



# BBF/KSF-R-HE

BALL VALVE FOR ONE TIME OPERATION / TIE-IN BALL VALVE

DN 65-200 | PN 25

REDUCED BORE

## INFORMATION

### Ball Valve for one time operation / Tie-in ball valve

/// Operating temperature up to +150 °C

/// The scope of delivery includes a cover for proper welding execution according to AGFW worksheet FW401.

/// The enclosed installation instructions must be observed!

/// Stem designed with double O-ring sealing

/// Disposable ball valves are supplied unpainted as standard.

/// Not suitable for autogenous welding

## MATERIALS

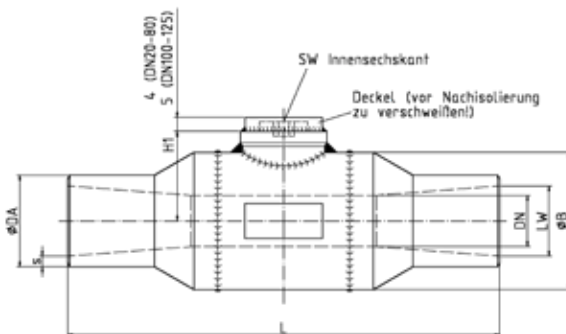
|            |                      |
|------------|----------------------|
| Body       | Forged Steel / Steel |
| Weld Ends  | Steel                |
| Ball       | Stainless Steel      |
| Ball Seals | PTFE                 |
| Stem Seals | EPDM                 |

## OPTIONS

/// Suitable for steam

/// For deviating operating conditions please send us a written request stating the fluids, as well as the pressure and temperature range.

For nominal diameters up to and including DN 50 please use our tapping ball valves



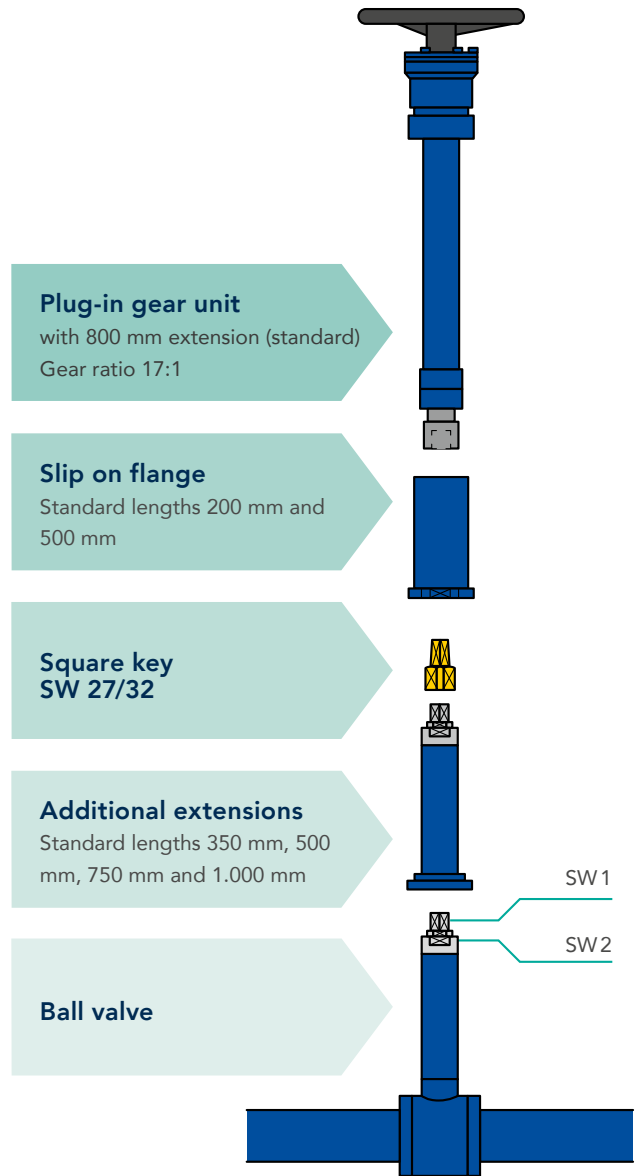
| DN/LW [mm]           | PN [bar] | Da [mm] | s [mm] | L [mm] | B [mm] | H1 [mm] | SW 1 [mm] | Weight [kg] | Article-No. |
|----------------------|----------|---------|--------|--------|--------|---------|-----------|-------------|-------------|
| 65/50                | 25       | 76.1    | 3.6    | 235    | 89     | 62.5    | 10        | 4.7         | 010.4196    |
| 80/65                | 25       | 88.9    | 4.0    | 265    | 121    | 77.5    | 10        | 7.9         | 010.4426    |
| 100/80               | 25       | 114.3   | 4.0    | 275    | 140    | 100     | 12        | 9.9         | 010.4427    |
| 125/100              | 25       | 139.7   | 4.5    | 300    | 171    | 114     | 12        | 17.5        | 010.5419    |
| 150/125 <sup>1</sup> | 25       | 168.3   | 5.0    | 335    | 203    | 149     | 22        | 24.0        | 010.5425    |
| 200/150 <sup>1</sup> | 25       | 219.1   | 6.3    | 375    | 254    | 188     | 32        | 48.0        | 010.2352    |

<sup>1</sup>These ball valves are designed with an external square key (SW1) on the control shaft.

# ACTUATING ACCESSORIES FOR UNDERGROUND BALL VALVES

The accessories for the Böhmer inground ball valves are designed on a modular principle.

The components can only be mounted in one positioning. The two-flat is used to accommodate additional extensions and slip-on flanges and is always aligned parallel to the pipeline axis. In conjunction with the notch for the ball bore in the square cap, a clear position indicator is thus always visible at the head of the valve in Böhmer inground ball valves.



**Plug-in gear unit**

with 800 mm extension (standard)  
Gear ratio 17:1

**Slip on flange**

Standard lengths 200 mm and  
500 mm

**Square key  
SW 27/32**

**Additional extensions**

Standard lengths 350 mm, 500  
mm, 750 mm and 1.000 mm

**Ball valve**

| DN        | DN               | SW 1 | SW 2 | Slip on flange<br>L 200 mm | Slip on flange<br>L 500 mm | Square key<br>yellow | Additional extension<br>L 350 mm | Additional extension<br>L 500 mm | Additional extension<br>L 750 mm | Additional extension<br>L 1000 mm | Plug-in gear<br>MDS 3000<br>L800 mm | Socket<br>wrench    |
|-----------|------------------|------|------|----------------------------|----------------------------|----------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|-------------------------------------|---------------------|
| full bore | reduced<br>boire | mm   | mm   | Article-No./<br>kg         | Article-No./<br>/kg        | Article-No./<br>/kg  | Article-No./<br>/kg              | Article-No./<br>/kg              | Article-No./<br>/kg              | Article-No./<br>/kg               | Article-No./<br>/kg                 | Article-No./<br>/kg |
| 20 - 65   | 25 - 80          | 16   | 40   | 075.7200<br>1,9            | 075.7201<br>4,8            | 628.2496<br>0,5      | 076.0736<br>2,5                  | 076.0737<br>3,3                  | 076.0729<br>4,7                  | 076.0947<br>6,2                   |                                     |                     |
| 80 - 125  | 100 - 150        | 22   | 50   | 075.7202<br>2,3            | 075.7203<br>4,9            | 628.2497<br>0,8      | 076.0682<br>4,5                  | 076.0738<br>5,4                  | 076.0739<br>7,5                  | 076.0805<br>9,1                   | 075.9999<br>18,4                    | 316.9999<br>6,0     |
| 150 - 300 | 200 - 400        | 32   | 80   | 075.7204<br>3,1            | 075.7205<br>5,6            | 628.2498<br>1,4      | 076.0623<br>10,5                 | 076.0740<br>12,5                 | 076.0640<br>17,5                 | 076.0720<br>22,0                  |                                     |                     |

# OPTIONS

|  | Underground Ball valves HE |           |           |                                     |                                   | Standard Ball valves HS |                |       |  |           |       |                                   |
|--|----------------------------|-----------|-----------|-------------------------------------|-----------------------------------|-------------------------|----------------|-------|--|-----------|-------|-----------------------------------|
|  | KSF V<br>KSF R             | ELF/ESF V | EMG/ESF V | KSF V<br>KSF R<br>Tie-in ball valve | KSF V<br>(Hot tapping ball valve) | KSF V<br>KSF R          | FSK V<br>FSK R | FSL V | FSL/KSF V + FSK/KSF V<br>FSL/KSF R + FSK/KSF R | KSG/KSF V | KSG V | KSF V<br>(Hot tapping ball valve) |
| Special lengths  | ✓                          | ✓         | ✓         |                                     |                                   | ✓                       |                | ✓     | ✓  | ✓         |       |                                   |
| Variable stem extensions for underground installation <sup>2</sup>       | ✓                          |           |           |                                     |                                   |                         |                |       |  |           |       |                                   |
| Stem extension 60 mm /100 mm   |                            |           |           |                                     |                                   | ✓                       | ✓              | ✓     | ✓  | ✓         | ✓     | ✓                                 |
| Spigot for drain and vent ball valve                                     | ✓                          |           |           |                                     |                                   |                         |                |       |  |           |       |                                   |
| Test connection from DN150 (with plug or ball valve)                     |                            |           |           |                                     |                                   | ✓                       | ✓              | ✓     |  |           |       |                                   |
| greater wall thicknesses for extreme axial loads or corrosion surcharges | ✓                          |           |           |                                     |                                   |                         |                |       |  |           |       |                                   |
| With Flange/Weld end from DN125  |                            |           |           |                                     | ✓                                 |                         |                |       |  |           |       | ✓                                 |
| Suitable for steam   | ✓                          |           |           | ✓                                   | ✓                                 | ✓                       | ✓              | ✓     |  |           | ✓     |                                   |

<sup>2</sup>Variable spindle extensions for buried installation:

We recommend using additional extensions from our accessories list on to compensate for height differences.

Tender specification texts are available for download on our website.

# TECHNICAL INFORMATION

## Wall thicknesses for ball valves for underground installation

The pipe ends used for BÖHMER inground district heating ball valves comply with the requirements of AD-Merkblatt B9 for the necking of pipes. Necking for drain and vent lines can be carried out on these pipes without falling below the mi-

nimum wall thickness requirements of EN488. The following wall thicknesses refer to the pipe material used. These are machined at the weld preparation by wall thickness adjustment.

| DN              | 20          | 25          | 32          | 40          | 50          |
|-----------------|-------------|-------------|-------------|-------------|-------------|
| Pipe dimensions | 26,9 x 3,2  | 33,7 x 3,2  | 42,4 x 3,2  | 48,3 x 3,6  | 60,3 x 3,6  |
| DN              | 65          | 80          | 100         | 125         | 150         |
| Pipe dimensions | 76,1 x 4,0  | 88,9 x 4,5  | 114,3 x 4,5 | 139,7 x 4,5 | 168,3 x 5,0 |
| DN              | 200         | 250         | 300         | 350         | 400         |
| Pipe dimensions | 219,1 x 6,3 | 273,0 x 7,1 | 323,9 x 8,0 | 355,6 x 8,0 | 406,4 x 8,8 |

## Flange dimensions

For all ball valves the standard for flange connections EN1092 is complied with. Below you will find an overview of the flange connection dimensions for pressure ratings PN10 - PN40, which

were not listed in the data sheets for reasons of clarity. The flange sheet thicknesses may deviate upwards from the dimensions required in the standard for manufacturing reasons.

| DN  | PN10 | PN16 | PN25 | PN40 | D   | g   | K   | b  | z  | d  |
|-----|------|------|------|------|-----|-----|-----|----|----|----|
| 10  | X    | X    | X    | X    | 90  | 40  | 60  | 16 | 4  | 14 |
| 15  | X    | X    | X    | X    | 95  | 45  | 65  | 16 | 4  | 14 |
| 20  | X    | X    | X    | X    | 105 | 58  | 75  | 18 | 4  | 14 |
| 25  | X    | X    | X    | X    | 115 | 68  | 85  | 18 | 4  | 14 |
| 32  | X    | X    | X    | X    | 140 | 78  | 100 | 18 | 4  | 18 |
| 40  | X    | X    | X    | X    | 150 | 88  | 110 | 18 | 4  | 18 |
| 50  | X    | X    | X    | X    | 165 | 102 | 125 | 20 | 4  | 18 |
| 65  | X    | X    |      |      | 185 | 122 | 145 | 22 | 4  | 18 |
| 65  |      |      | X    | X    | 185 | 122 | 145 | 22 | 8  | 18 |
| 80  | X    | X    | X    | X    | 200 | 138 | 160 | 24 | 8  | 18 |
| 100 | X    | X    |      |      | 220 | 158 | 180 | 20 | 8  | 18 |
| 100 |      |      | X    | X    | 235 | 162 | 190 | 24 | 8  | 22 |
| 125 | X    | X    |      |      | 250 | 188 | 210 | 22 | 8  | 18 |
| 125 |      |      | X    | X    | 270 | 188 | 220 | 26 | 8  | 26 |
| 150 | X    | X    |      |      | 285 | 212 | 240 | 22 | 8  | 22 |
| 150 |      |      | X    | X    | 300 | 218 | 250 | 28 | 8  | 26 |
| 200 | X    |      |      |      | 340 | 268 | 295 | 24 | 8  | 22 |
| 200 |      | X    |      |      | 340 | 268 | 295 | 24 | 12 | 22 |
| 200 |      |      | X    |      | 360 | 278 | 310 | 30 | 12 | 26 |
| 200 |      |      |      | X    | 375 | 285 | 320 | 34 | 12 | 30 |
| 250 | X    |      |      |      | 395 | 320 | 350 | 26 | 12 | 22 |
| 250 |      | X    |      |      | 405 | 320 | 355 | 26 | 12 | 26 |
| 250 |      |      | X    |      | 425 | 335 | 370 | 32 | 12 | 30 |
| 250 |      |      |      | X    | 450 | 345 | 385 | 38 | 12 | 33 |
| 300 | X    |      |      |      | 445 | 370 | 400 | 26 | 12 | 22 |
| 300 |      | X    |      |      | 460 | 378 | 410 | 28 | 12 | 26 |
| 300 |      |      | X    |      | 485 | 395 | 430 | 34 | 16 | 30 |
| 300 |      |      |      | X    | 515 | 410 | 450 | 42 | 16 | 33 |
| 350 | X    |      |      |      | 505 | 430 | 460 | 26 | 16 | 22 |
| 350 |      | X    |      |      | 520 | 438 | 470 | 30 | 16 | 26 |
| 350 |      |      | X    |      | 555 | 450 | 490 | 38 | 16 | 33 |
| 350 |      |      |      | X    | 580 | 465 | 510 | 46 | 16 | 36 |
| 400 | X    |      |      |      | 565 | 482 | 515 | 26 | 16 | 26 |
| 400 |      | X    |      |      | 580 | 490 | 525 | 32 | 16 | 30 |
| 400 |      |      | X    |      | 620 | 505 | 550 | 40 | 16 | 36 |
| 400 |      |      |      | X    | 660 | 535 | 585 | 50 | 16 | 39 |

# TENSILE AND COMPRESSIVE FORCES, DRAG COEFFICIENTS

## Permissible tensile and compressive forces

| Diameter of the connecting pipe |                         | Examples of pre-heated pipes and "cold-laid" pipes |   |
|---------------------------------|-------------------------|--|---|
| Full bore DN [mm]               | reduced bore DN/LW [mm] | Tensile force at 130 K cooling [kN]                | Compressive force at 130 K heating [kN] |
| 20                              | 20/16                   | 26   | 41                                      |
| 25                              | 25/50                   | 37   | 60                                      |
| 32                              | 32/25                   | 53   | 86                                      |
| 40                              | 40/32                   | 61   | 99                                      |
| 50                              | 50/40                   | 85   | 139                                     |
| 65                              | 65/50                   | 109  | 177                                     |
| 80                              | 80/65                   | 140  | 228                                     |
| 100                             | 100/80                  | 204  | 332                                     |
| 125                             | 125/100                 | 251  | 480                                     |
| 150                             | 150/125                 | 337  | 547                                     |
| 200                             | 200/150                 | 495  | 804                                     |
| 250                             | 250/200                 | 686  | 1.116                                   |
| 300                             | 300/250                 | 913  | 1.484                                   |
| 350                             | 350/300                 | 1.004  | 1.632                                   |
| 400                             | 400/300                 | 1.291  | 2.098                                   |
| 450                             | 450/400                 | 1.454  | 2.364                                   |
| 500                             | 500/400                 | 1.619  | 2.423                                   |
| 600                             | 600/500                 | 2.192  | 3.087                                   |
| 700                             | 700/600                 | 2.880  | 3.926                                   |
| 800                             | 800/700                 | 3.624  | 4.761                                   |
| 900                             | 900/800                 | 4.629  | 6.144                                   |
| 1000                            | 1000/900                | 5.661  | 7.439                                   |
| 1200                            | 1200/1000               | 7.729  | 9.636                                   |

The permissible tensile and compressive forces in the adjacent table correspond to the figures required by EN 488. The permissible tensile and compression forces listed here are valid for all fully-welded BÖHMER district heating ball valves.

**Ball valves for greater forces are also available on written request.**

## Drag coefficients

| Full Bore |                                    |      | Reduced Bore |                                    |      |
|-----------|------------------------------------|------|--------------|------------------------------------|------|
| DN        | K <sub>v</sub> [m <sup>3</sup> /h] | ζ(-) | DN/LW        | K <sub>v</sub> [m <sup>3</sup> /h] | ζ(-) |
| 10-16     | 25                                 | 0.17 | 20/16        | 15                                 | 1.14 |
| 20        | 52                                 | 0.09 | 20/16        | 15                                 | 1.14 |
| 25        | 83                                 | 0.09 | 25/20        | 32                                 | 0.60 |
| 32        | 119                                | 0.12 | 32/25        | 50                                 | 0.67 |
| 40        | 203                                | 0.10 | 40/32        | 98                                 | 0.43 |
| 50        | 334                                | 0.09 | 50/40        | 139                                | 0.51 |
| 65        | 603                                | 0.08 | 65/60        | 242                                | 0.49 |
| 80        | 978                                | 0.07 | 80/65        | 359                                | 0.51 |
| 100       | 1.510                              | 0.06 | 100/80       | 604                                | 0.44 |
| 125       | 2.558                              | 0.06 | 125/100      | 932                                | 0.45 |
| 150       | 4.181                              | 0.05 | 150/125      | 1.411                              | 0.41 |
| 200       | 7.983                              | 0.05 | 200/150      | 2.547                              | 0.40 |
| 250       | 13.580                             | 0.04 | 250/200      | 4.228                              | 0.35 |
| 300       | 20.917                             | 0.03 | 300/250      | 6.189                              | 0.34 |
| 350       | 28.897                             | 0.03 | 350/300      | -                                  | -    |
| 400       | 38.319                             | 0.03 | 400/300      | 10.963                             | 0.34 |
| 450       | 43.914                             | 0.03 | 450/400      | -                                  | -    |
| 500       | 60.542                             | 0.03 | 500/400      | 17.981                             | 0.31 |
| 600       | 93.059                             | 0.02 | 600/500      | 26.771                             | 0.29 |
| 700       | 129.351                            | 0.02 | 700/600      | 38.483                             | 0.26 |
| 800       | 196.170                            | 0.02 | 800/700      | 45.020                             | 0.25 |
| 900       | 223.513                            | 0.02 | 900/800      | 60.739                             | 0.22 |
| 1000      | 283.612                            | 0.02 | 1000/900     | 80.175                             | 0.20 |
| 1200      | 439.598                            | 0.01 | 1200/1000    | 82.375                             | 0.22 |

The drag coefficients were determined for ball valves with solid balls.

Hollow balls cause more resistance and thus result in higher drag coefficients. In order to determine the exact losses, it is necessary to distinguish between trunnion-mounted and floating hollow balls.

Since the use of trunnion-mounted balls depends partly on the operating pressure, it is not possible to determine generally-valid drag coefficients for hollow balls as a function of nominal sizes.

The following are drag coefficients of butterfly valves based on approximate figures according to Dubbel:

DN 50: ζ=1.4 Kv=85  
 DN 200: ζ=0.8 Kv=1.790  
 DN 500: ζ=0.63 Kv=12.613