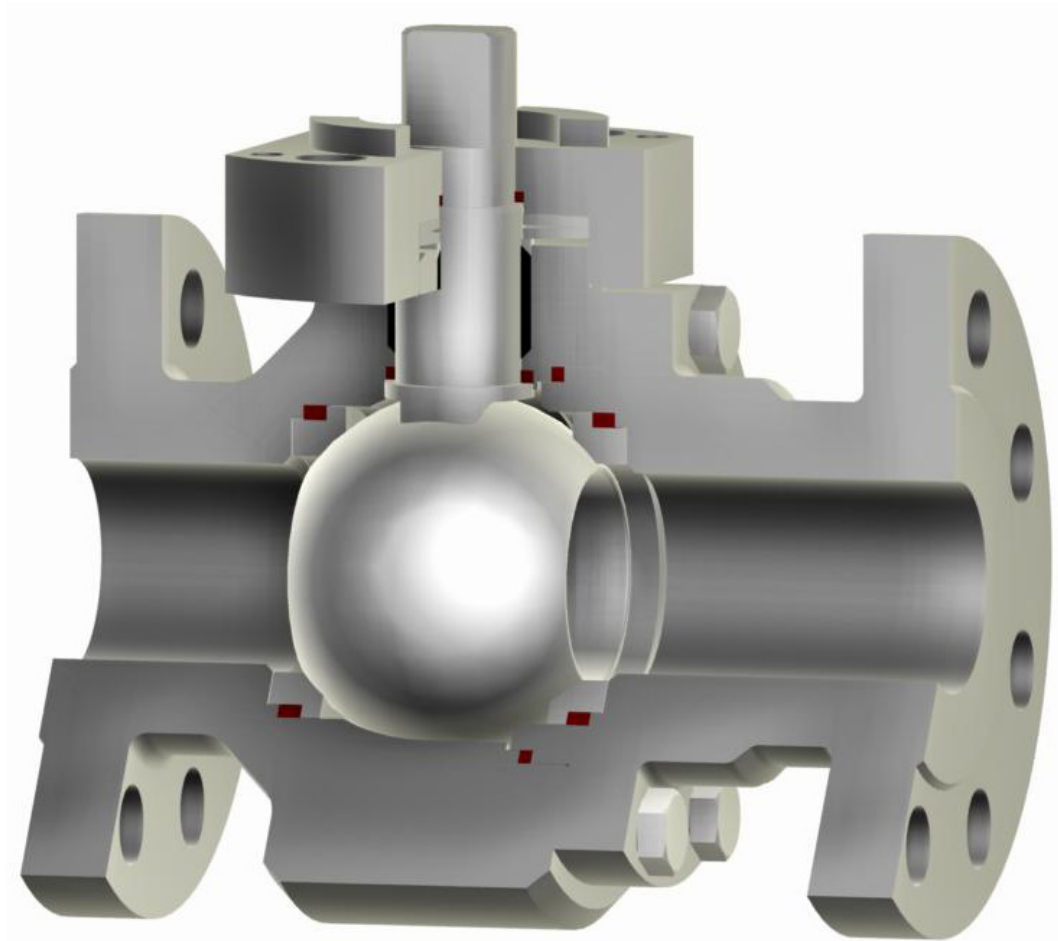




Two-Way Metal Seated Ball Valve Type 70-M



Design Characteristics

- ✓ Two piece body
- ✓ Floating ball
- ✓ Blow out proof stem
- ✓ Live loaded stem packing
- ✓ Fire Safe design optional

Design Standards

- ✓ EN 12516, EN 1983, ISO 5211, AD-2000
- ✓ ASME B 16.34, API 608

Range of Application

- ✓ Diameter ½" to 12" / DN 15 to 300
- ✓ Class 150 to 300 / PN 10 to 40
- ✓ -20°F to +850°F / -60°C to +450°C

Approvals

- ✓ "TA-Luft" certified for low fugitive emissions

Testing Standards

- ✓ EN 12266-1/2
- ✓ API 598



Main Parts

- 1 Body
- 2 Body End Connection
- 5 Ball
- 6 Stem
- 8 Gland Washer
- 10 Bearing Cover
- 16 Plate Spring
- 20 Sealing Ring
- 21 Seat Ring
- 23 Body Gasket
- 24 Stem Packing
- 25 Bearing Ring
- 26 Bearing Ring
- 28 Screw
- 29 Screw

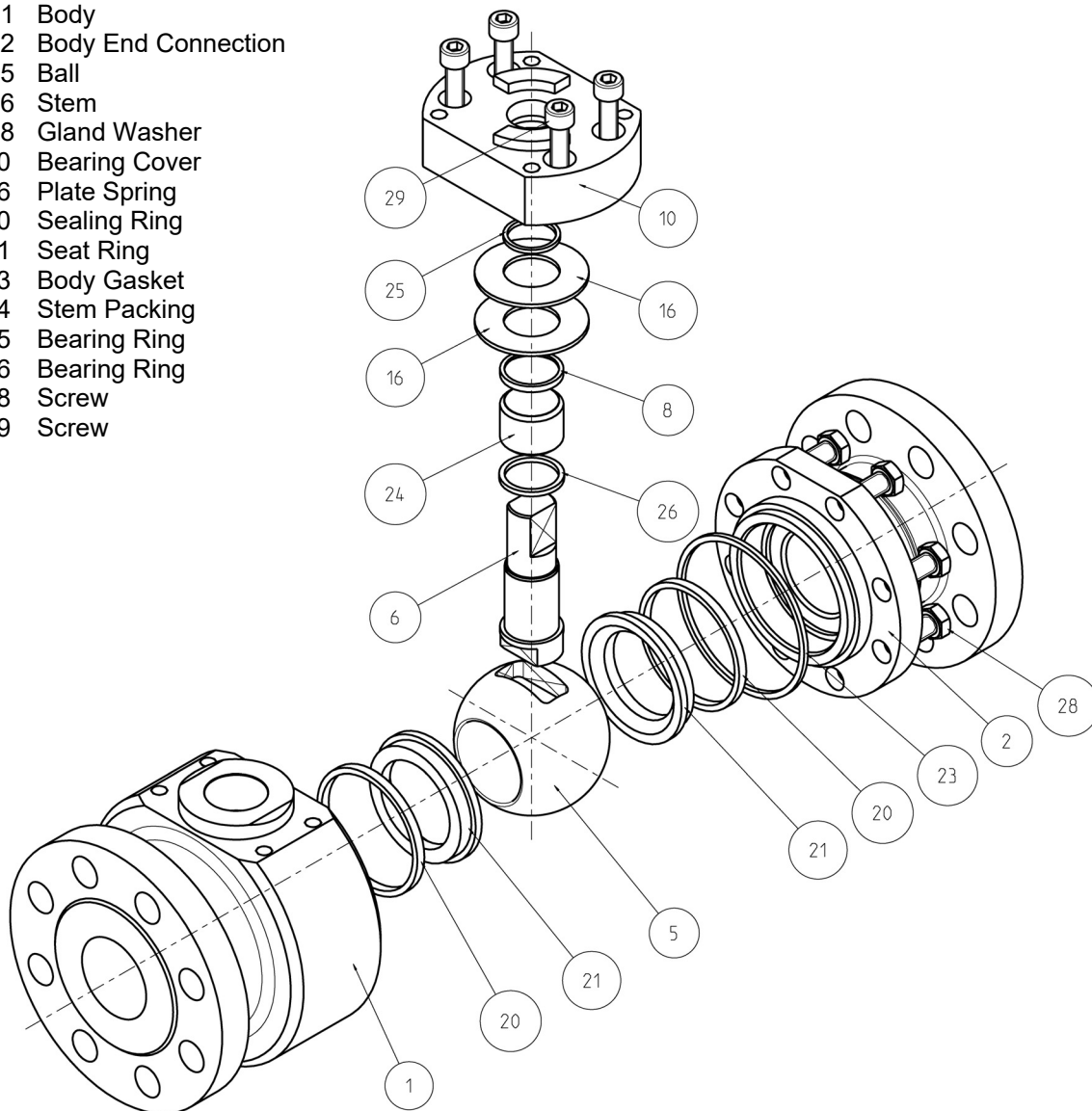


Fig.1

Description

This PERRIN ball valve design features a two piece body and a floating, seat supported ball. The stem packing is spring loaded and the metal seat rings are pre-loaded.

The valve is equipped with an integral actuator mounting flange for actuator connection according to ISO 5211. Stem extensions, locking devices and actuators with accessories, can be attached without operating interruptions.

The ball valve has an antistatic design with blow out proof stem. The stem packing and sealings are "TA-Luft" certified for low fugitive emissions.



Parts List / Materials

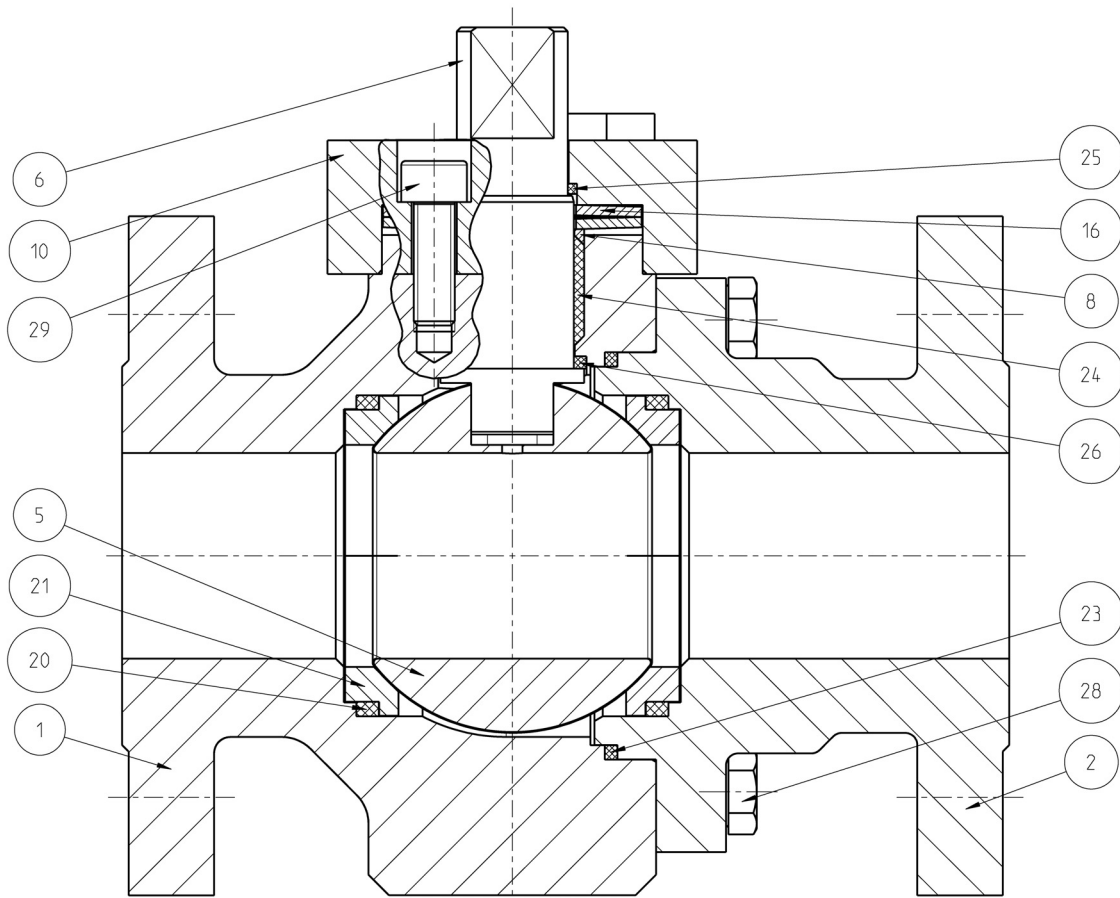


Fig.2

| Item | Designation | ASME | | DIN EN | |
|------|----------------------------|-------------------------------------|-------------------------------------|----------------------------------------------|----------------------------------------------|
| | | -20°F up to +850°F | -20°F up to +850°F | -60°C up to +450°C | -10°C up to +450°C |
| 1 | Body | A351 CF8M | A216 WCB | 1.4408 ¹⁾ | 1.0619 |
| 2 | Body End Connection | Type 316 (up to 2") | A105 (up to 2") | 1.4571 (up to 2") | 1.0460 (up to 2") |
| 5 | Ball | Type 316 coated A351 CF8M coated | Type 316 coated A351 CF8M coated | 1.4571 coated 1.4408 ¹⁾ coated | 1.4571 coated 1.4408 ¹⁾ coated |
| 6 | Stem | Type 51 ²⁾ Type 316 | Type 51 ²⁾ Type 316 | 1.4462 ²⁾ 1.4571 | 1.4462 ²⁾ 1.4571 |
| 8 | Gland Washer | Type 316 | Type 316 | 1.4571 | 1.4571 |
| 10 | Bearing Cover | Type 316 | A105 | 1.4571 | 1.0460 |
| 16 | Plate Spring ³⁾ | Type 301 | AISI 6150 | 1.4310 | 1.8159 |
| 20 | Sealing Ring | Graphite | Graphite | Graphite | Graphite |
| 21 | Seat Ring | Type 316 coated | Type 316 coated | 1.4571 coated | 1.4571 coated |
| 23 | Body Gasket | Graphite | Graphite | Graphite | Graphite |
| 24 | Stem Packing | | | | |
| 25 | Bearing Ring | | | | |
| 26 | Bearing Ring | Graphite with SS | Graphite with SS | Graphite with SS | Graphite with SS |
| 28 | Screw | SS | SS | SS | SS |
| 29 | Screw | SS | SS | SS | SS |

Tab.1

1) Temperature limitation 300°C [576°F] acc. to German technical rule AD-2000 W5 if intercrystalline corrosion resistant is required
 2) Temperature limitation 280°C [536°F]
 3) Material 2.4668 (Inconel 718) is generally required for operating temperature over 200°C [392°F]
 4) Materials for lower / higher temperature on request



Technical Data

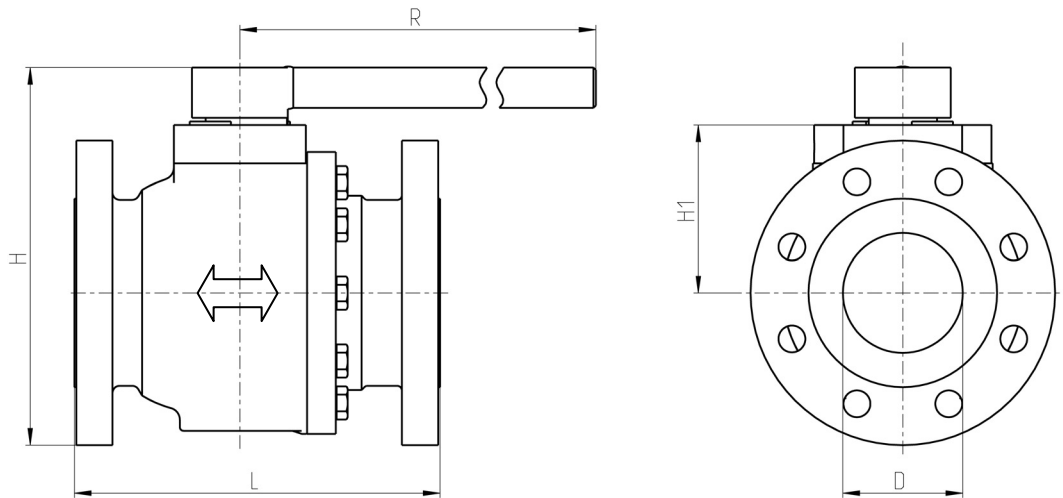


Fig.3

D = NPS = DN = Nominal Size
m = Weight

CLASS 150 - Full Bore

| NPS [inch] | DN [mm] | H | | H1 | | R | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|------------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| ½ | 15 | 5,9 | 150 | 2,0 | 51 | 7 | 180 | 4,25 | 108 | 27 | 9 | 4 |
| ¾ | 20 | 5,9 | 150 | 2,0 | 51 | 7 | 180 | 4,62 | 117 | 47 | 12 | 5,5 |
| 1 | 25 | 6,8 | 172 | 2 | 62 | 7 | 180 | 5 | 127 | 74 | 13 | 6 |
| 1¼ | 32 | 7 | 190 | 2,7 | 68 | 7 | 180 | 5,5 | 140 | 123 | 22 | 10 |
| 1½ | 40 | 8,1 | 206 | 3 | 81 | 12 | 300 | 6,5 | 165 | 191 | 31 | 14 |
| 2 | 50 | 8,9 | 226 | 4,0 | 101 | 12 | 300 | 7 | 178 | 298 | 37 | 17 |
| 2½ | 65 | 9,7 | 247 | 4,2 | 106 | 12 | 300 | 7,5 | 190 | 504 | 55 | 25 |
| 3 | 80 | 12,2 | 309 | 5 | 125 | 18 | 450 | 8 | 203 | 763 | 77 | 35 |
| 4 | 100 | 13 | 342 | 6 | 140 | 18 | 450 | 9 | 229 | 1192 | 97 | 44 |

Tab.2

CLASS 150 - Reduced Bore

| NPS [inch] | NPS-R [inch] | H | | H1 | | R | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|-----------------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| ¾ | ½ | 6,3 | 161 | 2 | 51 | 7 | 180 | 4,62 | 117 | 24 | 10 | 4,5 |
| 1 | ¾ | 6,3 | 161 | 2 | 51 | 7 | 180 | 5 | 127 | 43 | 13 | 6 |
| 1¼ | 1 | 7 | 177 | 2,4 | 62 | 7 | 180 | 5,5 | 140 | 67 | 17 | 7,5 |
| 1½ | 1¼ | 7,9 | 201 | 2,7 | 68 | 7 | 180 | 6,5 | 165 | 110 | 25 | 11,5 |
| 2 | 1½ | 8,3 | 211 | 3,2 | 81 | 12 | 300 | 7 | 178 | 172 | 33 | 15 |
| 2½ | 2 | 9,4 | 239 | 4 | 101 | 12 | 300 | 7,5 | 190 | 268 | 44 | 20 |
| 3 | 2½ | 10,1 | 257 | 4,2 | 106 | 12 | 300 | 8 | 203 | 454 | 64 | 29 |
| 4 | 3 | 12,7 | 322 | 4,9 | 125 | 18 | 450 | 9 | 229 | 687 | 79 | 36 |

Tab.3



CLASS 300 - Full Bore

| NPS [inch] | DN [mm] | H | | H1 | | R | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|------------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| ½ | 15 | 5,9 | 151 | 2,0 | 51 | 7 | 180 | 5,5 | 140 | 27 | 11 | 5 |
| ¾ | 20 | 6,2 | 157 | 2,0 | 51 | 7 | 180 | 6 | 152 | 47 | 14 | 7 |
| 1 | 25 | 6,6 | 168 | 2 | 62 | 7 | 180 | 6,5 | 165 | 74 | 18 | 8 |
| 1¼ | 32 | 7,3 | 186 | 2,7 | 68 | 12 | 300 | 7 | 178 | 123 | 29 | 13 |
| 1½ | 40 | 8,5 | 217 | 3 | 81 | 12 | 300 | 7,5 | 190 | 191 | 37 | 17 |
| 2 | 50 | 9 | 228 | 4,0 | 101 | 12 | 300 | 8,5 | 216 | 298 | 48 | 22 |
| 2½ | 65 | 9,7 | 247 | 4,2 | 106 | 12 | 300 | 9,5 | 241 | 504 | 73 | 33 |
| 3 | 80 | 12 | 305 | 4,9 | 125 | 18 | 450 | 11,12 | 282 | 763 | 92 | 42 |
| 4 | 100 | 13,5 | 343 | 6 | 140 | 28 | 700 | 12 | 305 | 1192 | 123 | 56 |

Tab.4

CLASS 300 - Reduced Bore

| NPS [inch] | NPS-R [inch] | H | | H1 | | R | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|-----------------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| ¾ | ½ | 6,4 | 162 | 2 | 51 | 7 | 180 | 6 | 152 | 24 | 13 | 6 |
| 1 | ¾ | 6,4 | 162 | 2 | 51 | 7 | 180 | 6,5 | 165 | 43 | 16 | 7 |
| 1¼ | 1 | 6,8 | 173 | 2,4 | 62 | 7 | 180 | 7 | 178 | 67 | 20 | 9 |
| 1½ | 1¼ | 7,8 | 197 | 2,7 | 68 | 7 | 180 | 7,5 | 190 | 110 | 33 | 15 |
| 2 | 1½ | 8,7 | 222 | 3,2 | 81 | 12 | 300 | 8,5 | 216 | 172 | 43 | 20 |
| 2½ | 2 | 9,5 | 241 | 4 | 101 | 12 | 300 | 9,5 | 241 | 268 | 56 | 25 |
| 3 | 2½ | 10,1 | 257 | 4,2 | 106 | 12 | 300 | 11,12 | 282 | 454 | 83 | 38 |
| 4 | 3 | 12,4 | 315 | 4,9 | 125 | 18 | 450 | 12 | 305 | 687 | 106 | 48 |

Tab.5

PN 16 – PN 40

| DN [mm] | H [mm] | H1 [mm] | R [mm] | L [mm] DIN EN 558 | | Kv [m³/h] | m [kg] | |
|------------|-----------|------------|-----------|----------------------|------|--------------|-----------|------|
| | | | | GR1 | GR27 | | GR1 | GR27 |
| 15 | 150 | 51 | 180 | 130 | 115 | 23 | 4 | 3 |
| 20 | 150 | 51 | 180 | 150 | 120 | 41 | 5 | 4 |
| 25 | 172 | 62 | 180 | 160 | 125 | 64 | 6 | 5 |
| 32 | 190 | 68 | 300 | 180 | 130 | 106 | 8 | 7 |
| 40 | 206 | 81 | 300 | 200 | 140 | 165 | 10 | 9 |
| 50 | 226 | 101 | 300 | 230 | 150 | 258 | 12 | 11 |
| 65 | 247 | 106 | 300 | 290 | 170 | 436 | 19 | 17 |
| 80 | 309 | 125 | 450 | 310 | 180 | 660 | 25 | 21 |
| 100 | 342 | 140 | 700 | 350 | 190 | 1031 | 35 | 29 |

Tab.6

Other dimensions and pressure classes on request.

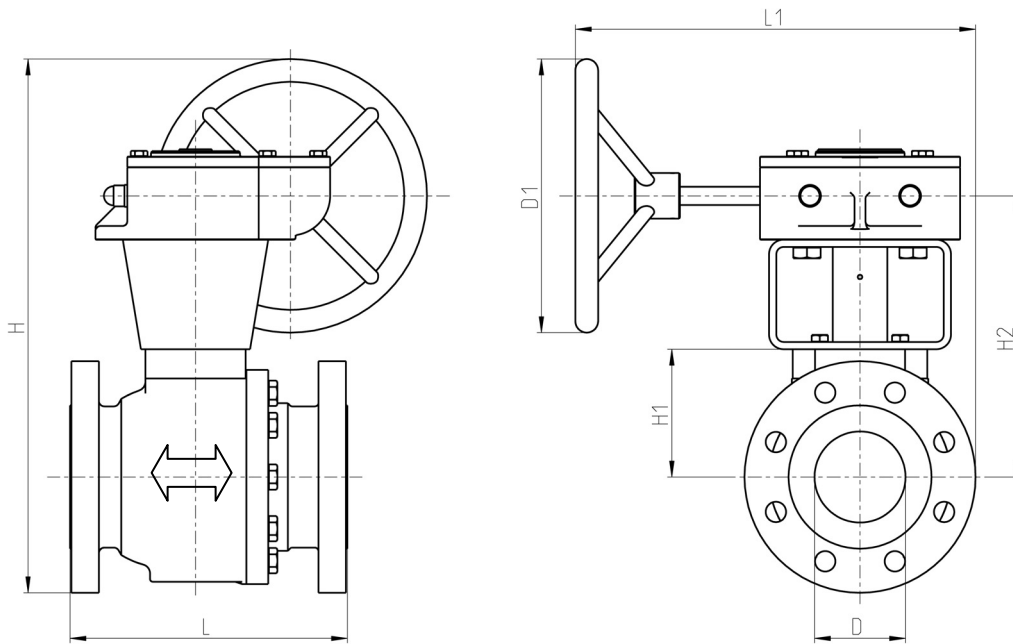


Fig.4

D = NPS = DN = Nominal Size
m = Weight

CLASS 150 - Full Bore

| NPS [inch] | DN [mm] | H | | H1 | | H2 | | L1 | | D1 | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|------------|--------|------|--------|------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| 6 | 150 | 31,9 | 811 | 7,8 | 197 | 13 | 321 | 14,7 | 373 | 28 | 700 | 15,5 | 394 | 2548 | 295 | 134 |
| 8 | 200 | 35,6 | 903 | 9,5 | 241 | 15 | 382 | 18 | 467 | 28 | 700 | 18 | 457 | 4528 | 486 | 221 |
| 10 | 250 | 38 | 966 | 11,1 | 282 | 18,2 | 463 | 21 | 528 | 24 | 600 | 21 | 533 | 7358 | 779 | 354 |
| 12 | 300 | 43 | 1097 | 13 | 338 | 21,9 | 556 | 24 | 600 | 24 | 600 | 24 | 610 | 10190 | 1118 | 508 |

Tab.7

CLASS 150 - Reduced Bore

| NPS [inch] | NPS-R [inch] | H | | H1 | | H2 | | L1 | | D1 | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|-----------------|--------|------|--------|------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| 6 | 5 | 19,3 | 489 | 5,5 | 140 | 10,4 | 264 | 12,3 | 312 | 18 | 450 | 15,5 | 394 | 1676 | 223 | 101 |
| 8 | 6 | 32,6 | 828 | 7,8 | 197 | 13,3 | 338 | 14,7 | 373 | 28 | 700 | 18 | 457 | 2414 | 339 | 154 |
| 10 | 8 | 37,1 | 943 | 9,5 | 241 | 16,6 | 422 | 18,4 | 467 | 28 | 700 | 21 | 533 | 4291 | 559 | 254 |
| 12 | 10 | 39,5 | 1003 | 11,1 | 282 | 19,7 | 500 | 20,8 | 528 | 24 | 600 | 24 | 610 | 6972 | 894 | 407 |

Tab.8



CLASS 300 - Full Bore

| NPS [inch] | DN [mm] | H | | H1 | | H2 | | L1 | | D1 | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|------------|--------|------|--------|------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| 6 | 150 | 33 | 841 | 9 | 241 | 15 | 382 | 20 | 515 | 24 | 600 | 15,9 | 403 | 2548 | 383 | 174 |
| 8 | 200 | 35 | 880 | 11 | 282 | 18 | 464 | 23 | 588 | 18 | 450 | 20 | 502 | 4528 | 608 | 277 |
| 10 | 250 | 42 | 1058 | 13 | 338 | 25 | 636 | 27 | 679 | 16 | 400 | 22 | 568 | 7358 | 938 | 427 |
| 12 | 300 | 52 | 1310 | 18 | 452 | 30 | 750 | 30 | 770 | 24 | 600 | 26 | 648 | 10190 | 1469 | 668 |

Tab.9

CLASS 300 - Reduced Bore

| NPS [inch] | NPS-R [inch] | H | | H1 | | H2 | | L1 | | D1 | | L ASME B16.10 | | Cv [gal/min] | m | |
|---------------|-----------------|--------|------|--------|------|--------|------|--------|------|--------|------|------------------|------|-----------------|-------|------|
| | | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | | [lbs] | [kg] |
| 6 | 5 | 28 | 701 | 7,8 | 197 | 13 | 338 | 12 | 315 | 28 | 700 | 15,9 | 403 | 1676 | 319 | 145 |
| 8 | 6 | 34 | 865 | 9 | 241 | 15 | 382 | 20 | 515 | 24 | 600 | 20 | 502 | 2414 | 507 | 230 |
| 10 | 8 | 40 | 1006 | 11 | 282 | 18 | 464 | 23 | 588 | 18 | 450 | 22 | 568 | 4291 | 782 | 355 |
| 12 | 10 | 43 | 1083 | 13 | 338 | 25 | 636 | 27 | 679 | 16 | 400 | 26 | 648 | 6972 | 1224 | 556 |

Tab.10

PN 16

| DN [mm] | H [mm] | H1 [mm] | H2 [mm] | L1 [mm] | D1 [mm] | L [mm] | | Kv [m³/h] | m [kg] | |
|------------|-----------|------------|------------|------------|------------|------------|------|--------------|-----------|------|
| | | | | | | DIN EN 558 | | | GR1 | GR27 |
| | | | | | | GR1 | GR27 | | | |
| 150 | 814 | 197 | 321 | 435 | 700 | 480 | 350 | 2320 | 117 | 101 |
| 200 | 902 | 241 | 382 | 526 | 700 | 600 | 400 | 4124 | 192 | 167 |
| 250 | 966 | 282 | 463 | 600 | 600 | 730 | 450 | 6701 | 307 | 267 |
| 300 | 1086 | 338 | 556 | 687 | 600 | 850 | 500 | 9279 | 441 | 384 |

Tab.11

PN 40

| DN [mm] | H [mm] | H1 [mm] | H2 [mm] | L1 [mm] | D1 [mm] | L [mm] | | Kv [m³/h] | m [kg] | |
|------------|-----------|------------|------------|------------|------------|------------|------|--------------|-----------|------|
| | | | | | | DIN EN 558 | | | GR1 | GR27 |
| | | | | | | GR1 | GR27 | | | |
| 150 | 965 | 241 | 365 | 506 | 900 | 480 | 350 | 2320 | 151 | 132 |
| 200 | 836 | 282 | 423 | 585 | 450 | 600 | 400 | 4124 | 240 | 209 |
| 250 | 944 | 338 | 519 | 682 | 400 | 730 | 450 | 6701 | 371 | 322 |
| 300 | 1228 | 452 | 670 | 768 | 600 | 850 | 500 | 9279 | 580 | 505 |

Tab.12

Other dimensions and pressure classes on request.



Top Works

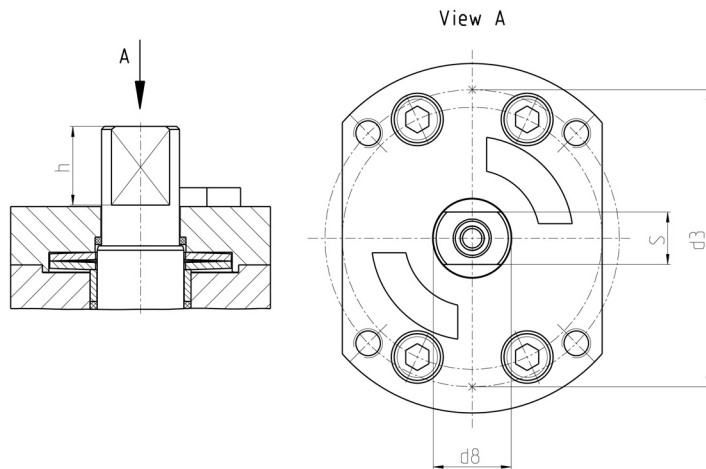


Fig.5

| F | h | | s | | d3 | | d8 | |
|-----|------|--------|------|--------|------|--------|------|--------|
| | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] | [mm] | [inch] |
| F05 | 17 | 0,7 | 10 | 0,4 | 50 | 2 | 13 | 0,5 |
| F07 | 22 | 0,9 | 12 | 0,5 | 70 | 2,8 | 17 | 0,7 |
| F10 | 27 | 1,1 | 18 | 0,7 | 102 | 4 | 27 | 1,1 |
| F12 | 38 | 1,5 | 32 | 1,3 | 125 | 4,9 | 40 | 1,6 |
| F14 | 38 | 1,5 | 38 | 1,5 | 140 | 5,5 | 57 | 2,2 |
| F16 | 48 | 1,9 | 44 | 1,7 | 165 | 6,5 | 68 | 2,7 |
| F25 | 48 | 1,9 | 55 | 2,2 | 254 | 10 | 82 | 3,2 |
| F30 | 99 | 3,9 | 65 | 2,6 | 298 | 11,7 | 93 | 3,7 |

Tab.13

Actuator-Connection ISO 5211 Full Bore

| NPS [inch] | DN [mm] | CLASS / PN | |
|---------------|------------|------------|----------|
| | | 150 / 16 | 300 / 40 |
| ½ | 15 | F05 | F05 |
| ¾ | 20 | F05 | F05 |
| 1 | 25 | F05 | F05 |
| 1¼ | 32 | F07 | F07 |
| 1½ | 40 | F07 | F10 |
| 2 | 50 | F07 | F10 |
| 2½ | 65 | F07 | F10 |
| 3 | 80 | F10 | F12 |
| 4 | 100 | F10 | F12 |
| 6 | 150 | F14 | F14 |
| 8 | 200 | F14 | F14* |
| 10 | 250 | F16 | F16* |
| 12 | 300 | F25 | F25* |

Reduced Bore

| NPS [inch] | NPS-R [inch] | CLASS | |
|---------------|-----------------|-------|------|
| | | 150 | 300 |
| ½ | - | - | - |
| ¾ | ½ | F05 | F05 |
| 1 | ¾ | F05 | F05 |
| 1¼ | 1 | F05 | F05 |
| 1½ | 1¼ | F07 | F07 |
| 2 | 1½ | F07 | F10 |
| 2½ | 2 | F07 | F10 |
| 3 | 2½ | F07 | F10 |
| 4 | 3 | F10 | F12 |
| 6 | 4 | F10 | F12 |
| 8 | 6 | F14 | F14 |
| 10 | 8 | F14 | F16 |
| 12 | 10 | F16 | F16* |

* Feather Keyway

Tab.14



Pressure / Temperature Diagram

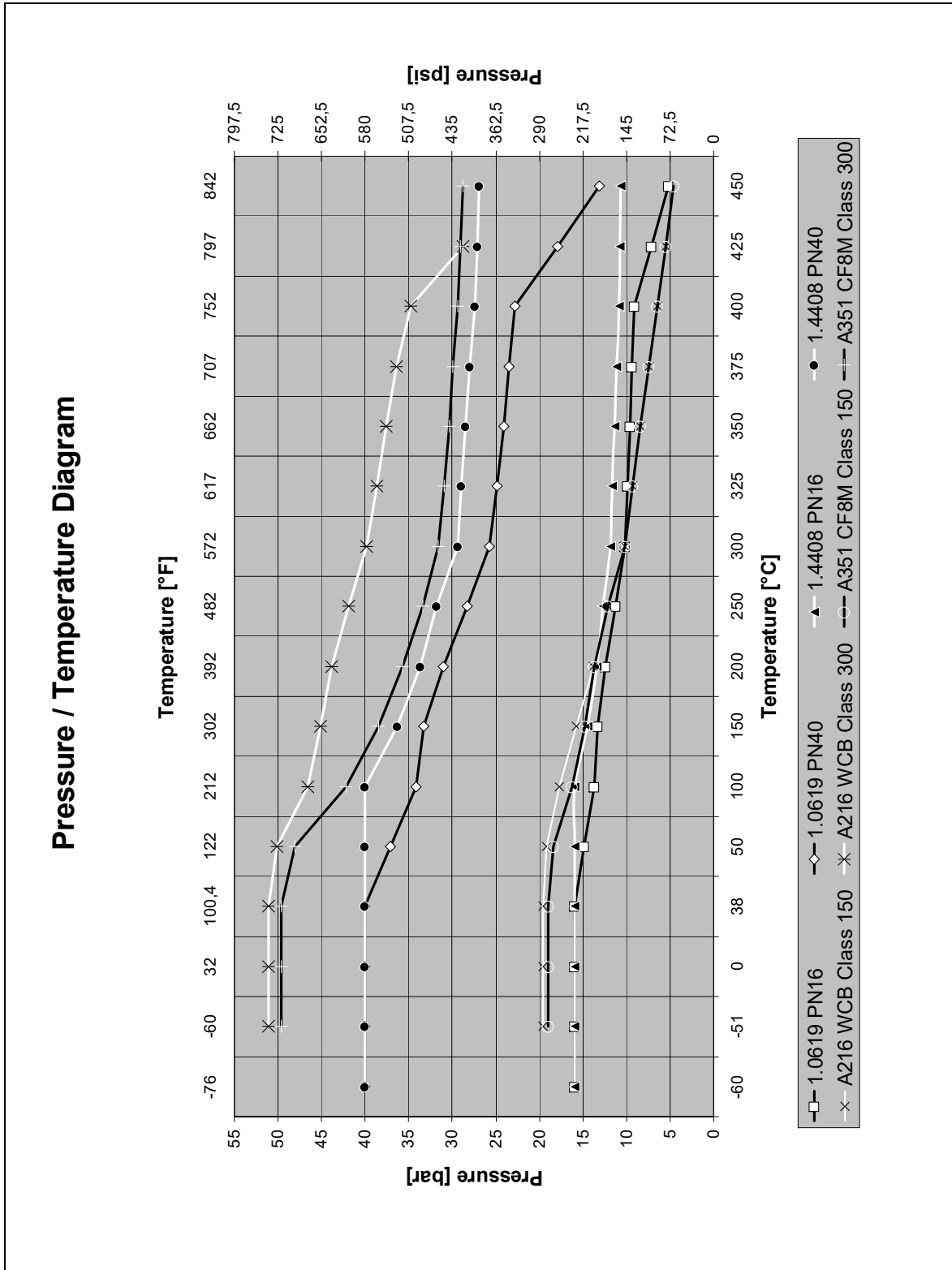


Fig.6



Options

1) Adjustable stem packing

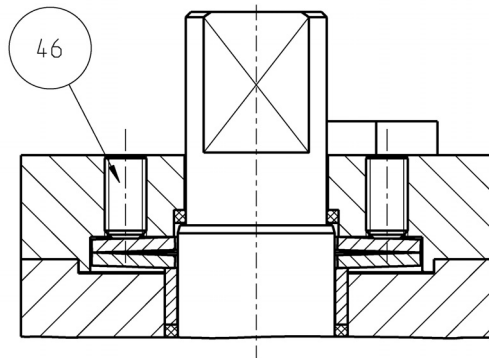


Fig.7

Additionally the live loaded stem packing may be equipped with hexagon socket screws (46). To fasten these screws it is possible to increase the spring force on the packing in the event of leakage.

2) Valve with heating jacket

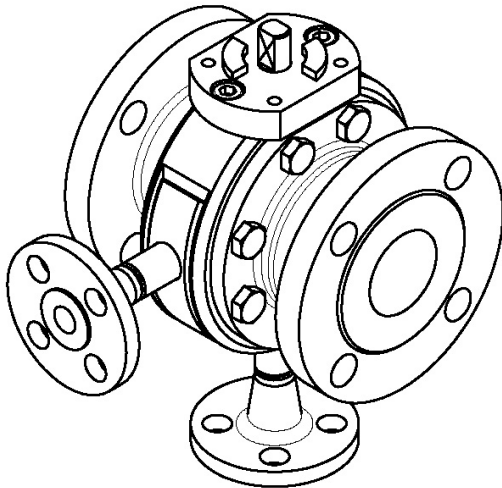


Fig.8

3) Seat rings with integrated cavity filler

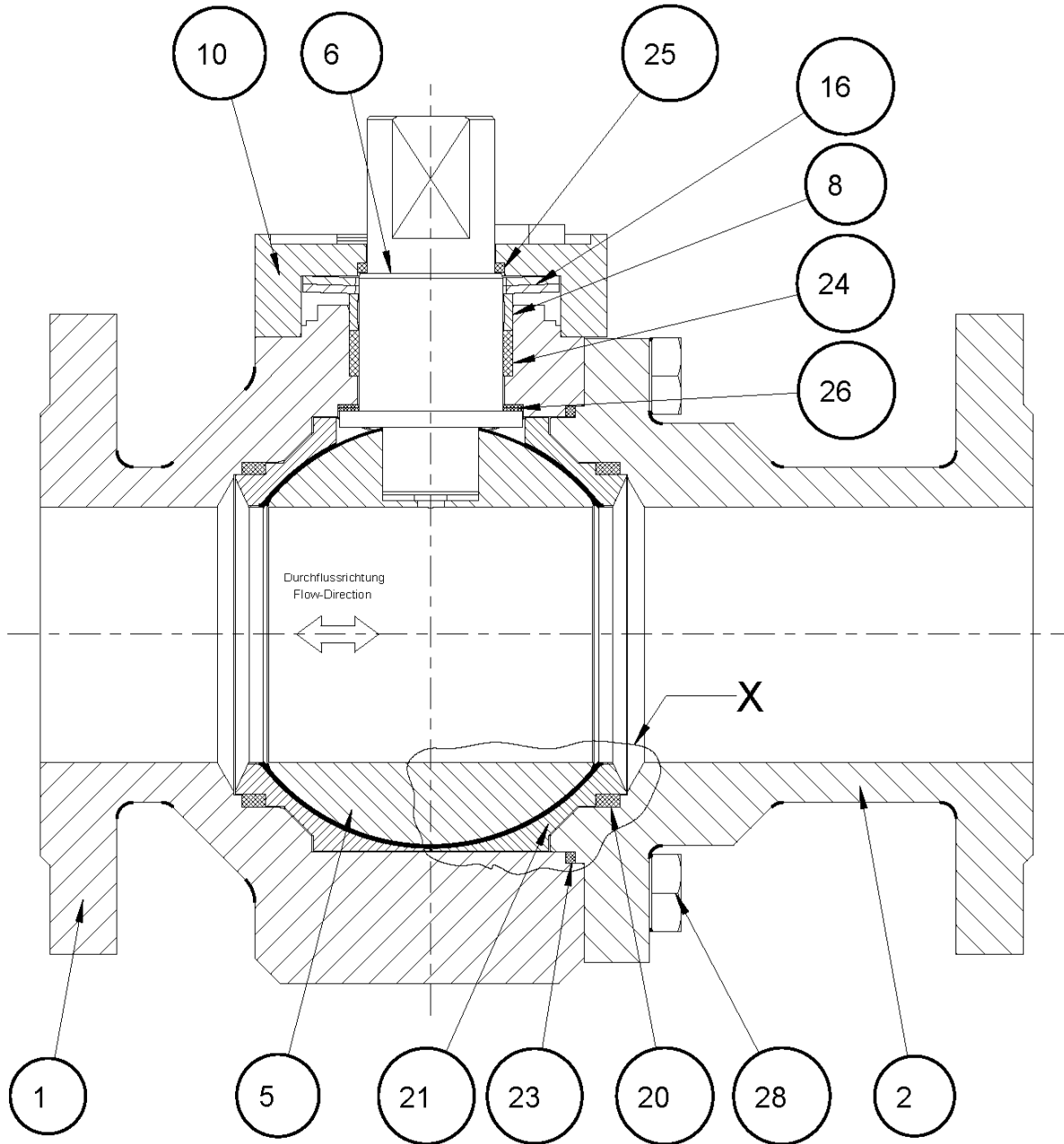


Fig.9

Additionally seat rings with integrated cavity filler (21) can be provided to minimize the cavity area between body and ball.

Technical modifications are reserved.

