

BUTTERFLY VALVE of carbon steel with welded ends **313 -series**




Description

Edition 23-07-2015

The welded butterfly valve 313 is specially designed for district heating and district cooling. It can be used as an on-off or control valve. Högfors butterfly valve is tight and tested in both flow directions.

The body of the butterfly valve with weld ends is carbon steel. The eccentric disc and shafts are made of stainless steel. Replaceable seat ring is hard chrome plated stainless steel. The shaft packing box is a combination of graphite rings and O-rings which are possible to tighten while in pipeline and are also replaceable.

| | | |
|--|--|-----------------------------|
| Nominal dimensions * | DN 200 - 1400 | DN 200 – 700 |
| Nominal pressure | PN 25 bar | PN 25 bar |
| Disk seal | Stainless steel (CS) | PTFE+C (TS) |
| Closing pressure (ΔP) | ΔP 16 bar or 25 bar | ΔP 16 bar or 25 bar |
| Tightness class ISO 5208, EN 12266-1 | Rate B – standard Rate A – option | Rate A |
| Working temperature of liquid media ** (version for steam also available) | max +260°C/ min -40°C | max 180°C / min -40°C |
| Connection | Weld end: The pipe according to standard DIN or GOST | |
| Safety | Conform to the requirements of the Council Directive 97/23/EC on Pressure Equipment, marking:  0496 Class: gas, group 1. | |

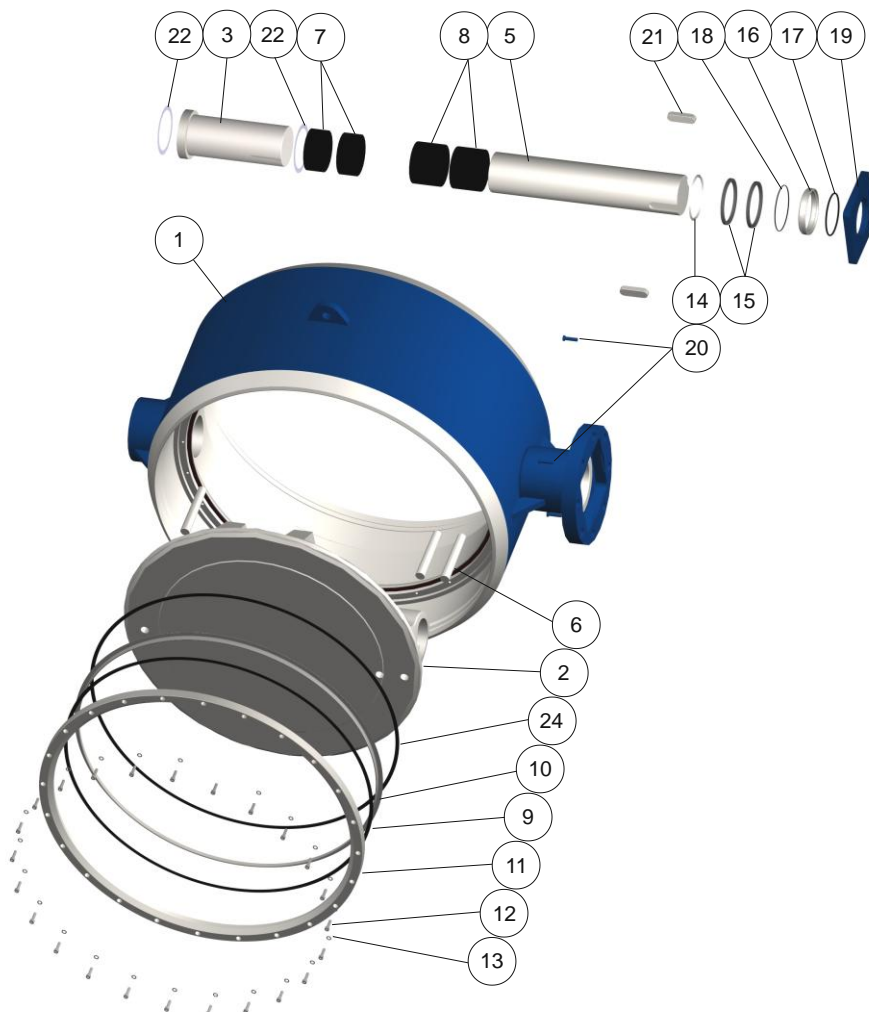
*) Valves fulfill the structural integrity requirements of the EN488:2011.

**) Wider temperature range is available.

Consult factory for details.



Exploded view

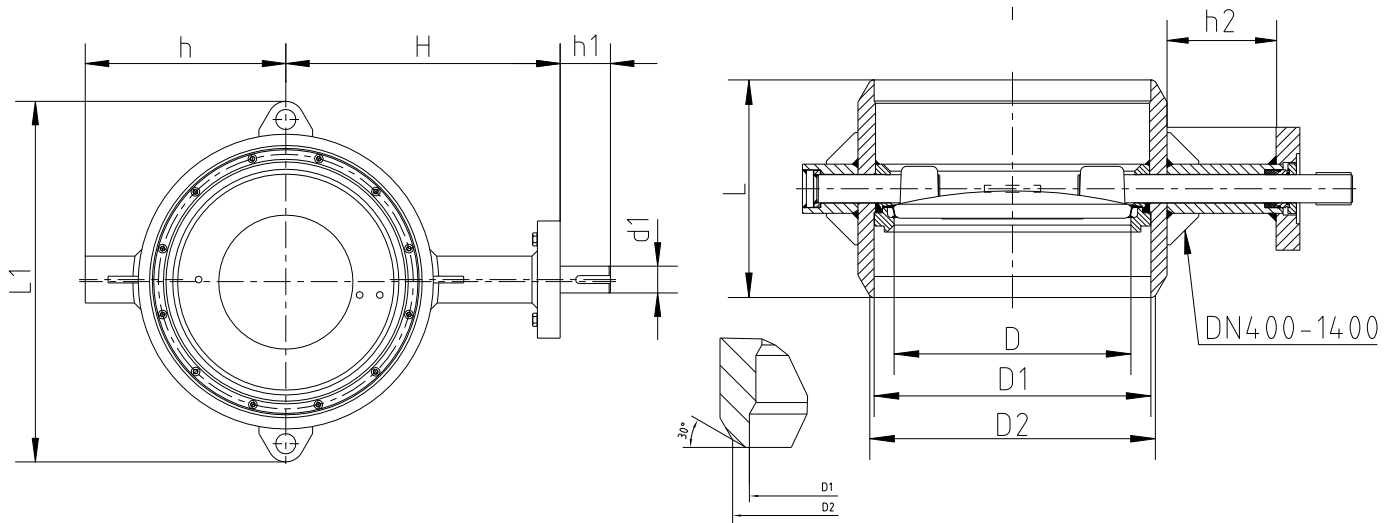


Parts list and standard materials

| Part | Material | | |
|--------|-------------------------|--|---------------------------------|
| 1 | Body | Carbon steel EN 10028-2 P265GH | |
| 2 | Disk | Stainless steel EN10213 1.4408, ASTM A351 CF8M, SS2324 | |
| 3 | Subshaft | Stainless steel EN10088-3 1.4460 / 1.4418+QT900 | |
| 5 | Main shaft | Stainless steel EN10088-3 1.4460 / 1.4418+QT900 | |
| 6 | Pin | Stainless steel EN10088-3 1.4462 / 1.4418+QT900 | |
| 7 | Subshaft bearing | PTFE on stainless steel net | |
| 8 | Stem bearing | PTFE on stainless steel net | |
| 9,24 | Shim | Carbon Fiber / Graphite | Graphite for steam version |
| 10 | Seat ring | Hard chrome plated stainless steel AISI 316L or PTFE+C | Special material by request |
| 11 | Retaining ring | Carbon steel EN10028-2 P265GH | |
| 12, 13 | Socket screw and washer | Stainless steel ISO 3506 A4-80 | |
| 14 | Back-up-ring | Stainless steel EN10216-5 1.4404 | |
| 15 | Box packing | Graphite | |
| 16 | Shaft seal bushing | Stainless steel EN10216-5 1.4404 | |
| 17,18 | O-ring | EPDM / FPM | Not fitted in version for steam |
| 19 | Gland | Stainless steel EN10028-7 1.4436 / 1.4404 | |
| 20 | Hexagonal screw | Stainless steel ISO 3506 A4-80 | |
| 21 | Key | Carbon steel 1.0503 DIN 6885A | |
| 22 | Bearing plate | PTFE on stainless steel net | |



Dimensions



| DN | L* | D | DIN end | | GOST end | | h | H | h1 | d1 | h2 | L1 | Flange ISO5211 | Weight, kg |
|------|-----|------|---------|-------|----------|-------|-----|------|-----|-----|-----|------|-------------------|---------------|
| | | | D1 | D2 | D1 | D2 | | | | | | | | |
| 200 | 230 | 138 | 210.1 | 219.1 | 210.1 | 219.1 | 154 | 259 | 58 | 25 | 115 | 233 | F10 | 32 |
| 250 | 250 | 187 | 263.0 | 273.0 | 263.0 | 273.0 | 193 | 298 | 63 | 30 | 125 | 385 | F12 | 47 |
| 300 | 270 | 238 | 312.7 | 323.9 | 312.7 | 323.9 | 229 | 323 | 69 | 35 | 125 | 435 | F12 | 64 |
| 350 | 290 | 286 | 344.4 | 355.6 | 365.0 | 377.0 | 255 | 352 | 75 | 40 | 125 | 465 | F14 | 95 |
| 400 | 310 | 337 | 393.8 | 406.4 | 414.0 | 426.0 | 300 | 409 | 75 | 40 | 155 | 540 | F14 | 124 |
| 450 | 330 | 386 | 444.4 | 457.0 | - | - | 326 | 445 | 86 | 50 | 149 | 590 | F16 | 164 |
| 500 | 350 | 437 | 495.4 | 508.0 | 514.0 | 530.0 | 351 | 470 | 86 | 50 | 149 | 660 | F16 | 201 |
| 600 | 390 | 483 | 593.6 | 609.6 | 616.0 | 630.0 | 376 | 548 | 103 | 60 | 178 | 760 | F16 | 315 |
| 700 | 430 | 582 | 693.6 | 711.2 | 704.0 | 720.0 | 440 | 601 | 119 | 70 | 181 | 860 | F25 | 437 |
| 800 | 470 | 682 | 795.2 | 812.8 | 804.0 | 820.0 | 490 | 651 | 119 | 70 | 183 | 955 | F30 | 527 |
| 900 | 510 | 775 | 894.4 | 914.4 | 902.0 | 920.0 | 575 | 718 | 125 | 90 | 194 | 1070 | F30 | 799 |
| 1000 | 550 | 855 | 994.0 | 1016 | 1000 | 1020 | 636 | 764 | 130 | 100 | 183 | 1200 | F30 | 1105 |
| 1200 | 630 | 1054 | 1195 | 1220 | 1195 | 1220 | 755 | 873 | 160 | 140 | 182 | 1440 | F35 | 2033 |
| 1400 | 710 | 1237 | 1392 | 1420 | 1392 | 1420 | 912 | 1018 | 180 | 170 | 206 | 1770 | F40 | 3215 |

*) Face-to-face length according to EN 558-1, series 14

Operation

Högfors valves can be equipped with an actuator to your specification.

- manual gear,
- electric actuator,
- all-purpose gear,
- pneumatic or hydraulic actuator.



Operation torque

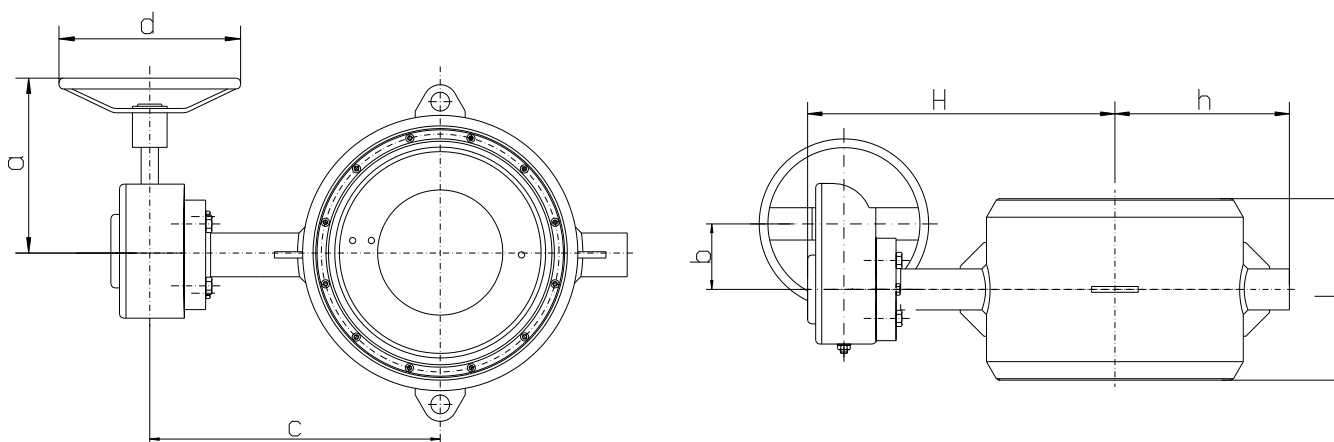
| DN | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 | 1400 | |
|----|-----|-----|-----|-----|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| Nm | CS | 240 | 400 | 700 | 1'100 | 1'600 | 2'200 | 3'000 | 4'200 | 6'800 | 10'000 | 13'000 | 16'000 | 24'000 | 34'000 |
| | TS | 190 | 320 | 550 | 850 | 1'300 | 1'800 | 2'400 | 3'400 | 5'500 | – | – | | | |

*) for steam duty use the next size up.

Manual gear

Opening and closing of the valves from the handwheel.

The position of disc can be seen on a position indicator on top of the gear.



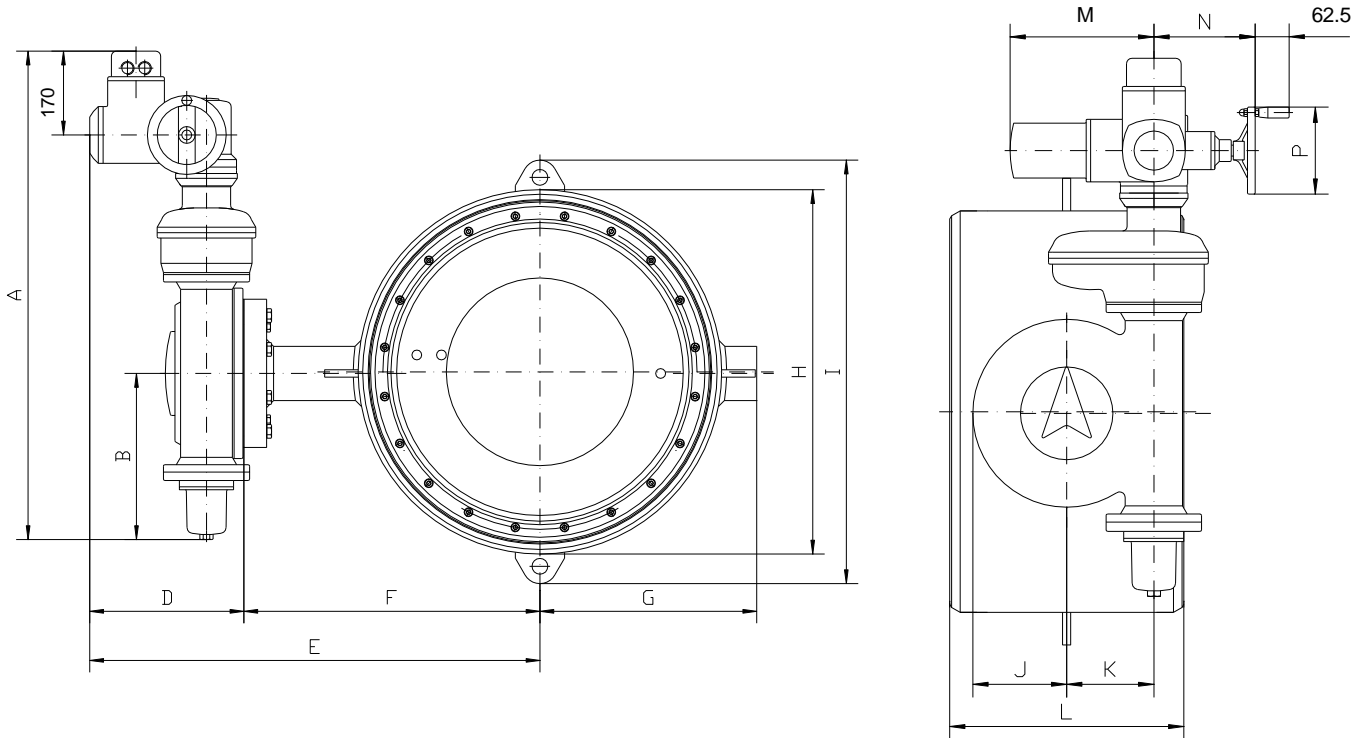
| DN | Manual gear Pro-Gear | | | | | | | | Manual gear Rotork | | | | | | | |
|------|----------------------|-----|-----|-----|-----|-----|-----|-----------------|--------------------|------|-----|-----|-----|------|-----|-----------------|
| | Type | H | h | a | b | c | d | Weight* , kg | Type | H | h | a | b | c | d | Weight* , kg |
| 200 | Q-800 | 349 | 154 | 202 | 67 | 301 | 200 | 40 | AB550N | 346 | 154 | 220 | 71 | 300 | 200 | 41 |
| 250 | Q-800 | 379 | 193 | 247 | 67 | 340 | 300 | 55 | AB550N | 385 | 193 | 255 | 71 | 339 | 300 | 56 |
| 300 | Q-800 | 417 | 229 | 264 | 90 | 373 | 300 | 72 | AB550N | 410 | 229 | 255 | 71 | 363 | 300 | 73 |
| 350 | Q-2000 | 446 | 255 | 264 | 90 | 402 | 500 | 111 | AB880N | 442 | 255 | 291 | 86 | 394 | 400 | 109 |
| 400 | Q-2000 | 503 | 300 | 264 | 90 | 459 | 500 | 140 | AB880N | 499 | 300 | 291 | 86 | 451 | 400 | 138 |
| 450 | Q-2000 | 573 | 326 | 405 | 138 | 500 | 500 | 180 | AB1950N | 566 | 326 | 387 | 130 | 500 | 500 | 196 |
| 500 | Q-4000 | 576 | 351 | 362 | 123 | 520 | 500 | 233 | AB1950N | 591 | 351 | 387 | 130 | 525 | 500 | 233 |
| 600 | Q-4000 | 675 | 376 | 387 | 154 | 598 | 500 | 347 | AB2000N | 678 | 376 | 382 | 53 | 608 | 500 | 347 |
| 700 | Q-12000 | 761 | 440 | 505 | 181 | 687 | 500 | 494 | AB6800N/SP4 | 760 | 440 | 500 | 263 | 660 | 500 | 482 |
| 800 | Q-12000 | 811 | 490 | 505 | 181 | 737 | 500 | 584 | AB6800N/SP4 | 810 | 490 | 500 | 263 | 710 | 500 | 572 |
| 900 | Q-16000 | 887 | 575 | 592 | 237 | 792 | 500 | 865 | AB6800N/SP6 | 877 | 575 | 546 | 278 | 777 | 500 | 1024 |
| 1000 | | | | | | | | | A200/SP9 | 942 | 636 | 571 | 384 | 864 | 500 | 1330 |
| 1200 | | | | | | | | | A200/SP9 | 1051 | 755 | 571 | 384 | 973 | 600 | 2258 |
| 1400 | | | | | | | | | IW9 | 1219 | 912 | 621 | 279 | 1118 | 700 | 3615 |

* weight of hand wheel is not included



Electric actuator

The typical solution is with AUMA Norm actuator.

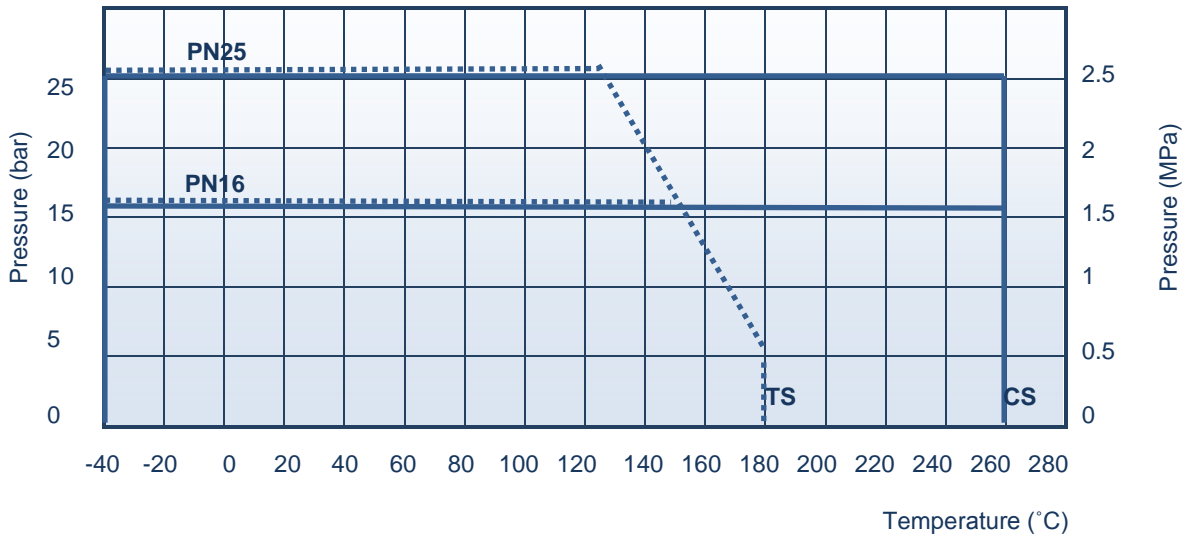


| DN | AUMA type | A | B | D | E | F | G | H | J | K | L | M | N | P | weight kg |
|------|------------------------------|------|-----|-----|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----------|
| 200 | SA07.2-GS50.3 – F10 | 444 | 96 | 277 | 536 | 259 | 154 | 233 | 63 | 50 | 230 | 265 | 186 | 140 | 58 |
| 250 | SA07.6-GS63.3 – F12 | 500 | 127 | 282 | 580 | 298 | 193 | 284 | 75 | 63 | 250 | 265 | 186 | 160 | 78 |
| 300 | SA07.6-GS80.3 – F12 | 510 | 132 | 284 | 607 | 323 | 229 | 334 | 88 | 80 | 270 | 265 | 186 | 160 | 99 |
| 350 | SA07.6-GS100.3/VZ4.3 – F14 | 689 | 182 | 312 | 665 | 353 | 255 | 389 | 105 | 100 | 290 | 265 | 186 | 160 | 149 |
| 400 | SA07.6-GS100.3/VZ4.3 – F14 | 689 | 182 | 312 | 721 | 409 | 299 | 440 | 105 | 100 | 310 | 265 | 186 | 160 | 178 |
| 450 | SA07.6-GS100.3/VZ4.3 – F16 | 689 | 182 | 312 | 757 | 445 | 326 | 490 | 105 | 100 | 330 | 265 | 186 | 160 | 218 |
| 500 | SA10.2-GS125.3/VZ4.3 – F16 | 700 | 187 | 322 | 792 | 470 | 351 | 540 | 125 | 125 | 350 | 282 | 193 | 200 | 269 |
| 600 | SA10.2-GS125.3/VZ4.3 – F16 | 700 | 187 | 322 | 870 | 548 | 376 | 638 | 125 | 125 | 390 | 282 | 193 | 200 | 383 |
| 700 | SA07.6-GS160.3/GZ160.3 – F25 | 990 | 337 | 313 | 914 | 601 | 440 | 738 | 173 | 160 | 430 | 265 | 186 | 160 | 549 |
| 800 | SA07.6-GS200.3/GZ200.3 – F30 | 1131 | 398 | 338 | 989 | 651 | 490 | 835 | 215 | 200 | 470 | 265 | 186 | 160 | 718 |
| 900 | SA07.6-GS200.3/GZ200.3 – F30 | 1131 | 398 | 338 | 1056 | 718 | 575 | 946 | 215 | 200 | 510 | 265 | 186 | 160 | 990 |
| 1000 | SA07.6-GS200.3/GZ200.3 – F30 | 1131 | 398 | 338 | 1145 | 764 | 636 | 1060 | 268 | 250 | 540 | 265 | 186 | 160 | 1296 |
| 1200 | SA10.2-GS250.3/GZ250.3 - F35 | 1303 | 486 | 381 | 1254 | 873 | 755 | 1279 | 268 | 250 | 630 | 282 | 193 | 200 | 2366 |
| 1400 | SA10.2-GS315/GZ30.1 – F40 | 1487 | 550 | 399 | 1417 | 1018 | 912 | 1492 | 340 | 315 | 710 | 282 | 193 | 200 | 3870 |



Pressure / Temperature Rating

The maximum working pressure ratings of the valve body



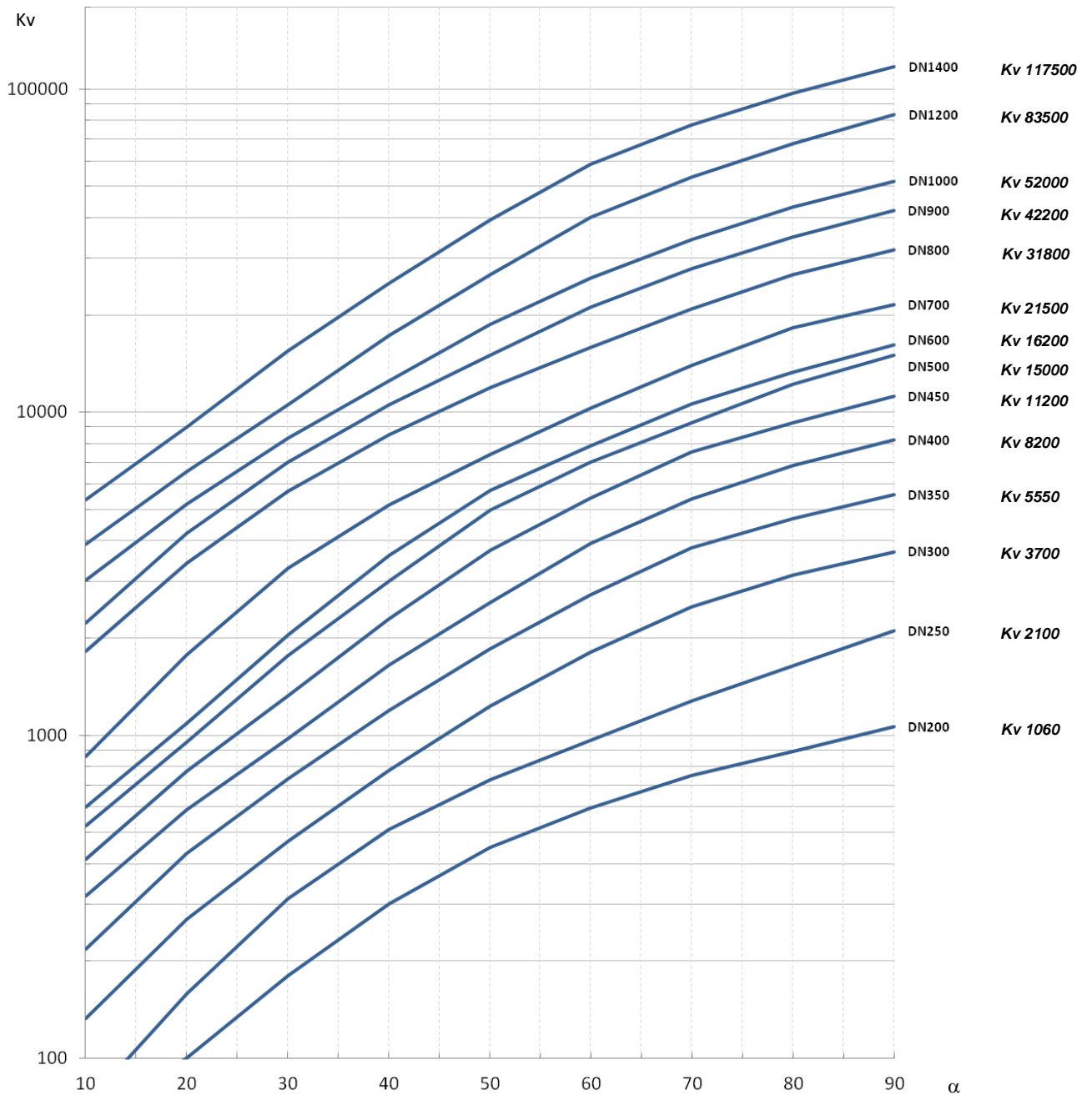
How to order

| | | | | | | | | | |
|-----------------|---|---|---|---|----|----|-----|---|----|
| | | 3 | 1 | 3 | 00 | CS | 800 | M | G5 |
| Body material: | 3 – Carbon steel | | | | | | | | |
| Valve type: | 1 - butterfly valve, | | | | | | | | |
| Connection: | 0, 1, 2 – wafer type, 3 - welded end, 5 – flanged, | | | | | | | | |
| Design options: | 00 – Standard, 01 - For steam | | | | | | | | |
| Main seal | (CS) - Stainless steel (TS) – PTFE+C | | | | | | | | |
| Size DN | | | | | | | | | |
| Operation: | (Z) - bare shaft, (M) - manual gear (MF) – all purpose gear | | | | | | | | |
| Options | (G) – GOST weld end, (5) – ΔP = 25 bar | | | | | | | | |



Flow curves

Indicating typical Kv values.



WATER:

Volume flow:

$$Q = K_v \sqrt{\frac{\Delta p}{\rho}}$$

K_v = KV value – Capacity factor

DN = nominal valve size, mm

α = disc opening angle

Δp = pressure difference, bar

ρ = density of liquid, kg/dm³

V = flow velocity, m/s

Q = volume flow, m³/h

Flow velocity:

$$V = 354 \frac{Q}{DN^2}$$