KLINGER India

KLINGER BALLOSTAR® KHA

3-piece ball valves
DN 15-125

KLINGER Fluid Control

www.klinger.in

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 135 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 reliabilty as well as by an above average lifecycle at a simultaneously very low 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:

Flexible production

Transparency in the supply chain

Product tests in the in-house test laboratory

Processing up to 6 tons of steel

11,000 m² production hall

~110 employees

110 employees work for KLINGER Fluid Control.

OPERATIONAL EXCELLENCE

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

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

ENCOMPASSING SERVICE

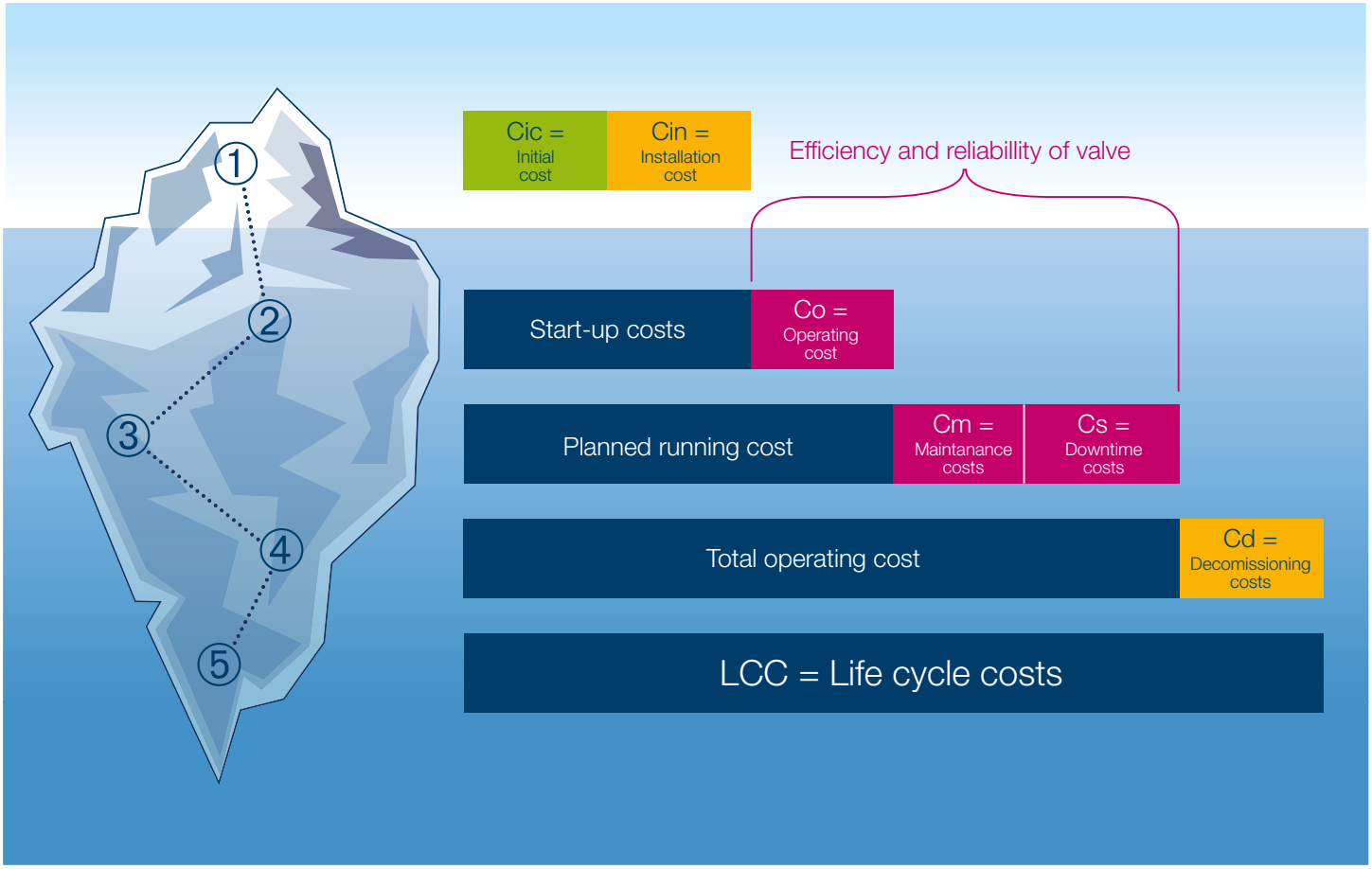
- Application expertise
- Product trainings
- Fast quotation and order processing
- Customer-specific logistics concepts
- Supply of spare parts
- Valve maintenance
- On-site technical support

70 service and sales companies worldwide

SUSTAINABLE EFFICIENCY

Cost efficiency and reliability at its best

The KLINGER Ballostar KHA is characterized by its low costs across the entire lifecycle of the valve (total cost of ownership – TCO) as well as by its extreme longevity. Due to its modular build, only affected components need to be replaced in the course of maintenance. This significantly increases the service life of the valve in the system. The plant operator therefore profits from lower costs during plant maintenance as well as from reduced storage and installation costs – while continuously retaining high levels of safety. With its unique design the KLINGER Ballostar KHA also offers plant operators the flexibility demanded by today's dynamic markets: Thanks to a broad selection of individually combinable modular system components, the ball valve can be equipped, refitted or even retrofitted for every possible application.



① **Cic** = Initial cost + **Cin** = Installation costs

② Start-up costs + **Co** (Operating costs (Co)) are costs associated with keeping the plant running (more specifically energy costs associated with pressure loss).

③ Planned running costs + **Cm** + **Cs**
Cm = Maintenance costs for KLINGER Fluid Control ball valves are very low due to the avoidance of the following:
Operating and checking the valve on a regular basis.
Dismantling the valve to change the sealing element.
Installation of the repaired or a new valve in the line.

Cs = Downtime costs can be very high. Emptying the pipe, repairing the valve as well as refilling and testing the network section can generate 20 to 30 % additional costs on top of the cost for the downtime.

④ Total operating Costs + **Cd** (Decommissioning cost, which is the cost incurred by companies in reversing the modifications made to landscape when a fixed asset is used up).

THE MULTI-TALENTED KHA

One product - many applications

Aflas/Graphite/Peek
(FS)

Labyrinth/Peek
(LABP)

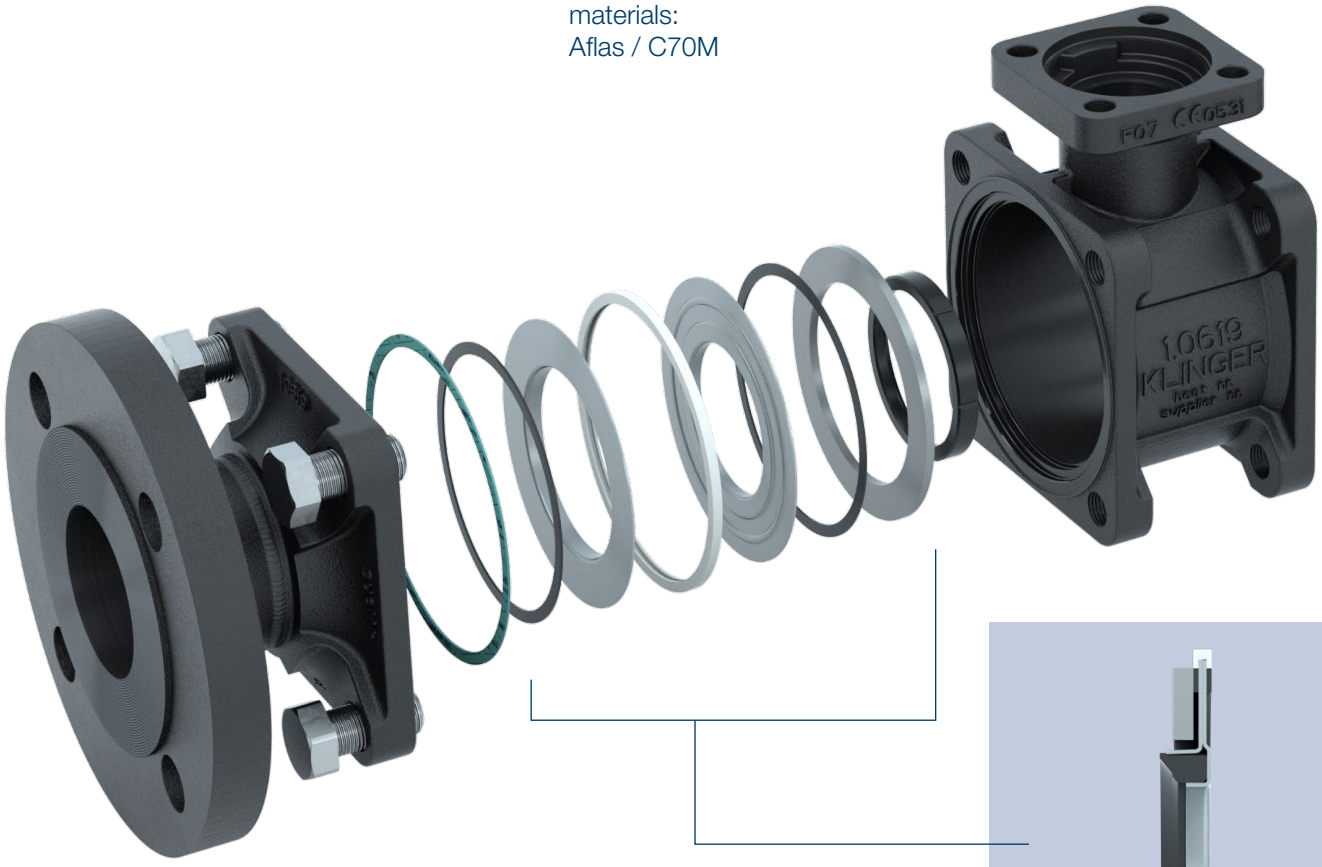
PURE PTFE/Peek
(PTFE)

Viton/Peek
(VIT)

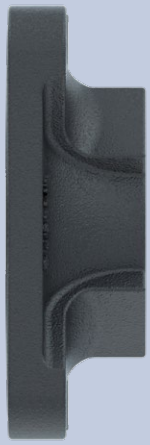
Graphite/
Peek
(GRA)

Gas O-rings &
Graphite/Peek
(GAS)

same design -
different O-ring
materials:
Aflas / C70M



Standard KFC Fire-Safe
(FF)



Threaded connection

Welding ends

Flanges

Standard KFC (KK)

PTFE (PP)

Viton (VV)

Gas KFC Fire-Safe (GG)

Metal (MM)

Metal special (SS)

Version	Common combinations in valve construction				Body material
	Sealing element type		Stuffingbox type		
Std. Fire-Safe		**"FF"** Standard KFC Fire Safe Multi part design With support ring		**"FS"** Aflas / Graphite / Peek Stuffingbox	Carbon steel Stainless steel Duplex
KFC-LABP		**"KK"** Standard KFC multi part design with support ring		**"LABP"** Labyrinth / Peek Stuffingbox	Carbon steel Stainless steel Duplex
PTFE		**"PP"** PTFE multi part design with support ring		**"LABP"** Labyrinth / Peek Stuffingbox	Carbon steel Stainless steel Duplex
PURE PTFE		**"PP"** PTFE multi part design with support ring		**"PTFE"** PURE PTFE / Peek Stuffingbox	Carbon steel Stainless steel Duplex
Viton		**"VV"** Viton multi part design with support ring		**"VIT"** Viton / Peek Stuffingbox	Carbon steel Stainless steel Duplex
Gas		**"GG"** Gas KFC Fire Safe One part design Without support ring Fire Safe GAS		**"GAS"** Hybrid Gas O-rings and graphite stuffingbox	Carbon steel Stainless steel Duplex
Metal		**"MM"** Metal multi part design with support ring		**"LABP"** Labyrinth / Peek Stuffingbox	Carbon steel Stainless steel Duplex
Metal special		**"SS"** Metal multi part design with support ring		**"GRA"** Graphite / Peek Stuffingbox	Carbon steel Stainless steel Duplex
DBB + TM		**"KK"** Standard KFC multi part design with support ring		**"AF"** Aflas / Peek Stuffingbox	Carbon steel Stainless steel Duplex
Ammonia		**"KK"** KFC multi part design with support ring (Upstream sealing element with pressure relief drilling)		**"C70M"** C70M / Peek stuffingbox for ammonia	Stainless steel Carbon steel Duplex

Body gasket	Application	Approvals/certificates Approvals
With body gaskets C4430	Standard applications Fire Safe applications Applications where TA Luft, VDI2440 or ISO15848 is required	Fire Safe acc. API607 & EN10497 TA Luft VDI2440 ISO15848 SIL 2
With body gaskets C4430	Standard applications Fire Safe applications Applications where TA Luft, VDI2440 or ISO15848 is required	TA Luft VDI2440 BAM approval when oil & grease free (KLN840) SIL2
With body gaskets C4430	Standard applications Chemical use	TA Luft VDI2440 BAM approval when oil & grease free (KLN840) PTFE seal ring with FDA approval SIL2
With body gaskets C4430	Chemical use Applications where graphite material is not allowed	SIL2 PTFE seal ring with FDA approval
With body gaskets C4430	For low vacuum application	TA Luft VDI2440 SIL2
With body gaskets C4430	For gas applications	Fire Safe acc. API607 & EN10497 Gas certificate ÖVGW/DVGW SIL2
With body gaskets C4430	When solids or particles are present in the fluid/gas	TA Luft VDI2440 SIL2
With body gaskets C4430	When solids or particles are present in the fluid/gas For high service temperatures until 400°C	SIL2
With body gaskets C4430	Double block & bleed Trunnion mounted	DBB: certificate of DBB functionality SIL2
With body gaskets C4430	For ammonia applications Upstream sealing element with pressure relief hole KLN2414/8 Temperature range -35°C to 125°C Carbon steel body: Temperature range -20°C to 125°C	SIL2

TECHNICAL HIGHLIGHTS

Absolute operational safety with certified quality

FIRE SAFETY

The ball valve can be used for fire safe applications at any given time as the basic design is already certified per default. In this context, the KLINGER Ballostar KHA offers a more stable bolting of the body with shorter bolts for greater mechanical stability with regard to thermal expansion. The type-testing fire safety requirements in accordance with API Standard 607, 7th Edition, and EN ISO 10497:2010 have been officially certified.

IMPROVED CORROSION PROTECTION

KLINGER **A**dvanced **C**orrosion **P**rotection is a newly developed, special coating procedure with galvanic coating ensuring improved protection against corrosion. An impressive value of 400 h was determined in the course of a “neutral salt spray mist test” in accordance with ISO 9227. A comparison: Common phosphatization leads to 20 h, while standard finishing only results in 100 h of protection. This value corresponds to a salt spray test duration comparable with a C3 coating in accordance with ISO 12944-1.

SERIAL ANTISTATIC

The KLINGER Ballostar KHA features serial antistatic equipment in accordance with ISO 7121 and EN 1983 respectively. In this context, an antistatic ball, from DN 50 upwards, ensures the electrostatic discharge.

EMISSION-TIGHT

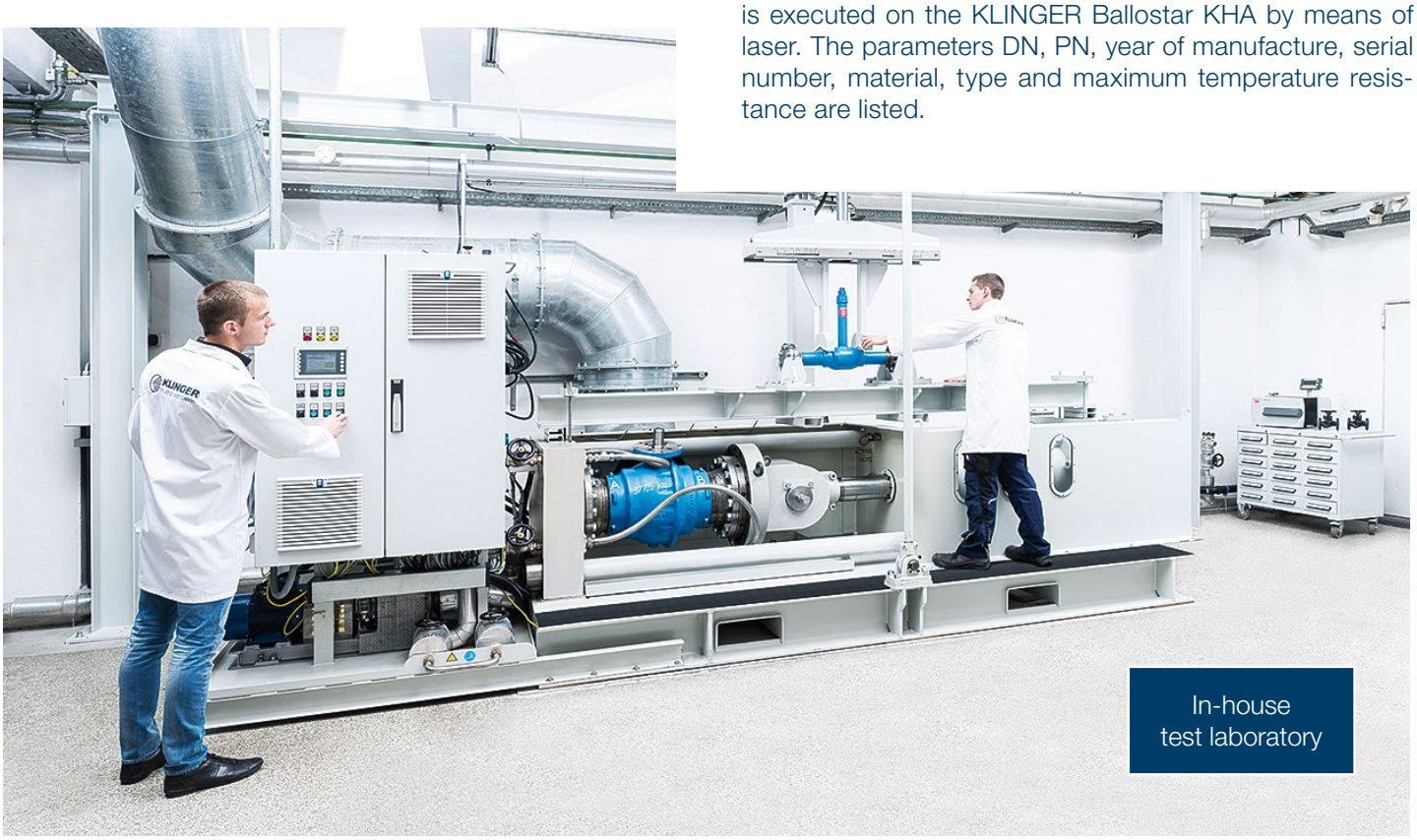
The standard stuffing box meets the requirements of TA Luft (VDI 2440:2000) and EN ISO 15848-1:2017. Double sealing at the body division by means of the KLINGERSIL® C-4430 soft gasket protects against external leakages and meets the highest helium emission testing requirements. The KLINGER Ballostar KHA is significantly below the requirements of emission limits to keep air clean.

OXYGEN DESIGN

Due to the fact that increased concentrations of oxygen lead to greater fire and explosion hazards, a valve must also meet certain pre-requirements in terms of oxygen.

STANDARDS-COMPLIANT MARKING

Standards-compliant marking in accordance with EN 19 is executed on the KLINGER Ballostar KHA by means of laser. The parameters DN, PN, year of manufacture, serial number, material, type and maximum temperature resistance are listed.



In-house test laboratory

WHAT YOU CAN RELY ON

The unique KLINGER sealing system

The sealing element is the heart of every valve. The type of sealing defines under which conditions a valve can reliably execute its shut-off or regulating function. Leakages and the negative consequences resulting thereof are an immense challenge for plant operators. A seal that keeps its promises is therefore a must.
With the new Ballostar KHA KLINGER has created a ball valve that absolutely convinces with its unique sealing system!

THE OPTIMIZED SEALING SYSTEM

A KLINGERSIL® C-4430

The fire safety requirements have been integrated into the standard design of the Ballostar KHA. The soft material gasket KLINGERSIL® C-4430 protects against external leakages and meets the highest helium emission testing requirements. The sleeve reliably holds the sealing element in the desired position. In the fire-safe version, a graphite ring additionally protects against excessive thermal stress.

B GRAPHITE GASKET

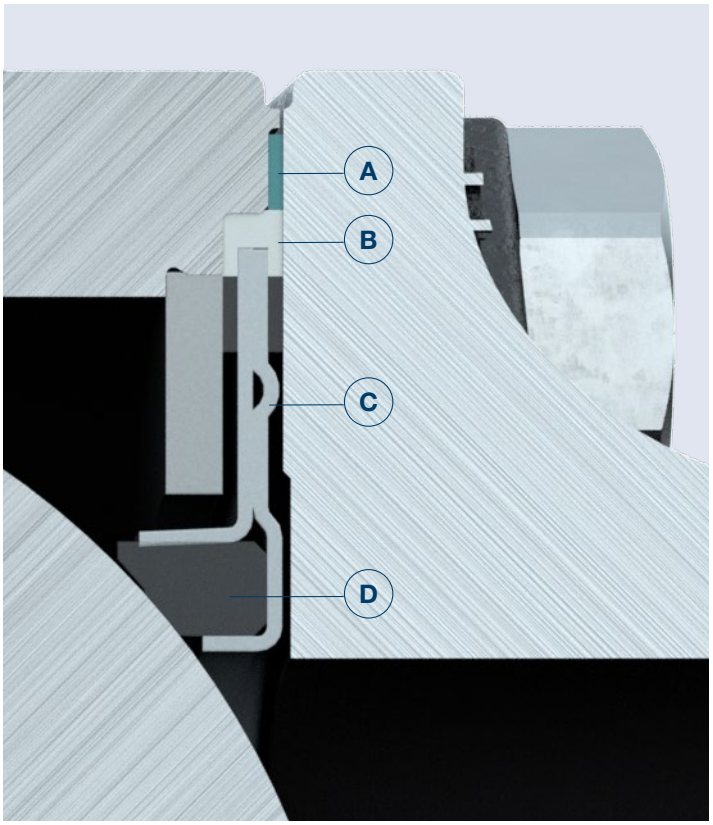
The graphite layer also protects against leakage to the atmosphere during high-temperature applications and, in combination with the KLINGERSIL® gasket, forms a double seal at the housing partition. This provides the highest degree of safety against external leakages.

C ELASTIC SEALING ELEMENT

The sealing element provides functionality across the entire lifecycle and simultaneously ensures the required contact pressure of the sealing ring. The valve therefore remains continuously tight – independent of the pressure of the medium and the flow direction.

D SEALING RING

The sealing ring forms the basis of every functioning sealing system. It stands for the highest quality and reliability in accordance with the KLINGER standard! The fiber-reinforced sealing ring KLINGER KFC-25 consists of PTFE and graphite and is surrounded on three sides by the spring-loaded sealing element. It can thus absorb large amounts of contact force without deformation and is simultaneously protected against the medium.



As a globally leading manufacturer, KLINGER offers valves and sealing elements from one source. We pass on this synergetic benefit with more than 135 years of experience and a high degree of competence to our customers.

THE MULTI-TALENTED KHA

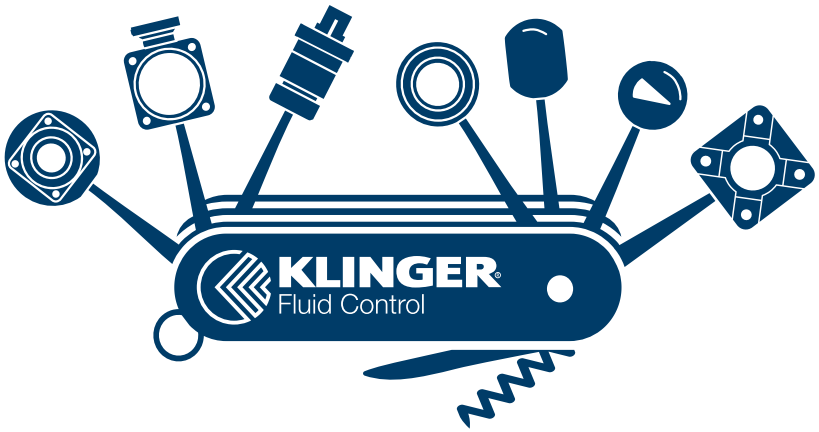
FLEXIBLE LIKE A SWISS KNIFE

PRODUCT ADVANTAGES

- Maintenance-free
- Supports pressurization on both sides
- Bidirectional flow
- Ball with a cylindrical full bore
- Standard version Fire Safe certified
- Standard version TA Luft certified
- Standard version EN ISO 15848-1 certified
- Greater mechanical robustness while exposed to thermal stress
- 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)
- Vacuum version
- Gas version
- Regulation design by means of V-port ball and actuator package
- Double-seated execution
- Double Block & Bleed execution with drain valve



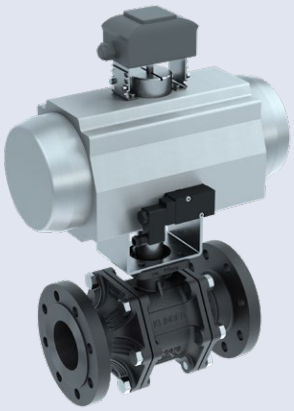
PRODUCT DETAILS

PN	16/25/40/63/100* and ASME CLASS150/300
DN	15-125 and 1/2“-5“
Housing	Cast steel, rust and acid-proof cast iron, duplex
Ball	Special materials on demand
Operating stem	Rust and acid-proof steel
Temperature	-196 °C to +400 °C
Design	Flanges, threaded connection, welding ends
Type	Three-piece ball valve

*) see table, page 12-14 PN and DN assignment

BALLOSTAR KHA

Product overview



BALLOSTAR KHA-F

Flange design

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

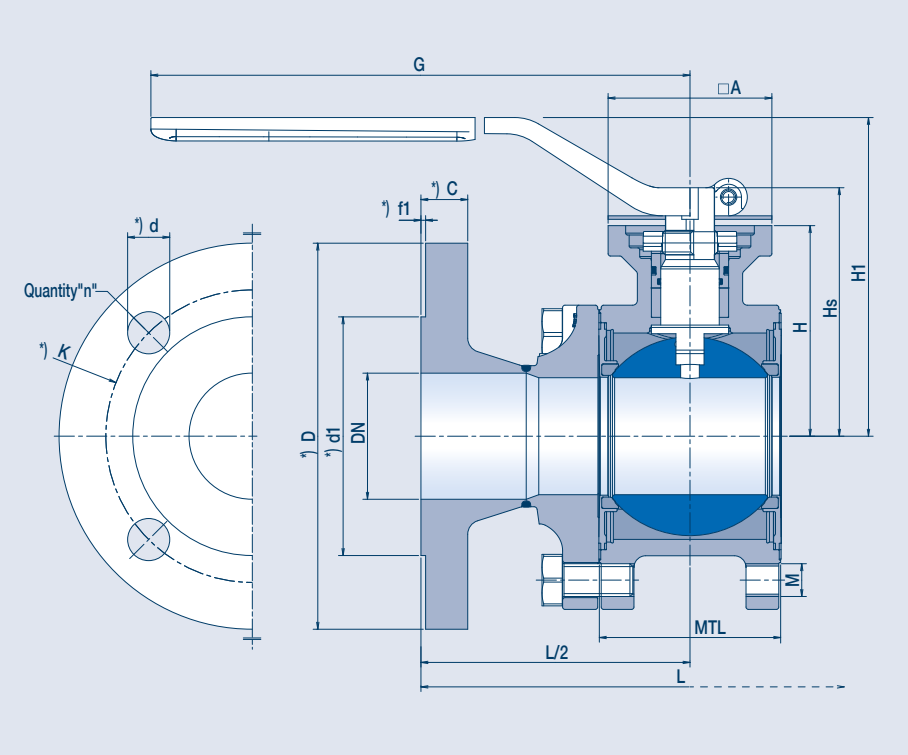
CONNECTIONS
» Flange in accordance with DIN EN 1092-1 or ASME B 16.5

DIMENSIONS
Face-to-face dimensions in accordance with EN 558-1, series 1 or dimensions in accordance with ANSI B16.10 CL 300

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)



* Flange dimensions in accordance with DIN EN 1092-1 or ASME B 16.5

DN		Dimensions								Pressure level		Head flange size acc. to ISO 5211	Weight [kg]
		MTL	□A	H	Hs	H1	G	M	L (EN)	L (ASME)	M1 (VIII)	M2/M3 (Xc)		
15	1/2“	26.4	42	35.0	43.5	83.0	130	M6	130	140	100	63	F04	2.3
20	3/4“	35.2	42	46.5	57.0	96.0	160	M8	150	152	100	63	F04	3.5
25	1“	41.5	42	50.0	60.5	100.0	160	M8	160	165	63	40	F04	4.3
32	1-1/4“	49.5	50	65.0	77.7	107.5	252	M10	180	178	63	40	F05	6.8
40	1-1/2“	63.0	50	72.5	85.2	114.7	252	M12	200	190	63	40	F05	9.0
50	2“	77.5	70	90.0	106.2	136.2	310	M14	230	216	40	40	F07	13.5
65	2-1/2“	93.5	70	100.0	116.2	146.2	310	M12	290	241	40	40	F07	18.0
80	3“	111.4	102	121.5	143.0	165.0	500	M16	310	282	40	40	F10	28.8
100	4“	131.6	102	135.0	156.5	178.5	500	M16	350	305	40	40	F10	40.6
125	5“	171.4	125	175.0	202.5	212.5	650	M16	400	381	40	40	F12	66.0

Material:
M1 (VIII) = Carbon steel
M2 (Xc) = Stainless steel
M3 (d) = Duplex

BALLOSTAR KHA-S

Welding ends

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

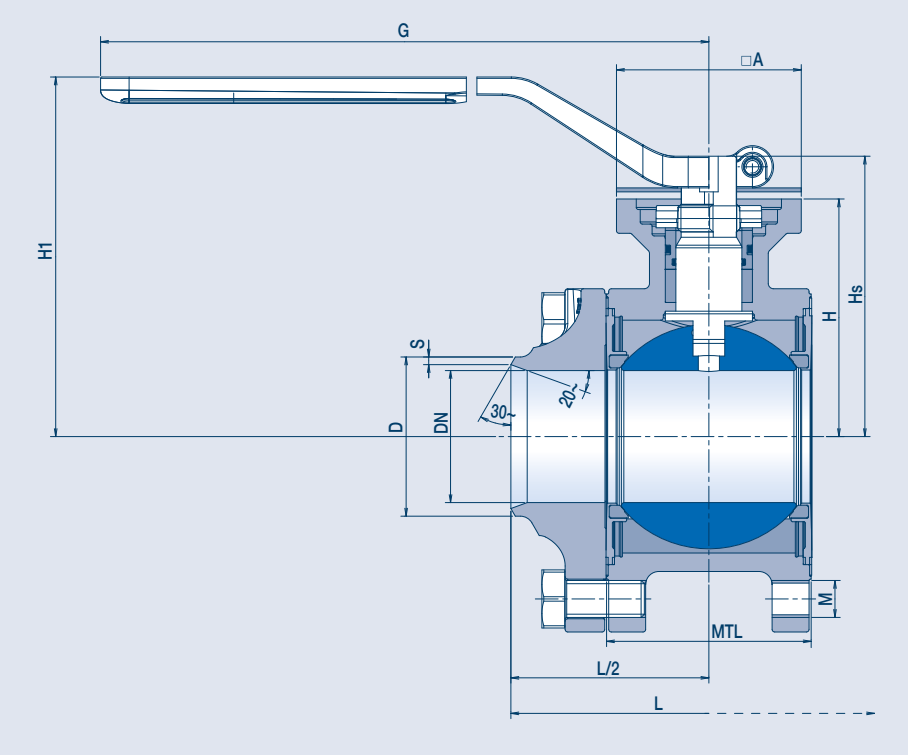
CONNECTIONS
Welding ends in accordance with DIN EN 12627

DIMENSIONS
Dimensions in accordance with DIN EN 12982, series 67 (DN 15-125)

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)



NOTICE: DOES NOT HAVE TO BE DISMANTLED WHEN WELDING INTO THE PIPELINE

DN	Dimensions										Pressure level		Head flange size acc. to ISO 5211	Weight [kg]
	MTL	D	S	□A	H	Hs	H1	G	M	Total face-to-face length L	M1 (VIII)	M2/M3 (Xc)		
15	26.4	21.3	2.0	42	35.0	43.5	83.0	130	M6	75	100	63	F04	0.85
20	35.2	26.9	2.5	42	46.5	57.0	96.0	160	M8	90	100	63	F04	1.45
25	41.5	33.7	2.6	42	50.0	60.5	100.0	160	M8	100	63	40	F04	1.80
32	49.5	42.4	2.6	50	65.0	77.7	107.5	252	M10	110	63	40	F05	3.10
40	63.0	48.3	3.2	50	72.5	85.2	114.7	252	M12	125	63	40	F05	4.75
50	77.5	60.3	2.9	70	90.0	106.2	136.2	310	M14	150	40	40	F07	7.60
65	93.5	76.1	3.1	70	100.0	116.2	146.2	310	M12	190	40	40	F07	10.60
80	111.4	88.9	3.2	102	121.5	143.0	165.0	500	M16	220	40	40	F10	19.50
100	131.6	114.3	3.6	102	135.0	156.5	178.5	500	M16	270	40	40	F10	28.00
125	171.4	139.7	4.0	125	175.0	202.5	212.5	650	M16	330	40	40	F12	49.50

Material:
M1 (VIII) = Carbon steel
M2 (Xc) = Stainless steel
M3 (d) = Duplex

BALLOSTAR KHA-G

Threaded connection

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

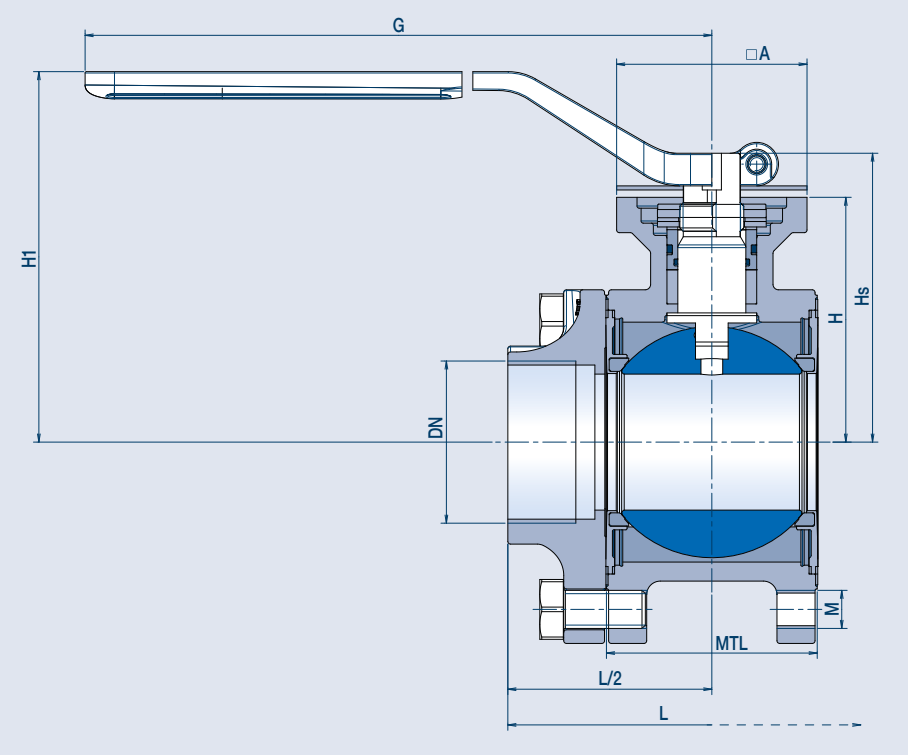
CONNECTIONS
» Internal thread Rp in accordance with EN 10226-1
» Internal thread in accordance with NPT ANSI B 1.20.1

DIMENSIONS
Face-to-face dimensions in accordance with EN 16722-114

ACCEPTANCE TESTING
» Seat leak tightness: EN 12266-1 P12, leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Strength: DIN 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)



DN	Dimensions								Pressure level		Head flange size acc. to ISO 5211	Weight [kg]
	MTL	□A	H	Hs	H1	G	M	L	M1 (VIII)	M2/M3 (Xc/Xd)		
1/2“	26.4	42	35.0	43.5	83.0	130	M6	85	100	63	F04	0.90
3/4“	35.2	42	46.5	57.0	96.0	160	M8	95	100	63	F04	1.45
1“	41.5	42	50.0	60.5	100.0	160	M8	105	63	40	F04	1.80
1-1/4“	49.5	50	65.0	77.7	107.5	252	M10	120	63	40	F05	3.15
1-1/2“	63.0	50	72.5	85.2	114.7	252	M12	130	63	40	F05	4.75
2“	77.5	70	90.0	106.2	136.2	310	M14	150	40	40	F07	7.55

Material:
M1 (VIII) = Carbon steel
M2 (Xc) = Stainless steel
M3 (d) = Duplex

DOUBLE BLOCK & BLEED

The safest solution for maintenance

BALLOSTAR KHA-DBB

A single ball valve instead of two? With the Double Block & Bleed (DBB) function, we offer a perfect solution regarding lifecycle costs.

As opposed to the floating design, the 3-piece ball valve is in this case trunnion mounted. This construction alternative (for nominal widths between 15 and 125 mm) improves durability, enabling the ball valve to guarantee optimal functionality and operational safety even under the most demanding conditions.

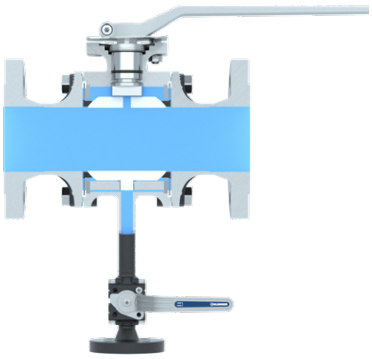
Next to time and cost savings, the optional Double Block & Bleed function, either with a drain valve or drainage by way of the trunnion, is important in applications featuring limited installation space.

Furthermore, the BALLOSTAR KHA-DBB convinces with its sealing and safety features.

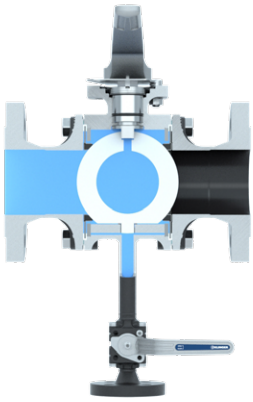
There are two different versions available:

1. Trunnion mounted
2. Trunnion mounted with drain cock (complete Double Block & Bleed solution)

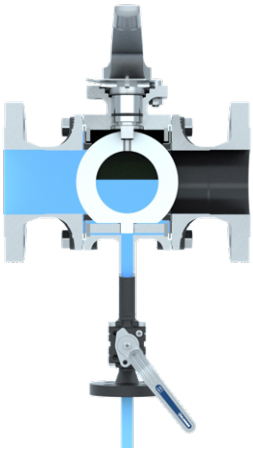
INSULATION IN DETAIL



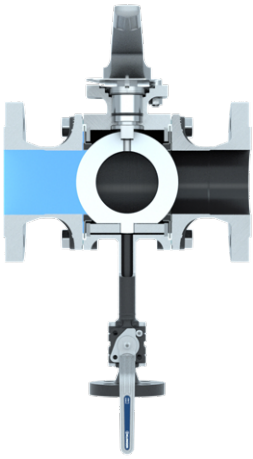
KHA ball valve fully open



KHA ball valve completely closed, dead space and ball filled with medium



Opening of the drain cock. Complete drainage of the dead space and inner space

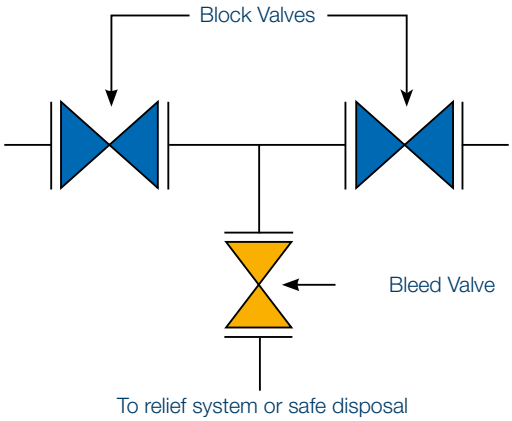


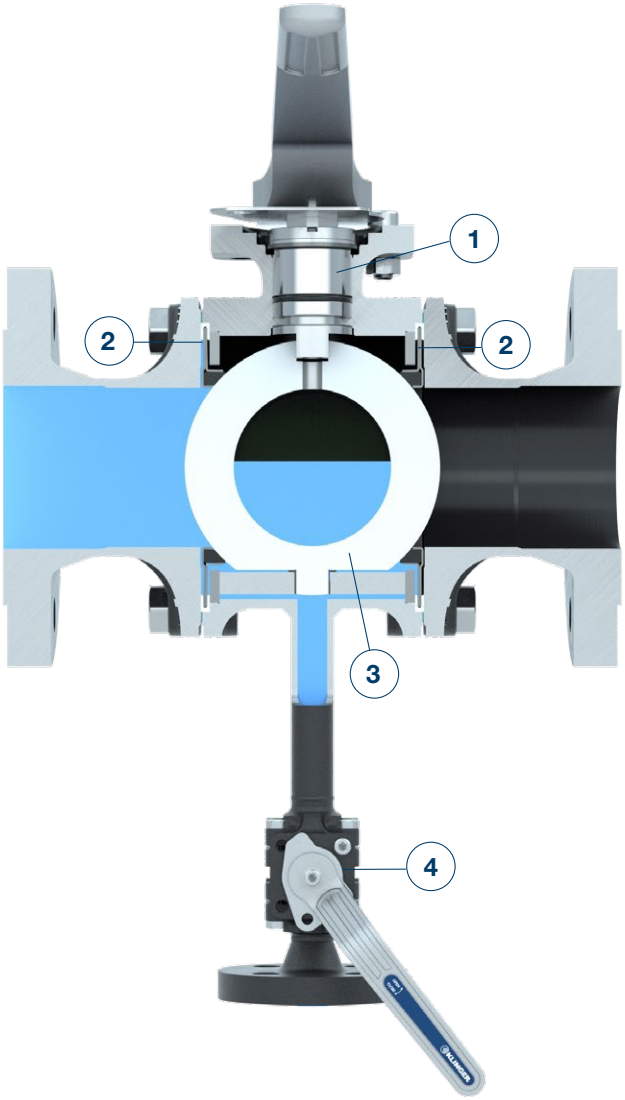
KHA ball valve completely closed with opened drain cock. Dead space and ball completely emptied.

DOUBLE BLOCK & BLEED

The safest solution for maintenance

Many shut-off applications, especially in the steam and hot water area, require an absolutely reliable and safe barrier of the medium to avoid accidents during maintenance operations on the pipework. In such an uneconomical variant, two identical valves installed in series to ensure that in the event of a failure one valve the second can continue to be operated. The connection line of the two valves was supplemented by another valve for emptying.





THE KLINGER BALLOSTAR KHA DBB

This version consists of two elastic sealing elements and a double bearing ball. The two independent of each other acting sealing elements unite the two valves.The additional drain cock is used for a complete drainage of the dead space. The cavity of the ball valve can be drained and depressurized by opening the drain/ test cock while the KHA is in closed position. Furthermore, during operation in the closed position there can be checked whether the input-side sealing element reliably sealed.

Double Block & Bleed edition

1 
Stuffing box with AFLAS O-rings

2 
sealing elements multipart KFC

3 Mounted ball made of stainless steel

4 Drain cock
for DN15 to 40, type ABZ-12-L8
for DN50 to 125, type KHA DN15

Useable up to 235°C according to P/T diagram:
for clear liquids and gases

Applications in:
- District Heating
- Steel
- Power
- Geothermal Energy
- Oil and gas
- Chemical industry

BALLOSTAR KHA-DBB

Double Block & Bleed DN 15-40

GENERAL FEATURES
» 3-piece ball valve with full bore and drain valve
» Double-seated ball, antistatic, lockable
» Optionally only as a double-seated ball valve
» Double sealing in both bore directions
» Modular component system

CONNECTIONS
» Flange
» Welding ends
» Threads

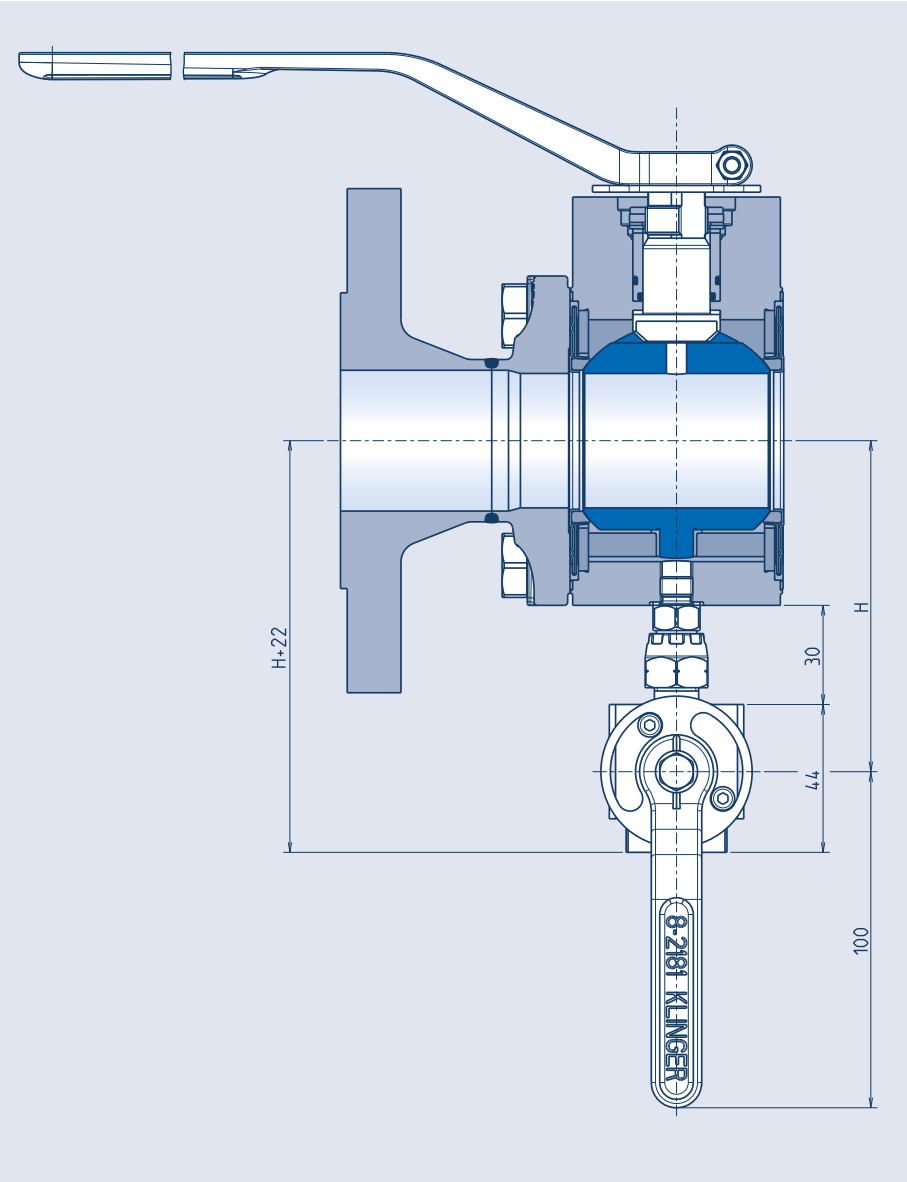
DIMENSIONS
See previous technical data sheets for face-to-face dimensions

ACCEPTANCE TESTING
» Seat tightness: EN 12266-1 P12, Leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Body strength: EN 12266-1 P10

AUTOMATION
The flanged connection in accordance with ISO 5211 allows for mounting of an actuator by means of a console. Pneumatic and electrical actuators possible.

TEMPERATURE
-10 °C to +235 °C (see pT diagram)

DN	H
15	110.0
20	116.7
25	119.0
32	126.5
40	135.5



General dimensions: see pages 12-14

BALLOSTAR KHA-DBB

Double Block & Bleed DN 50-125

GENERAL FEATURES
» 3-piece ball valve with full bore and drain valve
» Double-seated ball, antistatic, lockable
» Optionally only as a double-seated ball valve
» Double sealing in both bore directions
» Modular component system

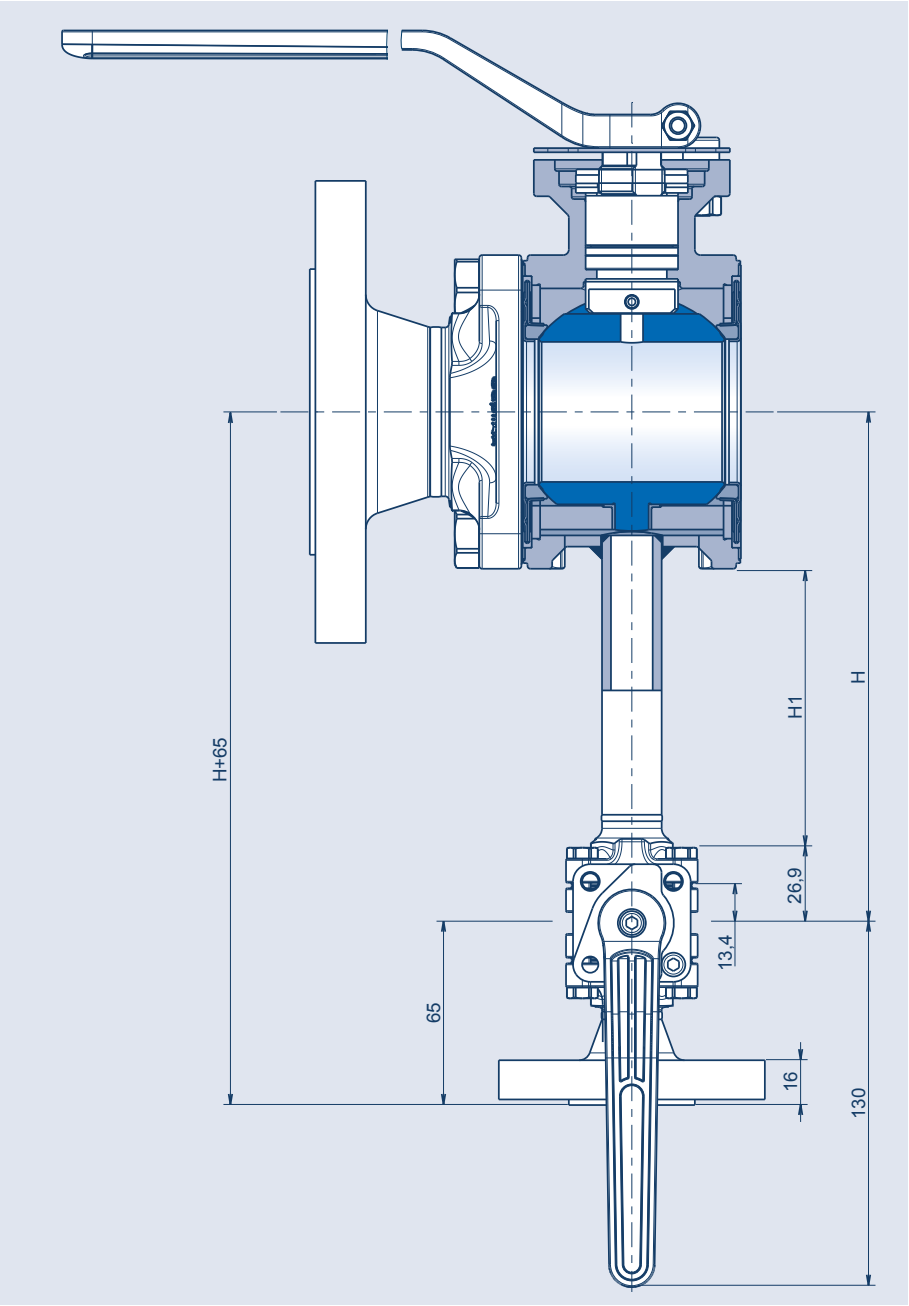
CONNECTIONS
» Flange
» Welding ends
» Threads

DIMENSIONS
See previous technical datasheets for face-to-face dimensions

ACCEPTANCE TESTING
» Seat tightness: EN 12266-1 P12, Leakage rate A
» Tightness to atmosphere: EN 12266-1 P11
» Body strength: EN 12266-1 P10

AUTOMATION
The flanged connection in accordance with ISO 5211 allows for direct mounting of an actuator or by means of a console. Pneumatic and electrical actuators possible.

TEMPERATURE
-10 °C to +220 °C (see pT diagram)

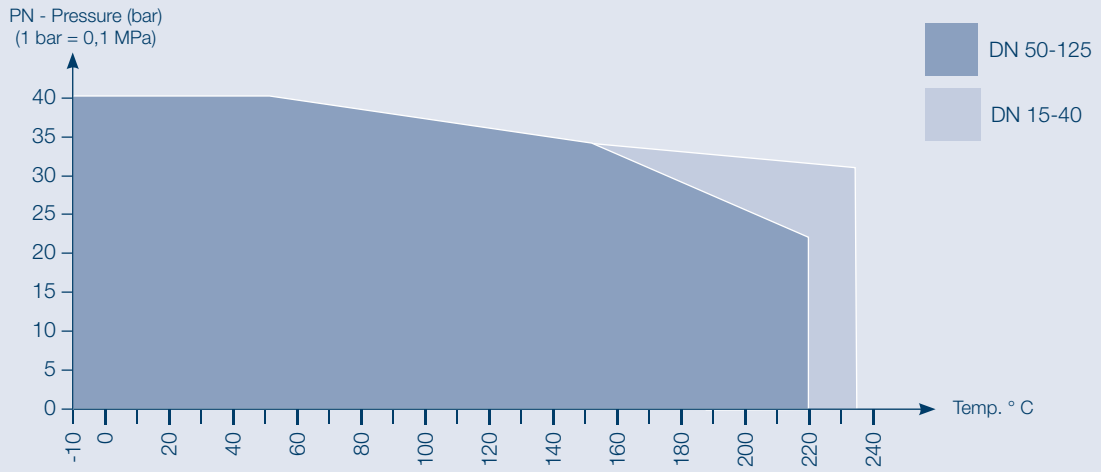


DN	H	H1
50	182.5	99.6
65	192.4	95.0
80	204.4	92.5
100	217.4	89.5
125	240.4	81.5

General dimensions: see pages 12-14

BALLOSTAR KHA-DBB

Pressure and temperature ranges

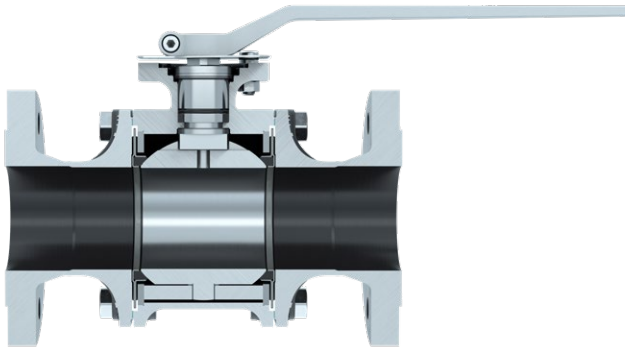


Version DBB+TM - with sealing element KK and stuffing box AF (see table page 6/7)

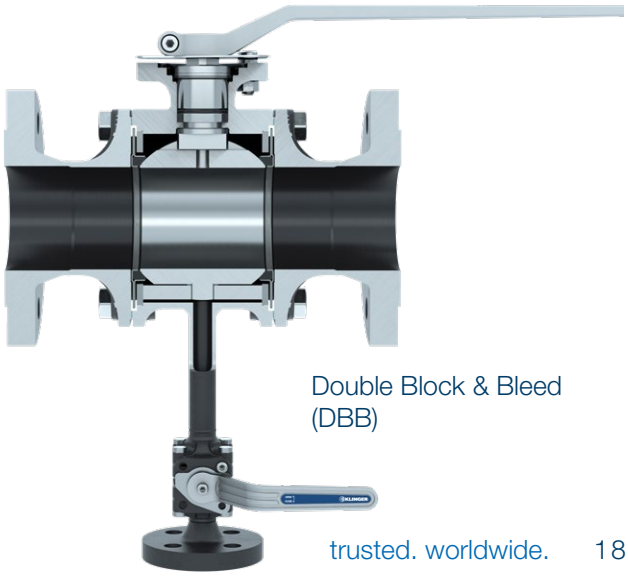
Operating moments for DBB 15-125

Nominal diameter DN		Differential pressure (bar)							
		0	5	10	16	20	25	30	40
inch	mm	Torque (Nm)							
1/2"	15	6	6	7	7	7	7	7	8
3/4"	20	12	12	12	12	12	13	13	14
1"	25	14	14	15	15	16	17	17	18
1 1/4"	32	17	17	17	18	19	20	22	23
1 1/2"	40	25	25	27	29	31	32	33	35
2"	50	16	19	25	28	29	33	38	43
2 1/2"	65	26	38	46	47	55	59	67	75
3"	80	38	43	60	68	75	80	89	125
4"	100	38	62	90	108	133	155	184	207
5"	125	150	184	225	319	372	403	419	465

Type overview



Trunnion mounted
(TM)



Double Block & Bleed
(DBB)

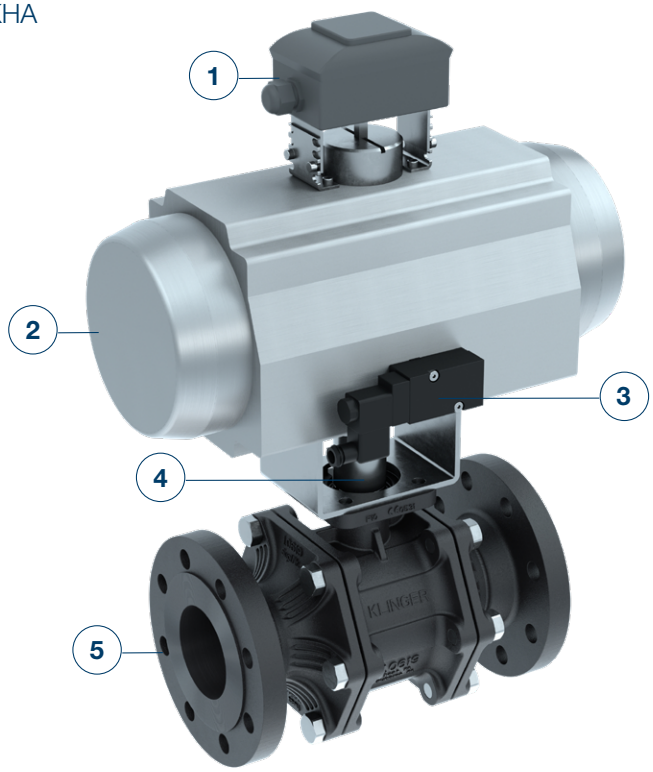
FULL POWER

Switch on and get going!

Both pneumatic and electromechanical actuators can be used for the automation of the KLINGER Ballostar KHA ball valve. The exact determination of the torque saves investment and follow-up costs. The actuator should therefore not be selected in accordance with the maximum possible options in mind, but rather according to actual needs. In this context the necessary pressure differential determines the torque of the required actuator.

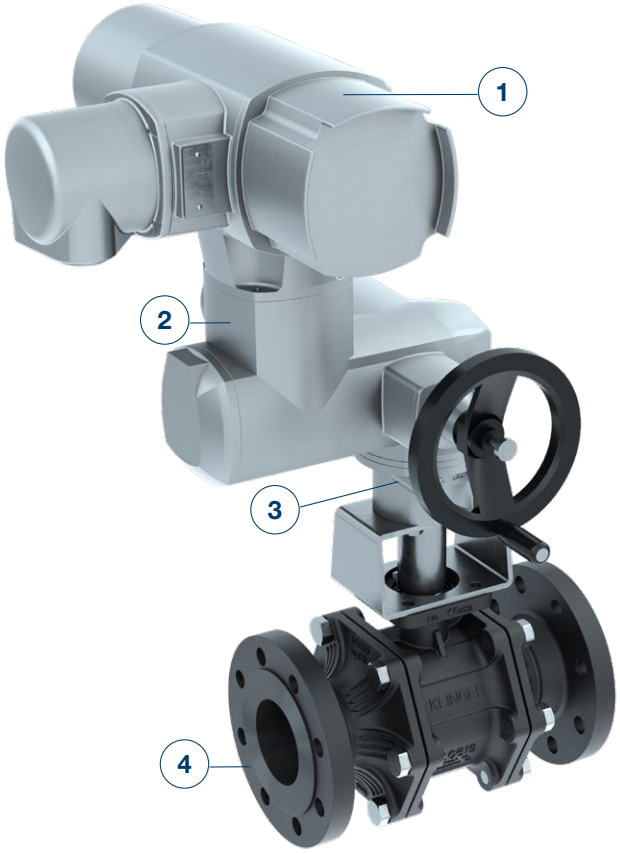
PNEUMATIC ACTUATOR

1. Limit switch box
2. Pneumatic actuator, single or double-acting
3. Solenoid valve
4. Bracket and coupling
5. KHA

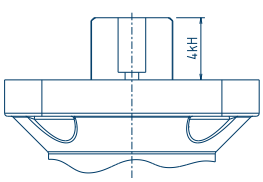


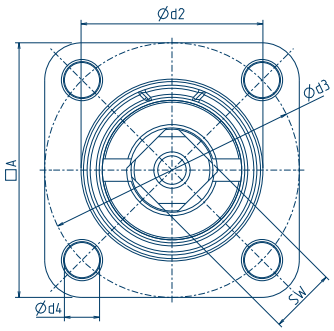
ELECTRIC ACTUATOR

1. Electric actuator
2. Actuator control
3. Bracket and coupling
4. KHA



Nennweite		ISO 5211	□A	SW	4kH	ød2	ød3	ød4
DN15	1/2"	F04	42	8	8,5	29	42	5,8
DN20	3/4"			11	10,5	30		
DN25	1"							
DN32	1 1/4"	F05	50	14	12,7	35	50	7
DN40	1 1/2"							
DN50	2"	F07	70	17	16,2	55	70	10
DN65	2 1/2"							
DN80	3"	F10	102	22	21,5	70	102	12
DN100	4"							
DN125	5"	F12	125	27	27,5	85	125	15





ACTUATOR SELECTION

Operating moments for the different sealing rings with multi-part sealing elements

KLINGER recommends the factor of 1.5 for standard calculations, meaning plus 50 % should be used, to compensate for increased breakaway torques due to downtime. For valves featuring a reduced bore, the previous row (i.e. the one with the smaller nominal diameter) should be used.

KFC-25

Nominal diameter DN		Differential pressure (bar)										
		0	5	10	16	20	25	30	40	50	63	100
inch	mm	Torque (Nm)										
½"	15	6	6	6	7	7	7	7	8	8	9	10
¾"	20	12	12	13	13	13	14	14	15	16	16	19
1"	25	14	15	16	17	18	19	20	22	24	27	
1 ¼"	32	17	18	20	22	23	24	26	28	31	35	
1 ½"	40	25	28	31	34	36	39	42	47	53	60	
2"	50	37	41	44	49	52	55	59	66			
2 ½"	65	60	66	73	80	85	91	98	110			
3"	80	96	114	132	154	168	186	204	240			
4"	100	160	184	208	236	255	279	303	350			
5"	125	270	318	365	422	460	508	555	650			

VITON

Nominal diameter DN		Differential pressure (bar)			
		0	5	10	16
Inch	mm	Torque (Nm)			
1"	25	14	15.9	17.8	20
1 ¼"	32	18	20.2	22.4	25
1 ½"	40	25	29.7	34.4	40
2"	50	40	49.4	58.8	70
2 ½"	65	55	72.2	89.4	110
3"	80	100	150	200	260
4"	100	160	219.4	278.8	350

PTFE

½"	15	5	6	6	6	6	6	6	7	7	8	9
¾"	20	11	11	11	12	12	12	13	13	14	15	17
1"	25	13	14	14	16	16	17	18	20	22	24	
1 ¼"	32	15	17	18	19	20	22	23	26	28	32	
1 ½"	40	21	24	26	29	31	33	35	40	45	51	
2"	50	30	33	36	40	42	45	48	54			
2 ½"	65	51	56	62	68	72	78	83	94			
3"	80	72	86	99	115	126	140	153	180			
4"	100	120	138	156	177	191	209	227	263			
5"	125	203	238	274	317	345	381	416	488			

METAL/METAL SPECIAL

½"	15	8	8	8	9	9	9	9	10	11	12	14
¾"	20	15	16	16	17	18	19	19	21	22	24	29
1"	25	18	19	21	23	24	25	27	29	32	36	
1 ¼"	32	25	27	28	30	32	33	35	38	42	46	
1 ½"	40	40	45	50	55	59	64	69	78	88	100	
2"	50	55	64	74	85	93	102	111	130			
2 ½"	65	85	102	119	139	153	169	186	220			
3"	80	140	173	205	244	270	303	335	400			
4"	100	250	294	338	390	425	469	513	600			
5"	125	450	580	710	866	970	1100					

} Restriction stainless steel to 300°C

} Restriction stainless steel to 200°C

SPECIAL SOLUTIONS EXTENSIONS

KLINGER India

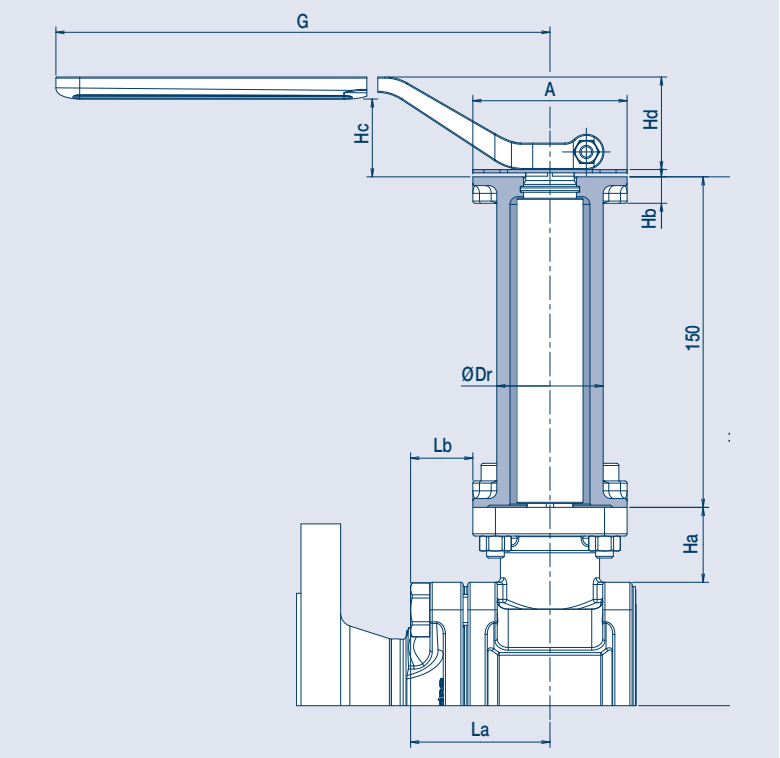
Special challenges – special solutions!

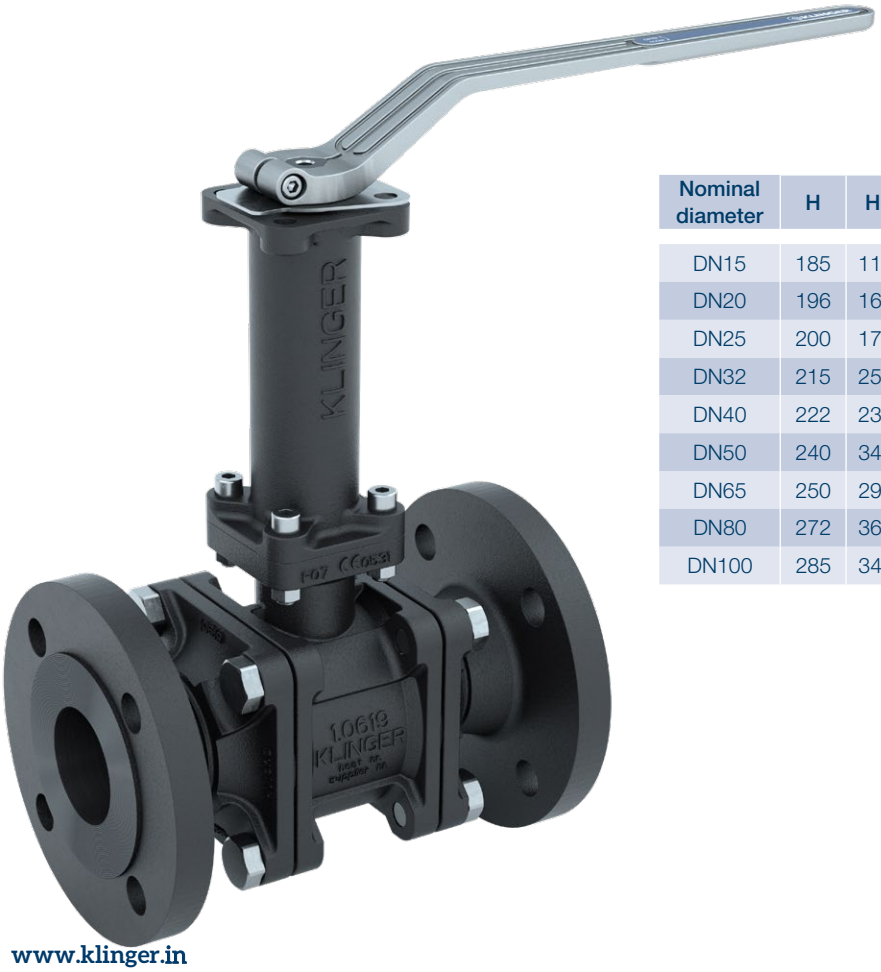
In certain applications it may be necessary to employ so-called operating stem extensions for the valve: for example in the event of necessary protective and thermal insulation layers around the valve. Limited space may also be a reason for considering an extension, for example when the hand lever cannot be mounted directly on an ISO-top flange. Extensions are available – with or without a protective tube – at a standard length of 150 mm. The protective tube is fitted with an ISO-top flange at the end of the extension, allowing for subsequent gear or actuator mounting.

Special lengths available upon request.

Special features:

» Standard length 150 mm
» Protective tube material 1.4404
» Operating stem material 1.4021 or special material on demand
» Design featuring protective tube and ISO-top flange certified in accordance with EN ISO 5211





Nominal diameter	H	Ha	Hb	Hc	Hd	ØDr	A	La	Lb	G
DN15	185	11.5	6	38	48	30	42	26.9	5.9	130
DN20	196	16.2	6	38	48	30	42	34.3	13.3	130
DN25	200	17.5	6	38	48	30	42	36.3	15.3	130
DN32	215	25.0	8	34.5	42.5	38	50	43.8	18.8	252
DN40	222	23.5	8	34.5	42.5	38	50	51.9	26.9	252
DN50	240	34.0	12	36	46.2	48.3	70	63.3	28.3	310
DN65	250	29.5	12	36	46.2	48.3	70	69.5	34.5	310
DN80	272	36.5	14	31	43.5	60.3	102	83.4	32.4	500
DN100	285	34.0	14	31	43.5	60.3	102	98.0	47.0	500

FULLY IN CONTROL!

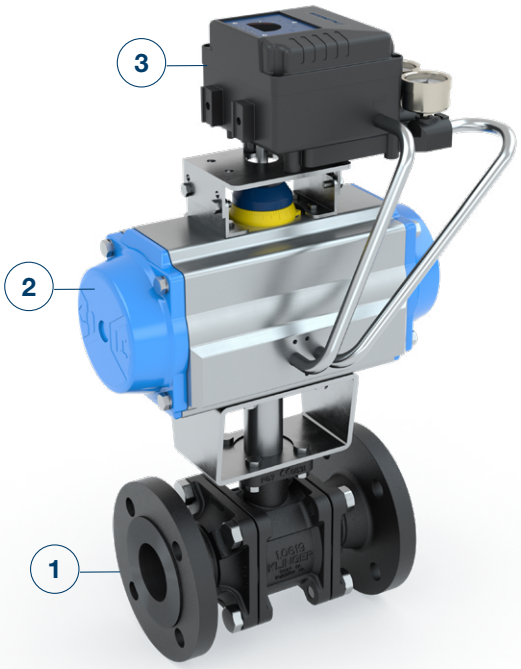
Control valve for regulated rate of flow

CONTROL VALVE

Control valves regulate the rate of flow.

Depending on the intended purpose of the system, the properties of a fluid medium can fluctuate in different ways: Temperature, pressure and fluid level are common variables in this context.

The control valve comprises three main components:
1) Valve, **2)** Actuator and **3)** Positioner.

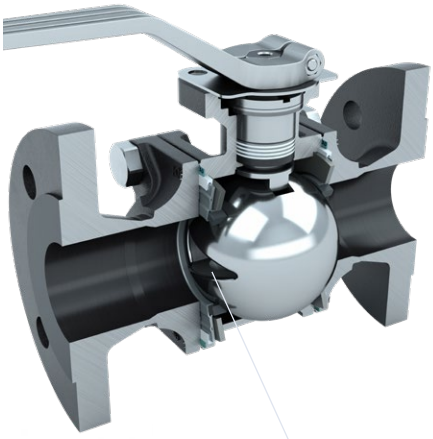


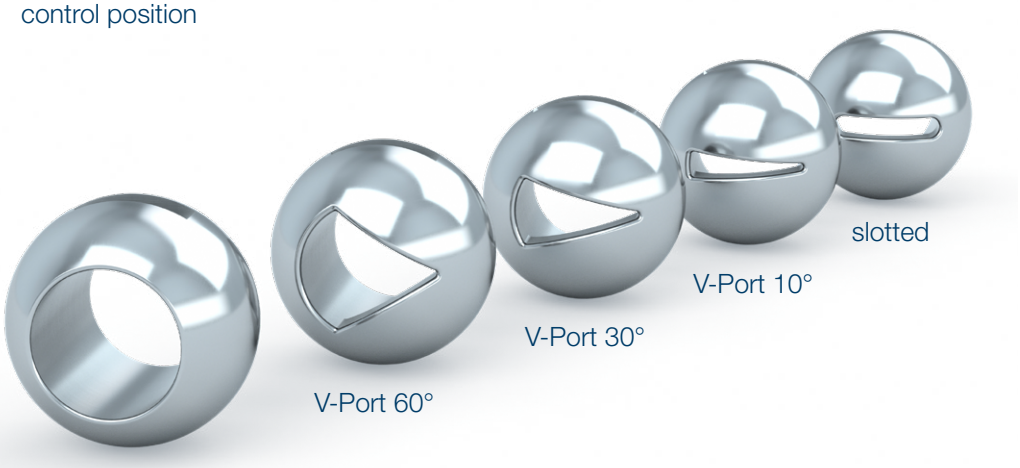
V-PORT BALL

For flow control and regulating applications, the ball valve model KHA is available with different v-port balls.

SPECIFICATIONS:

- Different characteristic curves due to various ball cuttings
- Applicable for clear media without solids
- Easily combinable with pneumatic and electric control actuators
- V-port ball versions are available with 10°, 30° and 60° angles as well as slotted
- The V-port balls in the different cuttings are available for the full line size range of the ball valve model KHA
- Soft sealing up to 230°C with KFC sealing rings in regular operation
- To maintain the leakage rate A, the valve may only cool down when the ball is fully open or closed - not in the control position





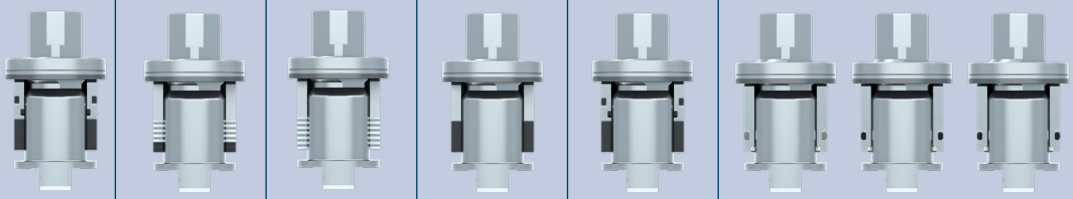
This V-cut gives this V-port ball valve its name. The size of the V-port regulates the flow rate – from full bore to sectioned 10°, 30° and 60° as well as slotted

AREAS OF UTILIZATION

KLINGER India

Stuffing boxes

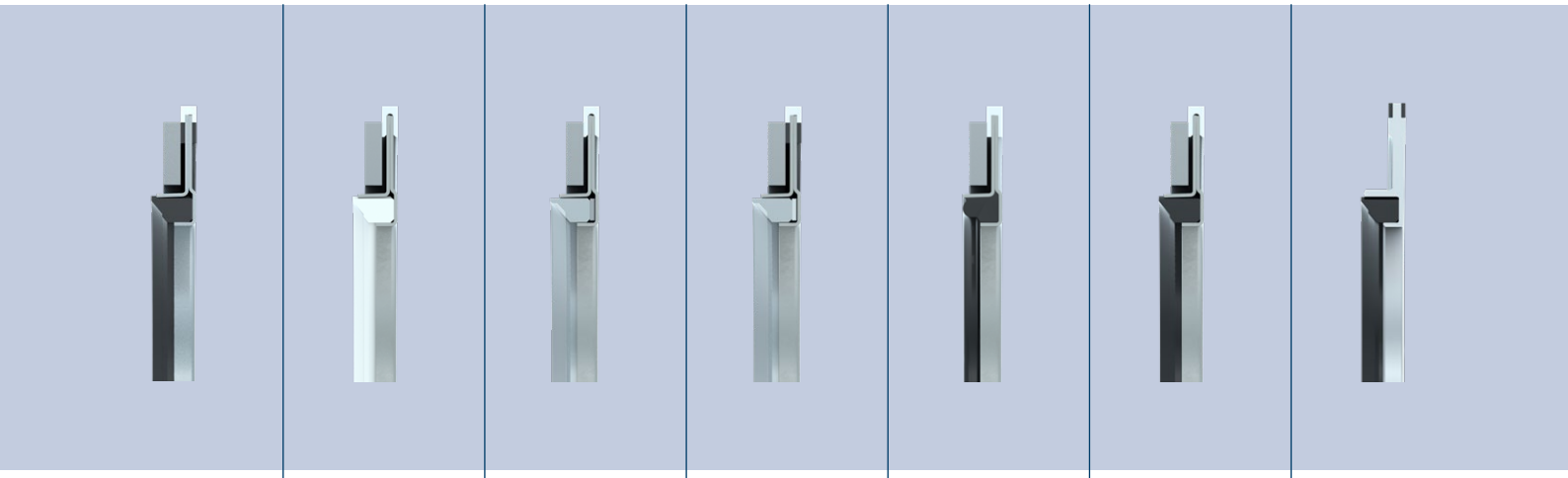
Recommended
Less suitable
Not recommended



		FS	LABP	PTFE	GRA	GAS	VIT		
		Aflas/Graphite/ Peek	PTFE Labyrinth/ Peek	PURE PTFE/ Peek	Graphite/Peek	Gas O-rings & Graphite/Peek	Viton	Aflas	C70M
Media	Water / hot water	■	■	■	■	■	■	■	■
	Mineral oil	■	■	■	■	■	■	■	■
	Heat-transfer oil	■	■	■	■	■	■	■	■
	Liquid gas / 1) cryogenic temperature	■	■	■	■	■	■	■	■
	Saturated steam	■	■	■	■	■	■	■	■
	Misc. gases	■	■	■	■	■	■	■	■
	Vacuum / full vacuum	■	■	■	■	■	■	■	■
	Hot steam (max. 300 °C)	■	■	■	■	■	■	■	■
	Ammonia	■	■	■	■	■	■	■	■
	Oxygen	■	■	■	■	■	■	■	■
Operating conditions	Standard utilization	■							
	High number of cycles	■	■	■	■	■	■	■	■
	Frequent temperature changes	■	■	■	■	■	■	■	■
	Fire safety (Fire-Safe)	■	■	■	■	■	■	■	■
	Chemical industry	■	■	■	■	■	■	■	■
	Abrasive media	■	■	■	■	■	■	■	■
	Temperature range (°C)	-20 * | +300	-196 | +300	-196 | +300	-85 | +400	-15 | +150	-15 | +150	-20*/+250	-35/+125
Certifications	VDI 2440 (TA-Luft)	+	+	+		+		+	
	ISO15848-1	+							
	DVGW/ÖVGW					+			
	Fire-Safe	+				+			

1) Combined with cryogenic temperature extension and sealing element
* O-rings for less temperature optionally available.

Sealing elements



FF	PP	MM	SS	VV	KK	GG
Standard KFC Fire-Safe	PTFE	Metal	Metal special	Viton	Standard KFC	Gas KFC Fire-Safe
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■				■	■
■						■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
■	■	■	■	■	■	■
-60/+300	-196/+200	-60/+300	-60/+400	-15/+150	-60/+300	-60/+300
+					+	+
+						+
						(+)
+						+

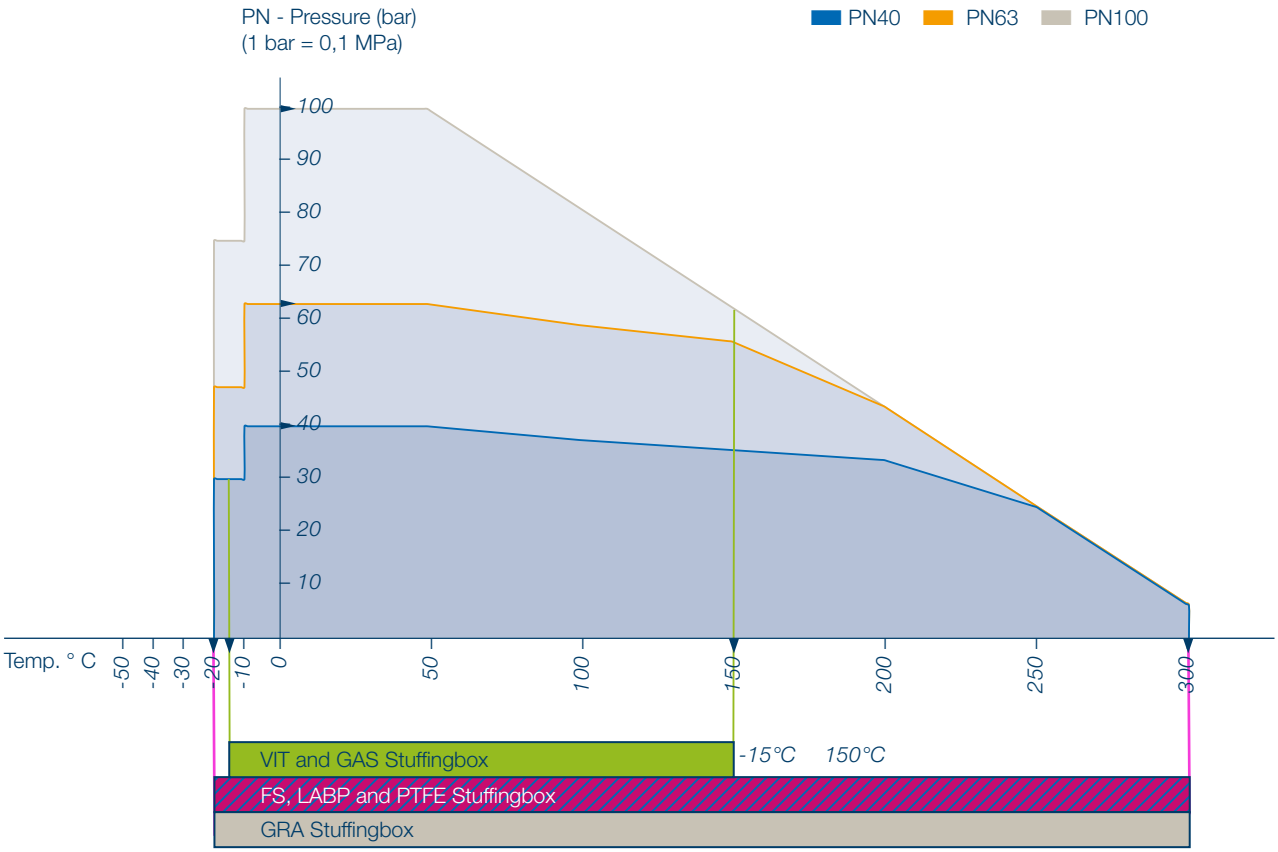
AREAS OF UTILIZATION

Pressure and temperature ranges

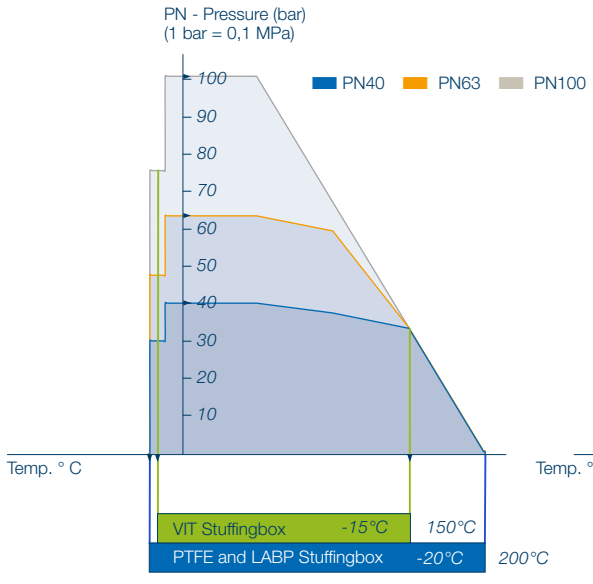
Carbon steel

Material index M1 (VIII)

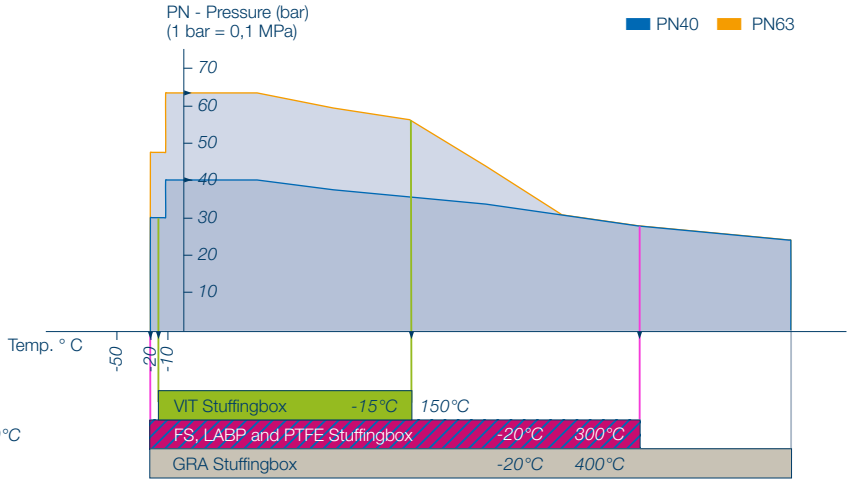
PT diagram for the sealing elements FF, KK, GG and MM



PT diagram for the sealing elements PP



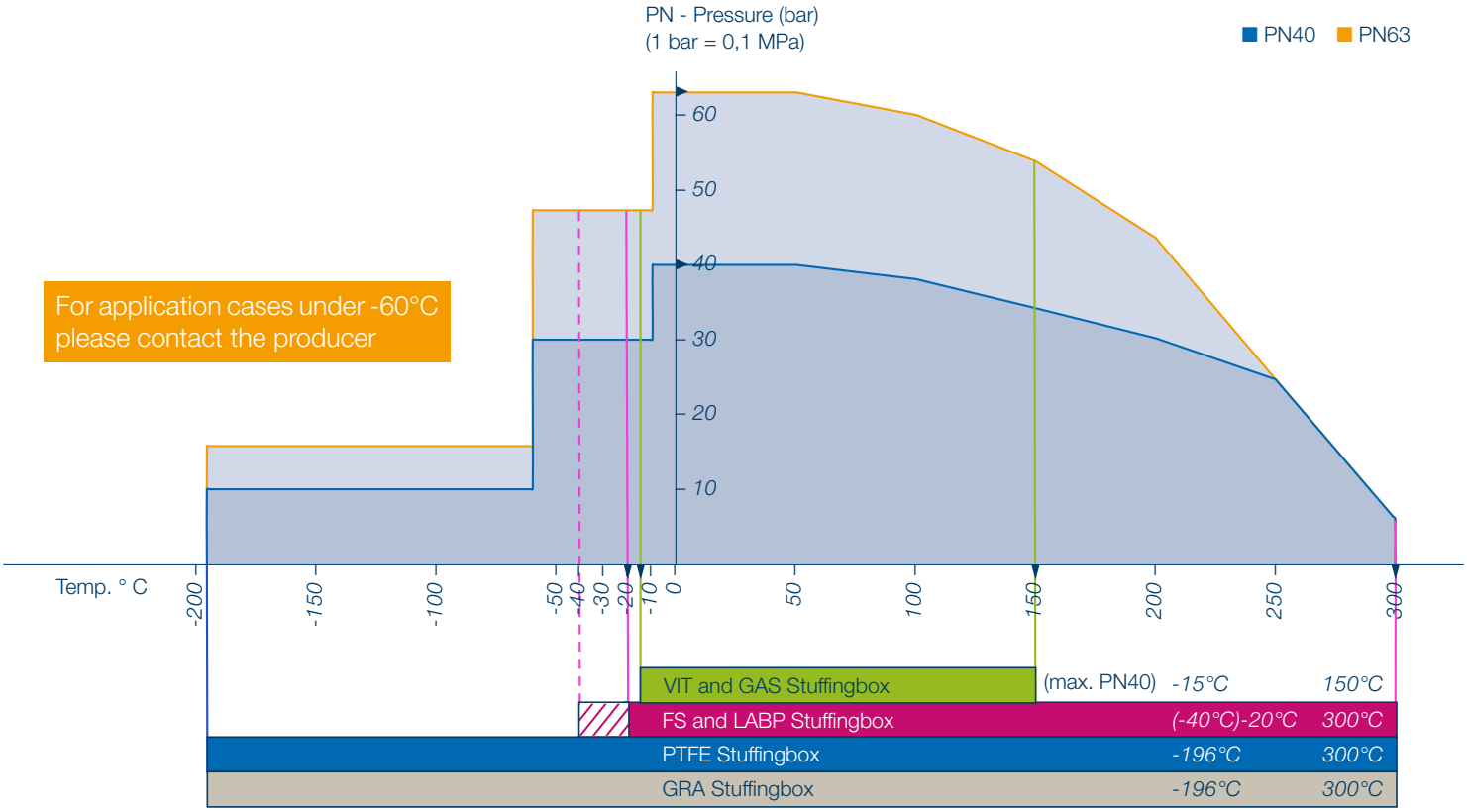
PT diagram for the sealing elements SS



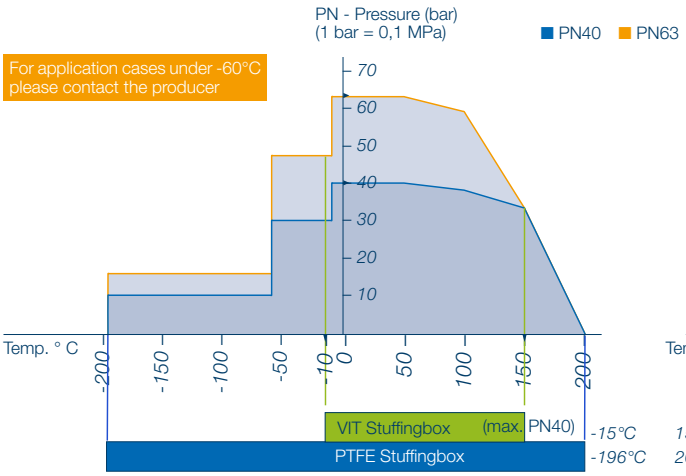
Stainless steel

Material index M2 (Xc)

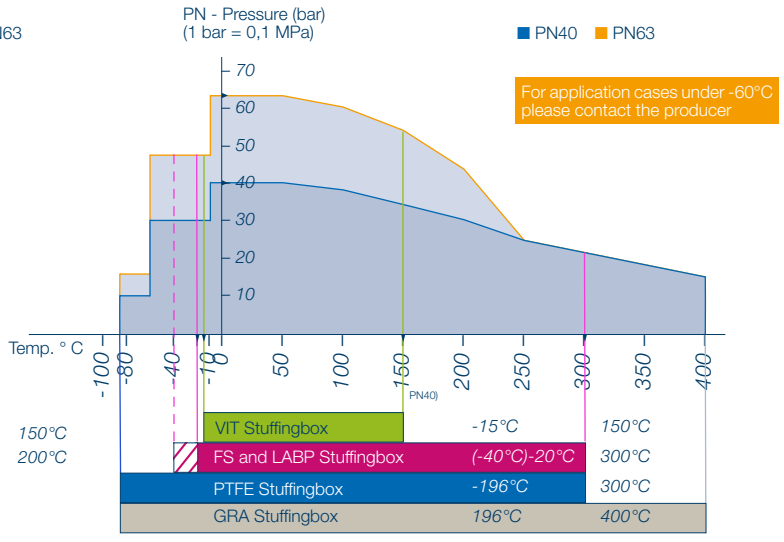
PT diagram for the sealing elements FF, KK, GG and MM



PT diagram for the sealing elements PP



PT diagram for the sealing elements SS



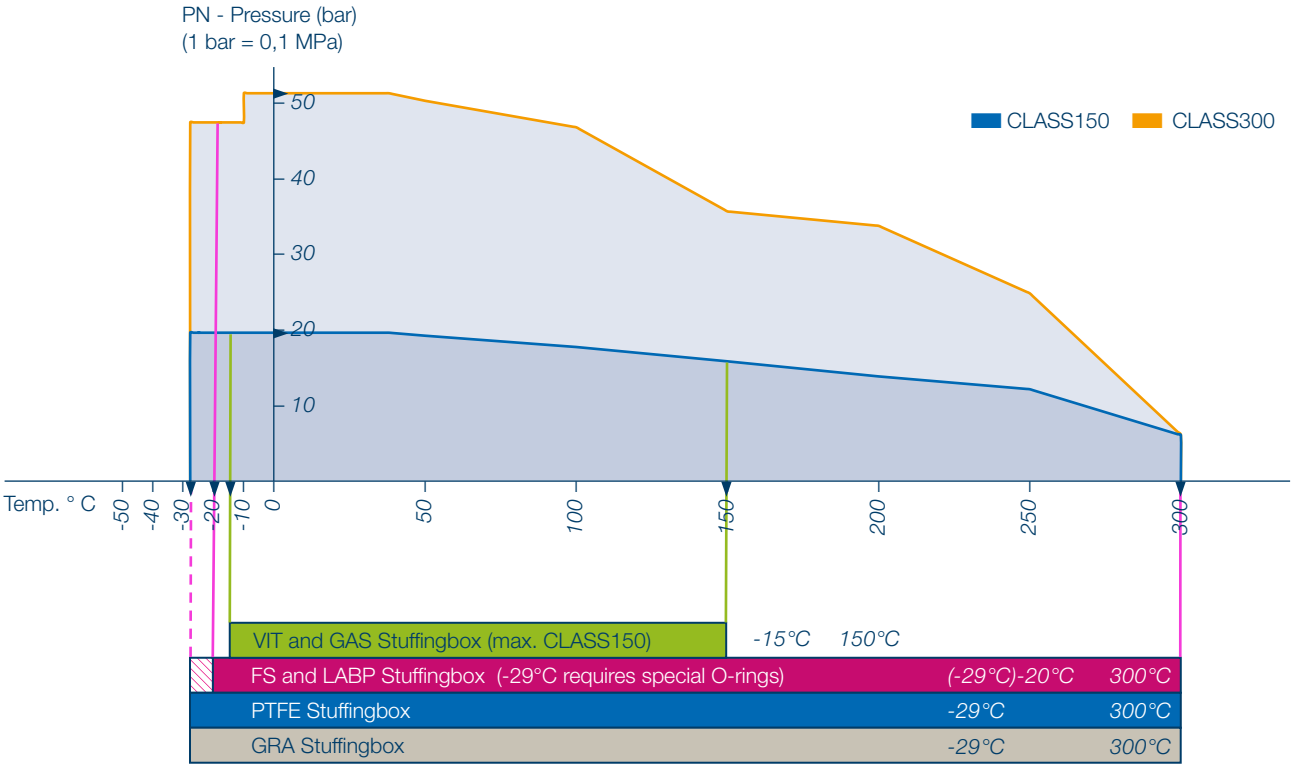
AREAS OF UTILIZATION

Pressure and temperature ranges

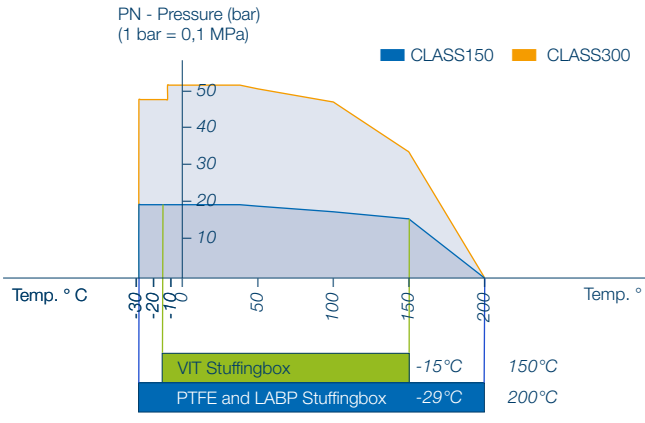
Carbon steel

Material index M1 (VIII)

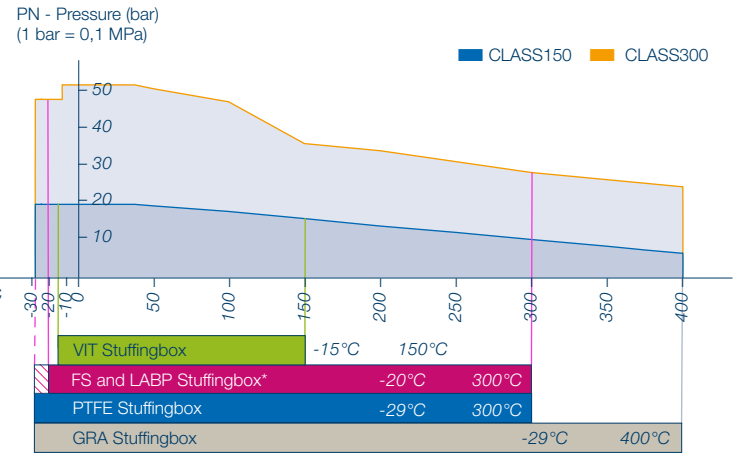
PT diagram for the sealing elements FF, KK, GG and MM



PT diagram for the sealing elements PP



PT diagram for the sealing elements SS

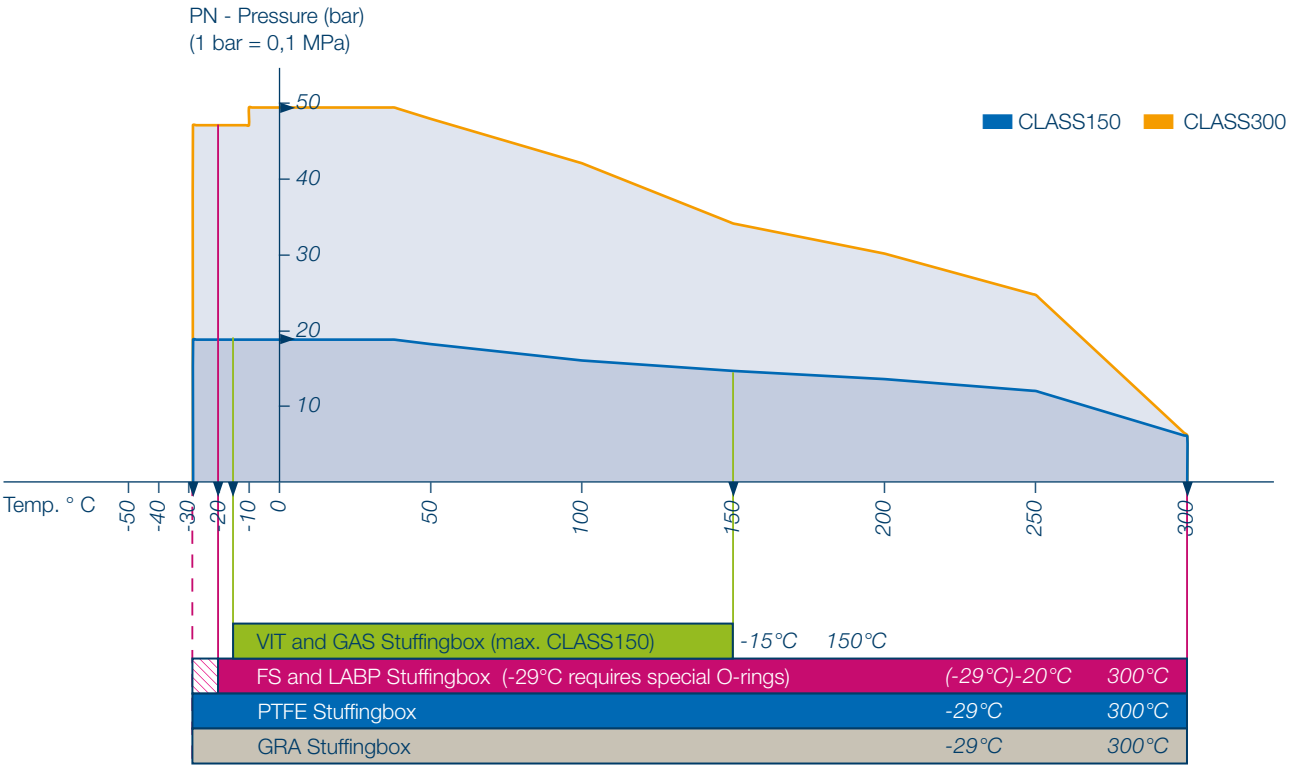


*) (-29°C requires special O-rings)

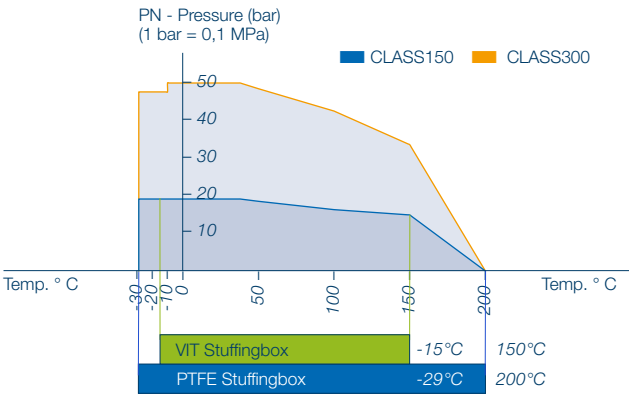
Stainless steel

Material index M2 (Xc)

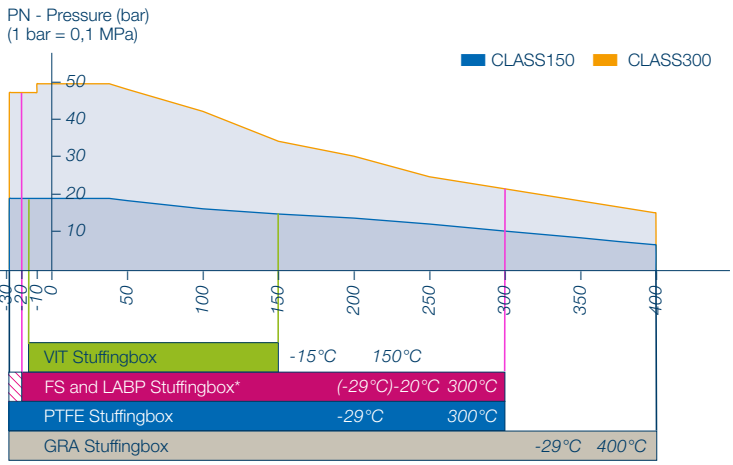
PT diagram for the sealing elements FF, KK, GG and MM



PT diagram for the sealing elements PP



PT diagram for the sealing elements SS



*) (-29°C requires special O-rings)

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
15	0.24	18.3
20	0.21	35.2
25	0.19	56.7
32	0.22	88.1
40	0.14	173.0
50	0.09	329.0
65	0.09	560.5
80	0.08	910.0
100	0.07	1522.0
125	0.06	2537.0

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.

PRESSURE LOSSES

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

oder

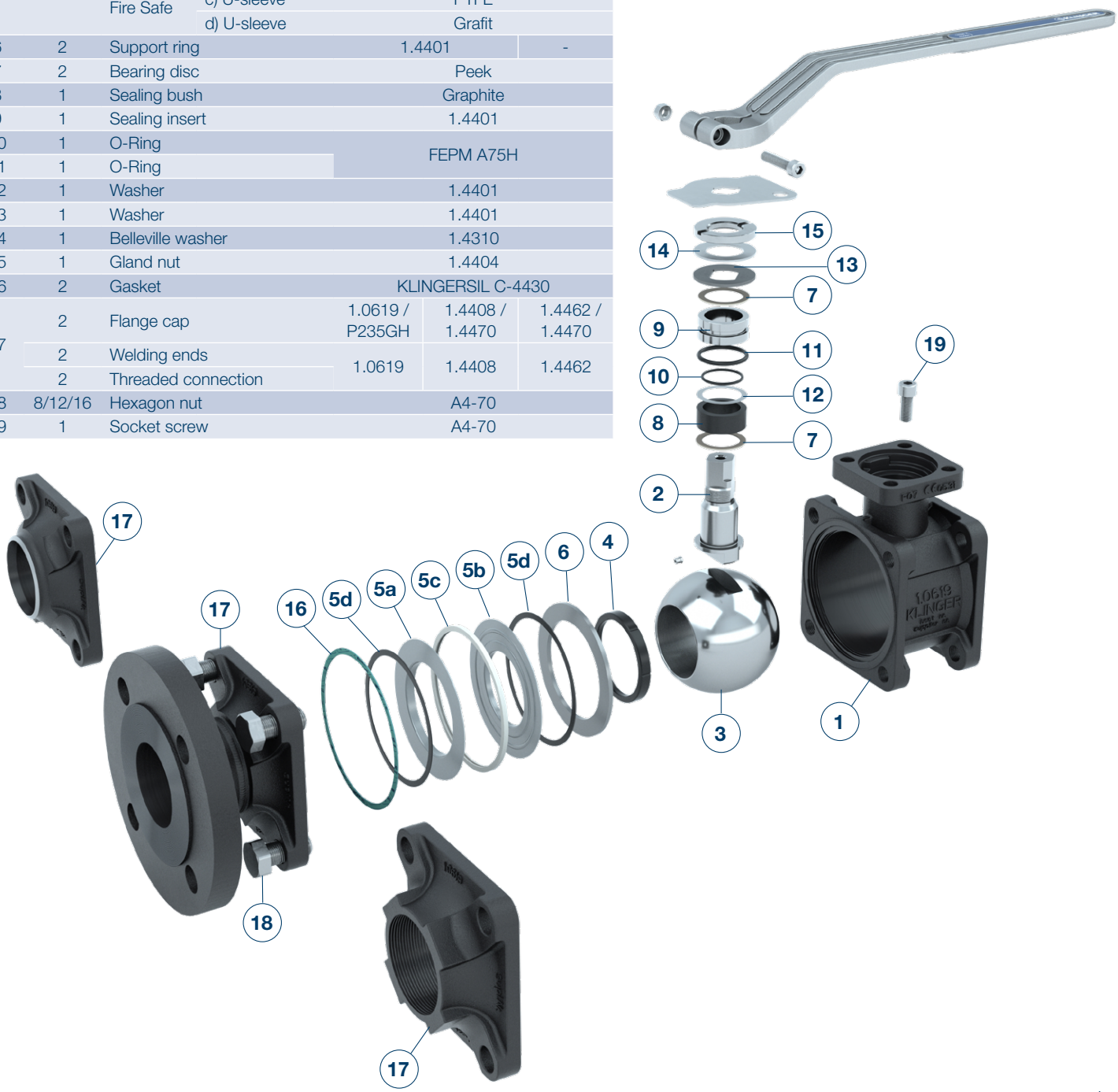
$$\Delta p = \left(\frac{Q}{k_v}\right)^2 * \frac{\rho}{1000}$$

TECHNICAL DETAILS

Bill of materials

PARTS LIST

Pos.	Qu.	Name		M1 (VIII)	M2 (Xc)	M3 (Xd)
1	1	Housing		1.0619	1.4408	1.4470
2	1	Operating shaft		1.4104	1.4404	1.4462
3	1	Ball		V4A		1.4462 / 1.4470
4	2	Sealing ring		KFC-25		
5	2	Sealing element Fire Safe	a) support disc	1.4401		1.4462
			b) cover disc	1.4401		
			c) U-sleeve	PTFE		
			d) U-sleeve	Grafit		
6	2	Support ring		1.4401		-
7	2	Bearing disc		Peek		
8	1	Sealing bush		Graphite		
9	1	Sealing insert		1.4401		
10	1	O-Ring		FEPM A75H		
11	1	O-Ring				
12	1	Washer		1.4401		
13	1	Washer		1.4401		
14	1	Belleville washer		1.4310		
15	1	Gland nut		1.4404		
16	2	Gasket		KLINGERSIL C-4430		
17	2	Flange cap		1.0619 / P235GH	1.4408 / 1.4470	1.4462 / 1.4470
	2	Welding ends		1.0619	1.4408	1.4462
	2	Threaded connection				
18	8/12/16	Hexagon nut		A4-70		
19	1	Socket screw		A4-70		



KLINGER India

Certified acc. to DIN EN ISO 9001:2015 Subject to technical alterations.
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