KLINGER Fluid Control

KLINGER BALLOSTAR® KHA

3-piece ball valves
DN 10 - 150

www.klinger.kfc.at

GUMPOLDSKIRCHEN
AUSTRIA

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, 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 total cost of ownership (TCO). As a solutions partner, KLINGER Fluid Control creates customer benefits with added value. In this regard, the focus is on the following core competences:

ENCOMPASSING SERVICE

» Application expertise
» Product trainings
» Fast quotation and order processing
» Customer-specific logistics concepts
» 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
» Compilation of 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

CONSISTENTLY MODULAR

One product – many applications

PRODUCT ADVANTAGES

- Maintenance-free
- Supports pressurization on both side
- Bidirectional flow
- Ball with a cylindrical full bore
- Unique pre-stressed and elastic sealing system
- Bidirectional sealing in accordance with EN 12266 – leakage rate A
- Modular selection of system components
- Serviceable without removal from the line
- Antistatic design in accordance with ISO 7121 / EN 1983
- Subsequent automation possible at any time (top flange in accordance with EN ISO 5211)

SPECIAL TYPES

- Metal seat (up to +400 °C) for abrasive media
- Operating stem sealed by O-rings
- Operating stem extension
- Oxygen version (oil, grease and silicone-free)
- Cryogenic version (down to -196 °C)
- Fire-Safe version
- Vacuum version
- Gas version

PRODUCT DETAILS

PN	16/25/40/63/100
DN	10 - 150
Housing	Cast steel, stainless steel, grey cast iron, nodular cast iron, special materials upon request
Ball	Stainless steel
Operating stem	Stainless steel
Temperature	-196 °C to +400 °C
Design	Flanges (long, short), threaded connections, welding ends (long, short), full and reduced bore
Type	Three-piece ball valve

PTFE Labyrinth

Graphite compact

Viton

Flange design

KFC-25

PTFE

Metal

Fire-Safe

Metal special

Viton

Threaded connection

Welding ends

GREATEST SAFETY

The unique KLINGER sealing system with automatic sealing chamber

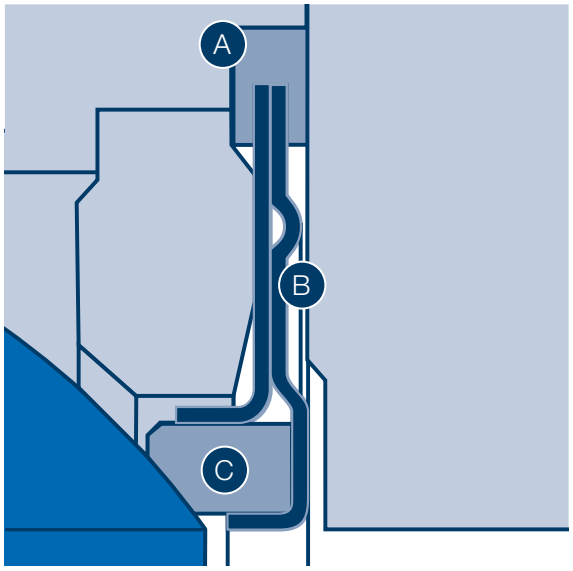
Leakages represent the worst case for any plant operator. Negative impacts on the environment as well as downtimes, harm to personnel and assets and in some cases heavy financial losses are just a few of the possible outcomes. A seal, which therefore “practices what it preaches“, i.e. a valve capable of reliably fulfilling its shut-off function, is a must. With the KLINGER Ballostar® KHA, this is ensured in multiple ways: By means of the unique ball valve sealing system and the automatic sealing chamber.

THE SEALING SYSTEM

A The sleeve reliably keeps the sealing element in the desired position. In the Fire-Safe design, a graphite ring adds additional protection against too high thermal loads.

B The diaphragm spring determines the sealing stress for the entire lifecycle of the seal and simultaneously ensures the required pressure of the sealing ring. As a consequence, the seal remains – independent of the medium pressure and the flow direction – continuously tight.

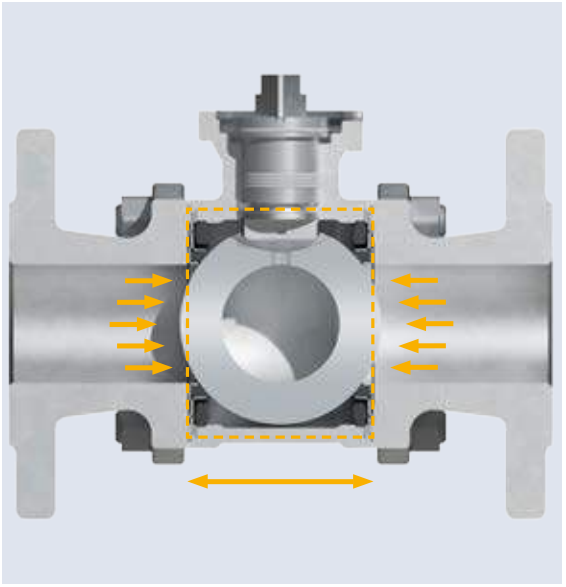
C The sealing ring itself is surrounded on three sides by the spring-loaded sealing element and can therefore absorb major loads without deformation.



THE AUTOMATIC SEALING CHAMBER

The automatic sealing chamber utilizes spring loads in the two sealing elements for the function of the valve. The result: An automatic sealing chamber, in which the loads of the sealing elements simultaneously work bidirectionally. On the basis of this principle, the TÜV Bayern confirms: The automatic sealing chamber is also capable of replacing two unilaterally sealing standard valves. Primarily, this concerns safety lines in plants, especially those with alternating flow directions.

In the case of the KLINGER Ballostar® KHA, as opposed to conventional ball valves, the absorption area of the medium pressure is not limited to the ball area, but encompasses the entire sealing element (ball and area of the diaphragm spring). In the event of an increase of differential pressure, the additional forces increase as well – the preloaded diaphragm springs, which press against the ball, are subsequently relieved and service life further improved.



CERTIFIED QUALITY

The KLINGER Ballostar® KHA lives up to its promises

This is proven by various tests and certifications – for plant operators this means absolute safety in operation with guaranteed tightness.

» **Valve according to "TA-Luft"**
With a standard value of 10^{-4} mbar l/s, the KLINGER Ballostar® KHA significantly outperforms the requirements of the German Technical Instructions on Air Quality Control.

» **Fire-Safe**
The Fire-Safe tests in accordance with API Standard 607, 4th Edition and EN ISO 10497:2004 have been certified by the TÜV Austria.

» **Valve for gaseous fuels**
Due to its product characteristics, the KLINGER Ballostar® KHA can be tested as a safety shut-off installation for firing systems in accordance with the European Norm EN 161. Certification for selected types, in combination with special actuators, can be issued on demand.

» **Valve for utilization with oxygen**
The BAM Berlin has approved the KLINGER Ballostar® KHA for the utilization in combination with oxygen.

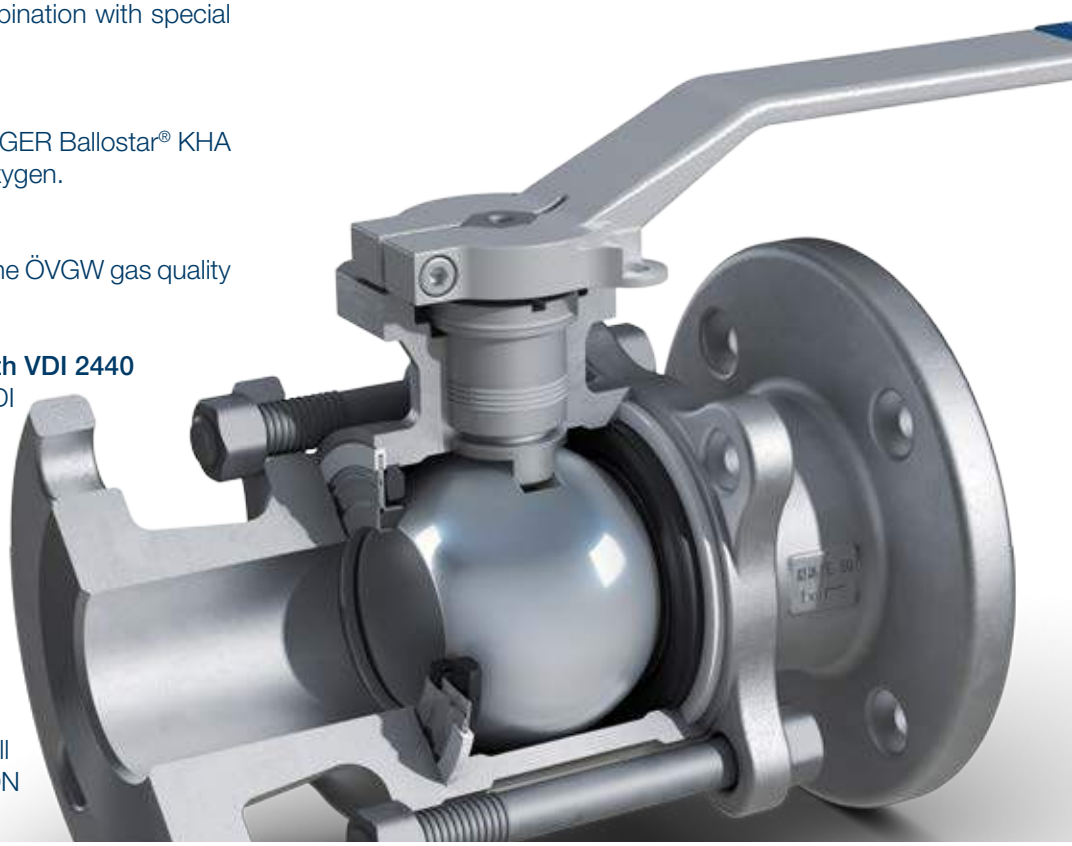
» **Valve for gas supply**
Certificate on the authorization to bear the ÖVGW gas quality trademark.

» **Emission testing in accordance with VDI 2440**
Certified emission testing pursuant to VDI 2440 for the KHA labyrinth stuffing box at room ambient temperature and at temperatures ≥ 250 °C. Testing of the KHA O-ring stuffing box (Viton) at ambient room temperature.

» **Standard antistatic**
The KLINGER Ballostar® KHA features standardized antistatic equipment in accordance with ISO 7121 and EN 1983 respectively. An antistatic ball ensures electrostatic discharge from DN 50 upwards.

» **Operational safety**
The KLINGER Ballostar® KHA has a fitting for the installation of a locking device as a standard feature. This negates unintended utilization.

» **3.1 Final inspection certificate**
In order to ensure quality, application safety and guaranteed tightness for the operator, the KLINGER Ballostar® KHA is standard-issued with a final inspection certificate on the basis of the norm EN 10204 – 3.1.



SUSTAINABLE EFFICIENCY

Reliability across the entire lifecycle

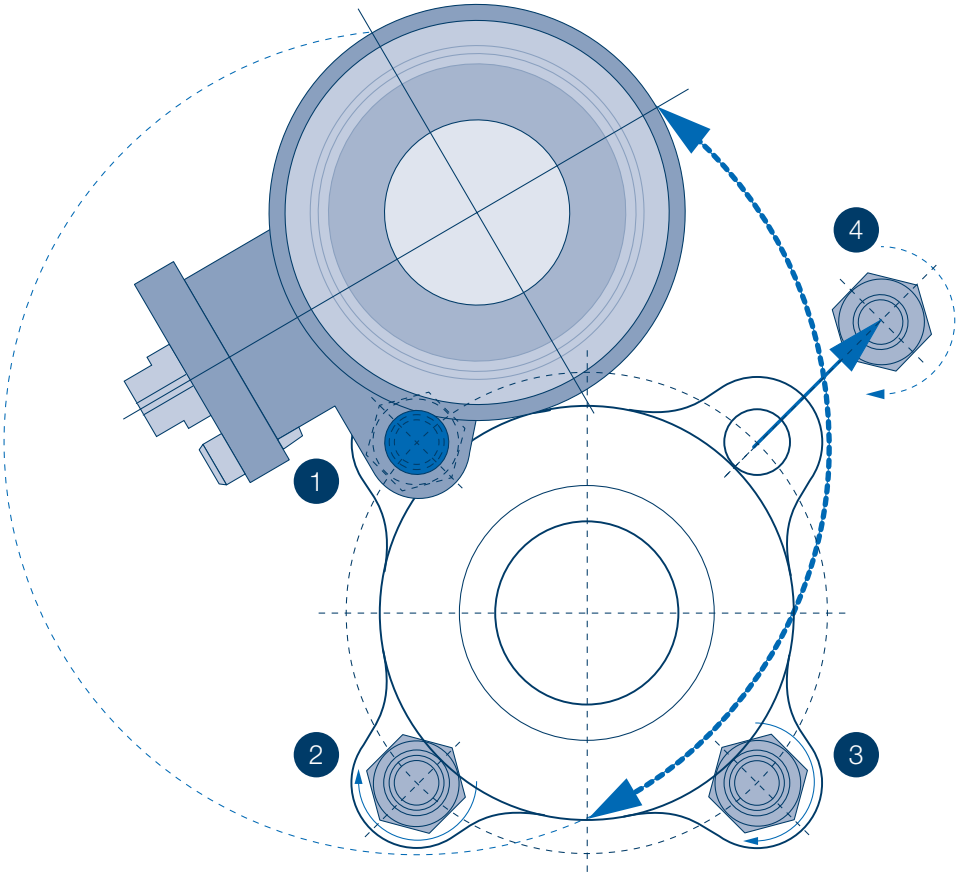
The KLINGER Ballostar® KHA is characterized by its low costs across the entire lifecycle of the valve (TCO) as well as by its high durability. As a result of its modularity, only affected components need to be replaced in the course of maintenance. This significantly increases the operating time of the valve in the system. For the operator, this means lower costs with regard to plant maintenance, stock keeping as well as installation – at continuously high safety levels. With its unique design, the KLINGER Ballostar® KHA also offers plant operators the flexibility, which dynamic markets demand today: Thanks to a wide range of modular system components, which can be individually combined among themselves, the ball valve can be equipped, refitted or retrofitted for each application case.

SIMPLE MAINTENANCE WITHOUT REMOVAL FROM THE LINE

During maintenance and service work, the nuts 1-3 need to be removed with the bolt. The remaining nut (4) is only loosened. This allows the core element of the valve to be swung out without major effort and removal from the line, while simultaneously providing access to the two sealing elements in the bore. These can also be easily removed and replaced. Changing the stuffing box seals, removal of the ball and the operating stem (applies to the models KHA SL, SK and G) is also carried out in a very user-friendly manner.

Replacement part: **Ball**

Replacement part: **Sealing elements**



BALLOSTAR®
KHA

Overview of types

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BALLOSTAR®
KHA-FL

Long flange design

GENERAL FEATURES
» 3-piece ball valve with full or reduced bore
» Floating ball, antistatic, lockable
» Double tightness in both directions
» Modular system components

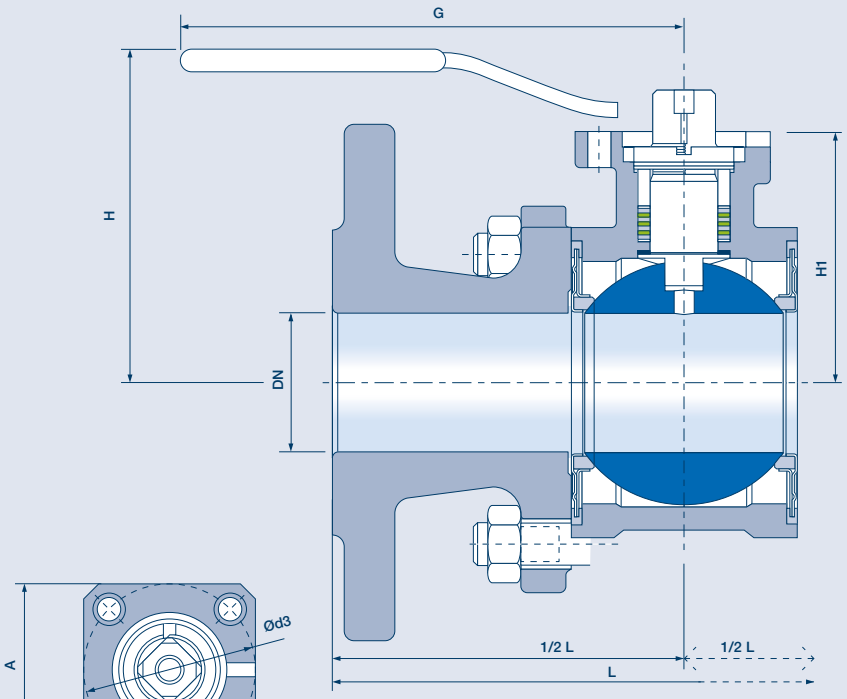
CONNECTIONS
Flange in accordance with EN 1092-1 (VIII, Xc)
Flange in accordance with EN 1092-2 (III)

DIMENSIONS
Face-to-face dimensions in accordance with EN 558-1, series 1

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
-196 °C to +400 °C (see pT diagram)



KHA-FL VARIANTS

FULL BORE
Material: Grey cast iron EN-GJL-250
(Material code III)*

*refers to flange, body made of steel casting

	Dimensions				PN			Mounting flange for actuator				Weight
DN	L	H	H1	G	III	VIII	Xc	ISO	A	Ød3	Ød4	kg
15	130	80	35	130	16			F04	42	42	5.8	2.4
50	230	131	90	315	16			F07	70	70	10	13.8
65	290	141	100	315	16			F07	70	70	10	20.7
80	310	162	122	500	16			F10	102	102	12	30.9
100	350	176	135	500	16			F10	102	102	12	44

FULL BORE
Material: Steel casting 1.0619
(Material code VIII)
Stainless steel casting 1.4408
(Material code Xc)

10	120	80	35	130		40	40	F04	42	42	5.8	2.3
15	130	80	35	130		40	40	F04	42	42	5.8	2.4
20	150	94	46	160		40	40	F04	42	42	5.8	3.7
25	160	98	50	160		40	40	F04	42	42	5.8	4.7
32	180	106	65	250		40	40	F05	50	50	7	7.4
40	200	113	72	250		40	40	F05	50	50	7	9.8
50	230	131	90	315		40	40	F07	70	70	10	14.5
65	290	141	100	315		40	40	F07	70	70	10	20.6
80	310	162	122	500		40	40	F10	102	102	12	31.6
100	350	176	135	500		40	40	F10	102	102	12	44.8
125	400	211	175	650		40	40	F12	125	125	15	75.7

Subject to modification of designs and dimensions.

BALLOSTAR®
KHA-FL

Long flange design

GENERAL FEATURES
» 3-piece ball valve with full or reduced bore
» Floating ball, antistatic, lockable
» Double tightness in both directions
» Modular system components

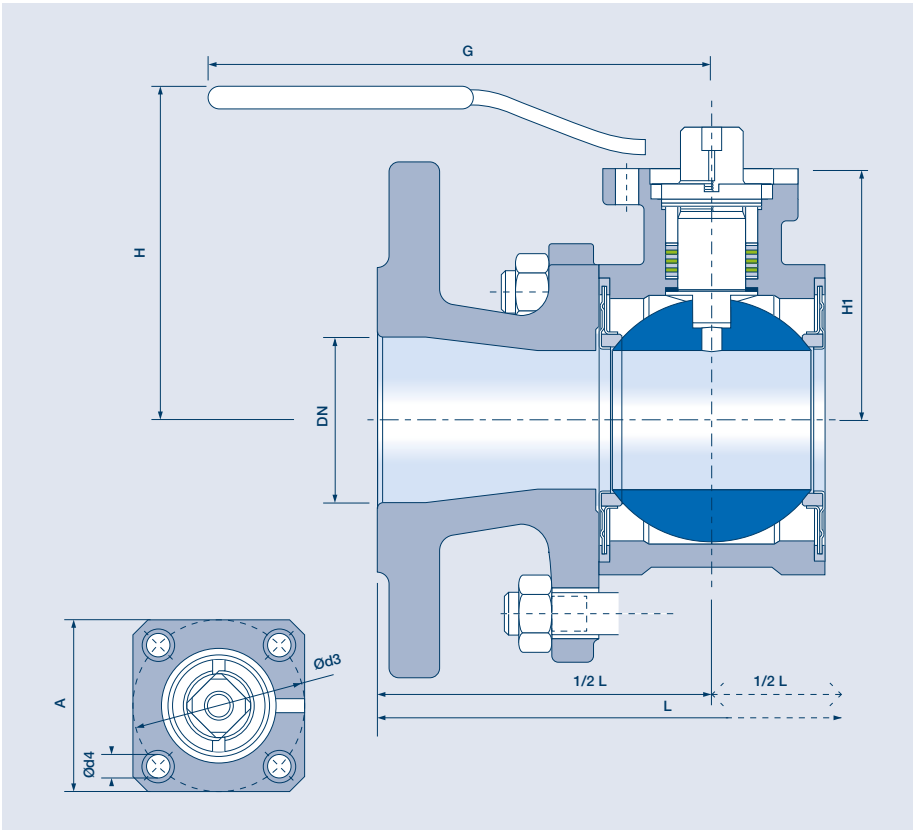
CONNECTIONS
Flange in accordance with EN 1092-1 (VIII, Xc)
Flange in accordance with EN 1092-2 (III)

DIMENSIONS
Face-to-face dimensions in accordance with EN 558-1, series 1 to DN 100R80
Face-to-face dimensions in accordance with EN 558-1, series 27 for DN 125R100 and 150R125

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
-196 °C to +400 °C (see pT diagram)



KHA-FL VARIANTS

REDUCED BORE
Material: Grey cast iron EN-GJL-250 (Material code III)*

*refers to flange, body made of steel casting

	Dimensions				PN			Mounting flange for actuator				Weight
DN	L	H	H1	G	III	VIII	Xc	ISO	A	Ød3	Ød4	kg
20R15	150	80	35	130	16			F04	42	42	5.8	2.7
25R20	160	94	46	160	16			F04	42	42	5.8	3.8
32R25	180	98	50	160	16			F04	42	42	5.8	5.7
40R32	200	106	65	250	16			F05	50	50	7	7.5
50R40	230	113	72	250	16			F05	50	50	7	10.7
65R50	290	131	90	315	16			F07	70	70	10	16.5
80R65	310	141	100	315	16			F07	70	70	10	22.3
100R80	350	162	122	500	16			F10	102	102	12	34
125R100	325	176	135	500	16			F10	102	102	12	45.9
150R125	350	211	175	650	16			F12	125	125	15	73

REDUCED BORE
Material: Steel casting 1.0619 (Material code VIII)
Stainless steel casting 1.4408 (Material code Xc)

20R15	150	80	35	130		40	40	F04	42	42	5.8	3.2
25R20	160	94	46	160		40	40	F04	42	42	5.8	4.4
32R25	180	98	50	160		40	40	F04	42	42	5.8	5.9
40R32	200	106	65	250		40	40	F05	50	50	7	8.1
50R40	230	113	72	250		40	40	F05	50	50	7	11.6
125R100	325	176	135	500		40	40	F10	102	102	12	51.7

BALLOSTAR®
KHA-FK

Short flange design

GENERAL FEATURES
» 3-piece ball valve with full or reduced bore
» Floating ball, antistatic, lockable
» Double tightness in both directions
» Modular system components

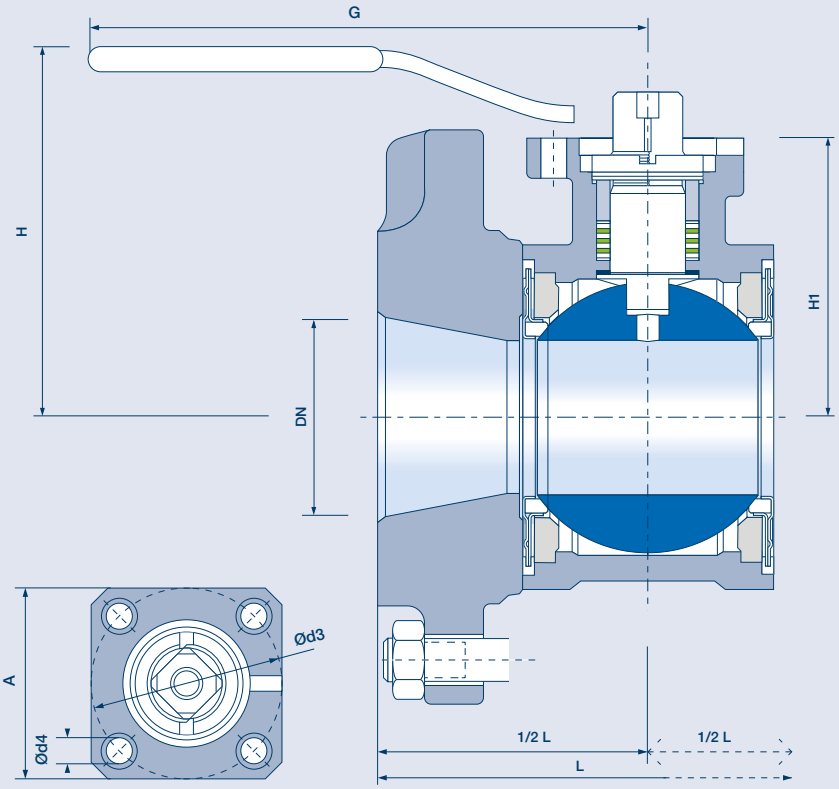
CONNECTIONS
Flange in accordance with EN 1092-1 (VIII, Xc)
Flange in accordance with EN 1092-2 (III)

DIMENSIONS
Face-to-face dimensions in accordance with EN 558-1, series 27

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
-196 °C to +400 °C (see pT diagram)



KHA-FK VARIANTS

	Dimensions				PN			Mounting flange for actuator				Weight
DN	L	H	H1	G	III	VIII	Xc	ISO	A	Ød3	Ød4	kg
65R50	170	131	90	315	16			F07	70	70	10	14
80R65	180	141	100	315	16			F07	70	70	10	19.4
100R80	190	162	122	500	16			F10	102	102	12	26
65R50	170	131	90	315		40	40	F07	70	70	10	15.3
80R65	180	141	100	315		40	40	F07	70	70	10	20.2
100R80	190	162	122	500		40	40	F10	102	102	12	28.8

REDUCED BORE
Material: Grey cast iron EN-GJL-250
(Material code III)*
Steel casting 1.0619
(Material code VIII)
Stainless steel casting 1.4408
(Material code Xc)

*refers to flange, body made of cast steel

Subject to modification of designs and dimensions.

BALLOSTAR®
KHA-G

Threaded connection

GENERAL FEATURES
» 3-piece ball valve with full or reduced bore
» Floating ball, antistatic, lockable
» Double tightness in both directions
» Modular system components

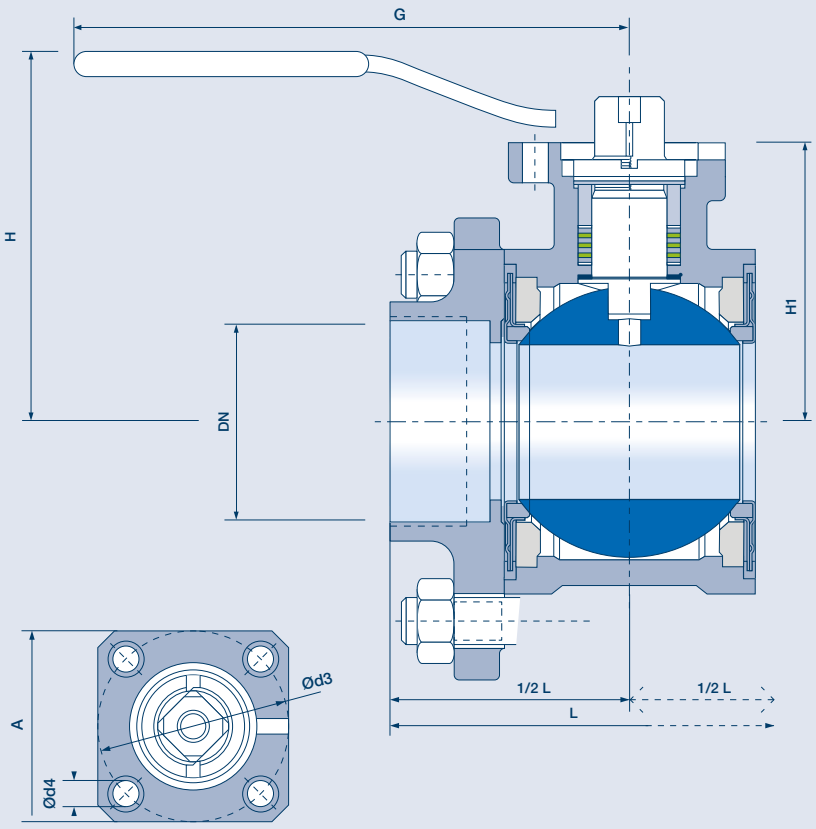
CONNECTIONS
Internal thread Rp in accordance with EN 10226-1

DIMENSIONS
Face-to-face dimensions in accordance with DIN 3202 Pt. 4

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
-196 °C to +400 °C (see pT diagram)



Schematic representation: reduced bore

KHA-G VARIANTS

FULL BORE
Material: Grey cast iron EN-GJS-400-15 (Material code III)*
Steel casting 1.0619 (Material code VIII)
Stainless steel casting 1.4408 (Material code Xc)
*refers to threaded connection, body made of cast steel

REDUCED BORE
Material: Steel casting 1.0619 (Material code VIII)
Stainless steel casting 1.4408 (Material code Xc)

	Dimensions				PN			Mounting flange for actuator				Weight
DN	L	H	H1	G	III	VIII	Xc	ISO	A	Ød3	Ød4	kg
3/8“	75	80	35	130		100	63	F04	42	42	5.8	0.8
1/2“	85	80	35	130		100	63	F04	42	42	5.8	0.9
3/4“	95	94	46	160		100	63	F04	42	42	5.8	1.5
1“	105	98	50	160		63	40	F04	42	42	5.8	1.9
1 1/4“	120	106	65	250		63	40	F05	50	50	7	3.2
1 1/2“	130	113	72	250		63	40	F05	50	50	7	4.8
2“	150	131	90	315		40	40	FO7	70	70	10	8.2
1/2“ / R15	75	80	35	130	16			F04	42	42	5.8	0.6
3/4“ / R15	80	80	35	130	16	100	63	F04	42	42	5.8	0.8
1“ / R20	90	94	46	160	16	100	63	F04	42	42	5.8	1.4
1 1/4“ / R25	110	98	50	160	16	63	40	F04	42	42	5.8	1.9
11/2“ / R32	120	106	65	250	16	63	40	F05	50	50	7	2.8
2“ /R40	140	113	72	250	16	63	40	F05	50	50	7	4.7

BALLOSTAR®
KHA-SL

Long welding ends

GENERAL FEATURES
» 3-piece ball valve with full or reduced bore
» Floating ball, antistatic, lockable
» Double tightness in both directions
» Modular system components

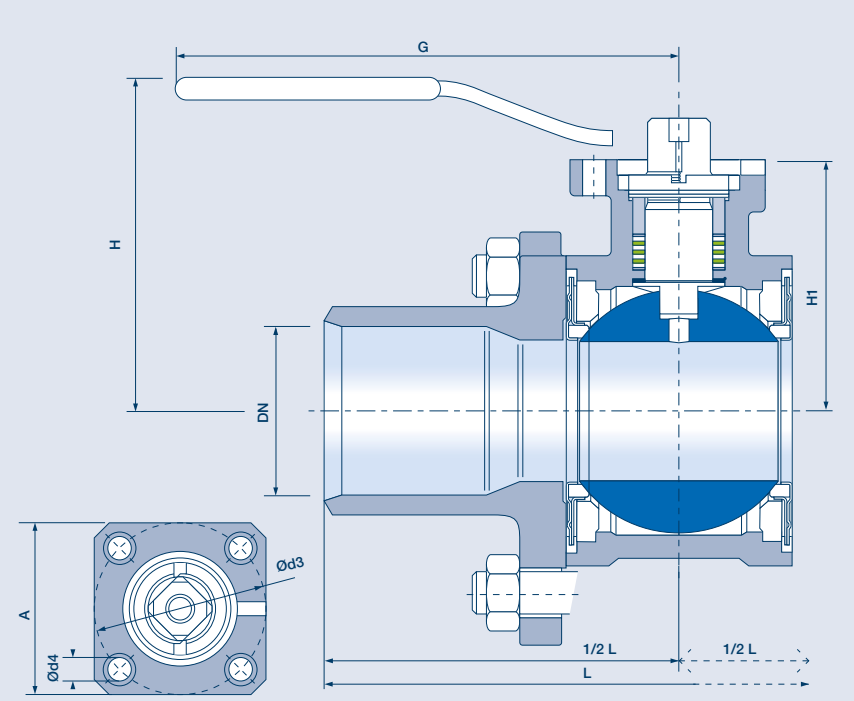
CONNECTIONS
Welding ends in accordance with DIN EN 12627

DIMENSIONS
FTF dimensions in accordance with DIN EN 12982, series 68 (DN 10-40 and 20R15-40R32)
FTF dimensions in accordance with ANSI B16.10 Cl. 300 (DN 50-100 and 50R40-100R80)
FTF dimensions in accordance with DIN EN 12982, series 7 (DN 125)

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
-196 °C to +400 °C (see pT diagram)



Schematic representation: reduced bore

KHA-SL VARIANTS

FULL BORE
Material: Steel casting 1.0619
(Material code VIII)
Stainless steel casting 1.4408
(Material code Xc)

REDUCED BORE
Material: Steel casting 1.0619
(Material code VIII)
Stainless steel casting 1.4408
(Material code Xc)

	Dimensions				PN		Mounting flange for actuator				Weight
DN	L	H	H1	G	VIII	Xc	ISO	A	Ød3	Ød4	kg
10	270	80	35	130	100	63	F04	42	42	5.8	1.1
15	270	80	35	130	100	63	F04	42	42	5.8	1.1
20	270	94	46	160	100	63	F04	42	42	5.8	1.9
25	270	98	50	160	63	40	F04	42	42	5.8	2.5
32	270	106	65	250	63	40	F05	50	50	7	3.9
40	270	113	72	250	63	40	F05	50	50	7	5.4
50	216	131	90	315	40	40	F07	70	70	10	8.5
65	241	141	100	315	40	40	F07	70	70	10	12.5
80	282	162	122	500	40	40	F10	102	102	12	21.2
100	305	176	135	500	40	40	F10	102	102	12	30.1
125	356	211	175	650	40	40	F12	125	125	15	55
20R15	270	80	35	130	100	63	F04	42	42	5.8	1.3
25R20	270	94	46	160	100	63	F04	42	42	5.8	2.2
32R25	270	98	50	160	63	40	F04	42	42	5.8	2.7
40R32	270	106	65	250	63	40	F05	50	50	7	3.9
50R40	216	113	72	250	63	40	F05	50	50	7	5.6
65R50	241	131	90	315	40	40	F07	70	70	10	8.9
80R65	282	141	100	315	40	40	F07	70	70	10	12.9
100R80	305	162	122	500	40	40	F10	102	102	12	23.1

Subject to modification of designs and dimensions.

BALLOSTAR®
KHA-SK

Short welding ends

GENERAL FEATURES
» 3-piece ball valve with full or reduced bore
» Floating ball, antistatic, lockable
» Double tightness in both directions
» Modular system components

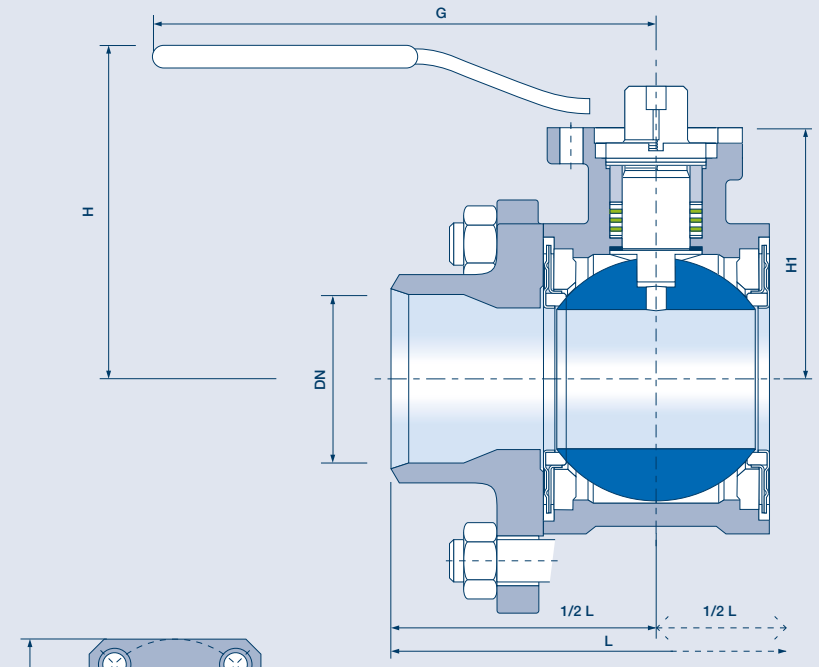
CONNECTIONS
Welding ends in accordance with DIN EN 12627

DIMENSIONS
Face-to-face dimensions in accordance with DIN EN 12982, series 67

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
-196 °C to +400 °C (see pT diagram)



Schematic representation: reduced bore

KHA-SK VARIANTS

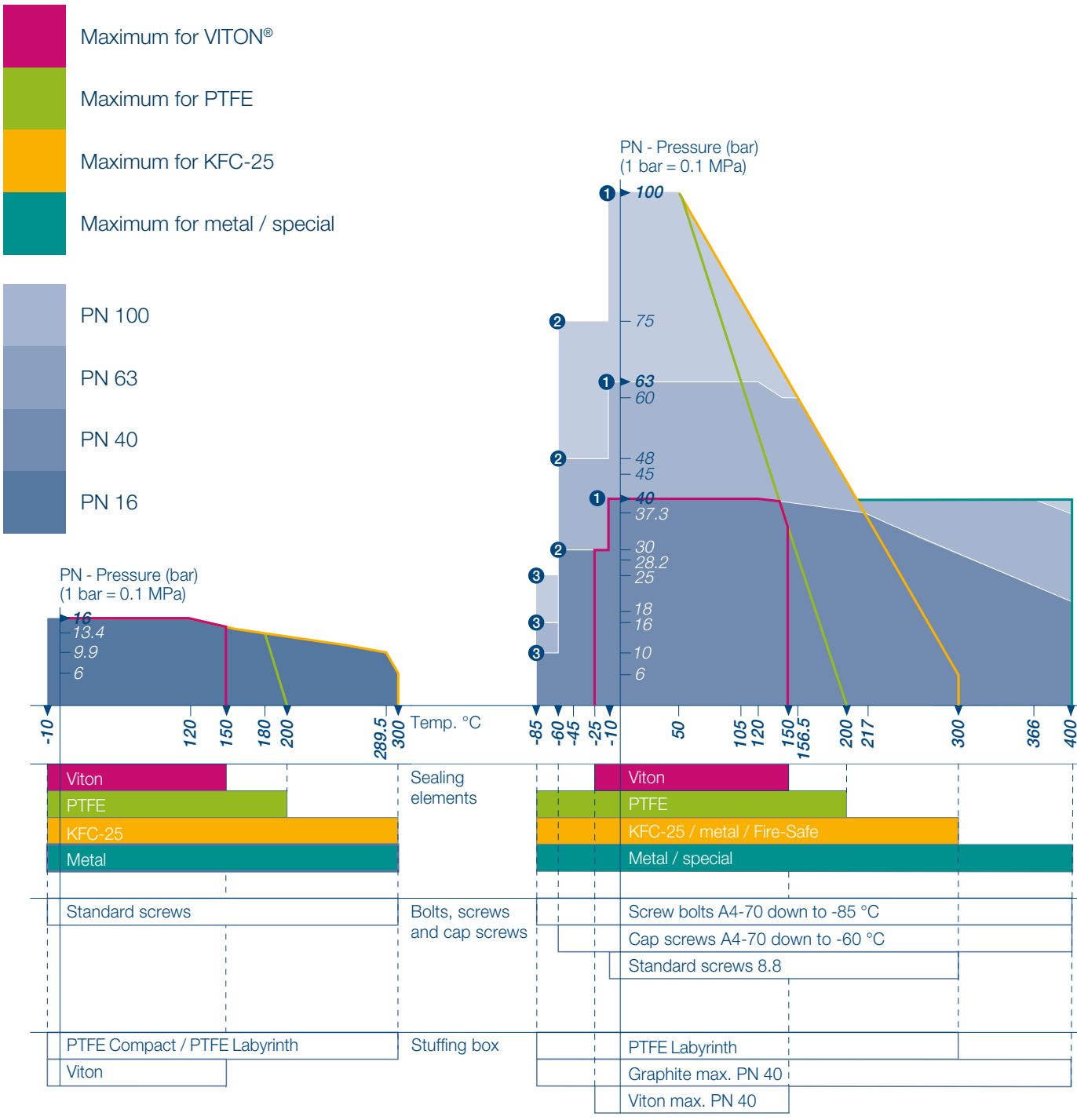
FULL BORE
Material: Steel casting 1.0619 (Material code VIII)
Stainless steel casting 1.4408 (Material code Xc)

REDUCED BORE
Material: Steel casting 1.0619 (Material code VIII)
Stainless steel casting 1.4408 (Material code Xc)

	Dimensions				PN		Mounting flange for actuator				Weight
DN	L	H	H1	G	VIII	Xc	ISO	A	Ød3	Ød4	kg
10	70	80	35	130	100	63	F04	42	42	5.8	0.6
15	75	80	35	130	100	63	F04	42	42	5.8	0.8
20	90	94	46	160	100	63	F04	42	42	5.8	1.4
25	100	98	50	160	63	40	F04	42	42	5.8	1.6
32	110	106	65	250	63	40	F05	50	50	7	3
40	125	113	72	250	63	40	F05	50	50	7	4.7
20R15	90	80	35	130	100	63	F04	42	42	5.8	0.8
25R20	100	94	46	160	100	63	F04	42	42	5.8	1.4
32R25	110	98	50	160	63	40	F04	42	42	5.8	1.8
40R32	125	106	65	250	63	40	F05	50	50	7	3.1
50R40	150	113	72	250	63	40	F05	50	50	7	5

AREAS OF UTILIZATION

Pressure and temperature ranges



Grey cast iron

Material code III

Steel casting

Material code VIII

The pT diagrams illustrate the influence of the three body materials, the sealing materials and the actuator shafts on the area of utilization of the ball valve.

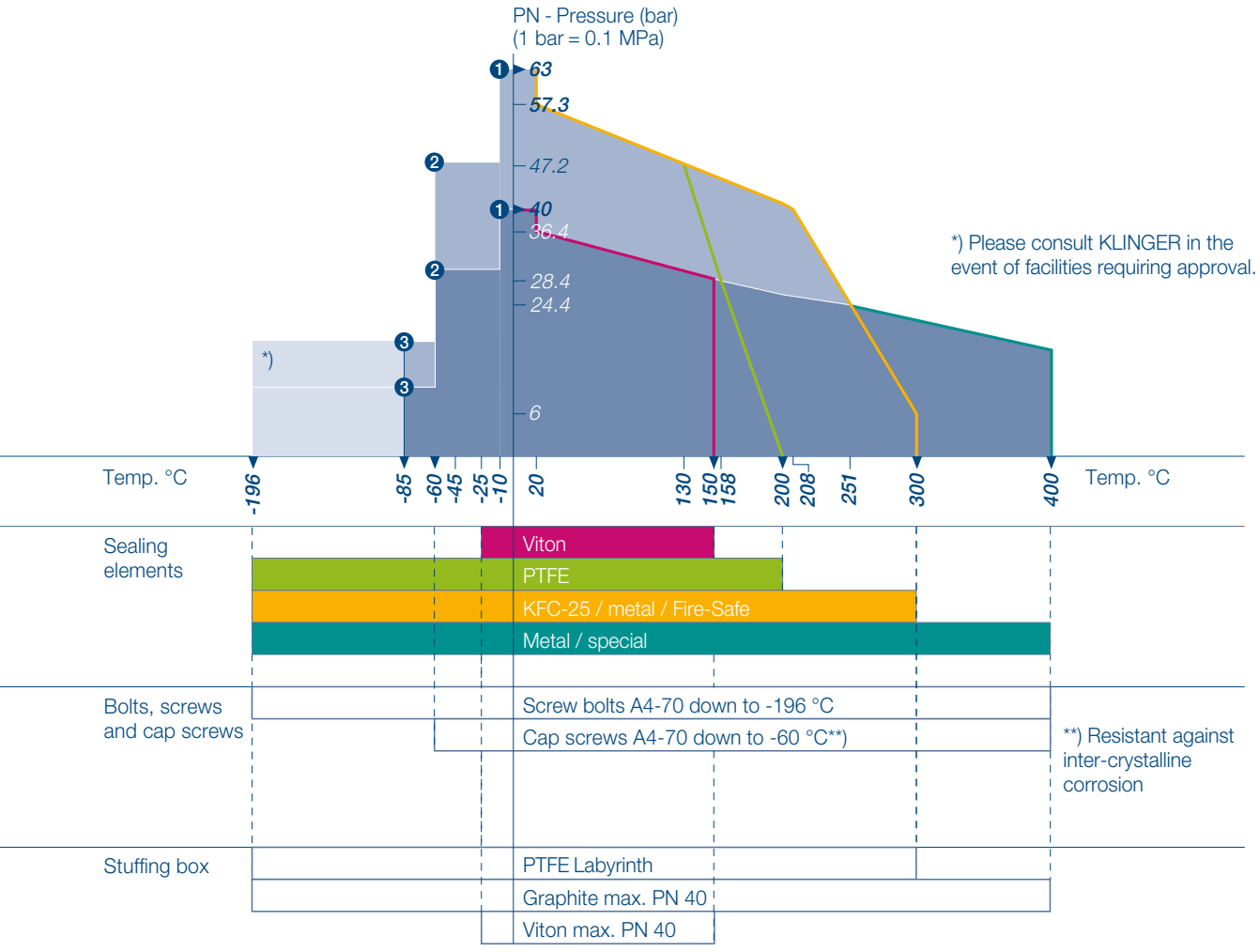
This represents safety at the highest level. Insert your operating point into the diagram fields and you will identify whether your safety reserves meet your requirements. At the same time, you will see which parameters may require further change. Carrying out your selection on the basis of this principle, you will optimize the cost-effectiveness of your valve.

1 If the operating pressure is between 75 - 100 % of the nominal pressure, then the application field in all three pressure stages (PN 100, 63 40) will reach down to -10 °C.

2 If the operating pressure, including load peaks, is between 25 - 75 %, the field of application increases to -60 °C. Cap screws made of the material A4 -70 are a pre-requirement in this case.

3 If the operating pressure reaches a maximum of 25 % of the nominal pressure, the safety range of the valve increases to -85 °C. Actuator shafts made of the material A4-70 also represent a pre-requirement in this case.

In case the operating pressure drops into the nominal pressure range, the application field in the temperature range will increase.



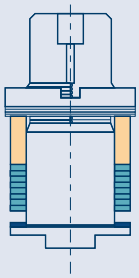
Stainless steel casting

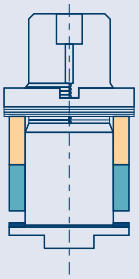
Material code Xc

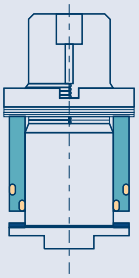
AREAS OF UTILIZATION

Stuffing boxes

As a standard, the ball valves are fitted with the stuffing box PTFE Labyrinth and the sealing element KFC-25. The remaining designs listed here can be optionally requested upon order. Special designs are supplied with a type plate.







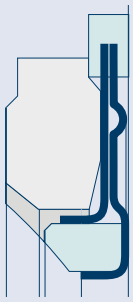
Recommended

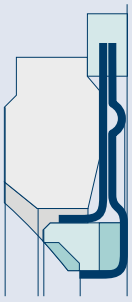
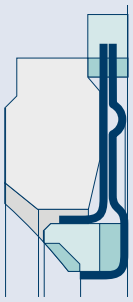
Less suitable

Not recommended

		PTL	GRK	VIT
		PTFE Labyrinth	Graphite Compact	Viton
Media	Water / hot water	■	■	■
	Mineral oil	■	■	■
	Heat-transfer oil	■	■	■
	Liquid gas / cryogenic temperature	■	■	■
	Saturated steam	■	■	■
	Misc. gases	■	■	■
	Vacuum / full vacuum	■	■	■
	Hot steam (max. 300 °C)	■	■	■
	Oxygen	■		
Operating conditions	Standard utilization	■		
	High number of cycles	■	■	■
	Frequent temperature changes	■	■	■
	Fire safety (Fire-Safe)	■	■	■
	Chemical industry	■	■	■
	Abrasive media	■	■	■
	Temperature range (°C)	-196 | +300	-85 | +400	-25 | +150
Certifications	VDI 2440	+		+
	ÖVGW			+
	Fire-Safe API 607 4th edition, EN ISO 10497:2004	+		
	TA-Luft	+		+
	VdTÜV 1065	+		
	EN 161			+

Sealing elements



KFC	**PTF**	**MET**	**MES**	**VIR**	**FIS**
KFC-25	PTFE	Metal*	Metal / special*	Viton	Fire-Safe
-196 | +300	-196** | +200	-196 | +300	-60 | +400	-25 | +150	-196 | +300
+					
+					
					+
+					
+					

*permissible internal leakage rate at 6 bar of water pressure: 1 Per mille of the K_{vs}-value per minute | **special equipment and accessories for cryogenic temperature.

ACTUATOR SELECTION

Actuation torque for the various seals

KFC-25

Nominal diameter DN		Differential pressure (bar)										
		0	5	10	16	20	25	30	40	50	63	100
Inch	mm	Torque (Nm)										
3/8"	10	6	6.2	6.4	6.6	6.8	7	7.2	7.6	8	8.5	10
1/2"	15	6	6.2	6.4	6.6	6.8	7	7.2	7.6	8	8.5	10
3/4"	20	12	12.4	12.7	13.1	13.4	13.8	14.1	14.8	15.5	16.4	19
1"	25	14	15	16.1	17.3	18.1	19.2	20.2	22.3	24.3	27	
1 1/4"	32	17	18.4	19.9	21.6	22.7	24.1	25.6	28.4	31.3	35	
1 1/2"	40	25	27.8	30.6	33.9	36.1	38.9	41.7	47.2	52.8	60	
2"	50	37	40.6	44.3	48.6	51.5	55.1	58.8	66			
2 1/2"	65	60	66.3	72.5	80	85	91.3	97.5	110			
3"	80	96	114	132	153.6	168	186	204	240			
4"	100	160	183.8	207.5	236	255	278.8	302.5	350			
5"	125	270	317.5	365	422	460	507.5	555	650			
6"	150	270	317.5	365	422							

PTFE

3/8"	10	5.4	5.6	5.8	6	6.1	6.3	6.5	6.4	7.2	7.7	9
1/2"	15	5.4	5.6	5.8	6	6.1	6.3	6.5	6.4	7.2	7.7	9
3/4"	20	10.8	11.1	11.4	11.8	12.1	12.4	12.7	13.3	14	14.8	17.1
1"	25	12.6	13.5	14.5	15.6	16.3	17.2	18.2	20	21.9	24.3	
1 1/4"	32	15.3	16.6	17.9	19.4	20.4	21.7	23	25.6	28.2	31.5	
1 1/2"	40	21.3	23.6	26	28.8	30.7	33.1	35.4	40.1	44.9	51	
2"	50	30.3	33.3	36.3	39.9	42.2	45.2	48.2	54.1			
2 1/2"	65	51	56.3	61.6	68	72.3	77.6	82.9	93.5			
3"	80	72	85.5	99	115.2	126	139.5	153	180			
4"	100	120	137.8	155.6	177	191.3	209.1	226.9	262.5			
5"	125	202.5	238.1	273.8	316.5	345	380.6	416.3	487.5			
6"	150	202.5	238.1	273.8	316.5							

METAL/SPECIAL

3/8"	10	7.5	7.8	8.2	8.5	8.8	9.1	9.5	10.1	10.8	11.6	14
1/2"	15	7.5	7.8	8.2	8.5	8.8	9.1	9.5	10.1	10.8	11.6	14
3/4"	20	15	15.7	16.4	17.2	17.8	18.5	19.2	20.6	22	23.8	29
1"	25	18	19.4	20.9	22.6	23.7	25.1	26.6	29.4	32.3	36	
1 1/4"	32	25	26.7	28.3	30.3	31.7	33.3	35	38.3	41.7	46	
1 1/2"	40	40	44.8	49.5	55.2	59	63.8	68.6	78.1	87.6	100	
2"	50	55	64.4	73.8	85	92.5	101.9	111.3	130			
2 1/2"	65	85	101.9	118.8	139	152.5	169.4	186.3	220			
3"	80	140	172.5	205	244	270	302.5	335	400			
4"	100	250	293.8	337.5	390	425	468.8	512.5	600			
5"	125	450	580	710	866	970	1,100					
6"	150	450	580	710	866							

VITON

Nominal diameter DN		Differential pressure (bar)			
		0	5	10	16
Inch	mm	Torque (Nm)			
1"	25	14	15.9	17.8	20
1 1/4"	32	18	20.2	22.4	25
1 1/2"	40	25	29.7	34.4	40
2"	50	40	49.4	58.8	70
2 1/2"	65	55	72.2	89.4	110
3"	80	100	150	200	260
4"	100	160	219.4	278.8	350

For standard computations, KLINGER recommends the factor 1.5, i.e. using plus 50 %. With regard to ball valves with reduced bores, the values of the preceding row, i.e. a smaller nominal diameter, must be taken into account.

TECHNICAL DETAILS

Flow characteristics for the determination of the nominal diameter

SIZE OF BALL VALVE

Flow rate	Q	in m^3/h
Pressure loss	Δp	in bar
Density	ρ	in kg/m^3
Velocity	w	in m/s
Flow coefficient	K_v	in m^3/h
Pressure loss coefficient	ζ	

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_v-value is greater, or the ζ-value less than the computed value.

FLOW VALUES

DN (mm)	ζ	K_{vs}-value
10	0.35	6.8
15	0.23	18.8
20	0.20	35.8
25	0.14	66.8
32	0.12	118
40	0.11	193
50	0.10	316
65	0.076	607
80	0.067	980
100	0.058	1,645
125	0.051	2,742
20R15	0.96	16.3
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	0.30	730
125R100	0.30	1,141
150R125	0.30	1,642

PRESSURE LOSSES

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

or

$$\Delta p = \left(\frac{Q}{k_v}\right)^2 * \frac{\rho}{1000}$$

The characteristic unit for shut-off and control valves is the K_v-value.
The values provided in the table apply to a H_2O flow medium with a temperature of 5 – 30 °C, a density of 1000 kg/m^3 and a pressure loss of p = 1 bar at the valve.

In metric measurement systems the characteristic unit utilized is the K_v-value. In countries using inches, the characteristic unit is described by means of the cV-value. It provides how many US gal/min of water, at a temperature of 60 °F and with a pressure loss of 1 psi, flow through the valve.

PRODUCT OVERVIEW

Ballostar® KHI ball valves

Monolith KHO ball valves

Ballostar® KHE ball valves

KVN piston valves

AREAS OF APPLICATION

INDUSTRY

OIL & GAS

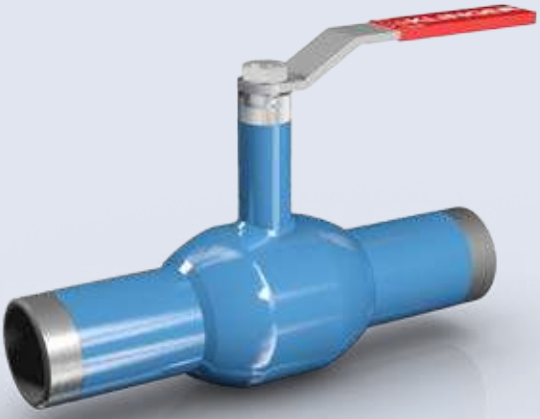
CHEMICAL

INFRASTRUCTURE

ENERGY

PHARMA

Monoball® KHM ball valves



Ballostar® KHA ball valves

AB-cocks

Gauge-glasses

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