KLINGER Fluid Control

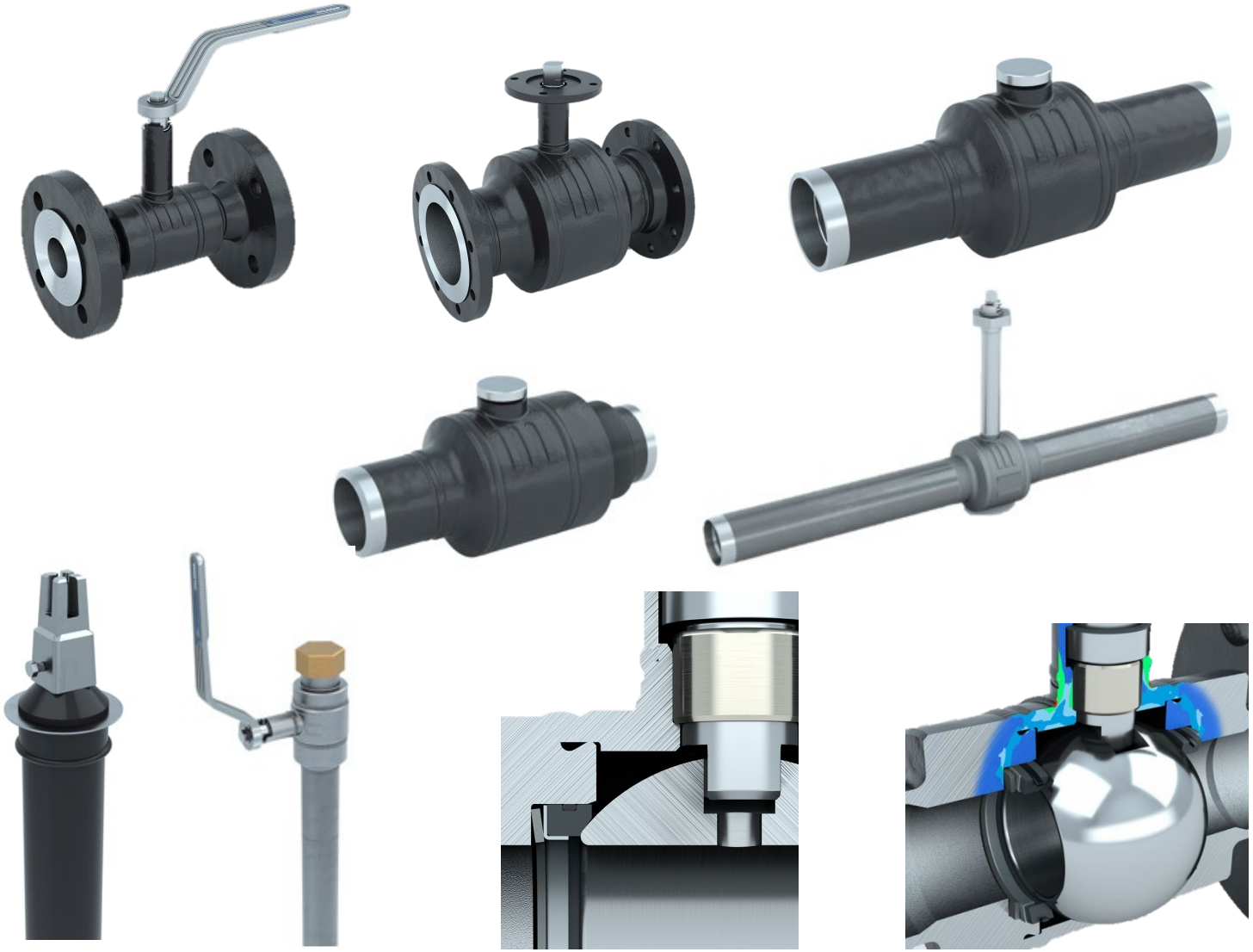
KLINGER FLUID CONTROL

KHO Monoball ball valve „Basic“

MONOBALL KHO BASIC

Agenda

- Standard designs
- Monoball KHO ISO TOP
- KHO-U design for insulation
- KHO-BH
- KHO-AB
- Stem extensions
- KHO drain/vent valves
- Construction
- Stem sealing and sealing system
- Function
- Welding seams and ball
- P/T diagram and EN488
- Advantages and model code



KHO MONOBALL DN15 - 125

Standard design overview

Monoball KHO flanged ends:

- Size range DN15 – 125, fully welded
- Flanges acc. EN1092-1
- Body length acc. EN558-1, GR1
- Pressure classes PN16 and 40
- Solid ball in stainless steel until DN65
- Hollow ball with guiding tube in stainless steel from DN80 to DN125
- Leakage rate A acc. EN12266-1, P10, P11 and P12
- Operation with hand lever
- Full & reduced bore
- Temperature range -5°C to +200°C
- KACP coating to DN50, >DN50 black painted RAL9017

Monoball KHO weld ends:

- Size range DN15 – 125, fully welded
- Weld ends acc. AGFW FW401 – part 5
- Body length acc. manufacturer standard
- Pressure classes PN16 and 40
- Solid ball in stainless steel until DN65
- Hollow ball with guiding tube in stainless steel from DN80 to DN125
- Leakage rate A acc. EN12266-1, P10, P11 and P12
- Operation with hand lever
- Full & reduced bore
- Temperature range -5°C to +200°C
- KACP coating to DN50, >DN50 black painted RAL9017

Monoball KHO flanged / weld end:

- Size range DN15 – 125, fully welded
- Weld end acc. AGFW FW401 – part 5, flange acc. EN1092-1
- Body length acc. manufacturer standard
- Pressure classes PN16 and 40
- Solid ball in stainless steel until DN65
- Hollow ball with guiding tube in stainless steel from DN80 to DN125
- Leakage rate A acc. EN12266-1, P10, P11 and P12
- Operation with hand lever
- Full & reduced bore
- Temperature range -5°C to +200°C
- KACP coating to DN50, >DN50 black painted RAL9017

KHO MONOBALL

The Monoball KHO design with ISO TOP flange:

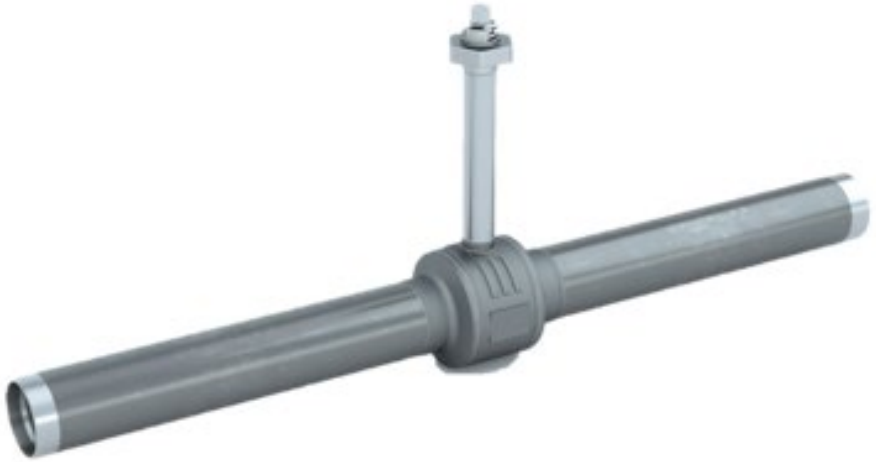
- Size range DN80 – DN250,
- Body carbon steel, fully welded
- Floating ball
- Flanges acc. EN1092-1
- Weld ends acc. AGFW FW401 – part 5
- Body length acc. manufacturer standard
- Pressure classes PN16 and 40
- Hollow ball with guiding tube in stainless steel from DN80 to DN125
- Certified acc. EN488:2019 and EHP003
- With ISO TOP flange acc. EN ISO5211
- Full and reduced bore
- Leakage rate A acc. EN12266-1, P10, P11 and P12

The Monoball KHO design weld / threaded end:

- Size range DN15, 20R15, 25R20
- Body carbon steel
- Floating ball
- Threaded end acc. ISO 228-1 with cap and chain
- Weld end acc. AGFW FW401 – part 5
- Body length acc. manufacturer standard
- Pressure class 40
- Solid ball stainless steel
- Fully welded
- Certified acc. EN488:2019 and EHP003
- Full and reduced bore
- Leakage rate A acc. EN12266-1, P10, P11 and P12
- Temperature range -5°C to +200°C

KHO-U MONOBALL

Underground design prepared for insulation



The Monoball KHO-U short & long underground design:

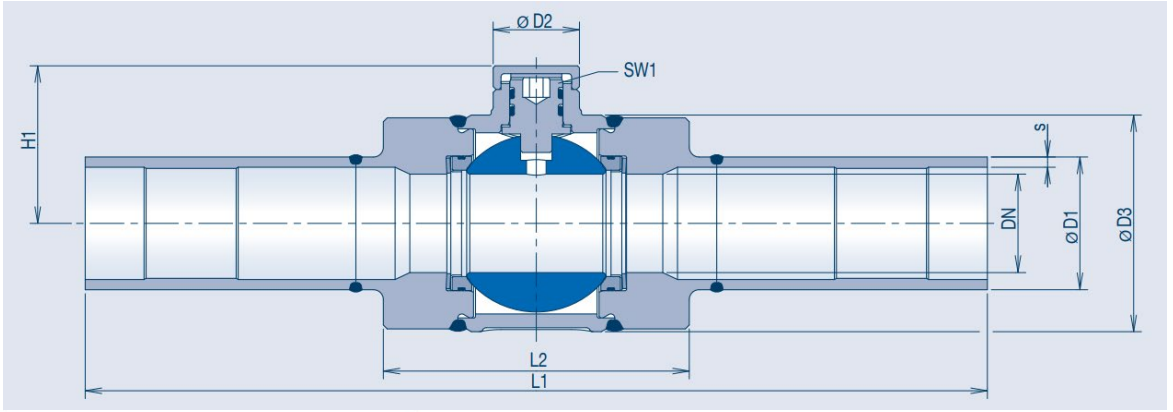
- Size range DN25 – DN125 operation with socket key
- Size range DN150 – DN250 operation with slip-on gear → during 2024
- Body carbon steel
- Floating ball
- Pressure class PN25/40
- Connection: weld ends
- Full & reduced bore
- Temperature range -5°C to +200°C
- With pipe extension 1500mm (DN25-125) and 2000mm (DN150-250) depending on line size

Construction Monoball KHO-U short & long:

- Pre - stressed sealing elements with stainless steel belleville washer
- Tripple shaft sealing
- Robust housing out of casting material
- Operating shaft stainless steel
- Blow out safe stem
- Fully welded
- EN488:2019 and EHP003 certified, meets requirements of AGFW FW401 – part5

MONOBALL KHO-BH

Branching valve



FULL BORE

DN	PN	L1	L2	H1	ØD1	s	ØD2	ØD3	SW1	weight
20	40	230	70	37	26.9	2.6	22	49	6	1
25	40	230	78	40	33.7	2.6	22	55	6	1.5
32	40	260	94	46	42.4	3.2	28	67	8	2.5
40	40	260	75	54	48.3	3.2	28	84	8	3
50	40	300	93	68	60.3	3.2	35	101	10	4.5
65	40	300	115	78	76.1	3.2	35	125	10	8
80	40	310	130	99	88.9	3.6	50	151	12	9.5
100	40	325	155	114	114.3	3.6	50	185	12	15.5

REDUCED BORE

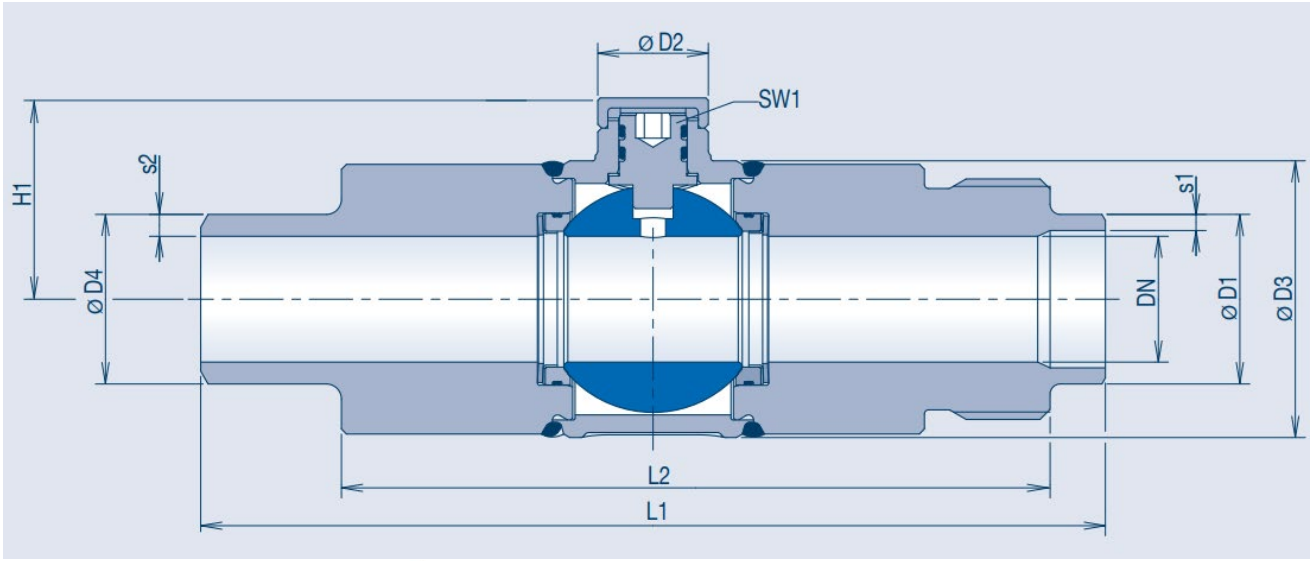
DN	PN	L1	L2	H1	ØD1	s	ØD2	ØD3	SW1	weight
25R20	40	230	78	37	33.7	2.6	22	49	6	1.5
32R25	40	260	94	40	42.4	3.2	22	55	6	2
40R32	40	260	96	46	48.3	3.2	28	67	8	2.5
50R40	40	300	73	54	60.3	3.2	28	84	8	3.5
65R50	40	300	82	68	76.1	3.2	35	101	10	5.5
80R65	40	310	115	78	88.9	3.6	35	125	10	8.5
100R80	40	325	125	99	114.3	3.6	50	151	12	11.5
125R100	40	290	155	114	139.7	3.6	50	185	12	17

FEATURES:

- Fully welded ball valve with full and reduced bore
- Pipe forces according to EN 488:2019
- Floating ball design
- High degree of resilience against pipework forces
- Equipped with cap to seal the shaft after final use. Cap secured with magnet
- Double O-ring stem sealing
- Welding ends in accordance with AGFW worksheet FW 401 – Part 5
- Length according to manufacturer standard
- -5°C to +200°C

MONOBALL KHO-AB

Hot tapping valve



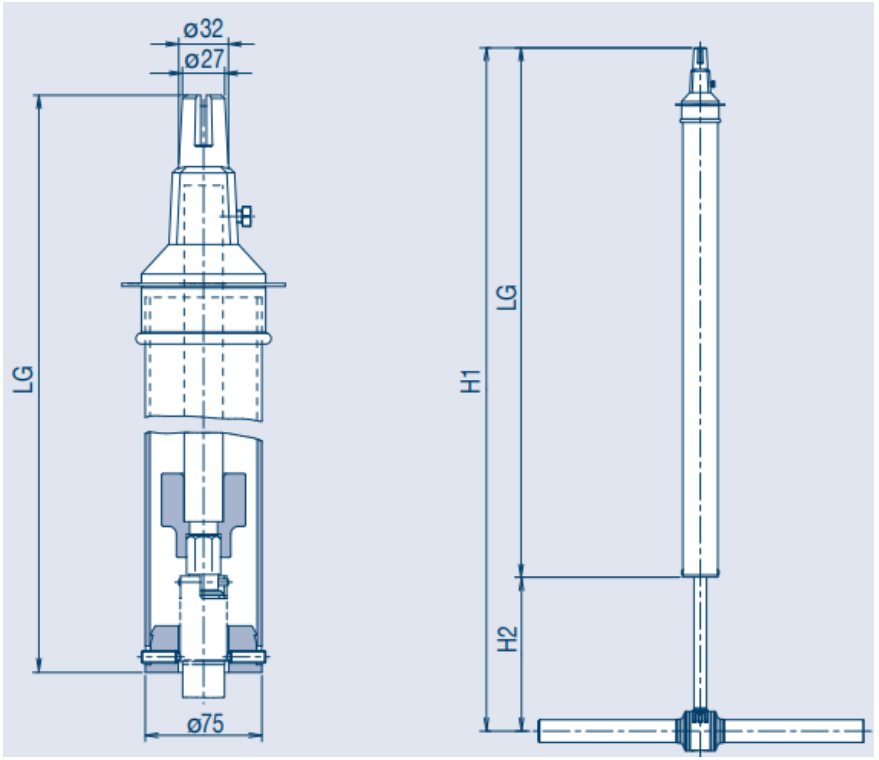
FEATURES:

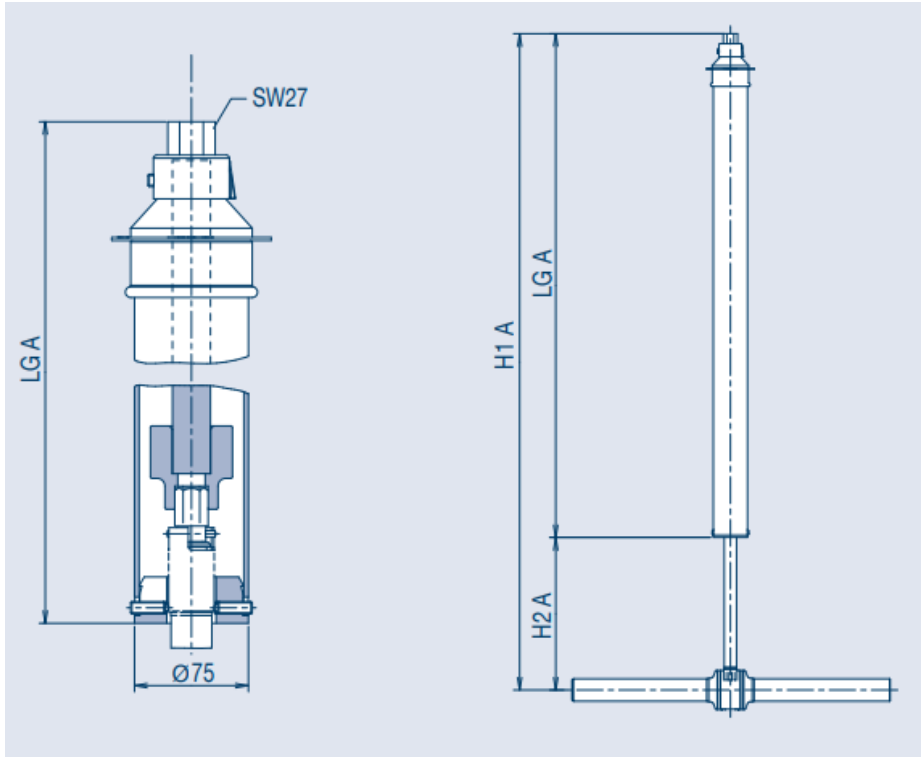
- Fully welded ball valve with full bore
- Pipe forces according to EN 488:2019
- Floating ball design
- High degree of resilience against pipework forces
- Tapping system Hütz + Baumgarten
- Equipped with cap to seal the shaft after final use. Cap secured with magnet
- Double O-ring stem sealing
- Connection acc. to manufacturer standard
- Length according to manufacturer standard
- -5°C to +200°C

FULL BORE

DN	PN	L1	L2	H1	ØD1	s1	ØD2	ØD3	ØD4	s2	G	SW1	weight
20	40	170	106	37	26.9	2.6	22	49	26.9	3.4	1"	6	1.5
25	40	180	116	40	33.7	3.2	22	55	33.7	4.3	1 1/2"	6	2
32	40	200	161	46	42.4	3.2	28	67	42.4	5.2	1 1/2"	8	3
40	40	210	93	54	48.3	3.2	28	84	51	5	2 1/2"	8	3.5
50	40	240	119	68	60.3	3.6	35	101	60.3	5	2 1/2"	10	6
65	40	260	147	78	76.1	3.6	35	125	76.1	5.6	2 3/4"	10	9
80	40	280	123	99	88.9	4.1	50	151	95	6.6	3"	12	10
100	40	300	145	114	114.3	4.6	50	185	114.3	7.5	4"	12	15.5

STEM EXTENSION DN25 – 65 SMALL



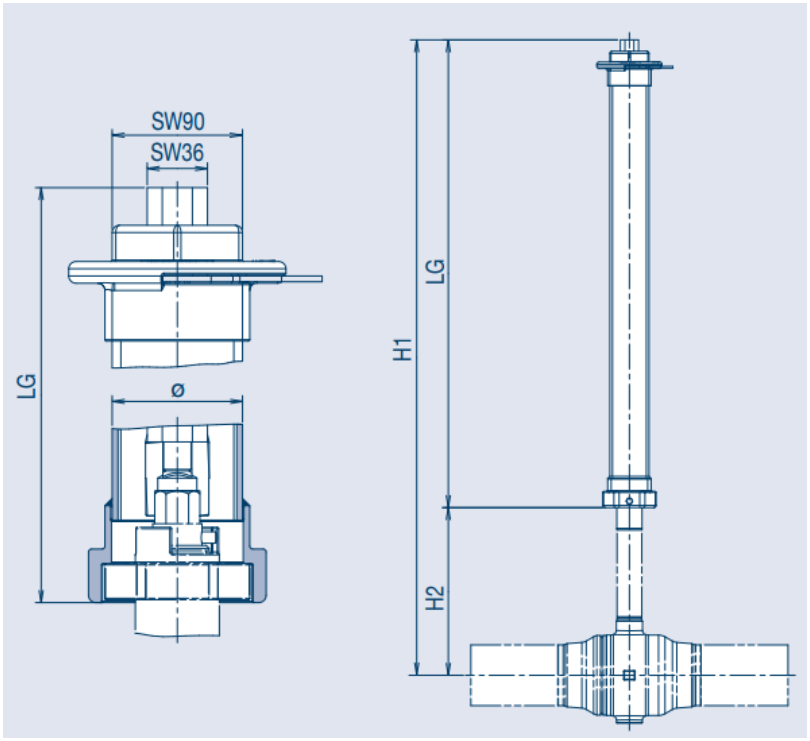


» The small version of operating stem extension is used for DN 25-65. Depending on the nominal width, they can be operated with a T-handle wrench.

» The underground extensions, which can be reduced in length on site, are available in the following lengths: 1 m, 1.5 m and 2 m, in three different versions.

DN	H1	H2	LG	H1 A	H2 A	LG A
25 / 32R25	1450 - 2450	315	1135 - 2135	1417 - 2417	328	1089 - 2089
32 / 40R32	1457 - 2457	322	1135 - 2135	1424 - 2424	335	1089 - 2089
40 / 50R40	1465 - 2465	330	1135 - 2135	1432 - 2432	343	1089 - 2089
50 / 65R50	1479 - 2479	344	1135 - 2135	1447 - 2447	357	1089 - 2089
65 / 80R65	1489 - 2489	354	1135 - 2135	1456 - 2456	367	1089 - 2089

STEM EXTENSION DN80 – 125 MEDIUM

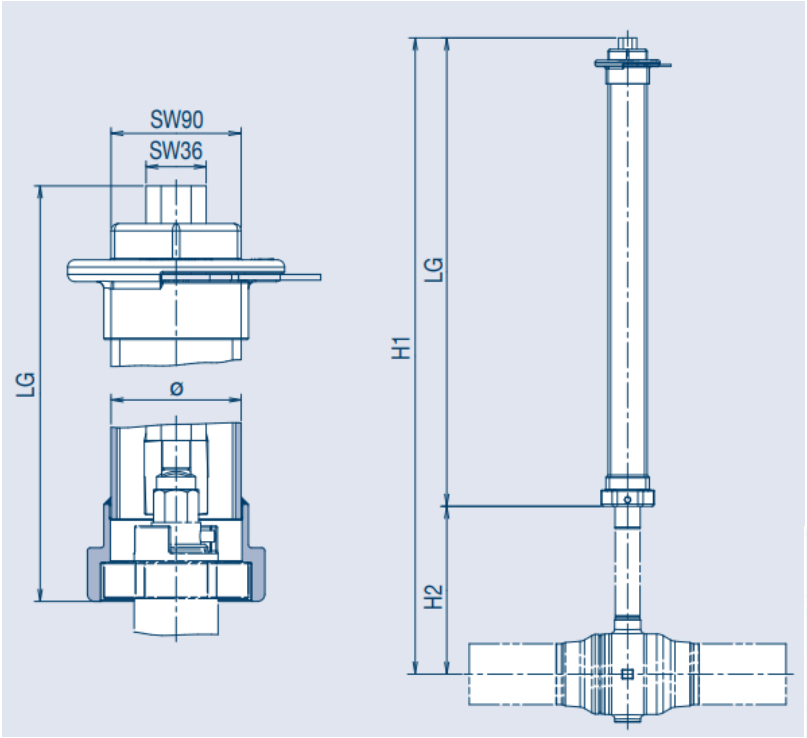


DN	H1	H2	LG	□
80 / 100R80	1449 - 2449	372	1077 - 2077	70
100 /125R100	1463 - 2463	386	1077 - 2077	70
125 / 150R125	1495 - 2495	418	1077 - 2077	70

» The medium version of operating stem extension is used for DN 80-125. Depending on the nominal width, they can be operated either with a T-handle wrench or with a mobile gearbox.

» The underground extensions, which can be reduced in length on site, are available in the following lengths: 1 m, 1.5 m and 2 m, in three different versions.

STEM EXTENSION DN150 – 250 LARGE



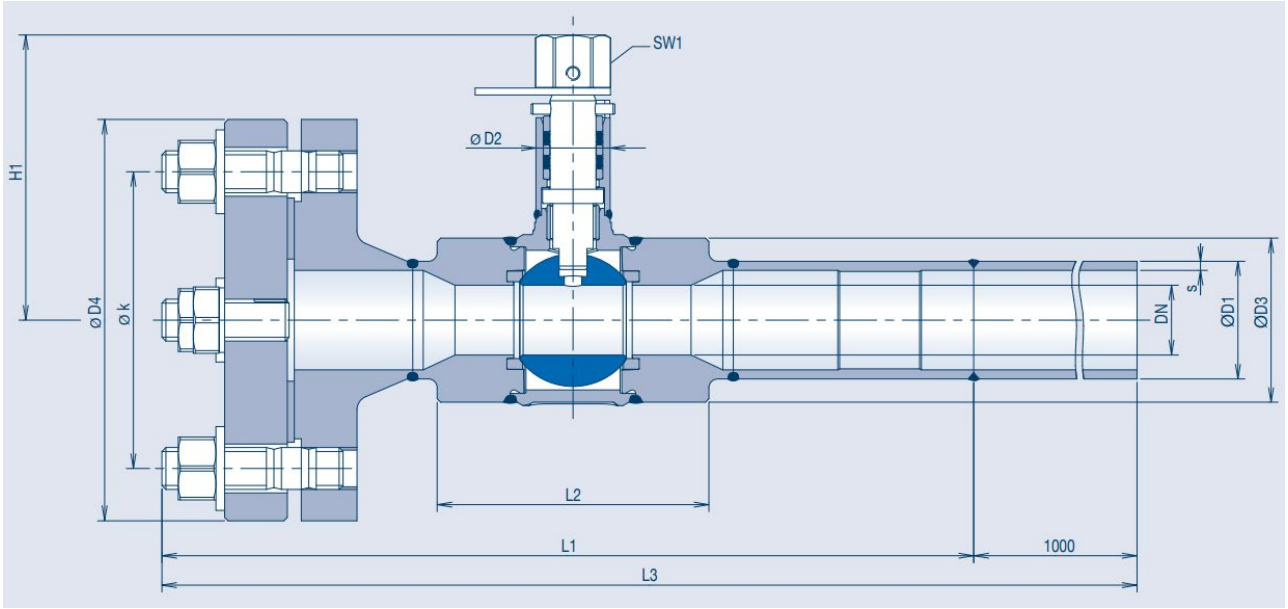
DN	H1	H2	LG	□
150	1515 - 2515	440	1075 - 2075	90
200	1548 - 2548	473	1075 - 2075	90
250	1583 - 2083	508	1075 - 1575	90

» The large version of operating stem extension is used for DN 150-250. Depending on the nominal width, they can be operated either with a T-handle wrench or with a mobile gearbox.

» The underground extensions, which can be reduced in length on site, are available in the following lengths: 1 m, 1.5 m and 2 m, in three different versions.

MONOBALL KHO-SF/SKT

Drain/vent – flange, actuation via hexagon



FEATURES:

- » Fully welded ball valve with full and reduced bore
- » Pipe forces according to EN 488:2019
- » Floating ball design
- » With welded carbon steel tube (length 1000 mm)
- » High degree of resilience against pipework forces
- » -5°C to +200°C
- » Welding end with carbon steel tube / Flanged end with blind flange

FULL BORE

DN	PN	L1	L2	L3	H1	ØD1	s	ØD2	ØD3	ØD4	Øk	n	SW1	weight
80	40	358	130	1358	159	88.9	3.6	48.3	151	200	160	8	22	29

REDUCED BORE

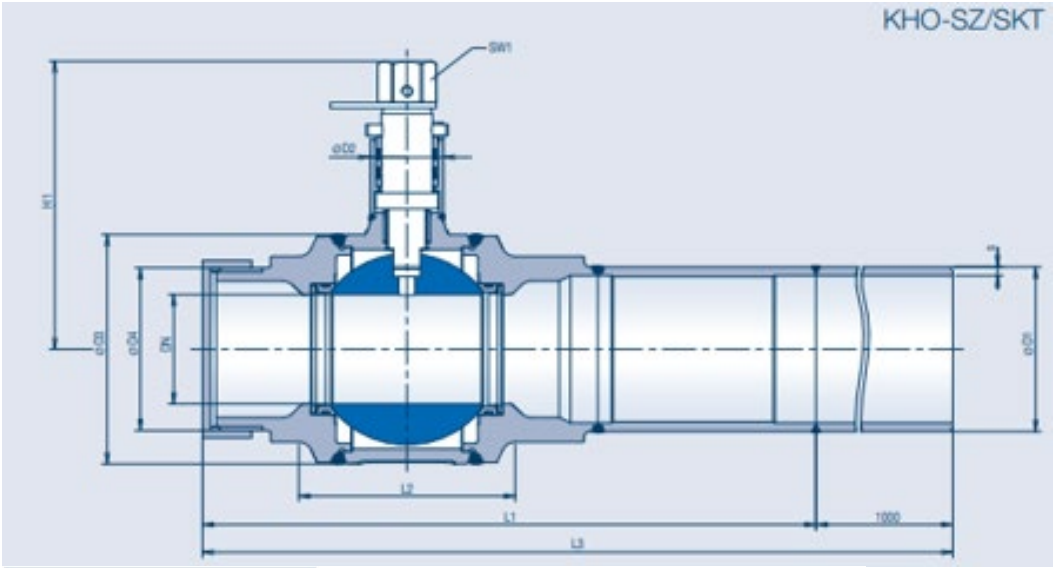
DN	PN	L1	L2	L3	H1	ØD1	s	ØD2	ØD3	ØD4	Øk	n	SW1	weight
25R20	40	233	78	1233	82	33.7	2.6	21.3	49	115	85	4	19	6
50R40	40	309	73	1309	106	60.3	3.2	26.9	84	165	125	4	19	14.5

MONOBALL KHO-SZ

Drain/vent – male thread with cap, actuation via hexagon / hand lever

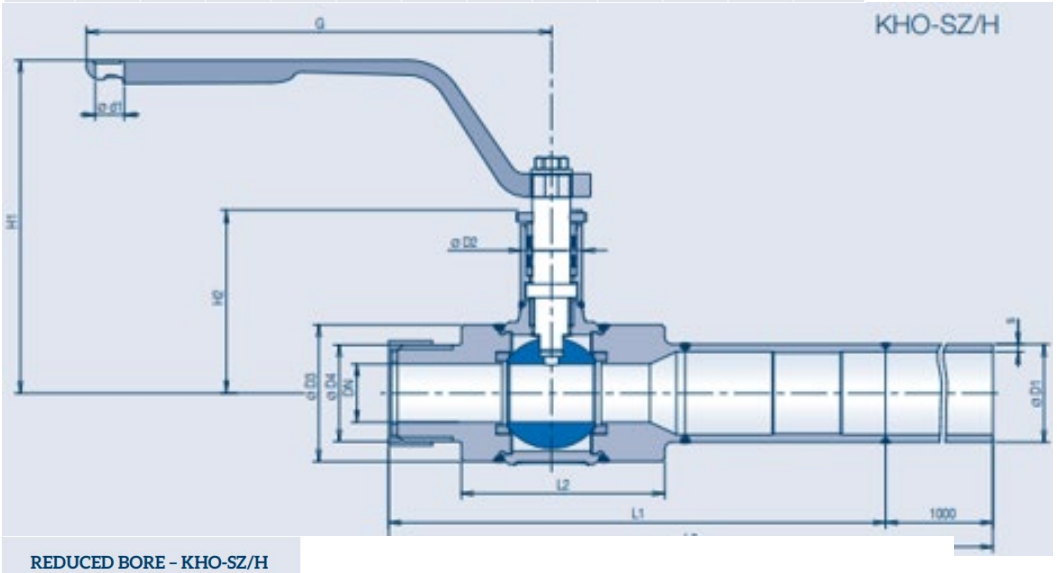
FEATURES:

- » Fully welded ball valve, reduced bore
- » Pipe forces according to EN 488:2019
- » Floating ball design
- » With welded carbon steel tube (length 1000 mm)
- » High degree of resilience against pipework forces
- » -5°C to +200°C
- » Connection welding end / male thread with cap Reduced bore



REDUCED BORE - KHO-SZ/SKT

DN	PN	L1	L2	L3	H1	ØD1	s	ØD2	ØD3	ØD4	SW1	weight
50R40	40	225	73	1225	106	60.3	3.2	26.9	84	G 2"	19	8



REDUCED BORE - KHO-SZ/H

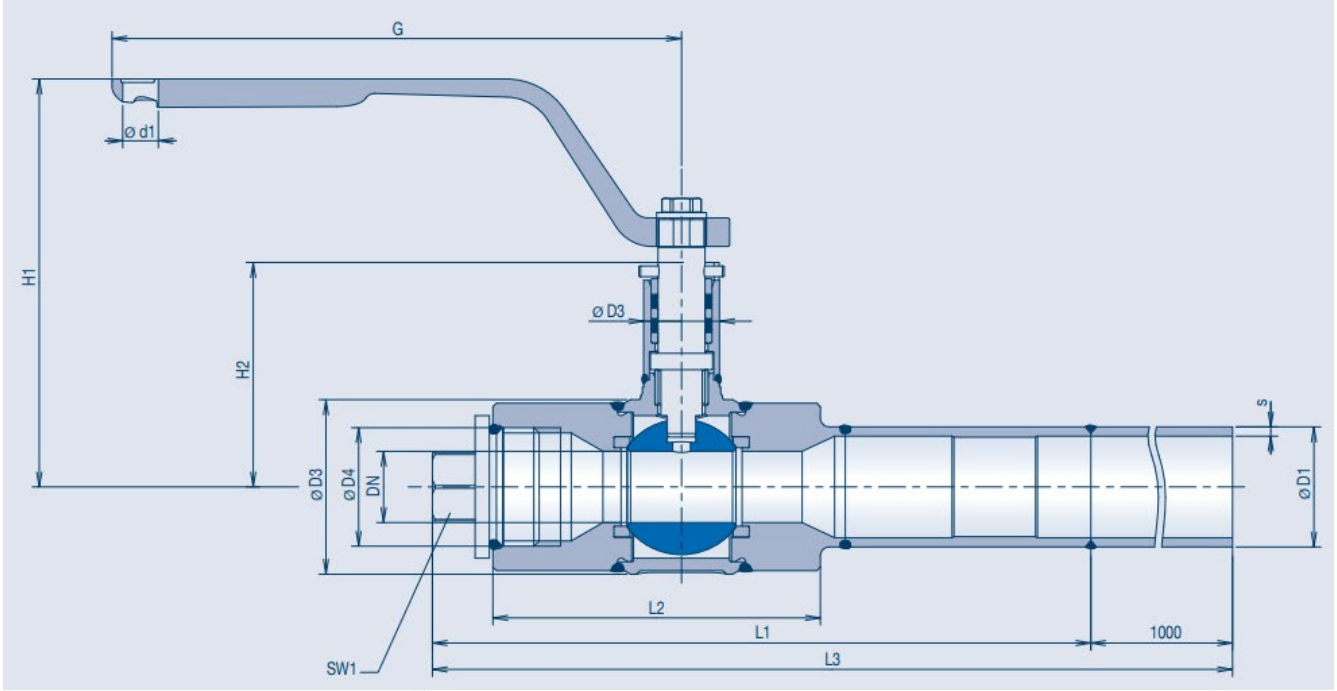
DN	PN	L1	L2	L3	H1	H2	ØD1	s	ØD2	ØD3	ØD4	Ød1	G	weight
25R20	40	171	70	1171	115	63	33.7	2.6	21.3	49	G 1"	10	160	3.5

MONOBALL KHO-SM/H

Drain/vent – female thread with plug, actuation via hand lever

FEATURES:

- » Fully welded ball valve reduced bore
- » Pipe forces according to EN 488:2019
- » Floating ball design
- » With welded carbon steel tube (length 1000 mm)
- » High degree of resilience against pipework forces
- » -5°C to +200°C
- » Connection welding end / internal thread with plug Reduced bore



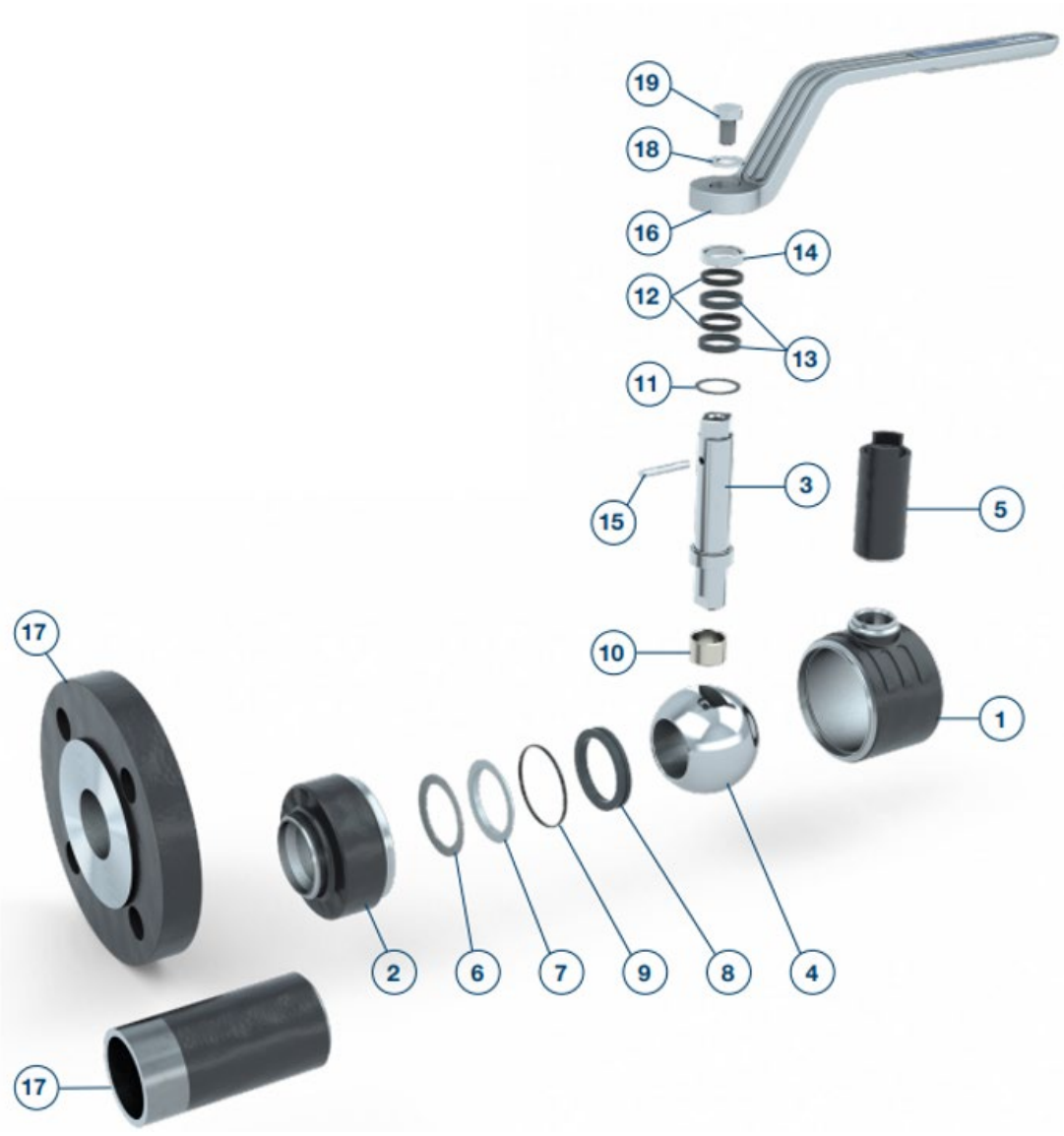
REDUCED BORE

DN	PN	L1	L2	L3	H1	H2	ØD1	s	ØD2	ØD3	ØD4	Ød1	G	SW1	weight
25R20	40	185	92	1185	115	63	33.7	2.6	21.3	49	G 1"	10	160	19	3.5
50R40	40	171	70	1171	138	83	60.3	3.2	26.9	84	G 2"	10	160	19	9

CONSTRUCTION KHO

Parts list

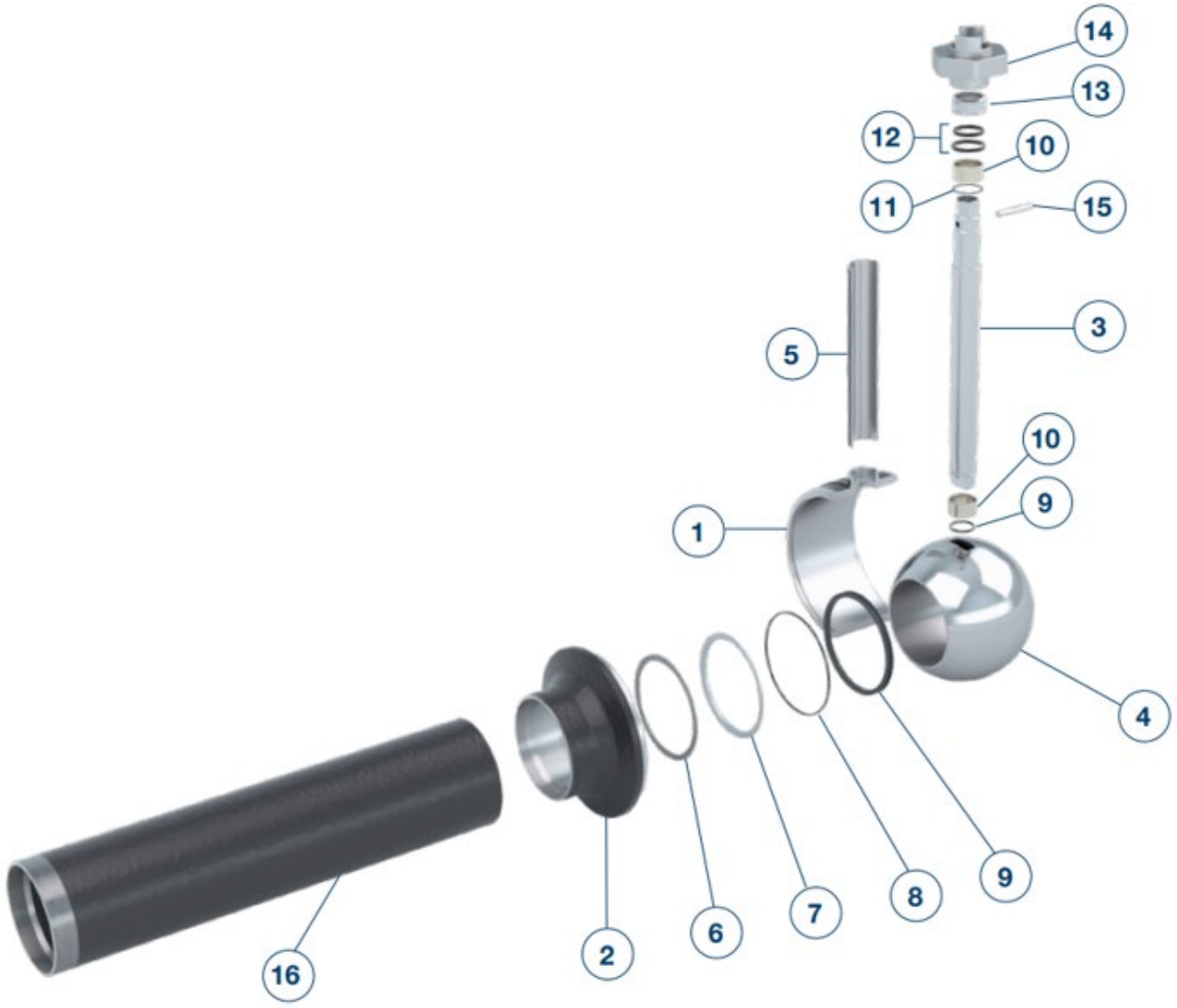
Pos.	number	name	material
1	1	Housing	1.0619
2	2	End-piece	S355J / S235J / 1.0619
3	1	Operating Shaft	1.4104
4	1	Ball	1.4308 / AISI 304L
5	1	Shaft	P235GH / P265GH
6	2	Belleville washer	1.4310
7	2	Sealing ring holder	1.4301
8	2	Sealing ring	KFC-25
9	2	O-Ring	FEPM
10	1	Bearing bush	St/Bz/PTFE
11	1	Bearing disc	KFC-15
12	2	O-Ring	FKM
13	2	Spacer	KFC-25
14	1	Spacer	1.4104
15	1	Grooved pin	1.4305
16	1	Hand lever	1.4408
17	2	Weld-on pipe	P235GH / P265GH
17	2	Flange end	P250GH
18	1	Washer	1.4310
19	1	Hexagon screw	A4



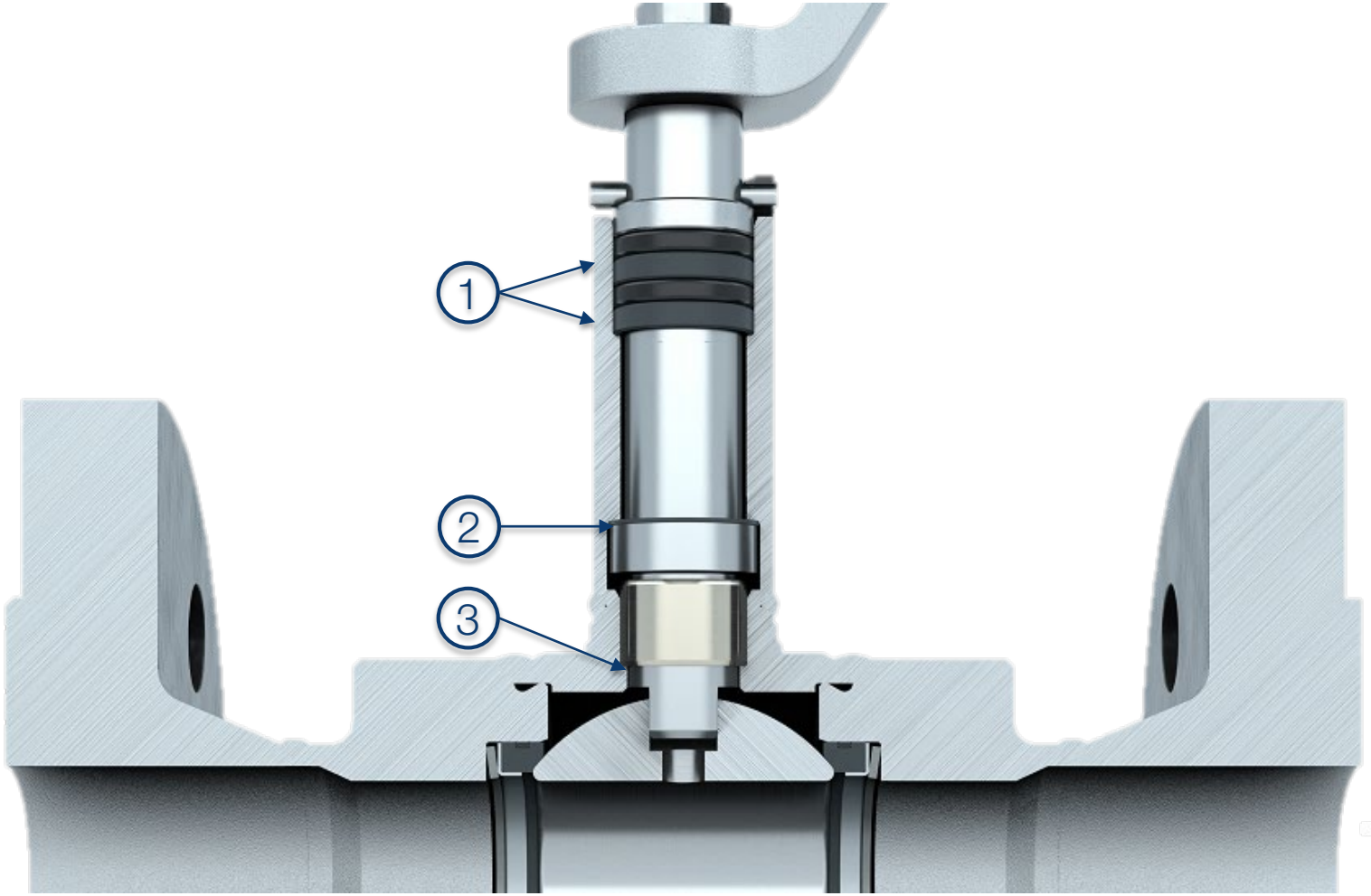
CONSTRUCTION KHO-U

Parts list

Pos.	number	name	material
1	1	Housing	1.0619
2	2	End-piece	S355J / S235J / 1.0619
3	1	Operating Shaft	1.4104
4	1	Ball	1.4308 / AISI 304L
5	1	Shaft	1.4301
6	2	Belleville washer	1.4310
7	2	Sealing ring holder	1.4301
8	2	Sealing ring	KFC-25
9	3	O-Ring	FEPM
10	2	Bearing bush	St/Bz/PTFE
11	1	Bearing disc	KFC-15
12	2	O-Ring	FKM
13	1	Bush insert	1.4104
14	1	Stem pipe upper part	1.4408
15	1	Grooved pin	1.4305
16	2	Weld-on pipe	P235GH / P265GH



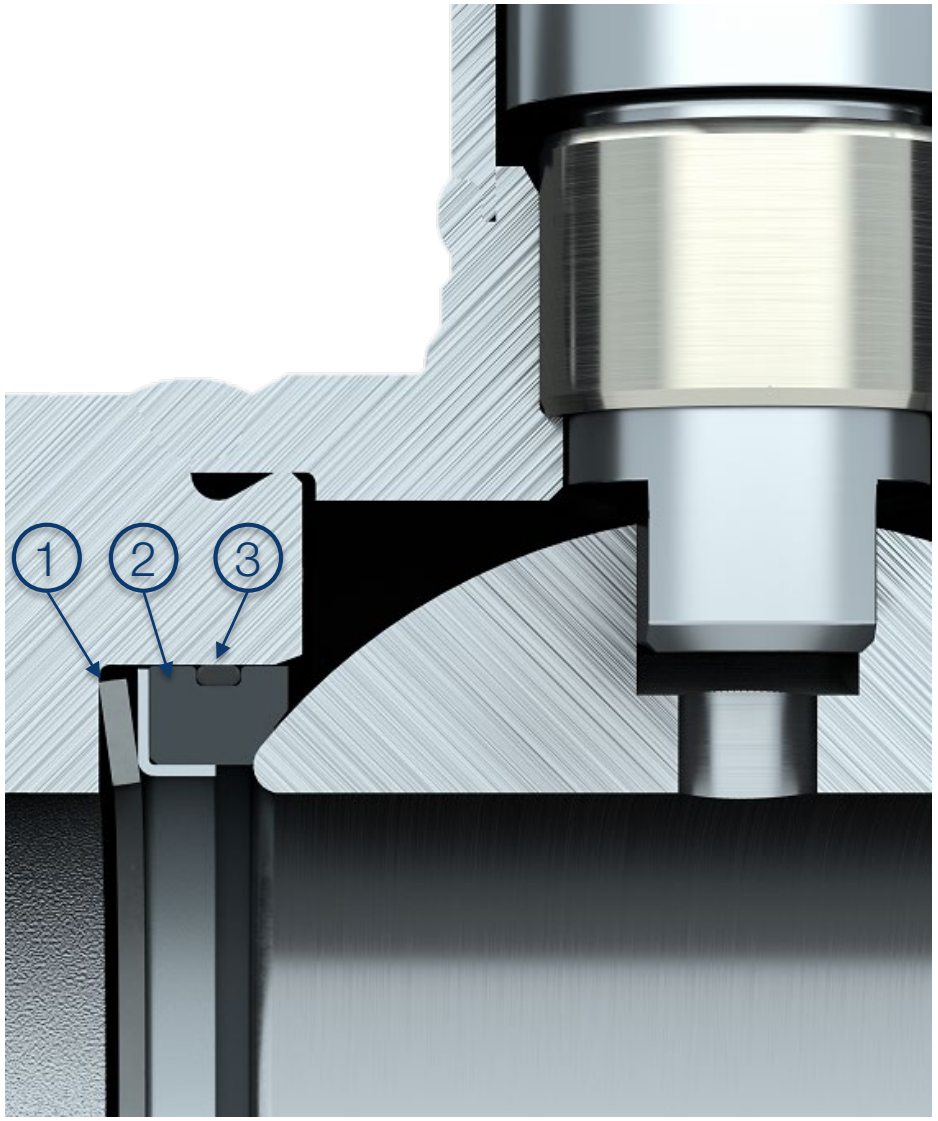
STEM SEALING

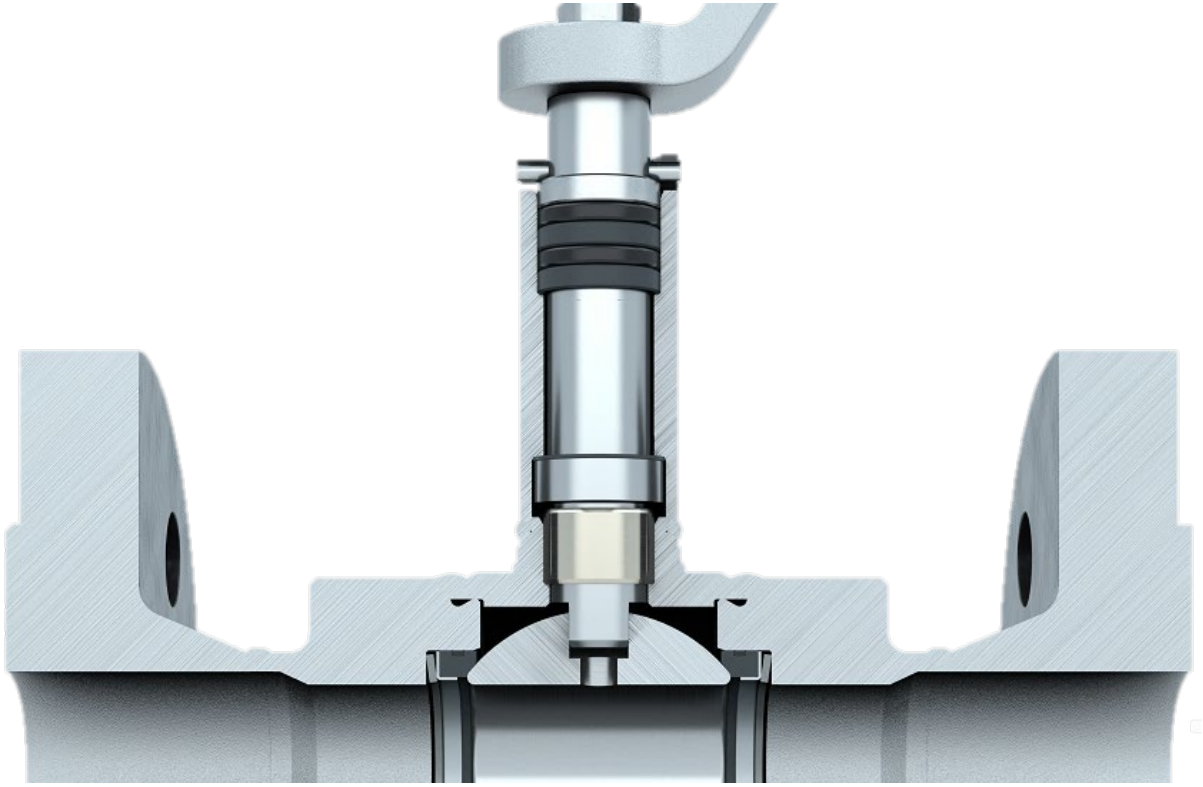


The triple shaft seal consists of:

- (1) Two temperature-resistant O-rings made of FKM up to +200°C
- (2) A flat gasket (KFC-25) - Top O-ring can be replaced when installed if necessary
- (3) Beginning with line size DN80, additional O-ring FEPM up to +200°C

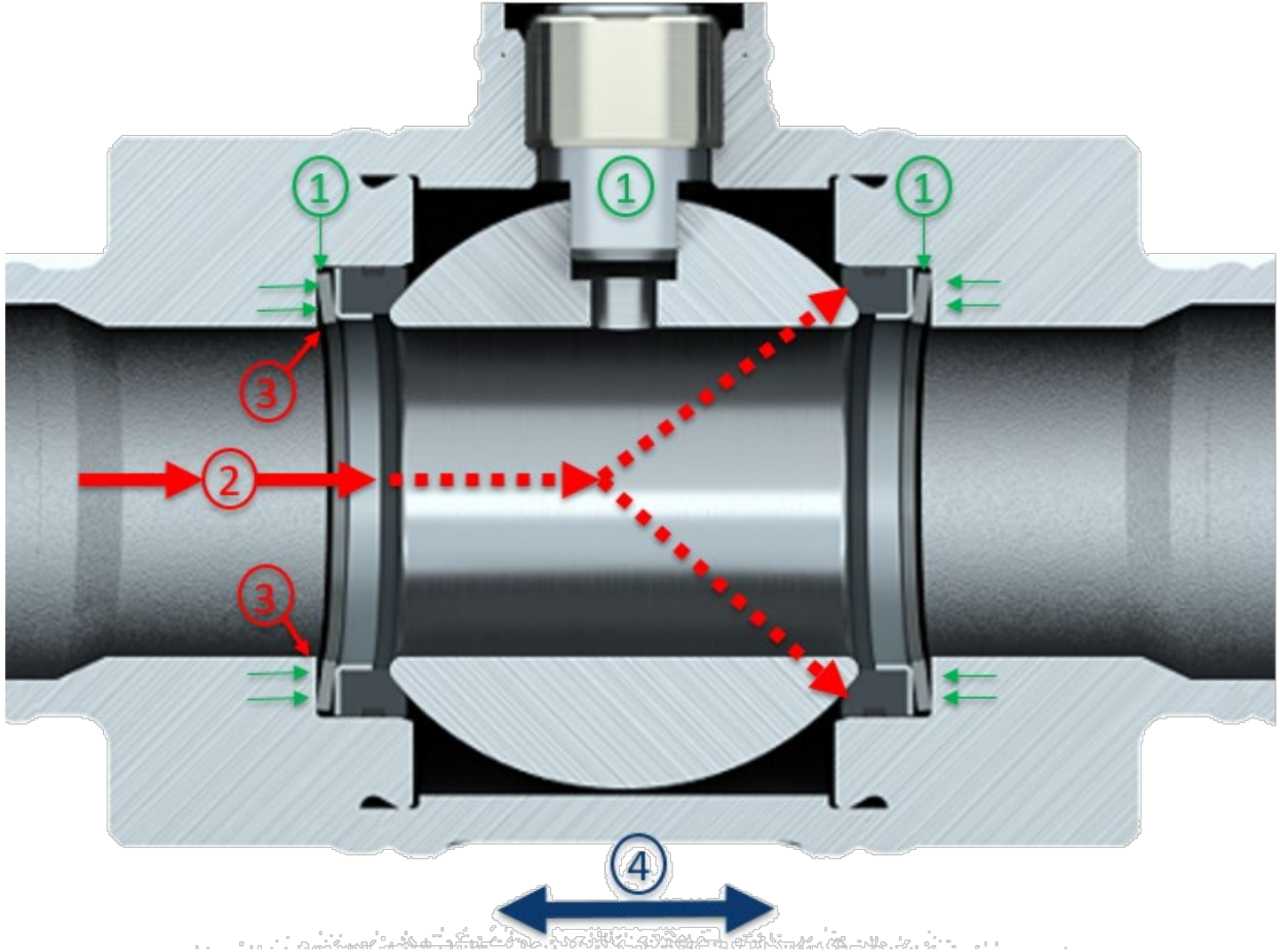
SEALING SYSTEM





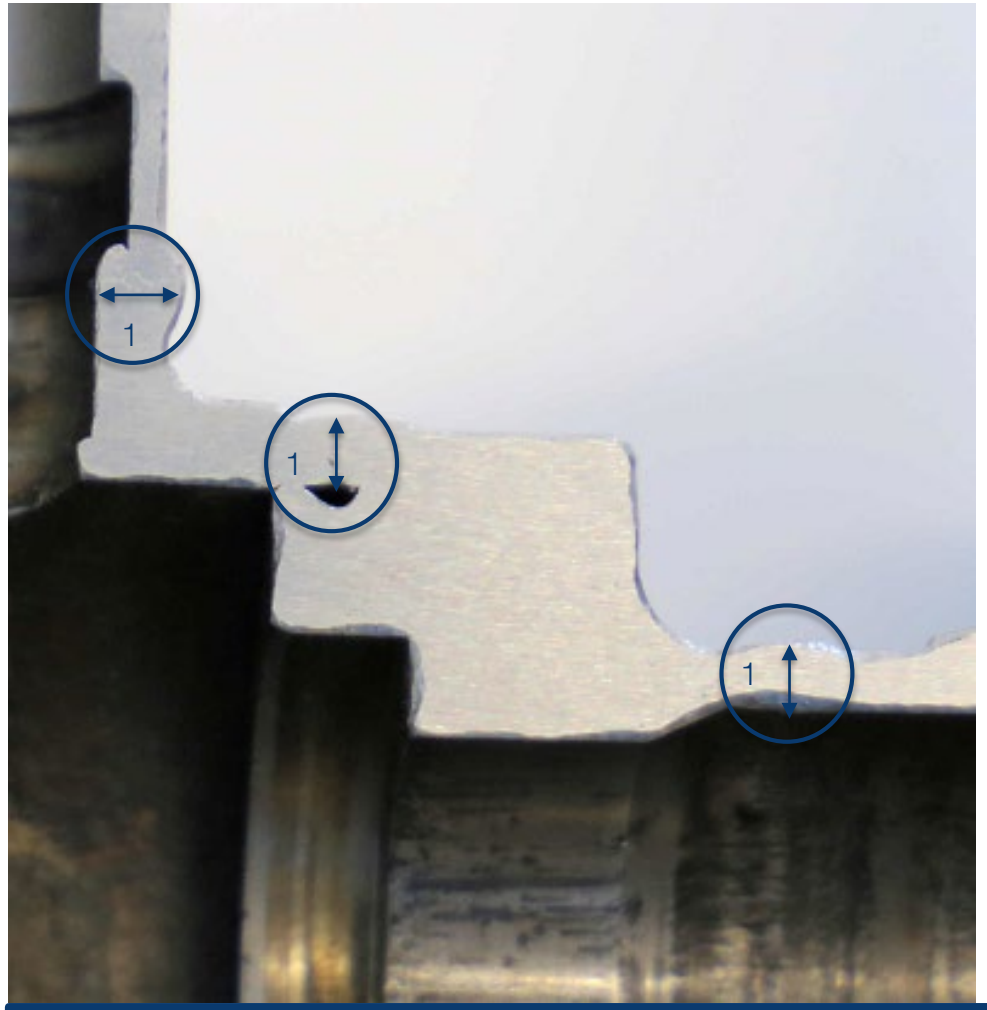
- (1) Belleville washer applies constant contact pressure on the ball
- (2) Seal ring PTFE with reinforced graphite -5°C to +200°C
- (3) An integrated "backup O-ring" AFLAS in the sealing seat prevents medium from entering the ball valve dead space
- The system is resistant to temperature and pressure fluctuations

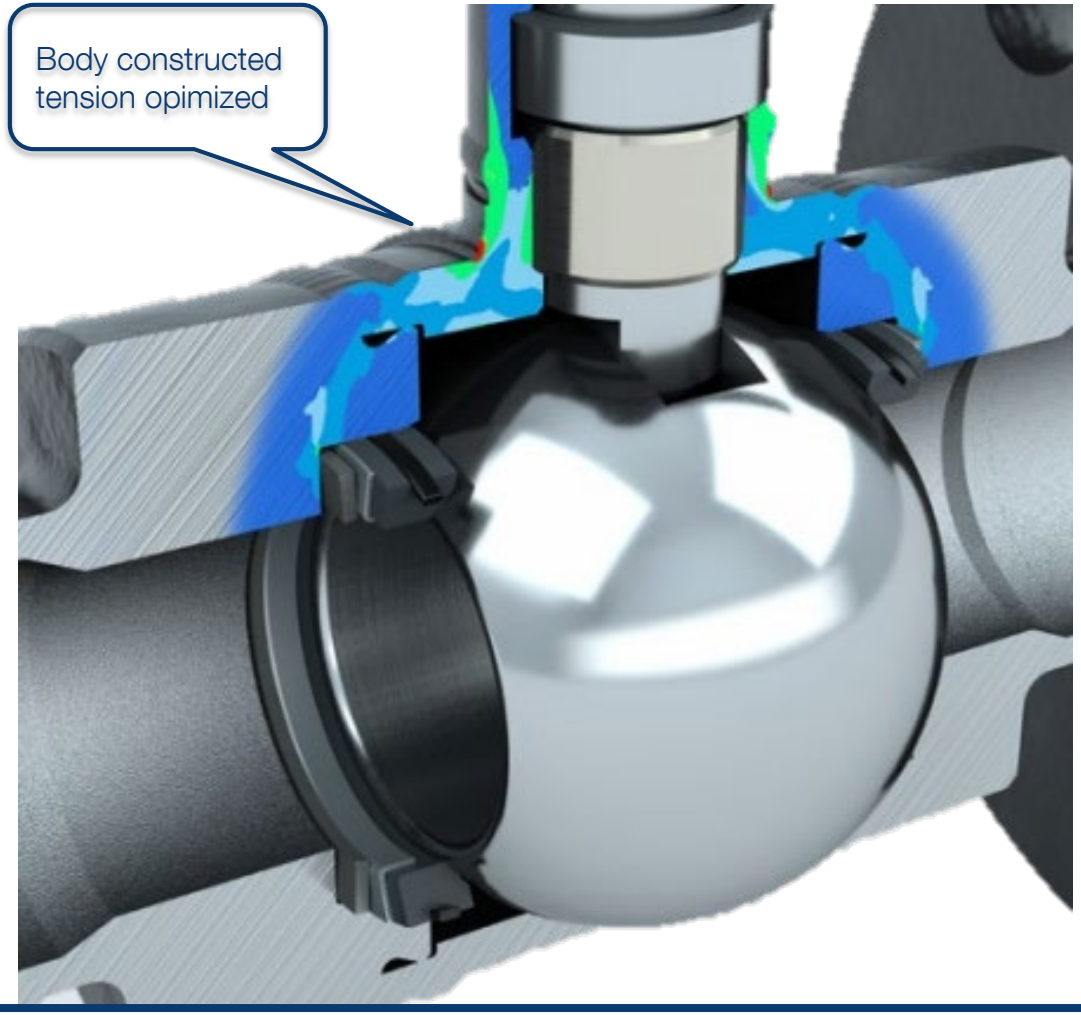
FUNCTION



- (1) Function due to floating ball principle – the ball is only guided from the stem. Contact force of the seal rings will be guaranteed by belleville washers behind the seal systems.
- (2) First, the media press on the ball and moves it in the downstream seal ring and ensures tightness on the outlet side of the valve.
- (3) The contact force of the upstream seal system on the ball will be increased from the media pressure and ensures tightness on the inlet side.
- (4) Due to the function principle of the seal system, bi – directional flow is possible.

WELDING SEAMS & TENSION



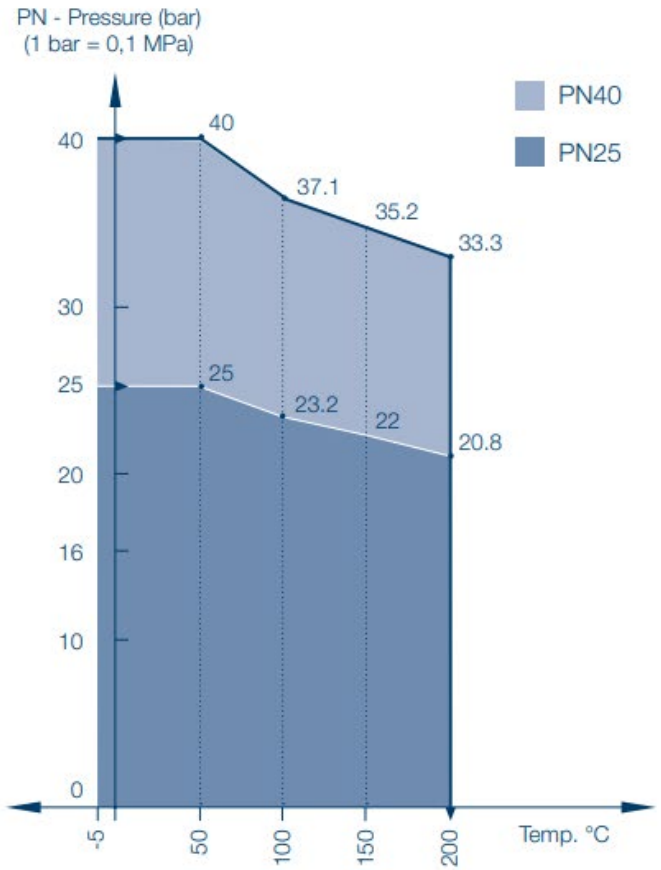


(1) Each body weld seam is completely welded through the entire cross-section which minimizes the possibility of crack corrosion

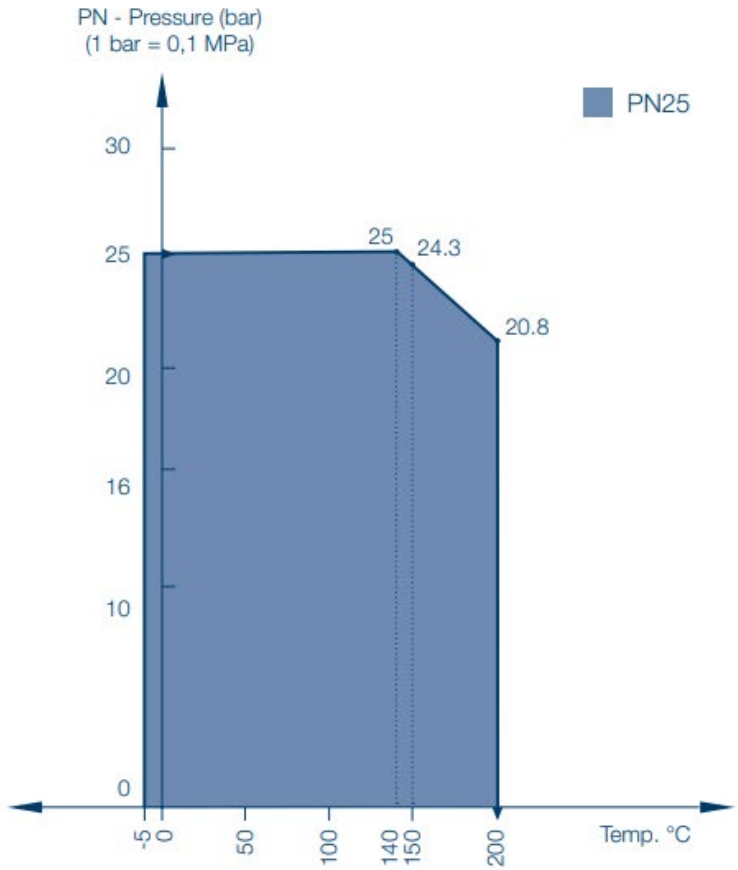
P/T DIAGRAM

Application design for standard and underground solutions

Pressure and temperature range KHO

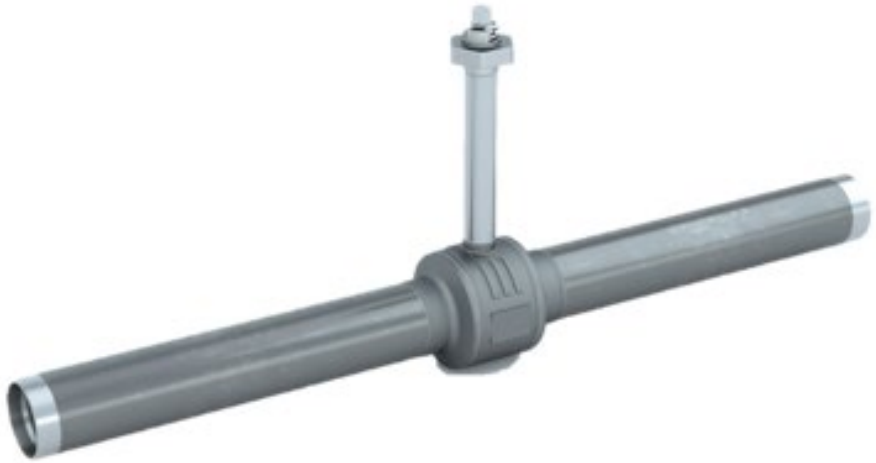


Pressure and temperature range KHO-U



Nominal diameter DN	Differential pressure	Torque
mm	bar	Nm
15 / 20R15	40	8
20 / 25R20	40	12
25 / 32R25	40	20
32 / 40R32	40	28
40 / 50R40	40	42
50 / 65R50	40	60
65 / 80R65	40	110
80 / 100R80	40	190
100 / 125R100	40	320
125 / 150R125	40	490
150	25	530
200	25	690
250	25	1420

TESTING ACC. EN488:2019



KLINGER Monoball® KHO ball valves will be tested in our plant own testing rig in accordance to the requirments of the standard **EN 488:2019 & EHP003** and is certified and audited from TUEV Austria.

ADVANTAGES

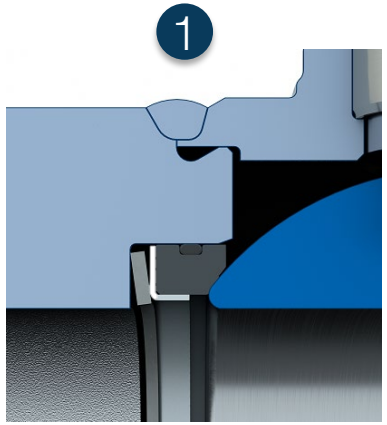
(1) Sealing elements:
» Design is elastic, robust, reliable and insensitive to impurities and pressure shocks → high lifetime.
» Bi- directional flow.

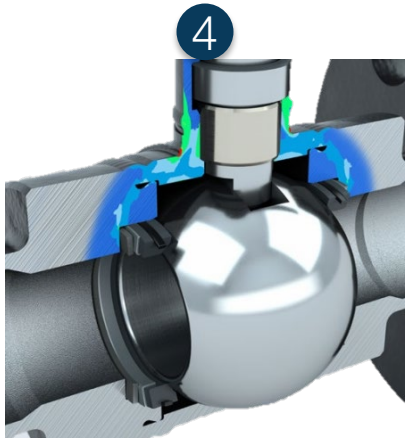
(2) Stem sealing:
» Triple stem sealing ensures maximum safety.
» Top O- ring can be changed inline.

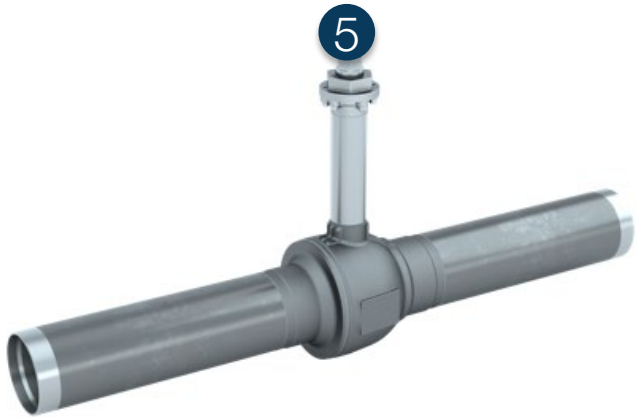
(3) Ball:
» Standard ball made of stainless steel 1.4401 /1.4408 / AISI 304L→ high resistance to chemical media and mechanical loads.
» The ball has a cylindrical passage which ensures laminar flow without turbulences.
» Larger ball ensures higher sealing surface of the seal ring.
» Ensures low pressure drop and lower pumping energy.

(4) Body:
» Compact casted body→ Insensitive to pipeline forces and tension optimised construction.
» Dome connection is of the middle piece is casted – no welding seam directly on the middle piece for the dome pipe.
» Each body welding seam is completely welded through the entire cross section → no possibility of crack corrosion.

(5) Quality
» Certified acc. EN488:2019 and EHP003.
» Maintenance free and long service life.



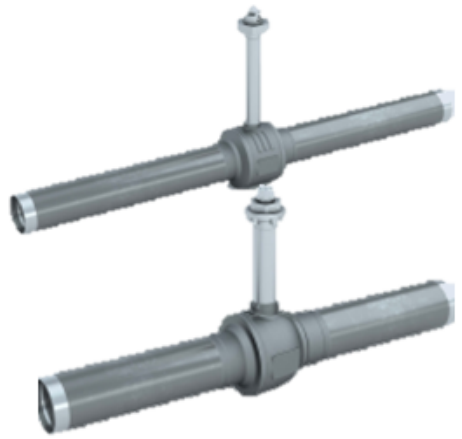




KHO MONOBALL MODEL CODING

CODE EXAMPLE: KHO S 50 P3 M1 H

Type	Connection	DN	PN	Pressure stage	Body	Material	Version	Description	Special 1	Description	Special 2	Description
KHMO	S	15	P1	PN16	M1	Carbon steel 1.0619	FW	Bare stem	BL1500	Extended body length to 1500mm until DN125	F10	ISO TOP flange F10
	F	20	P2	PN25	M2	Stainless steel 1.4408	H	Lever	BL2000	Extended body length to 2000mm from DN150	F12	ISO TOP flange F12
	SF	25	P3	PN40			AN	Actuator			F16	ISO TOP flange F16
	U (1)	32					GE	Gear w. hand wheel			RO	ROTORK gear with hand wheel
	KK(2)	40									AU	AUMA gear with hand wheel
	ELE (3)	50									SF-SKT	Version drain/vent valve: weld end/flange, Operation hexagonal screw
	AB (4)	65									SZ-SKT	Version drain/vent valve: weld end /male thread with cap, Operation hexagonal screw
	BH (5)	80									SM-H	Version drain/vent valve: weld end /female thread with plug, Operation with lever
		100									SZ-H	Version drain/vent valve: weld end /female thread, Operation with lever
		125										
		150										
		200										
		250										
		20R15										
		25R20										
		32R25										
		40R32										
		50R40										
		65R50										
		80R65										
		100R80										
		125R100										
		150R125										



(1) Underground version only with weld ends

(2) Version cap and chain

(3) Drain/Vent valve in stainless steel with 1000mm welded carbon steel pipe

(4) Hot tapping valve

(5) Branaching valve

Stem O-Rings always FKM

Sealing elements always KFC

THANKS FOR YOUR ATTENTION!

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