



# KLINGER MONOLITH KHO

Single-piece ball valve  
DN 20 – 300



# KLINGER FLUID CONTROL

Today for tomorrow

As a subsidiary of the KLINGER Group, KLINGER Fluid Control has been developing, manufacturing and maintaining high-quality industrial valves at the business location Gumpoldskirchen/Austria for more than 125 years. Via the global distribution and service network, KLINGER Fluid Control offers both standardized and tailored products and services as well as solutions for customers around the globe.

Products from KLINGER Fluid Control are characterized by their high level of reliability as well as by an above average lifecycle at a simultaneously very low total cost of ownership (TCO). As a trusted solutions partner, KLINGER Fluid Control creates customer benefits with added value with the focus on the following core competences:

## ENCOMPASSING SERVICE

- » Application expertise
- » Product trainings
- » Fast quotation and order processing
- » Customer-specific special solutions
- » Supply of spare parts
- » Valve maintenance
- » On-site technical support

## INNOVATIVE SOLUTIONS

- » State of the art development tools
- » Product development for different areas of application
- » Customer-specific special solutions
- » Automation solutions
- » Product tests in the company-own technical center
- » A wide range of certificates and approvals

## OPERATIONAL EXCELLENCE

- » Flexible production
- » Transparency in the supply chain
- » Short delivery times
- » ISO 9001 certified quality
- » ISO 14001 as well as EMAS certified environmental management system

GUMPOLDSKIRCHEN  
AUSTRIA



# RELIABLE STABILITY

Developed for the toughest application scenarios

## PRODUCT ADVANTAGES

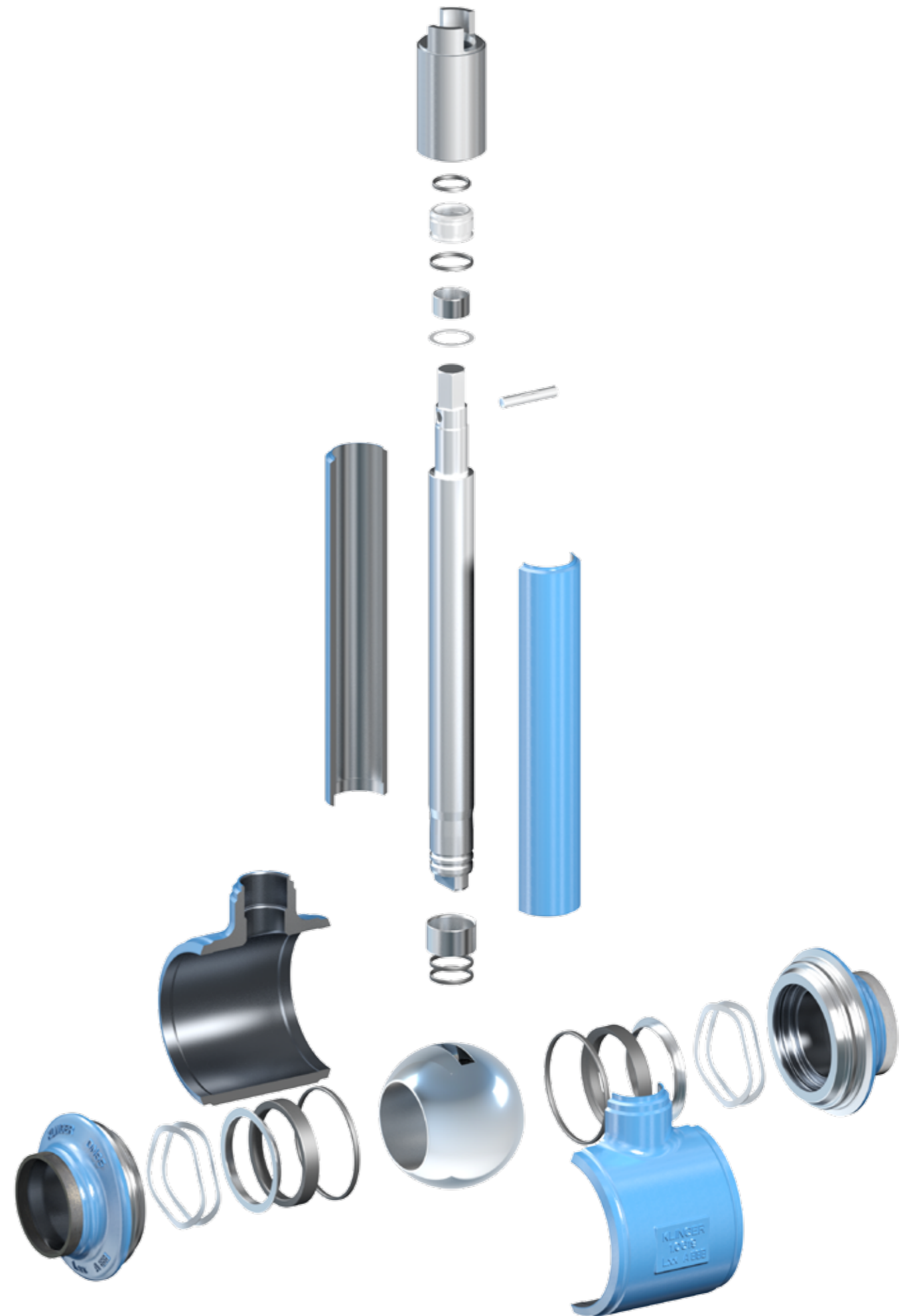
- » EN 488:2015 certification
- » Maintenance-free
- » Supports pressurization on both sides
- » Long heat-insulating shaft
- » Trunnion mounted and blowout-proof operating stem
- » Multi-layer, durable operating stem seal
- » High degree of resilience against pipework forces
- » Meets the requirements of the AGFW worksheet FW 401 – Part 5
- » Elastically pre-stressed sealing elements with stainless steel sinus springs
- » Trunnion-mounted ball (from DN 150 / 200R150 upwards)
- » Operating stem and end of stem construction made of stainless steel
- » Impervious to dirt

## SPECIAL TYPES

- » Pre-insulated design for plastic casing pipe systems
- » Available in different shaft lengths
- » Top flange in accordance with EN ISO 5211 for automation
- » Full solution with insulation extension, venting and bleeding, insulation and alert system

## PRODUCT DETAILS

PN	25/40
DN	20 – 250 / 25R20 – 300R250
Material	Cast steel
Temperature	-10 °C to +200 °C
Design	Welding ends, for underground installation, full and reduced bore
Type	Fully welded ball valve



# GREATEST SAFETY

## Sealing system

The KLINGER Monolith KHO ball valve was developed to meet the demand for absolute tightness as well as durability. The ball valve, which was especially designed with district heating applications in mind, is characterized by the high degree of stability of the body, its small installation space requirement, guaranteed tightness, no maintenance and its exceptional operational safety.

### OPERATING PRINCIPLE

The elastic sealing system ensures optimal tightness even in combination with low differential pressures and minimizes actuating torques. The ball with cylindrical bore causes only minimal flow losses and prevents turbulences. The KLINGER KHO Monolith ball valve can be operated in both flow directions.

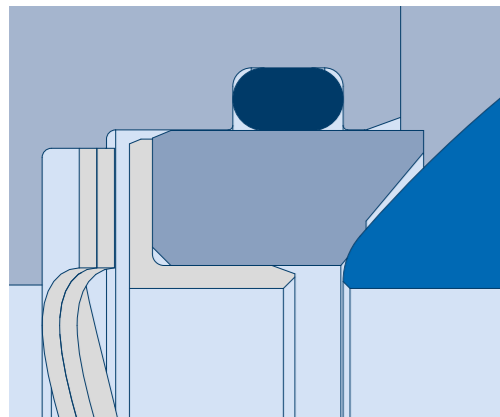


Fig. 1: Sealing element for floating ball for up to DN 125 / 150R125

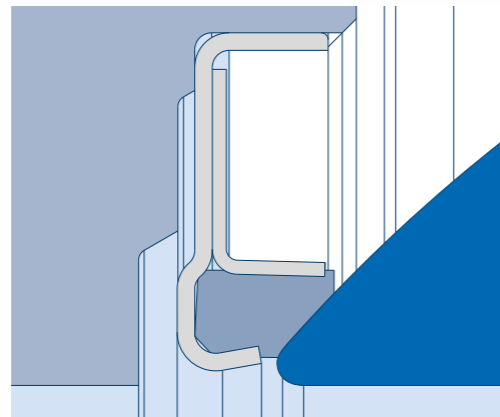


Fig. 2: Sealing element with trunnion-mounted ball for up to DN 150 / 200R150

Up to a nominal width of DN 125 / 150R125, the sealing system in the bore is formed by the two sealing rings (pre-stressed by sinus springs) and the ball. The pressure of the medium forces the ball against the downstream sealing element. The sealing ring on the upstream side, enclosed on three sides, is simultaneously pushed against the ball by the pressure of the medium and the sinus spring.

The forces exerted on the sealing rings increase with greater nominal widths. As a consequence, a reliable sealing system can only be ensured by means of a trunnion-mounted ball. From DN 150 / 200R150 upwards, the forces of the differential pressure are diverted into the body by the trunnion and the operating stem and the sealing elements serve only to ensure reliable sealing of the valve in the bore.

Tightness to atmosphere is ensured by double-sealing the operating stem. This prevents the medium from rising within the body shaft. Two O-rings, located at the base of the operating stem, form the primary seal and protect the trunnions of the operating stem against major contamination. The secondary O-rings are located at the end of the shaft construction and facilitate simple replacement – neither the entire valve nor the insulation must be removed for such a task.



# CERTIFIED QUALITY

## EN 488:2015

Over the years, the demands regarding underground shut-off valves have been continuously increased in order to further improve operational safety. This, however, is only possible through the utilization of special valves with especially rigid and deformation-resistant bodies. The KLINGER Monolith KHO ball valve series was specifically developed for the application in pipe systems operated in combination with major external loads. The valve is characterized by its massive cast design and the fully welded body, which is optimized to cope with major forces. As a consequence, neither cold formed sheet metal or pipe components are utilized, nor is a welding seam located directly on the body shaft. Instead, an optimized position of the body welding seams prevents contact corrosion. These measures lead to a valve body with a very high degree of rigidity and ensure that external loads do not exert an influence on the sealing system. The KLINGER Monolith KHO meets the requirements of the standard EN 488:2015 and of the AGFW worksheet FW 401.

EN 488 defines the technical requirements as well as the testing procedure for underground shut-off valves integrated directly into the district heating network.

Increased compressive forces as well as new bending moments for valves were already defined in the 2011 predecessor version of the standard. The tensile forces, however, remained unchanged. Compared to 2011, some requirements have now again been made stricter. The number of operations during the type approval test, for example, has been increased and all tests must be carried out on the same valve. Furthermore, the end of the last 100 mm of the spindle and shaft construction must feature corrosion protection. KLINGER Monolith KHO ball valves are successfully tested and certified by the TÜV Austria on the company-own multi-function test stand under inclusion of the expanded requirements of EN 488:2015.



# MONOLITH KHO

Overview of types

# KHO WITH LONG SHAFT

Full bore

## GENERAL FEATURES

- » Fully welded ball valve with full bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 150 upwards
- » High degree of resilience against pipework forces

## CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

## DIMENSIONS

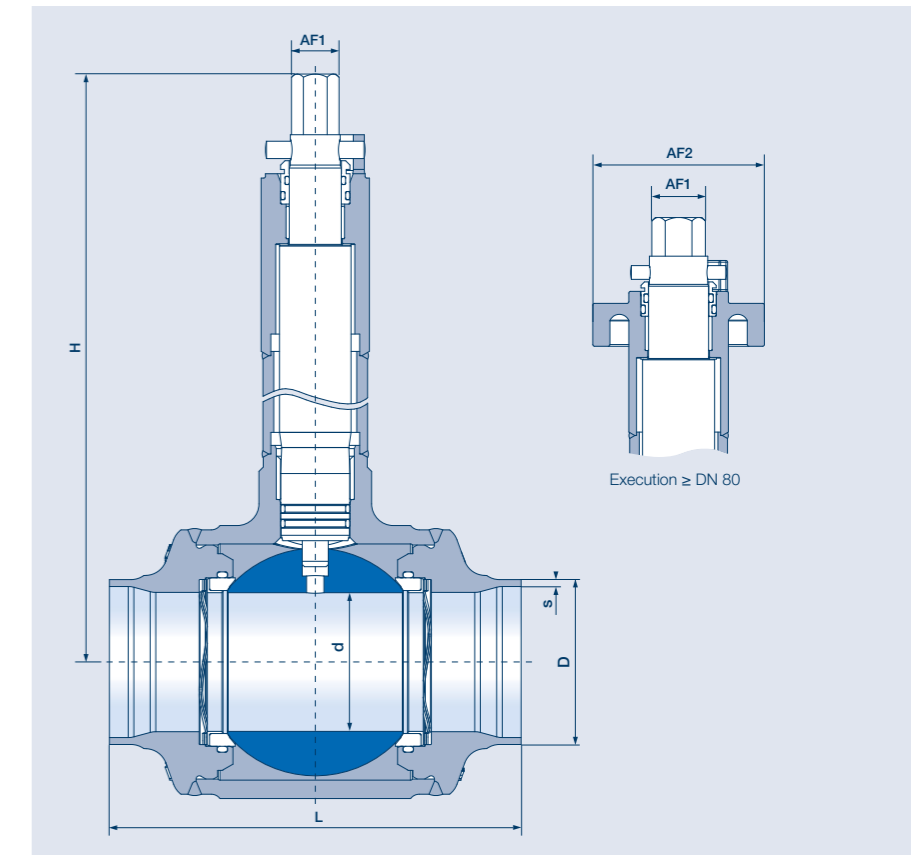
Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125) and series 63 (from DN 150 upwards)

## ACCEPTANCE TESTING

- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

## TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## FULL BORE

### MATERIAL

- Body: Cast steel 1.0619 (Material code VII)
- Ball: Stainless steel 1.4408 (up to DN 125), nodular cast iron 0.7040, hard-chrome-plated surface (from DN 150 upwards)

DN	PN	Dimensions					AF1	AF2	Weight in kg
		L	H	Ød	ØD	s			
20	40	90	398	20	26.9	2.6	19	n.a.	2.7
25	40	100	402	25	33.7	2.6	19	n.a.	3.2
32	40	110	413	32	42.4	3.2	19	n.a.	3.9
40	40	125	420	40	48.3	3.2	19	n.a.	5.3
50	40	150	430	50	60.3	3.2	19	n.a.	8.9
65	40	190	440	64	76.1	3.2	19	n.a.	13
80	40	220	449	79	88.9	3.2	27	90	20.1
100	40	260	463	98	114.3	3.6	27	90	31.2
125	40	330	495	125	139.7	3.6	27	90	52.6
150	25	457	515	150	168.3	4	50	90	80.9
200	25	521	548	200	219.1	4.5	50	90	139
250	25	559	583	250	273	5	50	90	206.1

n.a. = not available

» KHO Long shaft » 09



» KHO Long shaft with ISO flange » 11



» KHO Short shaft » 13



» KHO Short shaft with ISO flange » 15



# KHO WITH LONG SHAFT

## Reduced bore

### GENERAL FEATURES

- » Fully welded ball valve with reduced bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 200R150 upwards
- » High degree of resilience against pipework forces

### CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

### DIMENSIONS

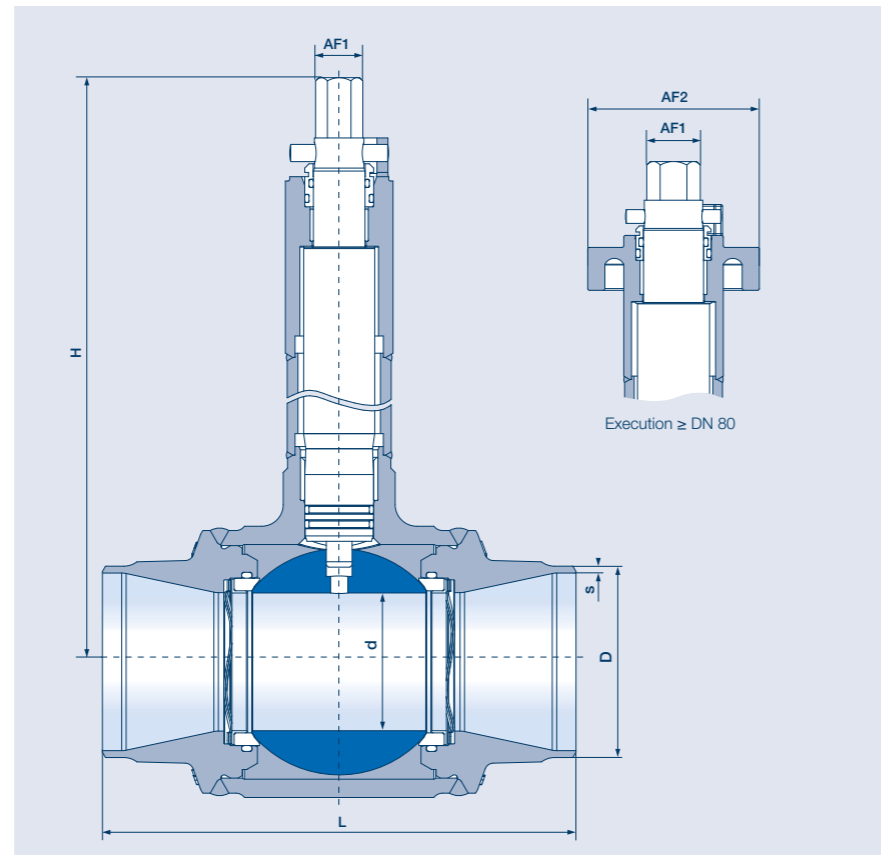
Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125R100) and series 63 (from DN 150R125 upwards)

### ACCEPTANCE TESTING

- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

### TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## REDUCED BORE

DN	PN	Dimensions					AF1	AF2	Weight in kg
		L	H	Ød	ØD	s			
25R20	40	100	398	20	33.7	2.6	19	n.a.	2.7
32R25	40	110	402	25	42.4	3.2	19	n.a.	3.3
40R32	40	125	413	32	48.3	3.2	19	n.a.	4
50R40	40	150	420	40	60.3	3.2	19	n.a.	5.5
65R50	40	190	430	50	76.1	3.2	19	n.a.	9.5
80R65	40	220	440	64	88.9	3.2	19	n.a.	13.6
100R80	40	260	449	79	114.3	3.6	27	90	23
125R100	40	330	463	98	139.7	3.6	27	90	35.5
150R125	40	457	495	125	168.3	4	27	90	64.8
200R150	25	521	515	150	219.1	4,5	50	90	103.1
250R200	25	559	548	200	273	5	50	90	155.7
300R250	25	635	583	250	323.9	5.6	50	90	245.5

n.a. = not available

### MATERIAL

Body: Cast steel 1.0619 (Material code VII)

Ball: Stainless steel 1.4408 (up to DN 150R125), nodular cast iron 0.7040, hard-chrome plated surface (from DN 200R150 upwards)

# KHO – LONG SHAFT WITH ISO FLANGE

## Full bore

### GENERAL FEATURES

- » Fully welded ball valve with full bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 150 upwards
- » High degree of resilience against pipework forces

### CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

### DIMENSIONS

Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125) and series 63 (from DN 150 upwards)

### ACCEPTANCE TESTING

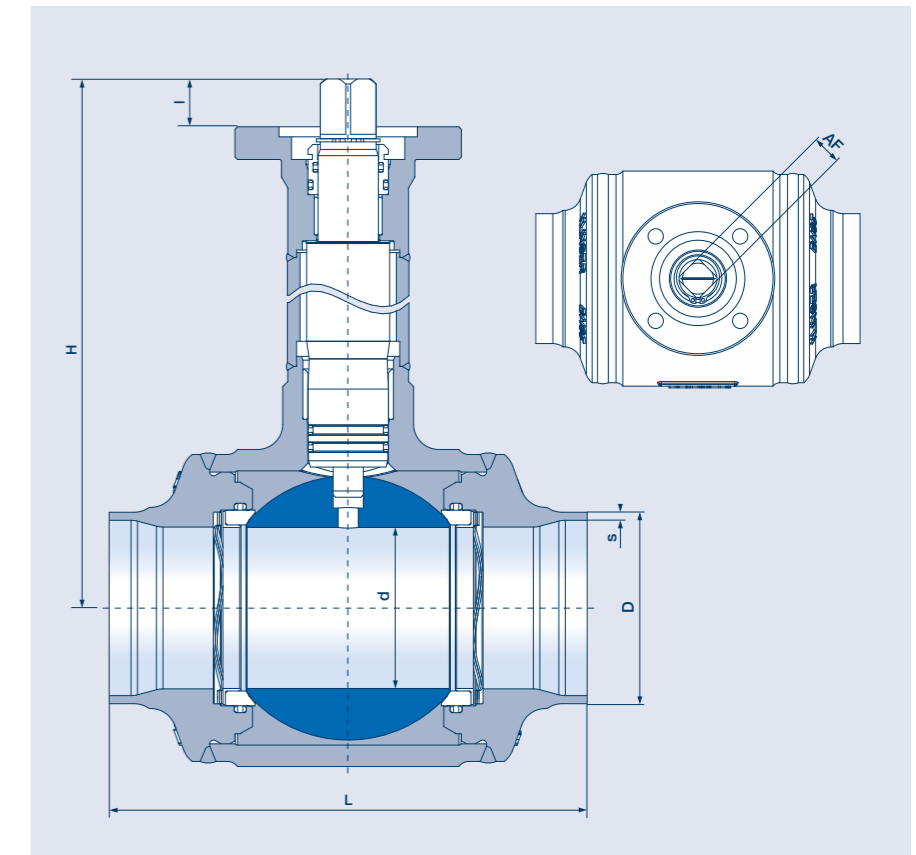
- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

### AUTOMATION

Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

### TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## FULL BORE

DN	PN	Dimensions					Mounting flange for actuator			Weight in kg
		L	H	Ød	ØD	s	ISO	I	AF	
20	40	90	381	20	26.9	2.6	F05	12	11	2.8
25	40	100	385	25	33.7	2.6	F05	12	11	3.3
32	40	110	396	32	42.4	3.2	F05	12	11	4
40	40	125	403	40	48.3	3.2	F05	12	11	5.4
50	40	150	421	50	60.3	3.2	F07	19	17	9.2
65	40	190	431	64	76.1	3.2	F07	19	17	13.3
80	40	220	448	79	88.9	3.2	F10	24	22	20.7
100	40	260	462	98	114.3	3.6	F10	24	22	31.8
125	40	330	494	125	139.7	3.6	F10	24	22	53.7
150	25	457	553	150	168.3	4	F14	65	Ø 48	84.5
200	25	521	586	200	219.1	4,5	F14	65	Ø 48	142.5
250	25	559	636	250	273	5	F16	80	Ø 60	213.4

### MATERIAL

Body: Cast steel 1.0619 (Material code VII)

Ball: Stainless steel 1.4408 (up to DN 125), nodular cast iron 0.7040, hard-chrome plated surface (from DN 150 upwards)

# KHO – LONG SHAFT WITH ISO FLANGE

Reduced bore

## GENERAL FEATURES

- » Fully welded ball valve with reduced bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 200R150 upwards
- » High degree of resilience against pipework forces

## CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

## DIMENSIONS

Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125R100) and series 63 (from DN 150R125 upwards)

## ACCEPTANCE TESTING

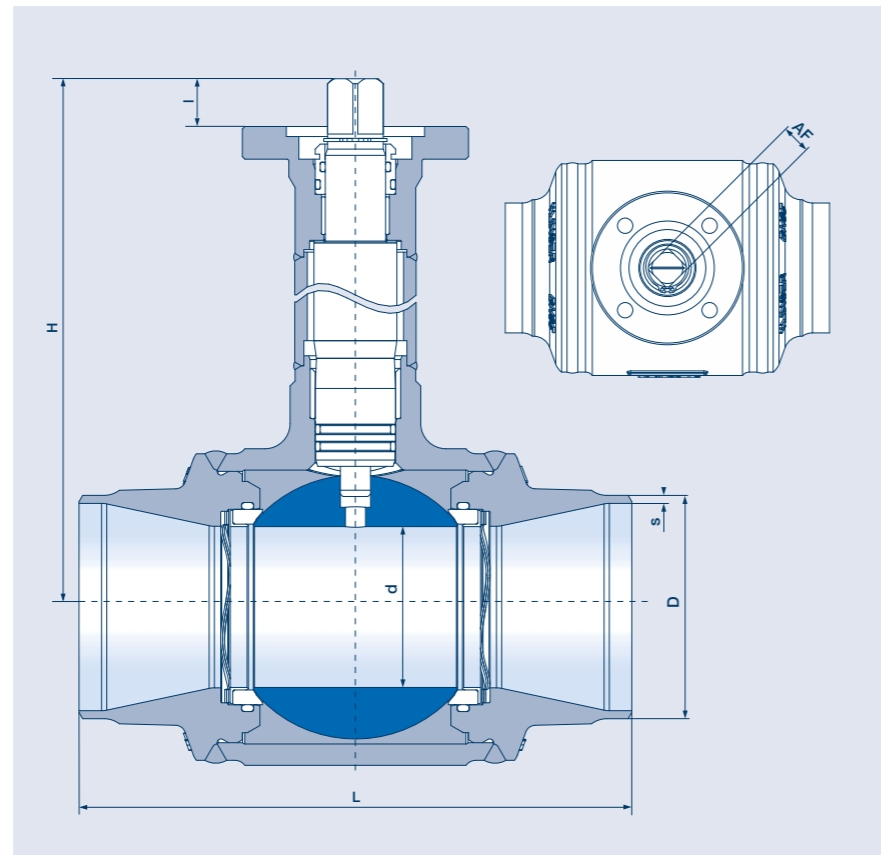
- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

## AUTOMATION

Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

## TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## REDUCED BORE

DN	PN	Dimensions					Mounting flange for actuator			Weight in kg
		L	H	Ød	ØD	s	ISO	I	AF	
25R20	40	100	381	20	33.7	2.6	F05	12	11	2.8
32R25	40	110	385	25	42.4	3.2	F05	12	11	3.4
40R32	40	125	396	32	48.3	3.2	F05	12	11	4.1
50R40	40	150	403	40	60.3	3.2	F05	12	11	5.6
65R50	40	190	421	50	76.1	3.2	F07	19	17	9.8
80R65	40	220	431	64	88.9	3.2	F07	19	17	13.9
100R80	40	260	448	79	114.3	3.6	F10	24	22	23.6
125R100	40	330	462	98	139.7	3.6	F10	24	22	36.1
150R125	40	457	494	125	168.3	4	F10	24	22	65.9
200R150	25	521	553	150	219.1	4.5	F14	65	Ø 48	106.7
250R200	25	559	586	200	273	5	F14	65	Ø 48	159.2
300R250	25	635	636	250	323.9	5.6	F16	80	Ø 60	252.8

## MATERIAL

Body: Cast steel 1.0619 (Material code VII)

Ball: Stainless steel 1.4408 (up to DN 150R125), nodular cast iron 0.7040, hard-chrome plated surface (from DN 200R150 upwards)

# KHO SHORT SHAFT

Full bore

## GENERAL FEATURES

- » Fully welded ball valve with full bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 150 upwards
- » High degree of resilience against pipework forces

## CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

## DIMENSIONS

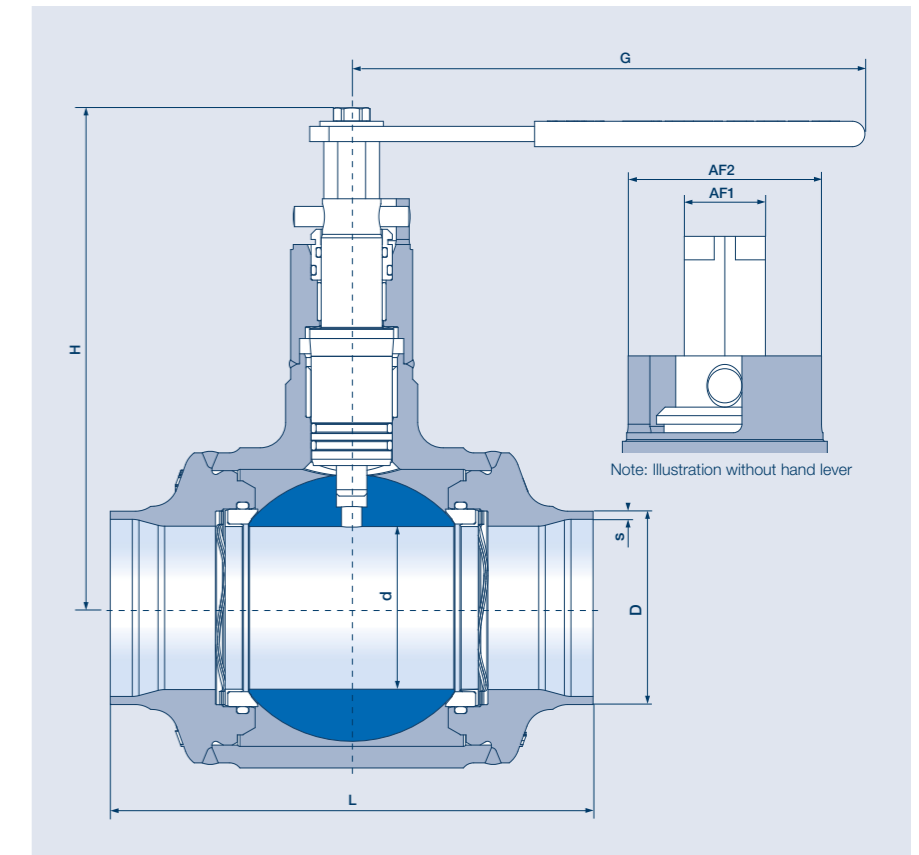
Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125) and series 63 (from DN 150 upwards)

## ACCEPTANCE TESTING

- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

## TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## FULL BORE

DN	PN	Dimensions						AF1	AF2	Weight in kg
		L	H	G	Ød	ØD	s			
20	40	90	398	120	20	26.9	2.6	19	n.a.	1.5
25	40	100	402	120	25	33.7	2.6	19	n.a.	2
32	40	110	413	120	32	42.4	3.2	19	n.a.	2.7
40	40	125	420	120	40	48.3	3.2	19	n.a.	4.1
50	40	150	430	200	50	60.3	3.2	19	n.a.	6.3
65	40	190	440	200	64	76.1	3.2	19	n.a.	10.4
80	40	220	449	400	79	88.9	3.2	27	90	17.1
100	40	260	463	400	98	114.3	3.6	27	90	28.8
125	40	330	495	630	125	139.7	3.6	27	90	50.2
150	25	457	515	700	150	168.3	4	50	90	74.9
200	25	521	548	1100	200	219.1	4.5	50	90	133.1
250	25	559	583	n.a.	250	273	5	50	90	197.4

n.a.= not available

# KHO SHORT SHAFT

Reduced bore

## GENERAL FEATURES

- » Fully welded ball valve with reduced bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 200R150 upwards
- » High degree of resilience against pipework forces

## CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

## DIMENSIONS

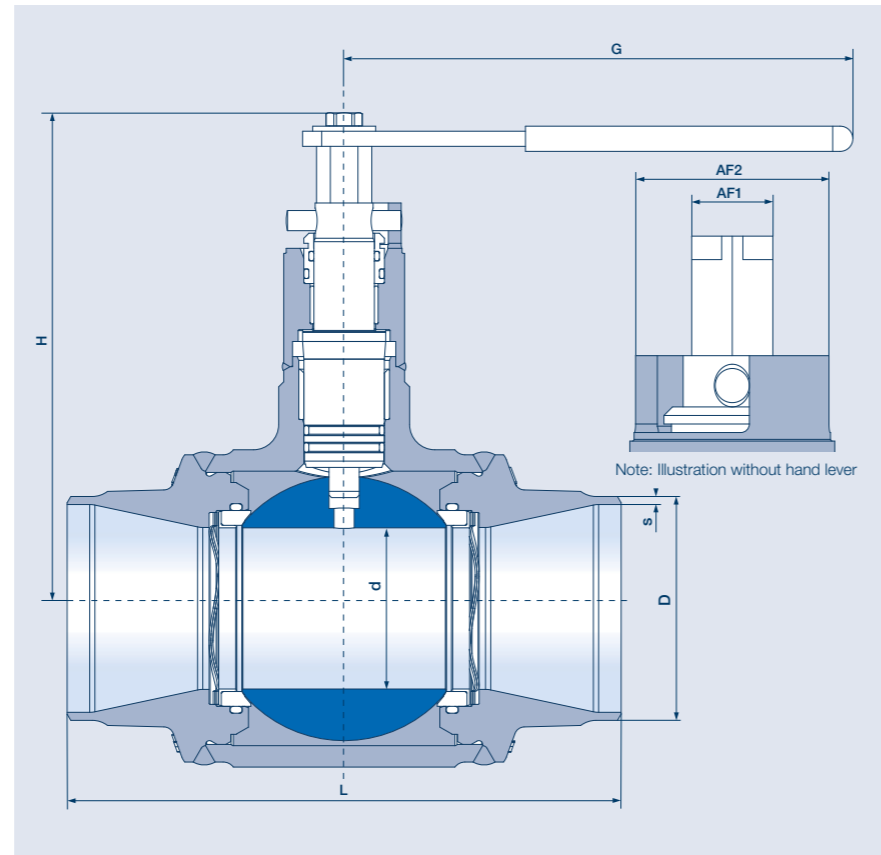
Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125R100) and series 63 (from DN 150R125 upwards)

## ACCEPTANCE TESTING

- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

## TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## REDUCED BORE

DN	PN	Dimensions							AF1	AF2	Weight in kg
		L	H	G	Ød	ØD	s				
25R20	40	100	398	120	20	33.7	2.6	19	n.a.	1.5	
32R25	40	110	402	120	25	42.4	3.2	19	n.a.	2.1	
40R32	40	125	413	120	32	48.3	3.2	19	n.a.	2.8	
50R40	40	150	420	120	40	60.3	3.2	19	n.a.	4.3	
65R50	40	190	430	200	50	76.1	3.2	19	n.a.	6.9	
80R65	40	220	440	200	64	88.9	3.2	19	n.a.	11	
100R80	40	260	449	400	79	114.3	3.6	27	90	20	
125R100	40	330	463	400	98	139.7	3.6	27	90	32.5	
150R125	40	457	495	630	125	168.3	4	27	90	62.4	
200R150	25	521	515	700	150	219.1	4.5	50	90	97.1	
250R200	25	559	545	1100	200	273	5	50	90	149.8	
300R250	25	635	583	n.a.	250	323.9	5.6	50	90	236.8	

n.a.= not available

## MATERIAL

Body: Cast steel 1.0619 (Material code VII)

Ball: Stainless steel 1.4408 (up to DN 150R125), nodular cast iron 0.7040, hard-chrome plated surface (from DN 200R150 upwards)

# KHO – SHORT SHAFT WITH ISO FLANGE

Full bore

## GENERAL FEATURES

- » Fully welded ball valve with full bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 150 upwards
- » High degree of resilience against pipework forces

## CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

## DIMENSIONS

Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125) and series 63 (from DN 150 upwards)

## ACCEPTANCE TESTING

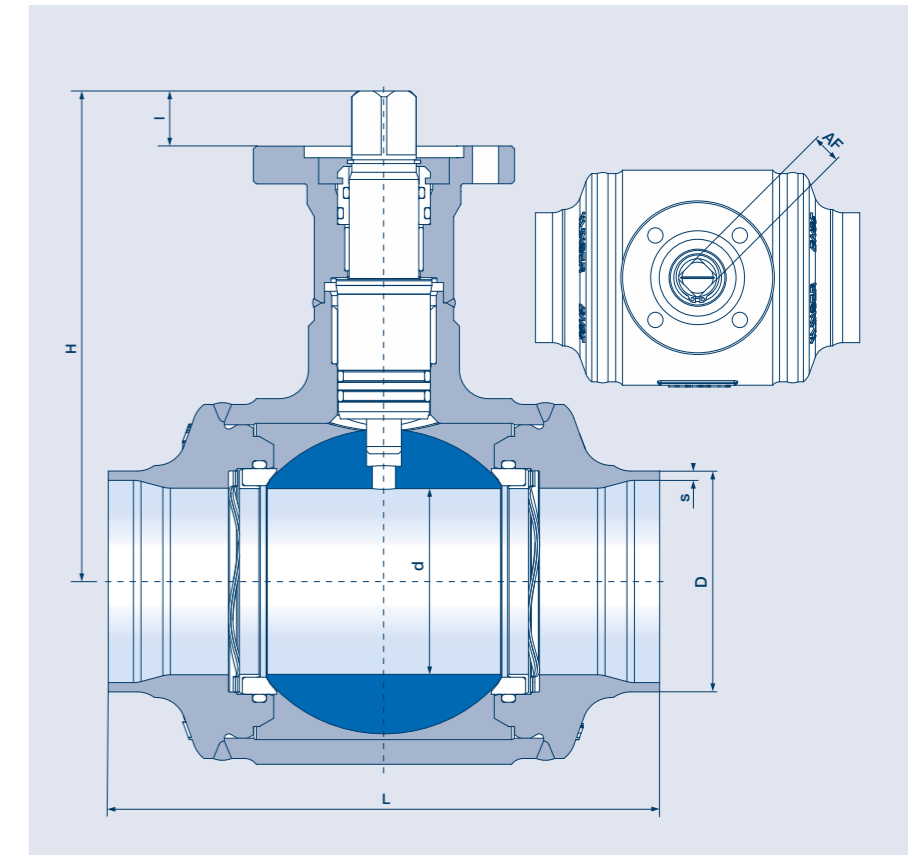
- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

## AUTOMATION

Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

## TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## FULL BORE

DN	PN	Dimensions					Mounting flange for actuator			Weight in kg
		L	H	Ød	ØD	s	ISO	I	AF	
20	40	90	99	20	26.9	2.6	F05	12	11	1.4
25	40	100	103	25	33.7	2.6	F05	12	11	1.9
32	40	110	114	32	42.4	3.2	F05	12	11	2.6
40	40	125	121	40	48.3	3.2	F05	12	11	4
50	40	150	159	50	60.3	3.2	F07	19	17	6.1
65	40	190	169	64	76.1	3.2	F07	19	17	10.2
80	40	220	206	79	88.9	3.2	F10	24	22	16.4
100	40	260	220	98	114.3	3.6	F10	24	22	27.5
125	40	330	252	125	139.7	3.6	F10	24	22	48.9
150	25	457	353	150	168.3	4	F14	65	Ø 48	75.6
200	25	521	386	200	219.1	4.5	F14	65	Ø 48	132.7
250	25	559	461	250	273	5	F16	80	Ø 60	203.4

## MATERIAL

Body: Cast steel 1.0619 (Material code VII)

Ball: Stainless steel 1.4408 (up to DN 125), nodular cast iron 0.7040, hard-chrome plated surface (from DN 150 upwards)



# KHO – SHORT SHAFT WITH ISO FLANGE

Reduced bore

## GENERAL FEATURES

- » Fully welded ball valve with reduced bore
- » Certified according to EN 488:2015
- » Trunnion mounted ball from DN 200R150 upwards
- » High degree of resilience against pipework forces

## CONNECTIONS

Welding ends in accordance with AGFW worksheet FW 401 – Part 5

## DIMENSIONS

Face-to-face dimensions in accordance with EN 12982, series 67 (up to DN 125R100) and series 63 (from DN 150R125 upwards)

## ACCEPTANCE TESTING

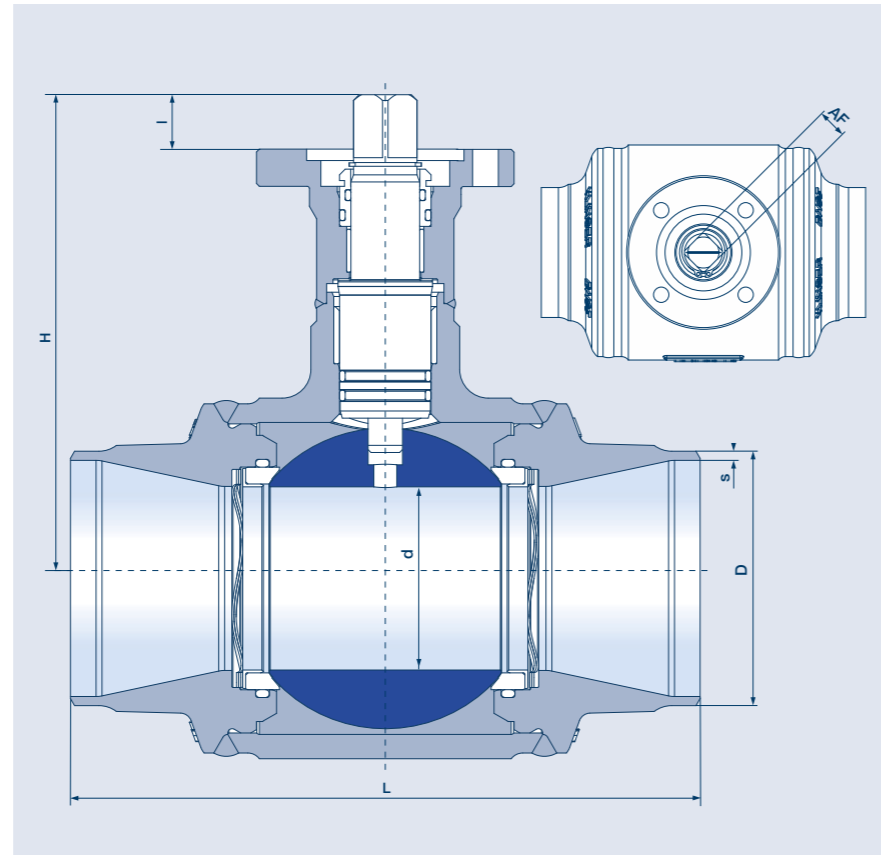
- » Seat leak tightness: EN 12266-1 P12, leakage rate A
- » Tightness to atmosphere: EN 12266-1 P11
- » Strength: EN 12266-1 P10

## AUTOMATION

Flange connection in accordance with ISO 5211, allows for direct mounting of an actuator or by means of brackets. Pneumatic and electrical actuators utilizable.

## TEMPERATURE

-10 °C to +200 °C (see P-T diagram)



## REDUCED BORE

DN	PN	Dimensions					Mounting flange for actuator			Weight in kg
		L	H	Ød	ØD	s	ISO	I	AF	
25R20	40	100	99	20	33.7	2.6	F05	12	11	1.4
32R25	40	110	103	25	42.4	3.2	F05	12	11	2
40R32	40	125	114	32	48.3	3.2	F05	12	11	2.7
50R40	40	150	121	40	60.3	3.2	F05	12	11	4.2
65R50	40	190	159	50	76.1	3.2	F07	19	17	6.7
80R65	40	220	169	64	88.9	3.2	F07	19	17	10.8
100R80	40	260	206	79	114.3	3.6	F10	24	22	19.3
125R100	40	330	220	98	139.7	3.6	F10	24	22	31.8
150R125	40	457	252	125	168.3	4	F10	24	22	61.1
200R150	25	521	353	150	219.1	4.5	F14	65	Ø 48	97.8
250R200	25	559	386	200	273	5	F14	65	Ø 48	149.4
300R250	25	635	461	250	323.9	5.6	F16	80	Ø 60	242.8

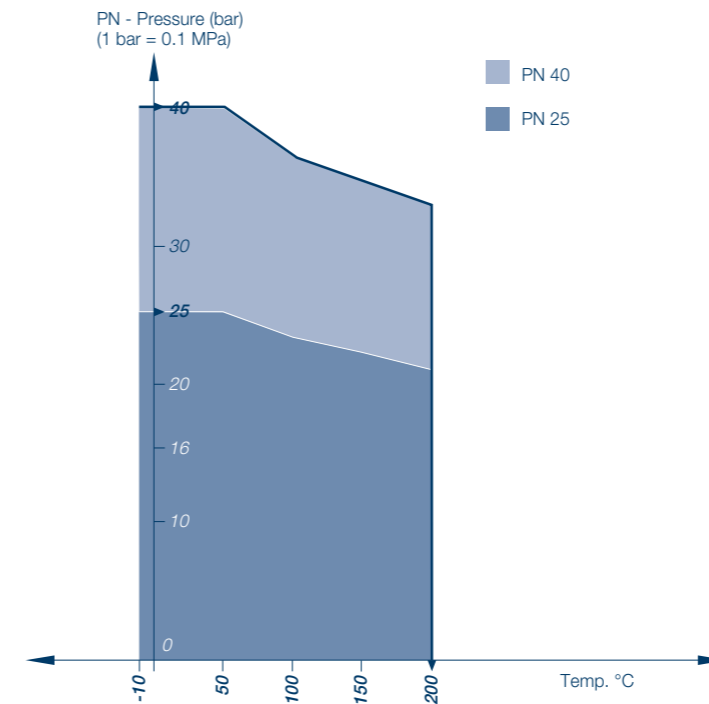
## MATERIAL

Body: Cast steel 1.0619 (Material code VII)  
 Ball: Stainless steel 1.4408 (up to DN 150R125), nodular cast iron 0.7040, hard-chrome plated surface (from DN 200R150 upwards)

# TECHNICAL DETAILS

Application design

## Pressure and temperature ranges



## Torques

Nominal diameter DN	Differential pressure (bar)	Torque (Nm)
mm	bar	Nm
20 / 25R20	40	11
25 / 32R25	40	16
32 / 40R32	40	26
40 / 50R40	40	42
50 / 65R50	40	61
65 / 80R65	40	113
80 / 100R80	40	190
100 / 125R100	40	326
125 / 150R125	40	490
150 / 200R150	25	431
200 / 250R200	25	708
250 / 300R250	25	1,379

For standard computations, KLINGER Fluid Control recommends the factor 1.5, i.e. using plus 50 %.

## Flow Values

### FULL BORE

DN (mm)	ζ	K <sub>vs</sub> -value
20	0.2	35.8
25	0.14	66.8
32	0.12	118
40	0.11	193
50	0.1	316
65	0.076	607
80	0.067	980
100	0.058	1,645
125	0.051	2,742
150	0.045	4,203
200	0.038	8,131
250	0.033	13,630

### REDUCED BORE

DN (mm)	ζ	K <sub>vs</sub> -Wert
25R20	0.54	34
32R25	0.41	63.9
40R32	0.35	108
50R40	0.33	174
65R50	0.32	299
80R65	0.31	460
100R80	0.3	730
125R100	0.3	1,141
150R125	0.3	1,642
200R150	0.3	2,920
250R200	0.29	4,640
300R250	0.29	6,682

### SIZE OF BALL VALVE

Flow rate  $Q$  in m<sup>3</sup>/h  
 Pressure loss  $\Delta p$  in bar  
 Density  $\rho$  in kg/m<sup>3</sup>  
 Velocity  $w$  in m/s  
 Flow coefficient  $K_v$  in m<sup>3</sup>/h  
 Pressure loss coefficient  $\zeta$

Allows for the calculation of:

$$K_v = Q * \sqrt{\frac{\rho}{1000 * \Delta p}}$$

or

$$\zeta = \frac{2 * \Delta p * 10^5}{\rho * w^2}$$

The valve is to be selected in a manner that the K<sub>vs</sub>-value is greater, or the ζ-value less than the computed value for the application.

# PRODUCT OVERVIEW

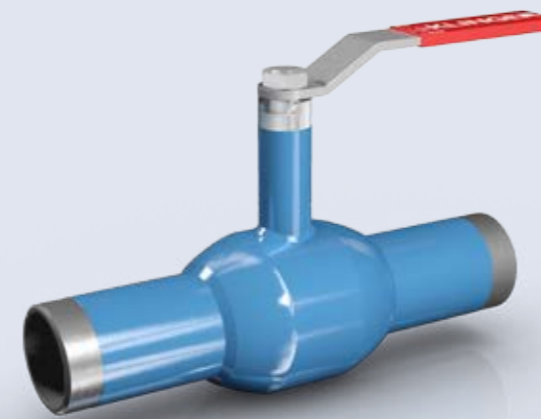
»» Ballostar® KHI ball valves



»» Monolith KHO ball valves



»» Monoball® KHM ball valves



»» Ballostar® KHA ball valves



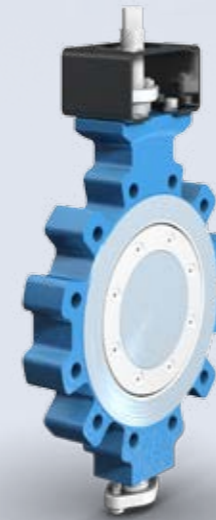
»» Ballostar® KHE ball valves



»» KVN piston valves



»» Butterfly valves  
Conaxe



»» AB-cocks  
and Gauge-glasses



## »» AREAS OF UTILIZATION





Klinger Portugal, Lda.  
Via José Régio, 36  
Centro Empresarial Vilar do Pinheiro  
4485-860 Vila do Conde  
T: +351 22 947 0910  
E-mail: geral@klinger.pt

Delegação Lisboa  
Rua de Cabo Verde, 8  
Prior Velho 2685-316  
T: +351 21 940 6620  
E-mail: lisboa@klinger.pt