



BBF/EMG/ESF-V-HE

BALL VALVE FOR VENTING AND  
DRAINING WITH THREAD  
AND WELDING END

DN 25-50 | PN 40

FULL BORE

INFORMATION

Ball valve for venting and draining with  
Thread and welding end

/// Operating temperature up to +150 °C

/// The sealing plug is included in the scope of  
delivery.

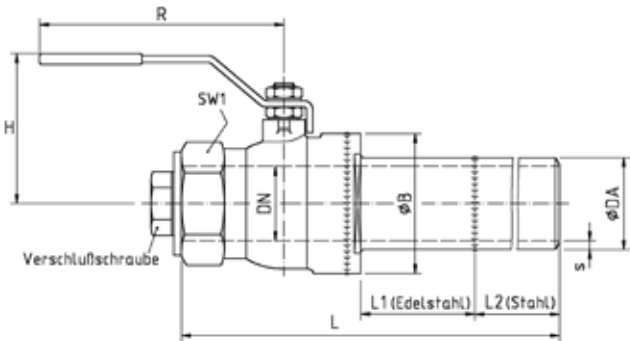
MATERIALS

|                  |                        |
|------------------|------------------------|
| Body             | Stainless Steel 1.4581 |
| Anschweißende    | Steel                  |
| Ball             | Stainless Steel        |
| Verschlußstopfen | 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.



| DN<br>[mm] | PN<br>[bar] | DA<br>[mm] | s<br>[mm] | L<br>[mm] | L1<br>[mm] | L2<br>[mm] | B<br>[mm] | H<br>[mm] | R<br>[mm] | SW1<br>[mm] | Weight<br>[kg] | Article-No. |
|------------|-------------|------------|-----------|-----------|------------|------------|-----------|-----------|-----------|-------------|----------------|-------------|
| 25         | 40          | 33.7       | 3.2       | 1000      | 148        | 757        | 49        | 65        | 135       | 41          | 3.4            | 050.5617    |
| 32         | 40          | 42.4       | 3.2       | 1000      | 63         | 774        | 65        | 84        | 155       | 50          | 5.2            | 050.0065    |
| 40         | 40          | 48.3       | 3.2       | 1000      | 50         | 771        | 75        | 85        | 155       | 55          | 6.2            | 050.0140    |
| 50         | 40          | 60.3       | 3.6       | 1000      | 151        | 711        | 92        | 95        | 155       | 70          | 7.4            | 050.2897    |



# COUNTER FLAP

FOR SIMPLIFIED ASSEMBLY  
OF FLANGE CONNECTIONS

DN 25-100 | PN 10 - 40

## INFORMATION

Counter lugs for flange connections in directly buried drain and vent ball valves.

/// For simplified assembly of flange connections in directly buried pipeline construction, the counter lugs provide assistance for the assembly personnel.

/// The use of the counter lugs eliminates the need for counter-holding when bolting the flange connection, which is difficult due to limited space.

/// The counter brackets replace the need to hold the flange in place with tools by mutually securing 2 bolted connections.

## MATERIAL

Stainless Steel



| DN<br>[mm] | Pressure ratings |       |       |       | Quantity per<br>Flange connection | Article-No. |
|------------|------------------|-------|-------|-------|-----------------------------------|-------------|
|            | PN 10            | PN 16 | PN 25 | PN 40 |                                   |             |
| 25         | X                | X     | X     | X     | 2                                 | 050.9502    |
| 50         | X                | X     | X     | X     | 2                                 | 050.9500    |
| 80         | X                | X     | X     | X     | 4                                 | 050.9501    |
| 100        |                  |       | X     | X     | 4                                 | 050.9504    |

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 |

All information subject to change and error

# 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<br>DN [mm]            | reduced bore<br>DN/LW [mm] | Tensile force at<br>130 K cooling<br>[kN]          | Compressive<br>force at 130 K<br>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> [m³/h] | ζ(-) | DN/LW        | K <sub>v</sub> [m³/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  | K <sub>v</sub> = 85     |
| DN 200: | ζ = 0.8  | K <sub>v</sub> = 1.790  |
| DN 500: | ζ = 0.63 | K <sub>v</sub> = 12.613 |

All information subject to change and error