



# BBF/FSK-R-HS

BALL VALVE WITH FLANGES.  
SHORT PATTERN

DN 200-1000 | PN 25

REDUCED BORE

## INFORMATION

### Ball Valve with Flanges

/// Operating temperature up to +150 °C

/// Flange drilled and dimensioned according to EN 1092 - pressure rating PN 25. Observe pressure-temperature rating. Flange dimensions can be found on the supplementary sheet „Technical Information“.

/// The trunnion mounted ball is standard

/// The worm gear with handwheel is included in the scope of delivery.

## MATERIALS

**Body** Forged Steel / Steel

**Flansche** Steel

**Ball** Stainless Steel; From DN 450: Steel chemically nickel plated

**Ball Seals** PTFE

**Stem Seals** EPDM

## OPTIONS

/// Suitable for steam

/// Further options for this ball valve according to the list on the „Options“ supplementary sheet

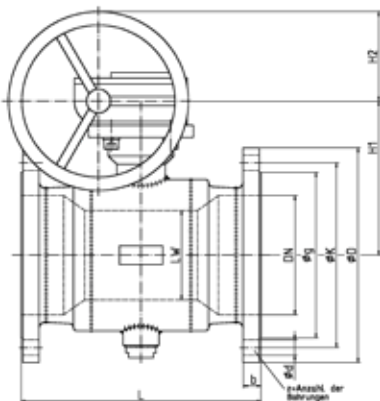
/// For deviating operating conditions please send us a written request stating the fluids, as well as the pressure and temperature range.

/// Also available automated with electric or pneumatic actuators.

**/// Other pressure ratings available on request**



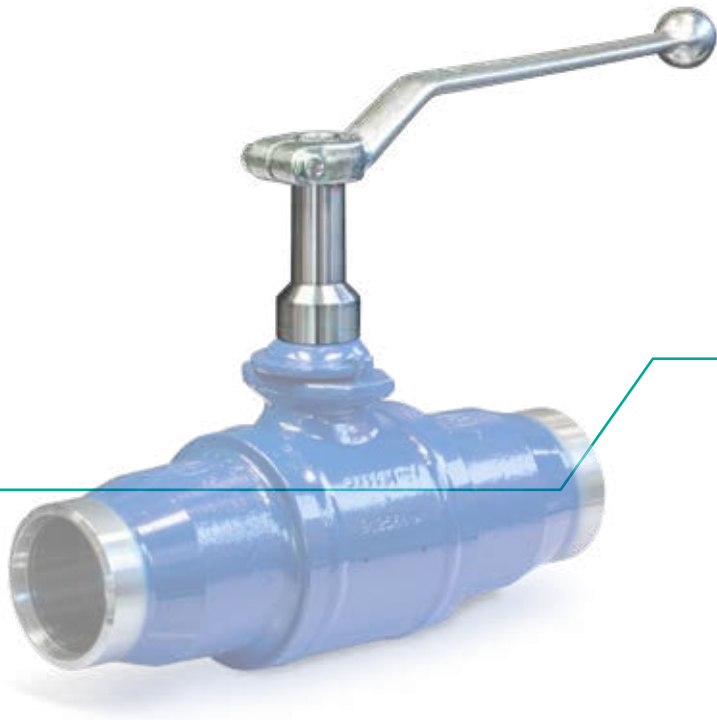
On request, we can also supply this ball valve in a version with double shut-off, in accordance with DGUV 103-002.



DN/LW [mm]	PN [bar]	L [mm]	D [mm]	H1 [mm]	H2 [mm]	Weight [kg]	Article-No.
200/150	25	400	360	349	100	95	075.0274
250/200	25	450	425	384	150	148	075.0277
300/250	25	750	485	355	200	380	075.0280
350/300	25	850	555	404	200	610	075.0283
400/300	25	950	620	404	200	665	075.0286
450/400	25	1050	670	531	200	1010	a.A.
500/400	25	1150	730	531	200	1065	a.A.
600/500	25	a. A.	845	608	250	a. A.	a. A.
700/600	25	a. A.	960	737	300	a. A.	a. A.
800/700	25	a. A.	1085	870	300	a. A.	a. A.
900/800	25	a. A.	1185	946	400	a. A.	a. A.
1000/900	25	a. A.	1320	1051	400	a. A.	a. A.

Ball valves with a nominal diameter of DN450 and above are made to order in accordance with the customer's requirements. Please refer to the corresponding drawings in case of order.

# STEM EXTENSION



DN 15-200 FULL BORE /  
DN 65-250 REDUCED BORE

## INFORMATION

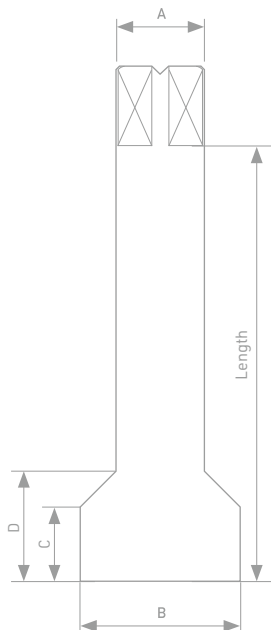
Stem extension for use on ball valves provided they are fitted with insulation.

/// Stem extension only applicable for Ball valves in Heating water version

/// The mounting screw is included in the scope of delivery

## MATERIAL

Stem extension	Stainless Steel
Mounting Screw	Steel, galvanized



DN		Article-No.		A [mm]	B [mm]	C [mm]	D [mm]
full bore [mm]	reduced bore [mm]	Length 60 [mm]	Length 100 [mm]				
15-20	15-25	050.3200	050.3204	12	22	11	16
25	32	050.3201	050.3205	15	22	12	16
32-65	40-80	050.3202	050.3206	20	31	15	21
80-125	100-150	050.3203	050.3207	28	45	24	33
150-200	200-250	---	050.3208	40	55	29	37

# OPTIONS

	Underground Ball valves HE					Standard Ball valves HS						
	KSF V KSF R	ELF/ESF V	EMG/ESF V	KSF V KSF R Tie-in ball valve	KSF V (Hot tapping ball valve)	KSF V KSF R	FSK V FSK R	FSL V	FSL/KSF V + FSK/KSF V FSL/KSF R + FSK/KSF R	KSG/KSF V	KSG V	KSF V (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	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