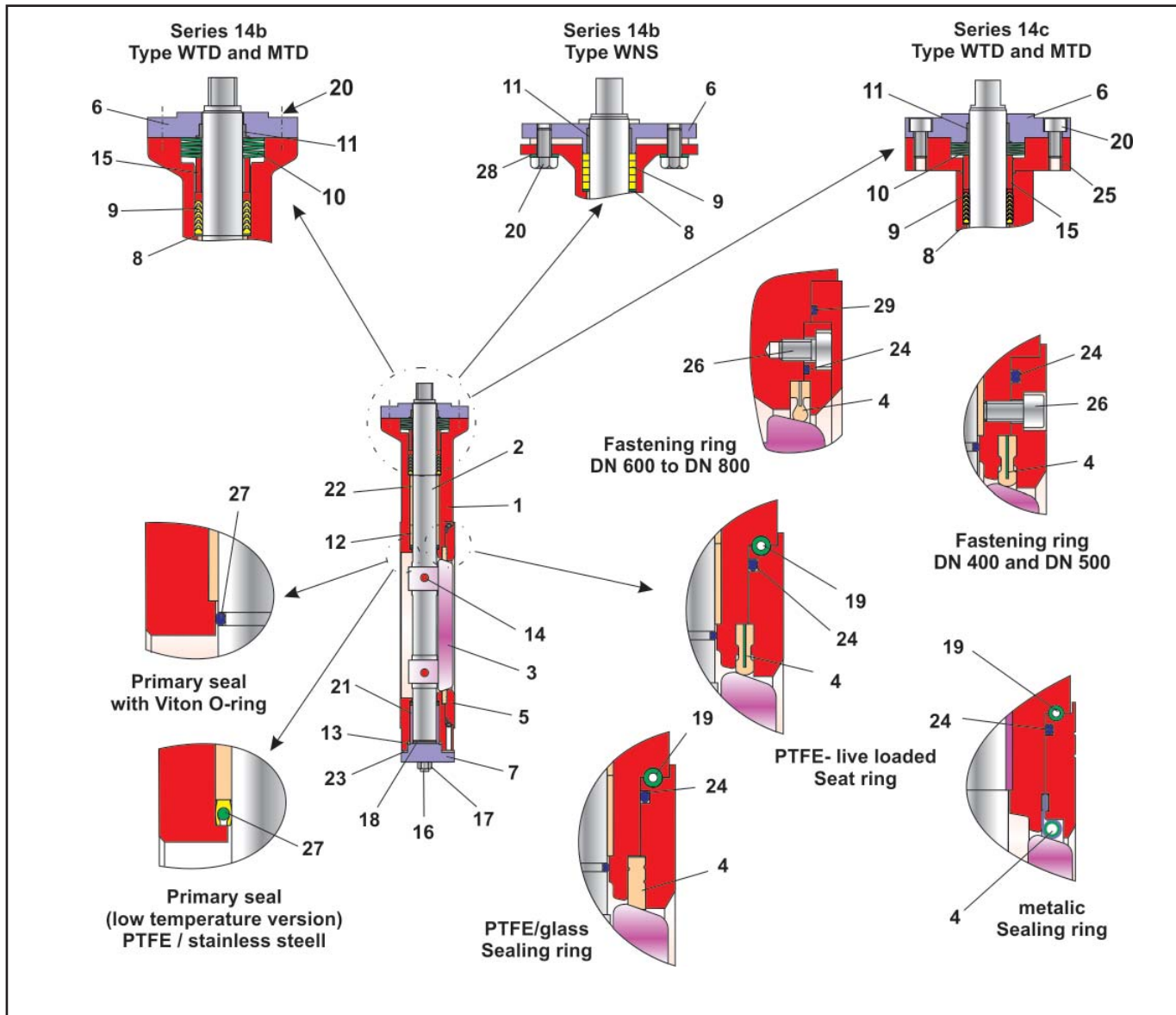


Fig. 3 - Sectional diagram of Series 14 Butterfly Valve

| Item | Description |
|------|--------------------------|
| 1 | Valve body |
| 2 | Valve shaft |
| 3 | Valve disc |
| 4 | Seat ring |
| 5 | Fastening ring |
| 6 | Packing box flange |
| 7 | Bonnet |
| 8 | Washer |
| 9 | Packing |
| 10 | Belleville spring washer |

| Item | Description |
|------|----------------|
| 11 | Bushing |
| 12 | Bushing |
| 13 | Body seal |
| 14 | Grooved pin |
| 15 | Spacer bushing |
| 16 | Stud bolt |
| 17 | Nut |
| 18 | Lower disc |
| 19 | Tension spring |
| 20 | Screw |

| Item | Description |
|------|---------------------|
| 21 | Spacer bushing |
| 22 | Spacer bushing |
| 23 | Bonnet seal |
| 24 | O-ring |
| 25 | Intermediate flange |
| 26 | Screw |
| 27 | Primary seal |
| 28 | Washer |
| 29 | O-ring |

Table 1 - Parts list

Versions:

Cast valve **Series 14b**

Full-mold cast valve **Series 14c**

optionally available in the following versions:

- Butterfly valve with Hand lever / grid plate
- Butterfly valve with Manual gear actuator
- Butterfly valve with pneumatic rotary actuator

Special versions:

- Double stuffing box
- Primary seal with O-ring
- Facing with groove, only series 16 and 25 of DIN EN 1092
- Special materials
- Low temperature version (-196°C)
- High temperature version (> 350°C)

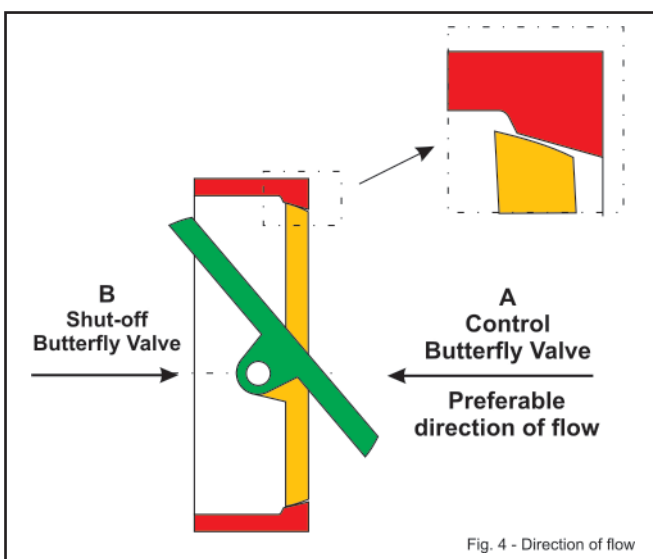
Additional accessories:

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

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

Other special accessories are available on request.

Principle of operation:



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

The disc (3) determines the flow through the free area between disc and seat (4).

Butterfly valves are sealed between the disc (3) and the seat (4).

The shaft (2) is sealed by a packing (9).

This is a PTFE-V-ring packing, which by means of the mounted spring washers (10) located in the top part of the packing chamber, are maintenance free and under tension.

Optionally, the packing can also consist of a PTFE-meshwork packing, which is pre-loaded over an adjustable stuffing box.

The direction of flow and the pressure difference determine the breakaway torque to open the butterfly valve.

The double eccentric bearing design of the shaft causes the disc on opening and closing to remain in contact with the seat only over a very small angle of rotation (Fig. 4).

This reduces wear and increases the service life of the valve.

In addition, it reduces the breakaway torque.

When the process medium flows through the valve in direction **A** (Fig. 4), the butterfly disc is slightly pressed out of the seat. This reduces the pre-loaded pressure and the breakaway torque.

When the process medium flows through the valve in direction **B**, the pre-loaded pressure increases, with a rise in the breakaway torque.

This results in a better tightness being achieved.



Failure position: depending on the mounting position of the actuator, there are two failure positions, which become active, either by pressure relieving or, failure of air supply:

- **Butterfly valve with actuator “ on failure closing “**
on failure of air supply the butterfly valve closes. The opening of the valve accrues by increasing 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 valve accrues by increasing air supply against the force of the springs.



Note:
These valves are not subject to ATEX 94/9/EC.



Dimensions and weights:

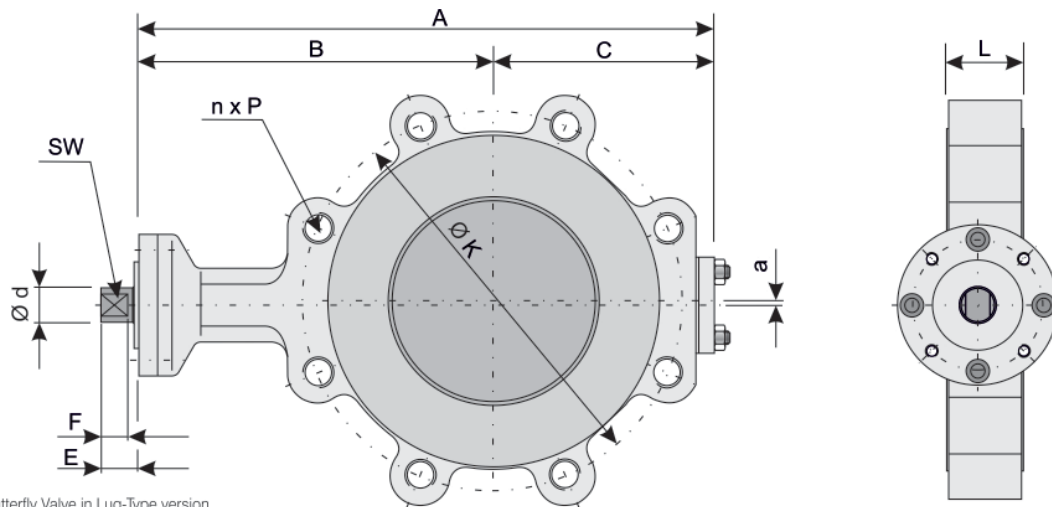


Fig. 5 - Butterfly Valve in Lug-Type version

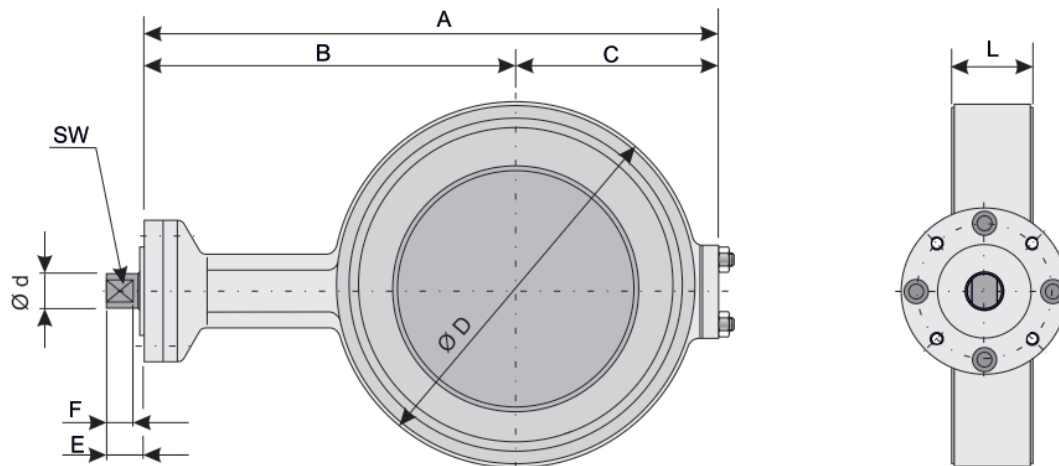


Fig. 6 - Butterfly Valve in Wafer-Type version

| DN | 50 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 700 | 800 |
|--|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------|---------------------------|------|------|
| NPS | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | 28 | 32 |
| EN 558, Series 20, PN 10 / 40 API 609, cl150 | 43 | 46 | 52 | 56 | 60 | 68 | 78 | 78 | 102 | 127 | 154 | 165 | 190 |
| L EN 558, Series 25, PN 10 / 40 + (cl150) | - | 49 | 56 | 70 | 71 | 76 | 83 | 92 | 102 | 127 | 154 | - | - |
| EN 558, Series 16, PN 10 / 40 + cl150/300 | 43 | 64 | 64 | 76 | 89 | 114 | 114 | 127 | 140 | 152 | 178 | 229 | 241 |
| A | 190.5 | 255 | 278 | 366 | 441 | 496 | 572 | 645 | 687 | 869.5 | 1057 | 1177 | 1340 |
| B | 123 | 160 | 170 | 225 | 277 | 262 | 300 | 360 | 377 | 445 | 597 | 652 | 740 |
| C | 67.5 | 95 | 108 | 141 | 164 | 234 | 272 | 285 | 310 | 424.5 | 460 | 525 | 600 |
| a | 1 | 1.6 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 14 | 16 |
| E | 14 | 19 | 19 | 22 | 26 | 26 | 31 | 31 | 37 | 43 | 180 | 180 | 180 |
| F | 9 | 14 | 14 | 17 | 19 | 19 | 24 | 24 | 30 | 34 | 60 | 60 | 60 |
| Ø d | 13 | 18 | 18 | 22 | 26 | 26 | 33 | 39 | 42 | 54 | 70 | 70 | 80 |
| SW | 9 | 14 | 14 | 17 | 19 | 19 | 24 | 24 | 30 | 34 | 55 | 55 | 65 |
| DIN ISO Connection | F04 | F05 | F05 | F07 | F10 | F10 | F12 | F12 | F14 | F16 | depending on the actuator | | |
| Weight ca. kg | 6 | 7 | 10 | 18 | 28 | 42 | 66 | 100 | 120 | 220 | 510 | 630 | 970 |

Table 2 - Dimensions in mm and Weights in kg

Wafer Type

| DN | 50 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 700 | 800 |
|---------|--------|--------|--------|---------|---------|---------|---------|---------|---------|--------|-----------------|-----------------|----------------|
| NPS | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | 28 | 32 |
| n x Ø P | 4x18 | 8x18 | 8x18 | 8x22 | 8x22 | 12x22 | 12x22 | 16x22 | 16x26 | 20x26 | 20x30 | 24x30 | 24x33 |
| Ø K | 125 | 160 | 180 | 240 | 295 | 350 | 400 | 460 | 515 | 620 | 725 | 840 | 950 |
| Ø D | 104 | 142 | 162 | 218 | 272 | 326 | 372 | 438 | 490 | 594 | 695 | 806 | 930 |
| n x Ø P | 4x18 | 8x18 | 8x18 | 8x22 | 12x22 | 12x26 | 12x26 | 16x26 | 16x30 | 20x33 | 4xM33 + 16x36 | 4xM33 + 20x36 | 4xM36 + 20x39 |
| Ø K | 125 | 160 | 180 | 240 | 295 | 355 | 410 | 470 | 525 | 650 | 770 | 840 | 950 |
| Ø D | 104 | 142 | 162 | 218 | 272 | 326 | 382 | 438 | 490 | 615 | 725 | 806 | 906 |
| n x Ø P | 4x18 | 8x18 | 8x22 | 8x26 | 12x26 | 12x30 | 16x30 | 16x33 | 16x36 | 20x36 | 4xM36 + 16x39 | 4xM39 + 20x42 | 4xM45 + 20x48 |
| Ø K | 125 | 160 | 190 | 250 | 295 | 370 | 430 | 490 | 550 | 660 | 770 | 875 | 990 |
| Ø D | 104 | 142 | 162 | 218 | 285 | 326 | 382 | 438 | 490 | 615 | 725 | 800 | 930 |
| n x Ø P | 4x18 | 8x18 | 8x22 | 8x26 | 12x30 | 12x33 | 16x33 | 16x36 | 16x39 | 20x42 | 4xM45 + 16x48 | 4xM45 + 20x48 | 4xM57 + 20x56 |
| Ø K | 125 | 160 | 190 | 250 | 295 | 385 | 450 | 510 | 585 | 670 | 795 | 900 | 1030 |
| Ø D | 104 | 142 | 162 | 218 | 285 | 326 | 382 | 438 | 490 | 615 | 735 | 845 | 960 |
| n x Ø P | 4x19.1 | 4x19.1 | 8x19.1 | 8x22.4 | 8x22.4 | 12x25.4 | 12x25.4 | 12x28.4 | 16x28.4 | 20x1½" | 4x1¼" + 16x35.1 | *) | *) |
| Ø K | 120.7 | 152.4 | 190.5 | 241.3 | 298.5 | 362 | 431.8 | 476.3 | 539.8 | 635 | 749.3 | *) | *) |
| Ø D | 104 | 134 | 162 | 217 | 272 | 326 | 382 | 438 | 490 | 594 | 695 | *) | *) |
| n x Ø P | - | - | - | - | - | - | - | - | - | - | - | 4x1¼" + 24x35.1 | 4x1½" + 24x42 |
| Ø K | - | - | - | - | - | - | - | - | - | - | - | 863.6 | 977.9 |
| Ø D | - | - | - | - | - | - | - | - | - | - | - | 806 | 930 |
| n x Ø P | - | - | - | - | - | - | - | - | - | - | - | 8x¾" + 32x22.4 | 8x¾" + 40x22.4 |
| Ø K | - | - | - | - | - | - | - | - | - | - | - | 795.3 | 900.2 |
| Ø D | - | - | - | - | - | - | - | - | - | - | - | 765 | 863.6 |
| n x Ø P | - | 8x22.3 | 8x22.3 | 12x22.3 | 12x25.4 | 16x28.4 | 16x31.7 | 20x31.7 | 16x35 | 24x35 | 4x1½" + 32x22.4 | *) | *) |
| Ø K | - | 168.3 | 200.2 | 269.7 | 330.2 | 387.4 | 450.9 | 514.4 | 571.5 | 685.8 | 812.8 | *) | *) |
| Ø D | - | 142 | 162 | 217 | 272 | 326 | 382 | 438 | 490 | 594 | 735 | *) | *) |

Table 3 - Dimensions in mm

*) on Request

Lug Type

| DN | 50 | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 | 700 | 800 |
|---------|-------|-------|-------|-------|---------|---------|---------|--------|--------|--------|--------|--------|--------|
| NPS | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | 28 | 32 |
| n x Ø P | 4xM16 | 8xM16 | 8xM16 | 8xM20 | 8xM20 | 12xM20 | 12xM20 | 16xM20 | 16xM24 | 20xM24 | 20xM27 | 24xM27 | 24xM30 |
| Ø K | 125 | 160 | 180 | 240 | 295 | 350 | 400 | 460 | 515 | 620 | 725 | 840 | 950 |
| n x Ø P | 4xM16 | 8xM16 | 8xM16 | 8xM20 | 12xM20 | 12xM24 | 12xM24 | 16xM24 | 16xM27 | 20xM30 | 20xM33 | 24xM33 | 24xM36 |
| Ø K | 125 | 160 | 180 | 240 | 295 | 355 | 410 | 470 | 525 | 650 | 770 | 840 | 950 |
| n x Ø P | 4xM16 | 8xM16 | 8xM20 | 8xM24 | 12xM24 | 12xM27 | 16xM27 | 16xM30 | 16xM33 | 20xM33 | 20xM36 | 24xM39 | 24xM45 |
| Ø K | 125 | 160 | 190 | 250 | 310 | 370 | 430 | 490 | 550 | 660 | 770 | 875 | 990 |
| n x Ø P | 4xM16 | 8xM16 | 8xM20 | 8xM24 | 12xM27 | 12xM27 | 16xM30 | 16xM33 | 16xM36 | 20xM39 | 20xM45 | 24xM45 | 24xM52 |
| Ø K | 125 | 160 | 190 | 250 | 320 | 385 | 450 | 510 | 585 | 670 | 795 | 900 | 1030 |
| n x Ø P | 4x¾" | 4x¾" | 8x¾" | 8x¾" | 8x¾" | 12x7/8" | 12x7/8" | 12x1" | 16x1" | 20x1½" | 20x1¼" | *) | *) |
| Ø K | 120.7 | 152.4 | 190.5 | 241.3 | 298.5 | 362 | 431.8 | 476.3 | 539.8 | 635 | 749.3 | *) | *) |
| n x Ø P | - | - | - | - | - | - | - | - | - | - | - | 28x1¼" | 28x1½" |
| Ø K | - | - | - | - | - | - | - | - | - | - | - | 863.6 | 977.9 |
| n x Ø P | - | - | - | - | - | - | - | - | - | - | - | 40x¾" | 40x¾" |
| Ø K | - | - | - | - | - | - | - | - | - | - | - | 795.3 | 900.2 |
| n x Ø P | - | 8x¾" | 8x¾" | 12x¾" | 12x7/8" | 16x1" | 16x1½" | 20x1½" | 20x1¼" | 24x1¼" | 24x1½" | *) | *) |
| Ø K | - | 168.1 | 200.2 | 269.7 | 330.2 | 387.4 | 450.9 | 514.4 | 571.5 | 685.8 | 812.8 | *) | *) |

Table 4 - Dimensions in mm

*) on Request

Technical Data:

| | | |
|---|--|-------------------------------------|
| Nominal size | 2" to 32" as well as DN 50 to 800 | |
| Nominal pressure | ANSI Class 150 and 300 as well as PN 10 to 40 | |
| Body style | Lug-Type or Wafer-Type | |
| Seat ring | soft sealing PTFE - live loaded | metal sealing |
| Temperature range | -76°F - 410°F (-60°C - 210°C) | -76°F - 662°F (-60°C - 350°C) |
| Leakage direction of flow A for direction of flow B | Leakage rate A acc. to DIN EN 12266-1, P12 | Leakage rate VI acc. to DIN EN 1349 |
| Rangeability | On request as it depends on pressure and temperature 50 : 1 | |
| Face to ANSI face DIN | Class 150: acc. to API 609 (DIN EN 558, Series 20), Class 300: acc. to EN 558, Series 16 acc. to DIN EN 558, Series 20, Special Version: acc. to DIN EN 558, Series 25, 16 | |
| Perm. operating pressures | See pressure-temperature diagram | |

Table 5 - technical data

Materials:

| Version | ANSI | DIN |
|---------------------|---|---------------------------|
| Valve body | Casted version A 351 CF8M / A 216 WCB | 1.4408/ 1.0619 |
| | Platt / forged version A 240 Gr. 316L / A 516 Gr.70 etc. | 1.4571/ 1.0570 etc. |
| Butterfly disc | A 351 CF8M | 1.4408 |
| Shaft | A 182 F51 / AISI 630 / H1150D | 1.4462 / 1.4542 / H1150 |
| Fastening ring | A479 F316Ti | 1.4571 |
| Stuffing box flange | A479 F316Ti | 1.4571 |
| Seat ring | soft | PTFE-live loaded / R-PTFE |
| | metal | Nickel |
| Packing | PTFE - V-ring-packing with cup springs of 1.8159, Delta Tone coated | |

Table 6 - Materials

Body version, materials and related temperature ranges:

| Butterfly valve version and body material | Shaft material and seat sealing AISI 630 / H1150D | | |
|---|---|--|--|
| | PTFE - soft sealing, live loaded | HT-metal sealing | |
| Series 14b Casted version | A 351 CF8M | -76 to 410°F (-60 to 210°C) | -76 to 572°F (-60 to 300°C) |
| | A 216 WCB / WCC | 14 / -21 to 410°F (-10 / -29 to 210°C) | 14 / -21 to 572°F (-10 / -29 to 300°C) |
| | 1.4408 | -76 to 410°F (-60 to 210°C) | -76 to 572°F (-60 to 300°C) |
| | 1.0619 | 14 to 410°F (-10 to 210°C) | 14 to 662°F (-10 to 350°C) |
| Series 14c Platt / forged version | A 240 Gr.316L | -76 to 410°F (-60 to 210°C) | -76 to 662°F (-60 to 350°C) |
| | A 516 Gr.70 | 14 to 410°F (-10 to 210°C) | 14 to 662°F (-10 to 350°C) |
| | S355J2G3 | 14 to 410°F (-10 to 210°C) | 14 to 662°F (-10 to 350°C) |
| | 1.4571 | -76 to 410°F (-60 to 210°C) | -76 to 662°F (-60 to 350°C) |

Table 7 - Body version, materials and associated temperature ranges (HT - High-temperature version)

Functional diagram with opening angles:

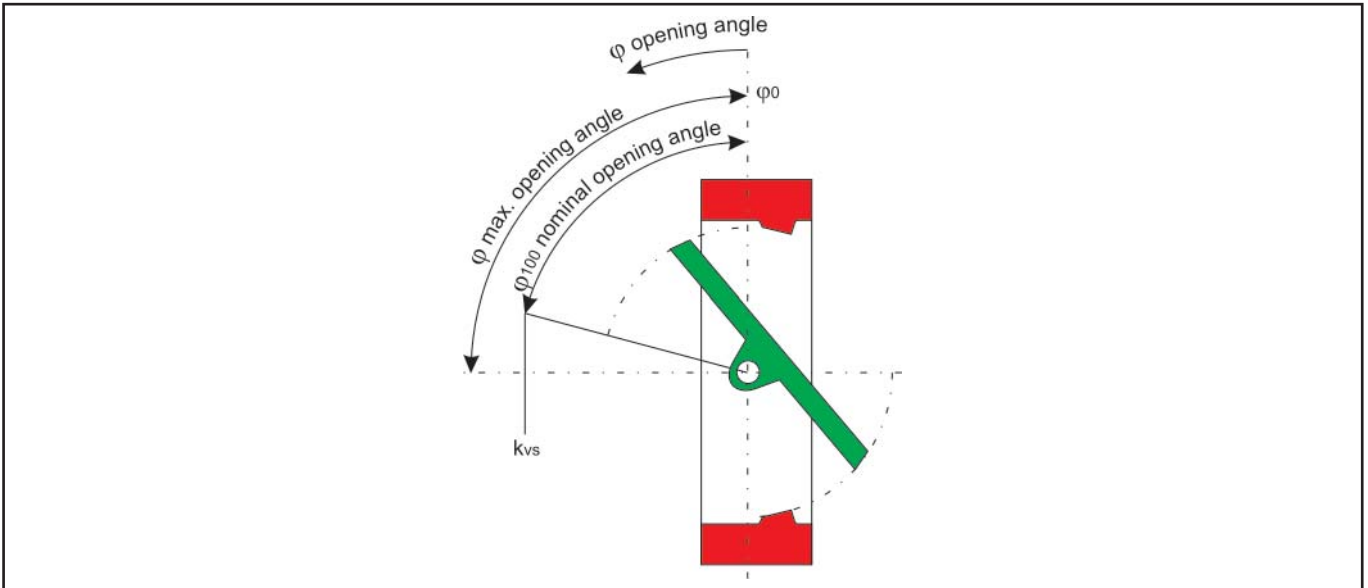


Fig. 7 – Functional diagram with opening angles

Characteristic curve:

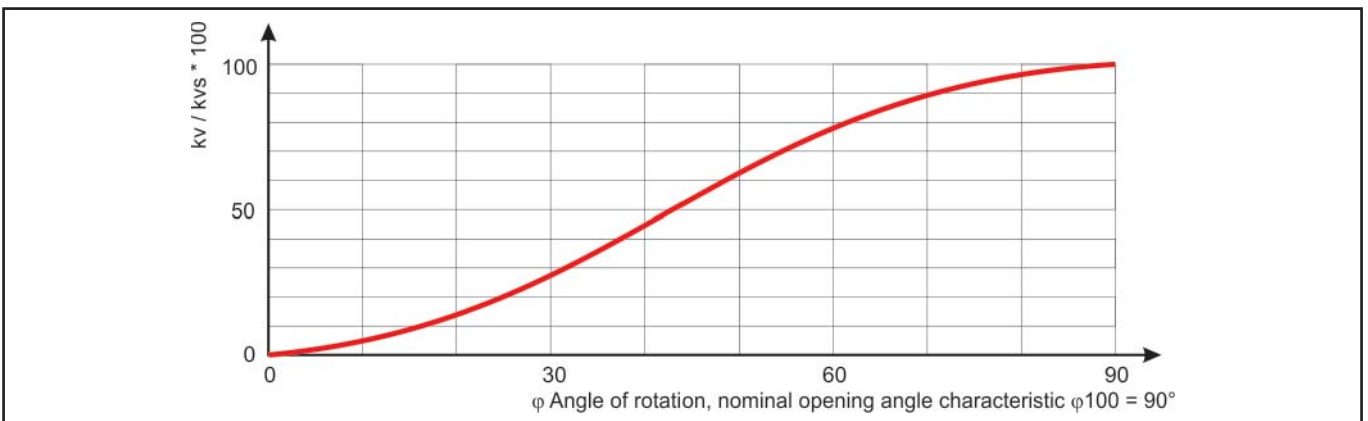


Fig. 8 - Characteristic curve

Terms for noise level calculation

| φ | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
|----|------|------|------|------|------|------|------|------|------|
| FL | 0.95 | 0.95 | 0.92 | 0.82 | 0.74 | 0.67 | 0.61 | 0.57 | 0.54 |
| xT | 0.75 | 0.75 | 0.73 | 0.57 | 0.47 | 0.38 | 0.31 | 0.28 | 0.25 |
| z | 0.35 | 0.30 | 0.25 | 0.20 | 0.17 | 0.14 | 0.12 | 0.11 | 0.10 |

Table 8- noise level calculation and terms for control valve sizing

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

Correction terms:

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

Cv values and related opening angles:

| 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 | |
| 600 | 24 | 495 | 2472 | 4946 | 7418 | 10220 | 13024 | 14674 | 16157 | 16489 | |
| 700 | 28 | 674 | 3367 | 6734 | 10103 | 13918 | 17738 | 19983 | 22003 | 22453 | |
| 800 | 32 | 882 | 4407 | 8813 | 13221 | 18214 | 23211 | 26150 | 28791 | 29381 | |

Table 9 - Cv values

kv values and related opening angles:

| 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 | |
| 600 | 24 | 423 | 2113 | 4227 | 6340 | 8735 | 11132 | 12542 | 13810 | 14093 | |
| 700 | 28 | 576 | 2878 | 5756 | 8635 | 11897 | 15161 | 17080 | 18806 | 19191 | |
| 800 | 32 | 754 | 3767 | 7533 | 11300 | 15568 | 19839 | 22350 | 24608 | 25112 | |

Table 10 - kv values

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.

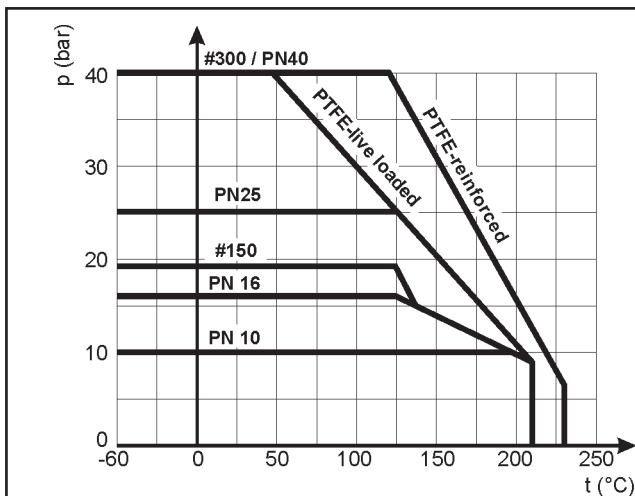


Fig. 9 - Pressure-temperature diagram (soft sealed)

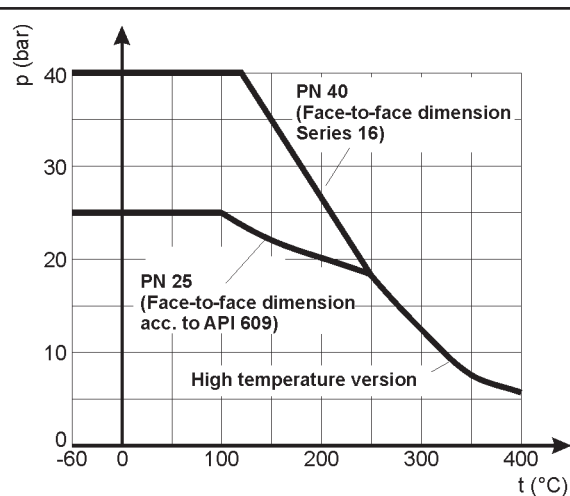


Fig. 10 - Pressure-temperature diagram (metal sealed)



Torque and breakaway torques:

| soft-sealed Butterfly Valve | | Perm. torques M _{dmax.} in Nm with shaft in | | Breakaway torque M _{dI} in Nm with differential pressure Δp in bar (direction of flow B) | | | |
|-----------------------------|-----|--|--------|--|------|------|-------|
| DN | NPS | 1.4542 / H1150 | 1.4542 | 0 | 5 | 10 | 16 |
| 50 | 2 | 224 | 311 | 23 | 29 | 36 | 41 |
| 80 | 3 | 679 | 943 | 40 | 43 | 45 | 51 |
| 100 | 4 | 679 | 943 | 48 | 54 | 59 | 67 |
| 150 | 6 | 1231 | 1710 | 91 | 106 | 114 | 157 |
| 200 | 8 | 1911 | 2654 | 190 | 219 | 269 | 288 |
| 250 | 10 | 1911 | 2654 | 320 | 364 | 433 | 480 |
| 300 | 12 | 2276 | 5398 | 370 | 467 | 578 | 654 |
| 400 | 16 | 7848 | 10900 | 690 | 903 | 1089 | 1239 |
| 500 | 20 | 14325 | 19895 | 885 | 1180 | 1450 | 1723 |
| 600 | 24 | 8937 | 12412 | 1399 | 1910 | 3819 | 6110 |
| 700 | 28 | 8937 | 12412 | 2226 | 3085 | 6170 | 9872 |
| 800 | 32 | 9726 | 13509 | 3336 | 4662 | 9324 | 14918 |

Table 11 - max. permissible torque and breakaway torque (soft sealed ,direction of flow "B")

| metal- sealed Butterfly Valve | | Perm. torques M _{dmax.} in Nm with shaft in | | Breakaway torque M _{dI} in Nm with differential pressure Δp in bar (direction of flow A) | | | | | | | |
|-------------------------------|-----|--|--------|--|------|------|------|------|-----|-----|-----|
| DN | NPS | 1.4542 / H1150 | 1.4542 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 40 |
| 50 | 2 | 224 | 311 | 23 | 29 | 36 | 40 | 52 | 56 | 73 | 89 |
| 80 | 3 | 679 | 943 | 32 | 32 | 46 | 56 | 73 | 79 | 103 | 125 |
| 100 | 4 | 679 | 943 | 43 | 51 | 73 | 89 | 116 | 126 | 164 | 199 |
| 150 | 6 | 1231 | 1710 | 60 | 127 | 183 | 222 | 290 | 316 | 410 | 500 |
| 200 | 8 | 1911 | 2654 | 82 | 241 | 348 | 422 | 551 | 600 | 779 | 950 |
| 250 | 10 | 1911 | 2654 | 189 | 473 | 683 | 857 | 1224 | - | | |
| 300 | 12 | 3886 | 5398 | 357 | 609 | 893 | 1301 | - | | | |
| 400 | 16 | 7848 | 10900 | 523 | 1024 | 1638 | - | | | | |
| 500 | 20 | 14325 | 19895 | 2616 | 3280 | 3700 | - | | | | |

Table 12- max. permissible torque and breakaway torque (metal sealed ,direction of flow "A")

The breakaway torques specified are average values which were measured with air at 20°C with the corresponding pressure differences. Operating temperature, process medium and long operating times may affect the permissible torques and breakaway torques considerably.

Selecting and sizing the butterfly valve:

1. Calculate the appropriate kv value.
2. Select the nominal size and the kvs value from Table 5 resp. 6.
3. Comparing the operation conditions in acc. to the pressure-temperature diagram.
4. Select a suitable actuator.



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.

Ordering text:

High-Performance butterfly valve Series 14b

Nominal size DN

Nominal pressure PN

Valve body material acc. to table 2

Seat seal Metal sealing or soft sealing

Direction of flow "A" standard direction of flow for throttling service
 "B" reversed direction of flow for shut.off service

Manual gear or

Actuator brand name:

Fail-safe position Valve OPEN or valve CLOSED

Supply air bar

Operating range Number of springs

Operating pressure bar

Medium temperature °C or °F

Medium Dry or lubricating

Limit switch brand name:

Solenoid valve brand name:

Positioner brand name:

Others