

BBF/KSF-R-HE

UNDERGROUND BALL VALVE WITH WELD ENDS

DN 450-1200 | PN 25

REDUCED BORE



INFORMATION

Ball Valve with weld ends

/// Ball Valves fulfill the requirements of EN 488 and are suitable for the cold laying method

/// Operating temperature up to +150 °C

/// Trunnion mounted ball is standard

/// Underground ball valves are delivered unpainted.

From DN 350:

/// The gear unit and the square key are included in the scope of delivery.

MATERIALS

Body	Forged Steel / Steel
Weld Ends	Steel
Ball	Stainless steel; From DN 600: Steel chemically nickel plated
Ball Seals	PTFE
Stem Seals	EPDM

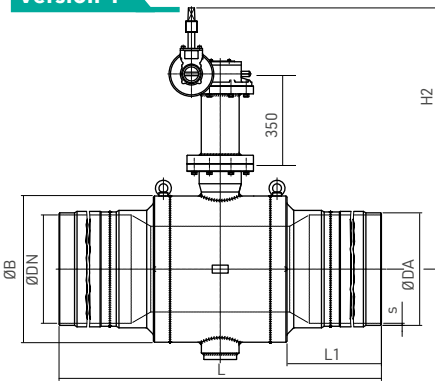
OPTIONS

/// Suitable for steam

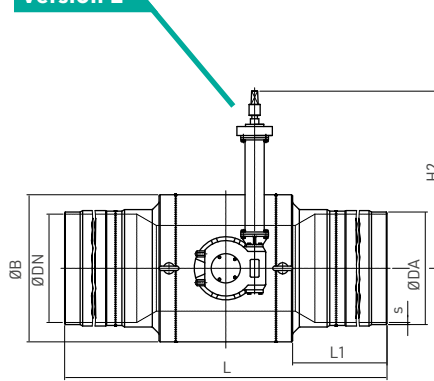
/// Additional extensions for adjusting the overlap height (for version 2 and 3) and other accessories can be found on the supplementary sheet: „Accessories for buried ball valves“.

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

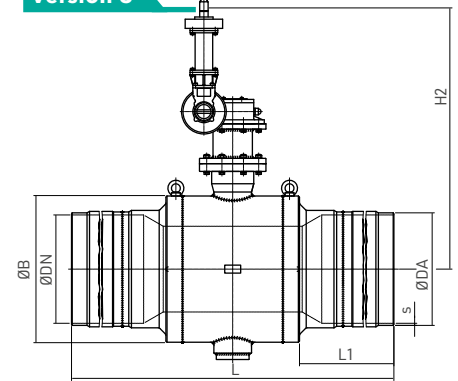
Version 1



Version 2



Version 3



DN [mm]	PN [bar]	DA [mm]	s* [mm]	L [mm]	L1 [mm]	B [mm]	Weight [kg]	Version 1		Version 2		Version 3	
								H2 [mm]	Article-No.	H2 [mm]	Article-No.	H2 [mm]	Article-No.
450	25	457	6.3	2000	819	720	1120	1121	076.0124	800	o. d.	1368	o. d.
500	25	508.0	6.3	2500	819	814	1400	1121	076.0126	800	o. d.	1368	o. d.
600	25	610	7.1	1143	1140	955	2400	1256	o. d.	800	o. d.	1445	o. d.
700	25	711	8.0	1295	1087	1116	ca. 3200	1389	o. d.	o. d.	o. d.	o. d.	o. d.
800	25	813	8.8	1397	1040	1261	ca. 4700	o. d.	o. d.	o. d.	o. d.	o. d.	o. d.
900	25	914	10	1499	1232	1396	ca. 6000	o. d.	o. d.	o. d.	o. d.	o. d.	o. d.
1000	25	1016	11	1800	a.A.	1561	ca. 7700	o. d.	o. d.	o. d.	o. d.	o. d.	o. d.
1200	25	1220	12.5	2400	a.A.	1890	ca. 12000	o. d.	o. d.	o. d.	o. d.	o. d.	o. d.

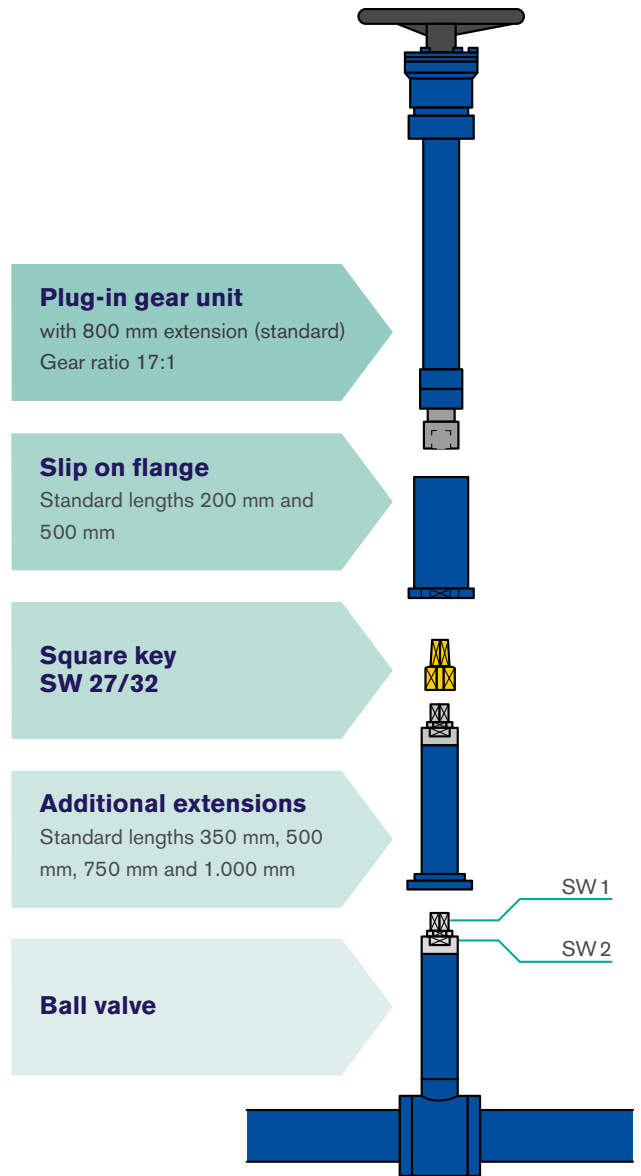
* The wall thickness adjustment of the pipe ends is carried out according to dimension s. For the actual pipe wall thicknesses used, please refer to the table on the „Technical Information“ supplement.

Ball valves from nominal size DN700 are made to order in accordance with the customer's requirements. Please refer to the corresponding drawings in case of order.

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.



DN	DN	SW 1	SW 2	Slip on flange L 200 mm	Slip on flange L 500 mm	Square key yellow	Additional extension L 350 mm	Additional extension L 500 mm	Additional extension L 750 mm	Additional extension L 1000 mm	Plug-in gear MDS 3000 L 800 mm	Socket wrench
full bore	reduced boire	mm	mm	Article-No./ kg	Article-No./ kg	Article-No./ kg	Article-No./ kg	Article-No./ kg	Article-No./ kg	Article-No./ kg	Article-No./ kg	Article-No./ kg
20 – 65	25 – 80	16	40	075.7200 1,9	075.7201 4,8	628.2496 0,5	076.0736 2,5	076.0737 3,3	076.0729 4,7	076.0947 6,2		
80 – 125	100 – 150	22	50	075.7202 2,3	075.7203 4,9	628.2497 0,8	076.0682 4,5	076.0738 5,4	076.0739 7,5	076.0805 9,1	075.9999 18,4	316.9999 6,0
150 – 300	200 – 400	32	80	075.7204 3,1	075.7205 5,6	628.2498 1,4	076.0623 10,5	076.0740 12,5	076.0640 17,5	076.0720 22,0		

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)
Variable lengths for underground installation ¹	✓											
Special lengths		✓	✓			✓		✓	✓	✓		
Variable stem extensions for underground installation ²	✓											
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	✓			✓	✓	✓	✓	✓			✓	

¹Variable overall lengths for installation in the ground:

The overall lengths specified in the catalog correspond to the standard dimensions. Other overall lengths are available on request as special production.

²Variable spindle extensions for buried installation:

The dome height of 350 mm shown in the catalog corresponds to the standard. In addition, dome heights of 500 mm, 750 mm and 1000 mm can be manufactured on request.

Tender specification texts are available for download on our website.

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 _v [m ³ /h]	ζ(-)	DN/LW	K _v [m ³ /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 _v =85
DN 200:	ζ=0.8	K _v =1.790
DN 500:	ζ=0.63	K _v =12.613

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 minimum

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