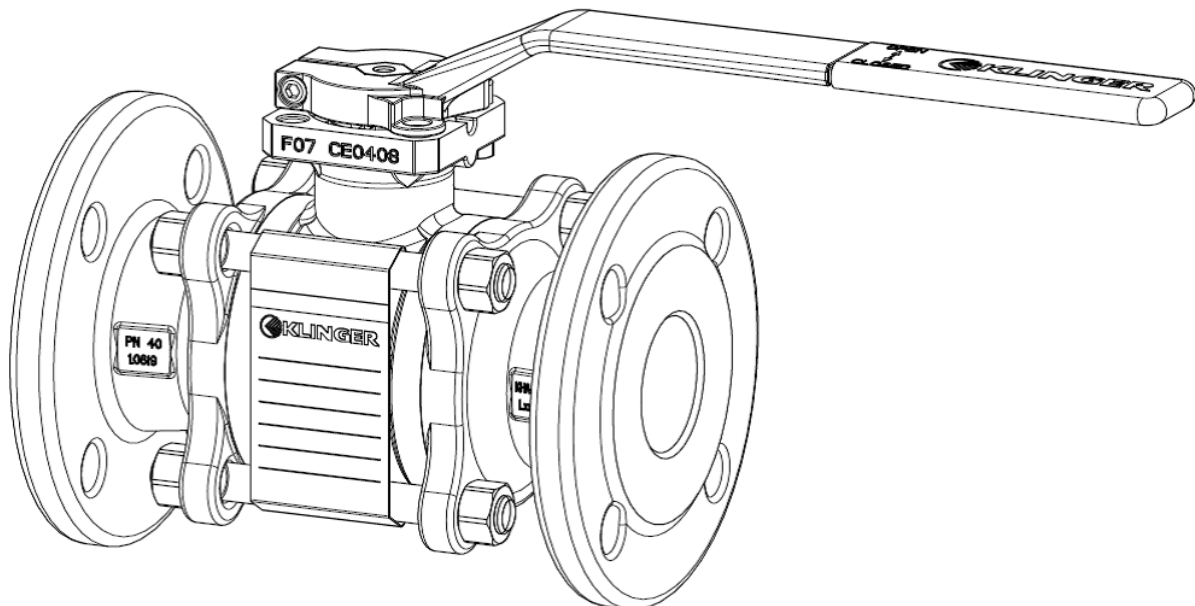


STANDARD OPERATION MANUAL FOR

KLINGER VALVES

BALLOSTAR® KHA BALL VALVE STANDARD AND HIGH-TEMPERATURE VERSION NOMINAL PIPE SIZE: DN 10 – DN 125 TYPE: 3-PIECE BALL VALVE



Issued: 08/2017

KLINGER Fluid Control GmbH

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1 Declaration of Conformity

We,

KLINGER Fluid Control GmbH
Am Kanal 8-10
A-2352 Gumpoldskirchen

declare, that the product range

Ball Valve KLINGER Ballostar
Type: **KHA**
Size: **DN 32 - 125 und 1 1/4" bis 5"**
Connection: **Flange, welding ends, threads**

to which this declaration is referring to, is in compliance with the directive 2014/68/EU (PED) and the following standards:

EN 19, EN 1092, EN 1563, EN 10213, EN 12266-1, EN 12516-1/-2 (except point 10), EN 13445-3 (only point 11), EN 16668 and AD 2000 (B0, W3/2)

and was subjected to the following conformity assessment procedure:

Modul H (full quality assurance)

The surveillance of the quality system and the design review is performed by:

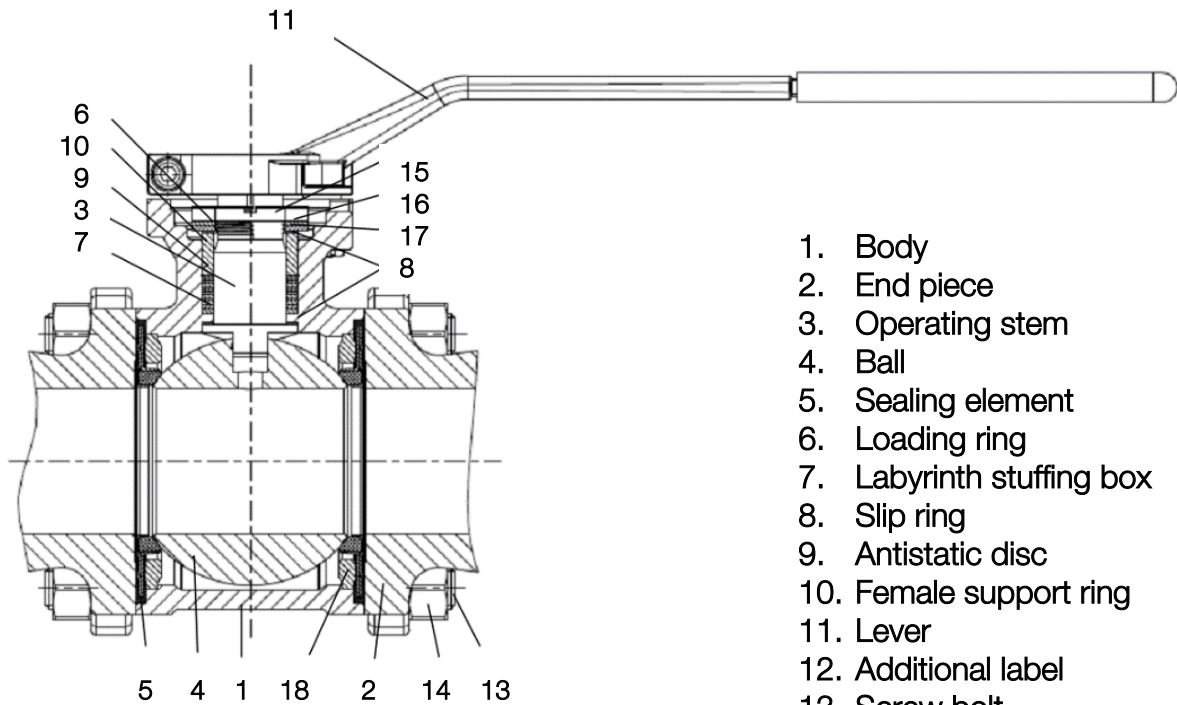
TÜV Süd Landesgesellschaft Österreich GmbH
Tiwagstraße 7
6200 Jenbach
(notified body No. 0531)

Gumpoldskirchen, 01.08.2017
(place and date of issue)

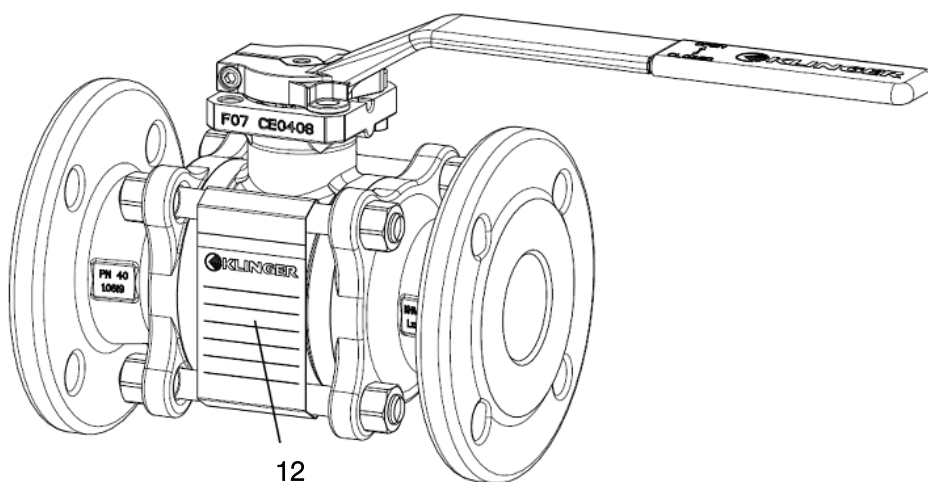

Manfred Stockinger
(managing director)

Rev: 08/2017

2 Individual Parts Designation



1. Body
2. End piece
3. Operating stem
4. Ball
5. Sealing element
6. Loading ring
7. Labyrinth stuffing box
8. Slip ring
9. Antistatic disc
10. Female support ring
11. Lever
12. Additional label
13. Screw bolt
14. Hexagon nut
15. Stuffing box nut
16. Belleville washer
17. Loading ring
18. Supporting ring



3 Proper Use

This product is exclusively intended to shut off or convey media within the approved pressure and temperature limits after installation in a pipeline system.

Please see the P/T diagram (pressure temperature diagram) for the permissible threshold values in accordance with the utilized materials.

This operating manual must unconditionally be brought to the attention of the corresponding personnel!

Prior to installation and putting into service for the first time, please read the operating manual carefully and pay attention to the hazard and safety notes!

! CAUTION	<p>Non-compliance with the hazard and safety notes of this operating manual may result in the creation of hazards and loss of the manufacturer's warranty.</p> <p>Please contact the manufacturer under +43 2252 600-0 for further details.</p>
----------------------------	--

Subject to technical alterations and misprints!

4 Testing of KLINGER Valves

KLINGER Valves are pressure-tested in accordance with EN 12266-1. The pressure test comprises the tests P10, P11 and P12. Testing the resistance to pressure of the ball (P20) is not included in the standard package.

5 Labeling of the Valves

Each valve is provided with the following data listed either on the body or on a type plate.

	Designation	Comment
Manufacturer	KLINGER	Please see the operation manual for the address
Model	e.g. KHA	Manufacturer's type designation
Size	DN and numeric value	Numeric value in mm, e.g. DN 80 or inches, e.g. 3"
PN / Class	Numeric value for PN / Class	Provides the max. permissible pressure at ambient temperature
FA-No.	Numbers / letters	FA-No. serves identification purposes
Material	e.g. 1.0619 or VII	In accordance with material codes
	CE	Market approval designation

6 Safety Instructions

This operation manual must be brought to the attention of the operating personnel.

6.1 General Notes on Safety

The safety instructions for valves also apply to the pipeline systems, into which they are installed. This operating manual exclusively focuses on safety instructions, which are to be additionally complied with for valves.

6.2 Safety Instructions for Operators

<p style="text-align: center;">! Danger to Life</p>	<p>A valve with a permissive pressure/temperature range that is not sufficient for the operating conditions may not be operated! This range is to be derived from the P/T diagram. With regard to materials, pressures or temperatures not listed there, contacting the manufacturer is mandatory. Ignoring this regulation can result in life-threatening situations and can cause damage to the pipeline system.</p>
<p style="text-align: center;">! Danger to Life</p>	<p>It must be ensured that materials selected for the parts coming into contact with the media are suitable for the utilized media. The manufacturer takes no responsibility for damages resulting from corrosion or through aggressive media. Ignoring this regulation can result in life-threatening situations and can cause damage to the pipeline system.</p>

The following items do **not** lie in the scope of responsibility of the manufacturer. As a consequence, when utilizing the valve, it must be ensured that

- » the valve is only utilized in accordance with its proper use, as illustrated under "Proper Use".
- » the actuator unit, which is subsequently mounted on the valve, is adjusted to the valve and correctly adjusted in the end position.
- » when connecting a valve actuator to the power grid, the safety notices of the actuator manufacturer are complied with.
- » the valves are correctly implemented into the system, especially those connected to the pipeline system by means of welding.
- » no additional tensions bear on the valves.
- » the operation parameters and operating conditions have been clarified with the manufacturer of the valve and that operating conditions such as vibrations, water hammers, pressure surges, erosion etc. are to be avoided.
- » pipeline system connections and valves, which are operated at operating temperatures $> 50\text{ °C}$ or $< -20\text{ °C}$, are protected against contact.
- » during welding procedures, the safety regulations of the plant operator and/or plant constructor are to be complied with.
- » the valve is only operated and maintained by trained personnel.
- » valves, which are utilized with hazardous media (flammable, corrosive, harmful to health etc.), are to be handled in accordance with their dangers. The corresponding handling regulations are the responsibility of the plant operator.
- » all ergonomic hazards are to be considered by the plant operator, such as e.g. accessibility, gauges etc.

- » when applying internal pressure for the first time (pressure test, trial operation) a sufficient safety distance is to be maintained.
- » when pressurized (medium), it is prohibited to open screw connections (with the exception of those on hand levers and handwheels).
- » installation and removal of valves is only carried out with a depressurized and drained pipeline.
- » all connections, following loosening, are again correctly tightened afterwards.
- » no screws are loosened on pressure-retaining parts, unless described so in the operation manual.
- » no screwed connections are forcibly opened.
- » that during longer shutdown periods, in the event of freezing media, the valve is drained and/or that depressurization is achieved in case of expanding media.

6.3 Hazard Warnings

Mechanical hazards:

- » Beware of possible sharp or protruding parts posing risk of injury.
- » Extra care is required during putting into operation: Do not reach into the bore opening during the valve closing process, as this poses a risk of injury.
- » Be careful of falling parts during transportation, maintenance and putting into operation.
- » When manipulating lifting appliances, the safety regulations for lifting appliances must be complied with.
- » Unauthorized and improper handling can result in undesired and spontaneous pressure loss and can result in significant damage.
- » With regard to valves featuring a mounting bracket it must be ensured that moving valve parts do not result in a risk of injury.

Electrical hazards:

- » With regard to valves featuring electric actuators, the operating manual and the safety instructions of the actuator manufacturer must be complied with.

Thermal hazards:

- » During operation, the surfaces of valves may feature high / low temperatures. Caution: Burn hazard.
- » Caution: The hot surfaces can cause self-ignition of flammable materials through either contact or heat emission.

Hazard generated by noise:

- » Depending on the application conditions, high levels of noise can be created by the cavitation processes, which bear the risk of hearing damage.
- » Opening an internally pressurized valve can result in major noise exposure as a result of exiting media; hearing damage hazard.

Vibration hazard:

- » Caution: Abrupt opening or closing of a valve can lead to undesired surges and vibrations in the pipe, which may possibly damage the valve or the pipeline system.

Electromagnetic radiation hazard:

- » The hazards resulting from possibly created electromagnetic radiation are to be consulted in the operating manual of the actuator manufacturer.

Hazards linked to the operational environment:

- » The ambient atmosphere and the ambient temperature are to be set in a manner that has no negative influence on the valve, the actuator of the valve, and the medium.

Transportation hazards:

- » Please see the chapter “Transportation and Storage” for transportation hazards.

Maintenance hazards:

- » All maintenance and repair tasks with the exception of lubricating and subsequent sealing of stuffing boxes are without exception to be carried out in an unpressurized state. Where required, the valve may have to be drained prior to servicing.
- » Valves may only be removed from pipeline systems in an unpressurized and empty state.
- » Attention must be paid to exiting media when resealing.
- » Caution: (Fire and chemical) burn hazard and risk of poisoning caused by valves utilized in dangerous media. Attention must be paid to medium residues during maintenance and putting into operation tasks.
- » Maintenance and repairs may only be carried out by qualified personnel.

Placing out of operation hazards:

- » When placing out of operation, the valves must be emptied fully and attention must be paid to hazards resulting from medium residue.
- » Should valves be no longer used, they are to be disposed of correctly.

Hazards when opening drain valves:

- » Danger of exiting medium. If utilized in high temperature water systems, the drain ball valve may only be opened after it has been ensured that the drain line is either correspondingly pressurized or that the temperature is less than 100°C (avoidance of steam hammers in the clearance volume).

Material failure hazard:

- » Parts made of grey cast iron are especially sensitive to brittle fracture and impact. This aspect must be considered in the course of material selection.

7 Technical Data

7.1 Material codes

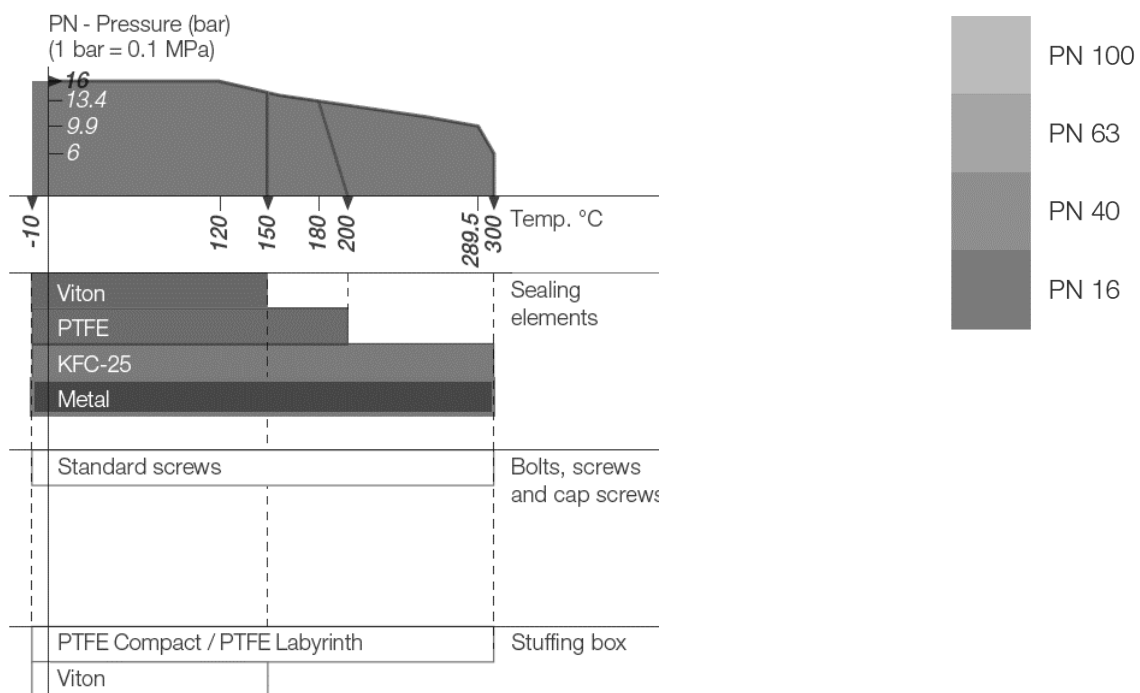
The main criterion of the material codes is the basic material of the body.

Symbol	Body	Interior Parts
III	Grey cast iron	Without nonferrous metal parts
VII	Cast steel	Nonferrous metal parts possible
VIII	Cast steel	Without nonferrous metal part
X	Stainless steel	Parts coming into contact with the medium are acid-resistant
Xc	Stainless steel	All parts acid-resistant

The above table may also contain material codes unavailable for this product.

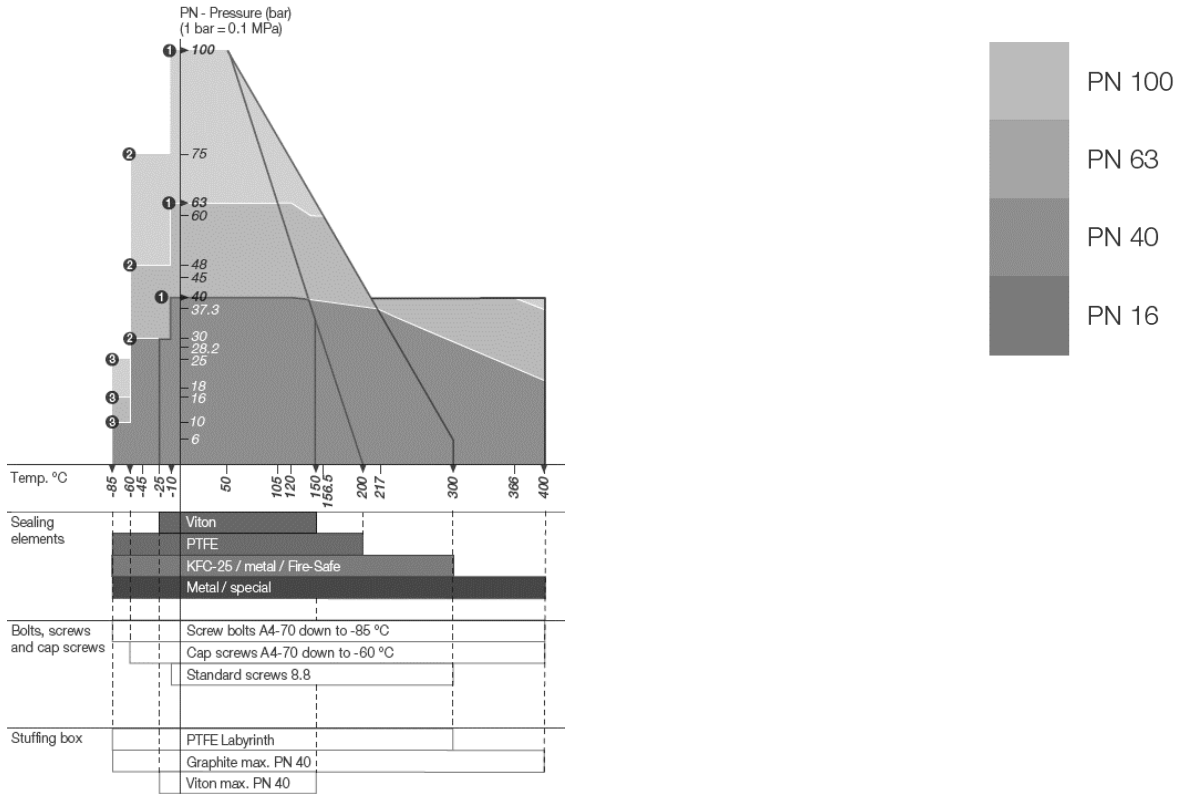
7.2 P/T Diagrams

The applicable maximum limitations of use regarding pressure and temperature are defined by their mutual interdependency. A P/T diagram is an ideal tool in order to select a suitable valve for pre-defined operational characteristics.



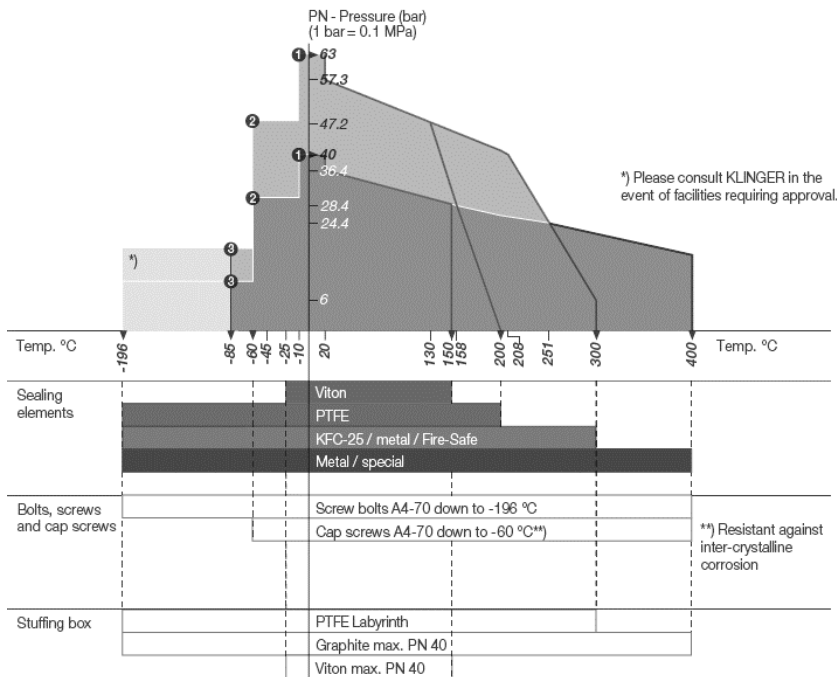
Grey cast iron

Material code III



Steel casting

Material code VIII



Stainless steel casting

Material code Xc

CAUTION | The diagrams illustrate all possible limitations of use of KLINGER valves.

7.3 Tightening Torques and Width Across Flats

Nominal width mid-body section	15	20	25	32	40	50	65	80	100	125
Tightening torque stuffing box nut (Nm)	5	15	15	25	25	20	20	40	40	40
Tightening torque body screws Xc (Nm)	9	25	25	40	55	75	70	100	130	145
Tightening torque body screws VIII (Nm)	9	20	20	30	40	60	60	80	110	120
Tightening torque body screws III (Nm)	9	20	20	30	40	60	60	70	110	120
AF hexagon screw stop	8	10	10	13	13	13	13	19	19	19
AF body screws KHA-FL,SL,SK,G	10	13	13	17	19	22	19	24	24	24
AF body screws KHA-FK-VIII, Xc						22	22	24		
AF body screws KHA-FK-III						19	22	22		

Tolerance for stuffing box nut tightening torque + 10 %

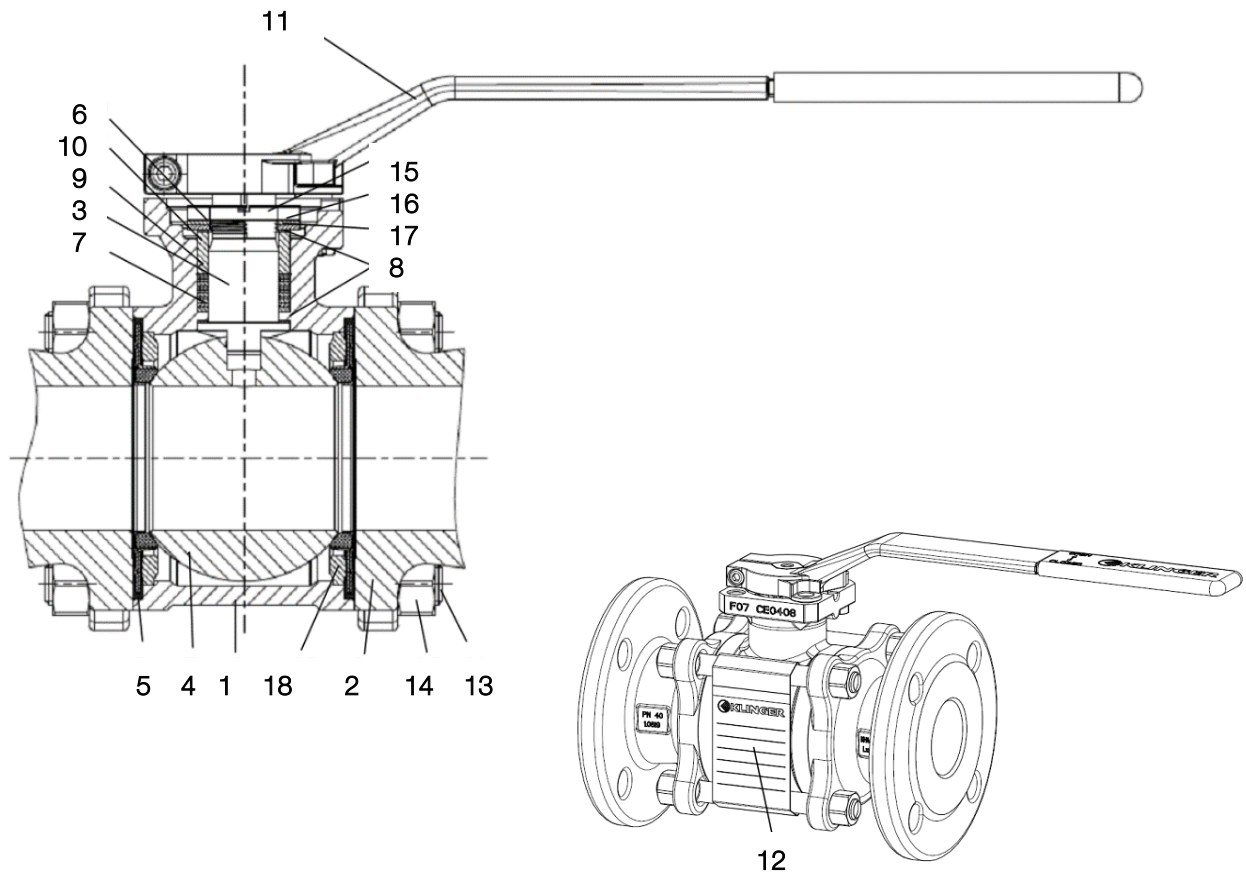
Tolerance for body screw tightening torque \pm 10 %

7.4 Table of Weights

This table features a weight estimate of a PN 40 valve with flange connections (full bore).

Nominal size	Weight
10	2.3 kg
15	2.4 kg
20	3.7 kg
25	4.7 kg
32	7.4 kg
40	9.8 kg
50	14.5 kg
65	20.6 kg
80	31.6 kg
100	44.8 kg
125	75.7 kg

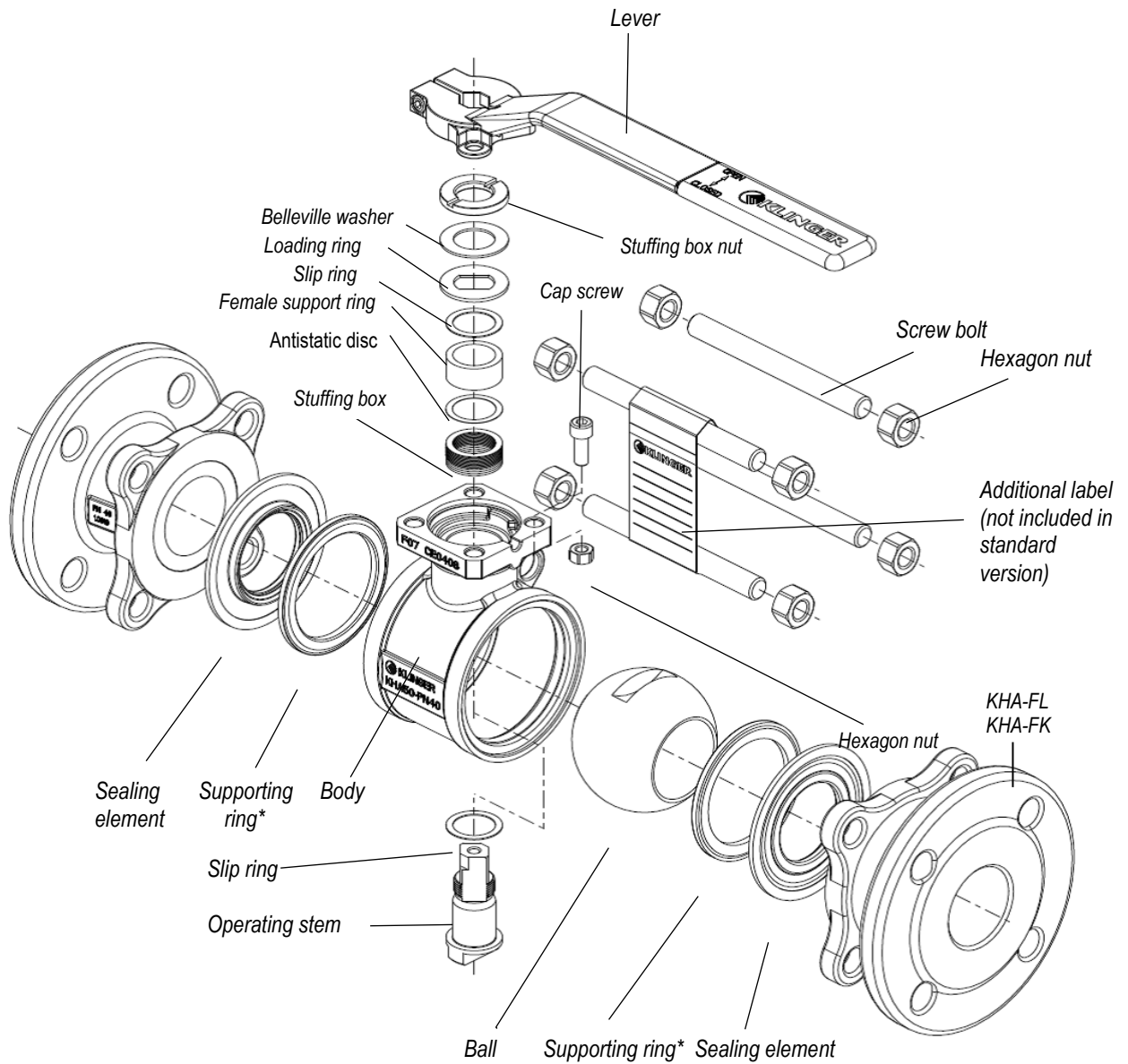
7.5 Material Combinations



Pos.	Individual Parts	Materials		
		VIII	Xc	III
1	Body	1.0619 Zn/Fe phrf	1.4408	1.0619 Zn/Fe phrf
2	End piece	1.0619 Zn/Fe phrf	1.4408	0.6025 (0.7040) Zn/Fe phrf
3	Operating stem	1.4104	1.4571	1.4104
4	Ball	1.4401 (1.4408 from DN 65 upwards)		
5	Sealing element	Xc – KFC		
6	Loading ring	1.4404		
7	Labyrinth stuffing box	K – Flon / 4401 / Graphite		
8	Slip ring 2x	KFC – 15		
9	Antistatic disc	1.4401		
10	Female support ring	1.4404		
11	Lever	1.4006/1.4408		
12	Additional label (standard version does not have additional label)	1.4310		
13	Screw bolt (hexagon screw)	8.8-A2L	A4-70	8.8-A2L
14	Hexagon nut	8-A2L	A 4	8-A2L
15	Stuffing box nut	1.4404		
16	Belleville washer	1.4310		
17	Loading ring	1.4404		
18	Supporting ring	Sint D10/Sint C39	1.4404	-----

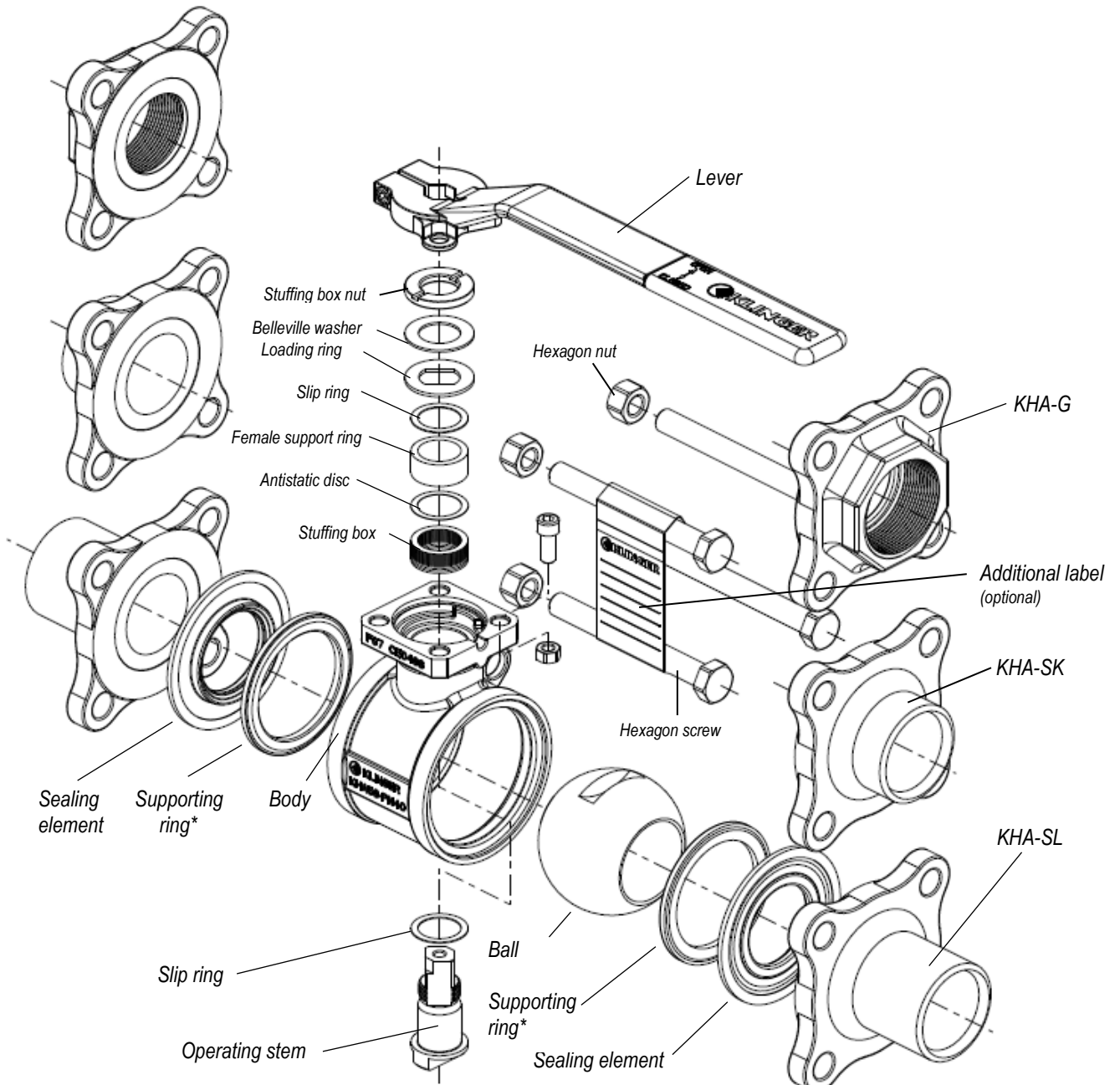
Subject to technical change

7.6 Exploded View KHA-FL, KHA-FK



* In the event that a single-part sealing element is installed, the supporting ring must be removed.

7.7 Exploded View KHA-G, KHA-SK, KHA-SL



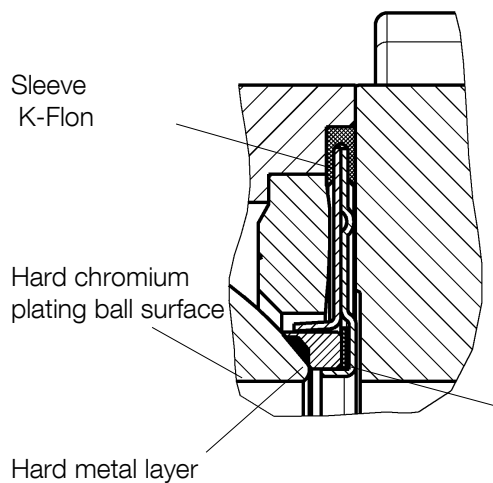
* In the event that a single-part sealing element is installed, the supporting ring must be removed.

7.8 Sealing Element for Special Requirements

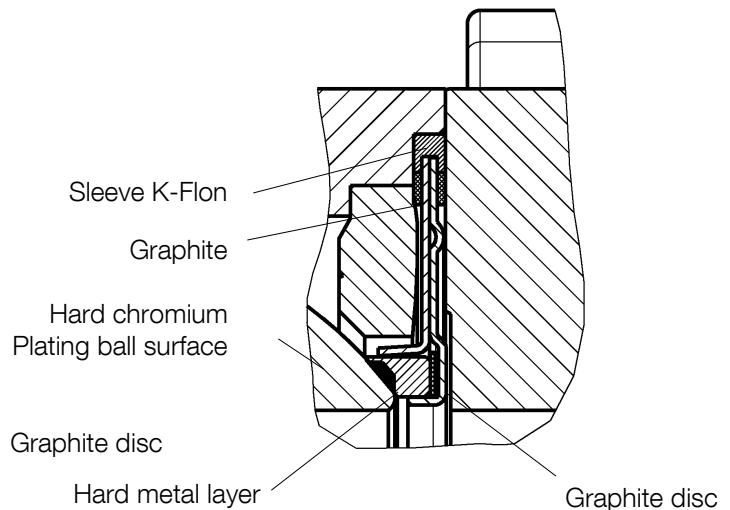
Due to a modular kit of system components, the sealing elements can be fitted with special gaskets in accordance with the requirements. This can also be achieved with already installed ball valves. All sealing elements are pre-installed in a pre-finished state!

CAUTION: The ball and the sealing ring must be lubricated during installation.

METALLIC Sealing Element

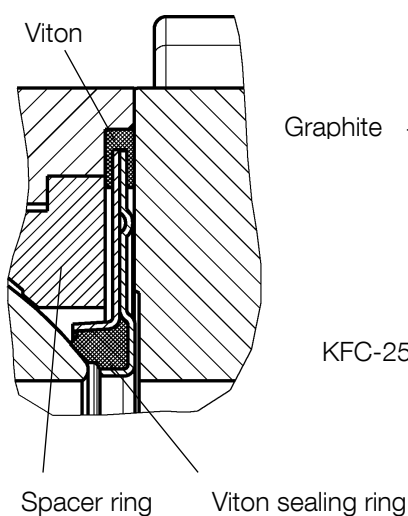


METAL-Special Temp. 400 °C Sealing Element

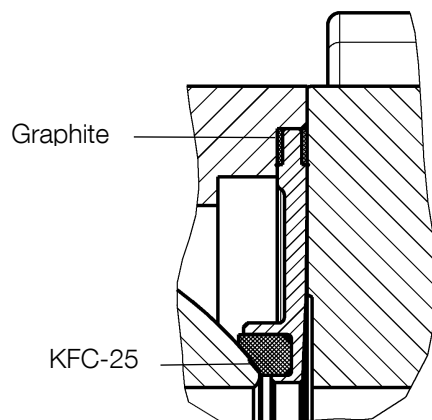


For abrasive media and media featuring particulate matter. Also for heavily polluted and granular media or displaying a tendency towards crystallization.

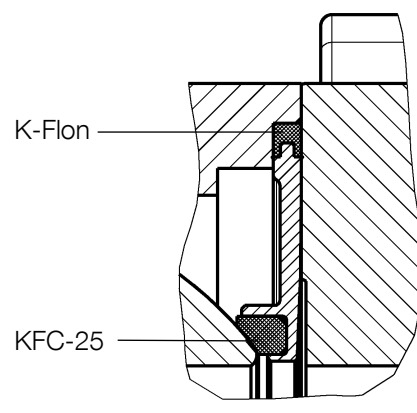
VITON Sealing Element (eg. Low and high vacuum range)



FIRE SAFE Sealing Element

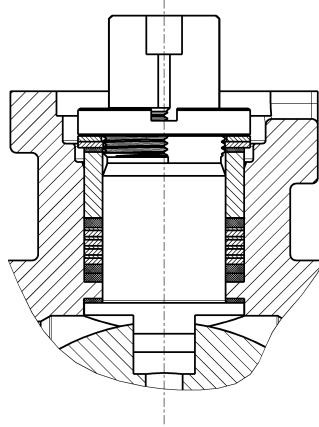


Single-Part Sealing Element (eg. Gas applications)



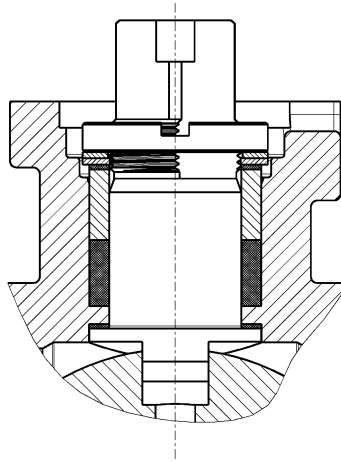
7.9 Special Requirements Stuffing Box

Labyrinth stuffing box



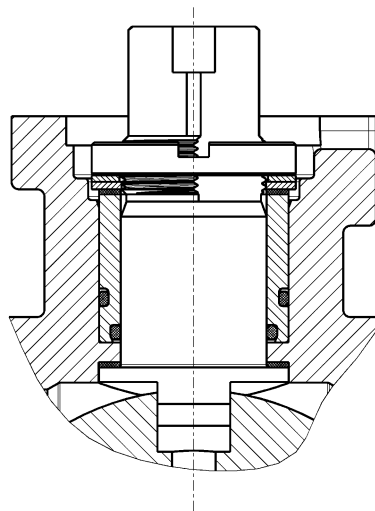
Area of application:
- Ideal for most applications

Graphite stuffing box



Area of application:
- High-temperature

Stuffing box set with O-ring sealing



Area of application:
- Low and high vacuum
- Gas applications

8 Transportation and Storage

Check the shipment immediately upon receipt for completeness of delivery and transport damage. Furthermore, it should be ensured that the valves and possibly mounted actuators have not been damaged during transport. Please also check that the supplied valves (types, nominal sizes etc.) correspond with the order. KLINGER Fluid Control is to be immediately notified of any kind of deviations. Regarding damage obviously resulting from transportation, please contact the freight forwarder in charge of delivery.

Ballostar® ball valves are supplied in the OPEN position with the connections covered in order to protect against dirt and damage. These covers may only be removed immediately prior to installation.

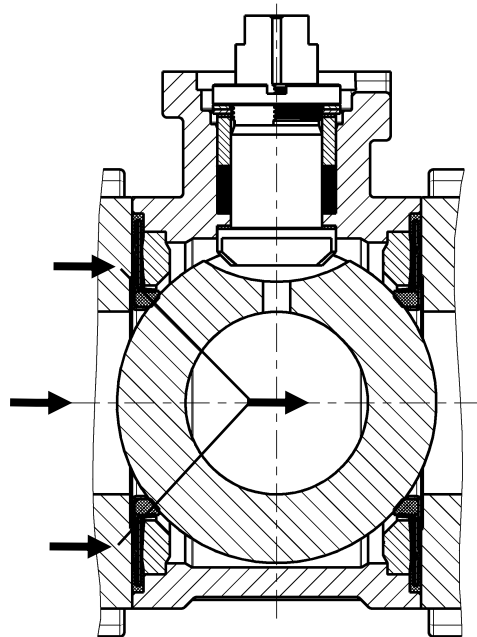
- » Storage in the default factory packaging.
- » The valves are to be stored in closed rooms, in a non-aggressive atmosphere, and protected against humidity and contaminants.
- » In the event that protective sheeting or shrinking foils are used, it must be ensured – through adequate measures – that the atmosphere within the covers remain free of condensation.
- » Corresponding protective measures are recommended for storage in dusty rooms.
- » In order to avoid mix-ups, all stored parts should be labeled in accordance with the shipping notes and stored in the correct place.
- » The temperature in the storage rooms should not exceed the limits -20 °C and +50 °C. Rapid temperature changes are to be avoided whenever possible (condensate water).
- » Possible changes originating from KLINGER Fluid Control and having an impact on storage will be announced in a timely manner in the form of a circular.
- » The operation manual is part of the delivery and must be stored with the item. This ensures that all important information and documents can be passed on.
- » Lift lines suitable for the weight and the lifting aids on the valve (to the extent present) are to be used for manipulation purposes.

Damages resulting from incorrect storage or manipulation free KLINGER Fluid Control from any obligations derivable from the warranty, guarantee and product liability.

9 Operating Principle

With its "elastic sealing system" the ball valve guarantees full tightness at both high and lowest pressures. The necessary contact forces between the ball-shaped shut-off section and the sealing elements are generated by the pressure differential created in the shut-off valve. With regard to this sealing principle, the "FLOATING BALL", it is important that the shut-off section between the two sealing rings is movable. These rings carry out a double function: They guide the ball and act as force transducers.

DISTRIBUTION OF FORCES



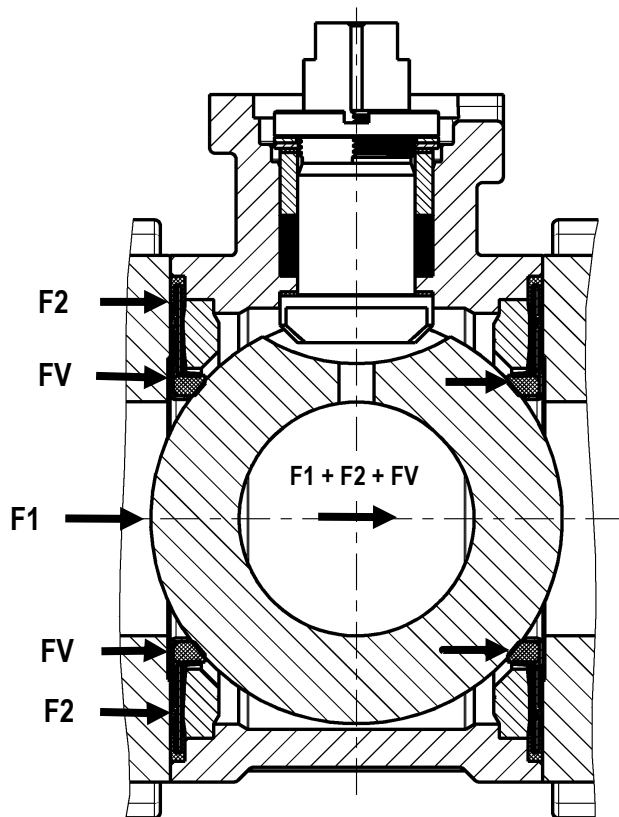
This principle is used in combination with ball valves of smaller nominal sizes. As the nominal sizes increase, so do the forces which have to be absorbed by the sealing rings. In order to achieve a long service life and to keep the torques for the pivoting of the ball as low as possible, this three-component design is not suitable for all nominal sizes.

10 Mode of Operation

The two pre-stressed elastic sealing elements made of stainless steel with KFC sealing rings, a K-Flon sleeve at the upstream and downstream side of the ball valve and the ball create the sealing system.

The pressure of the medium presses the ball onto the downstream sealing element. At the same time, the upstream element is also pressed against the ball. The Ballostar® ball valve is maintenance-free and can be pressurized in both flow directions.

The U-sleeve on the outer circumference of the holding disc is fully chambered (only refers to holding disc design) and provides tightness to atmosphere towards the body connector section.



Exerted forces:

F1....Force of the medium exerted on the ball

F2...Force of the medium exerted on the sealing element

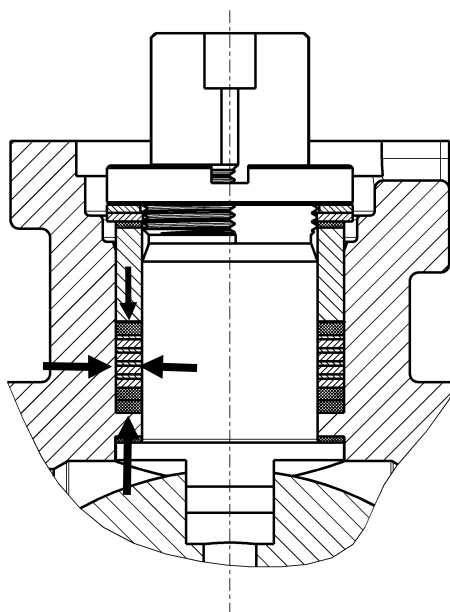
Fv....Pre-stress force of the sealing element

F1+F2+Fv....Total force exerted on the seat ring

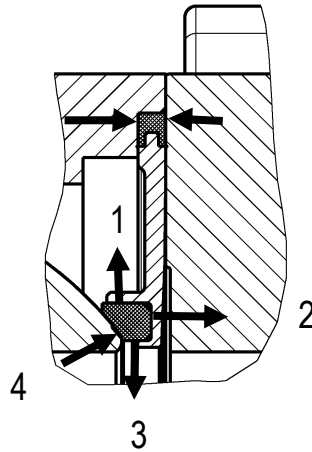
The seal of the operating unit (operating stem) is formed by a **STUFFING BOX** supported by a Belleville spring washer.

This type of seal is virtually maintenance-free, has a low setting behavior and only minor contact forces are necessary to achieve tightness.

The Belleville spring washer is positioned in a manner that a contact force is always exerted on the stuffing box. This ensures that temperature and pressure differences are compensated for.



The retaining washer negates movement of the sealing ring in radial direction (1), against the rear (2) and against the bore (3). The ball presses against the sealing ring (4). The sealing ring can therefore neither set nor shift, as it is enclosed on all sides (applies to retaining washer).



11 Installation and Putting into Service Regulations

In order to protect against impurities and damage, the connections of the valves are covered. We recommend removal of these covers only prior to installation.

Ballostar® ball valves can be installed in every orientation. Installation should be carried out in the OPEN position (delivery state) in order to avoid damage to the ball surface.

Valves with welding ends may generally be welded into a pipework by means of fusing welding procedures. In this context, the welding and quality requirements and their norms are to be complied with. As a consequence, welding may only be carried out by qualified personnel. The safety regulations of the plant operator and/or the plant manufacturer are also to be complied with.

The installation of valves with flange ends may only be carried out by qualified personnel in accordance with EN 1591. In this context it must be ensured that no additional tensions affect the valve, such as e.g. a too large gap between the to be screwed flanges.

Following installation and prior to putting into service, it must be ensured that solids and impurities, which are not part of the medium, have been removed from the pipeline system and/or from the facility.

A pressure and a function test must be carried out prior to putting into operation. Prior to putting into service of valves in steam pipes, proper condensate draining must be ensured in order to avoid steam hammer hazards. In extreme cases, a steam hammer may lead to breaking of the valve. Rapid increases in temperature and pressure are to be avoided during all operation phases (start – operation – shutting down).

The maximum permissible test pressure is $1.1 \times PN$ if the valve is in a closed state. The valve must be open when testing the pipe pressure ($1.5 \times PN$).

The ball valves are also to be secured against toppling or falling down during transportation to the place of installation. Furthermore, they are to be protected against colliding with each other or other forms of damage.

11.1 Welding Instructions

When welding, the requirements relating to both welding and quality and their respective norms must be complied with.

Welded hexagon nipple materials

Material designation		Material No.	C %	Si %	Mn %	Cr %	Mo %	Ni %
Klinger		DIN						
VIII	GS-C25 N	1.0619 *)	0.18-0.23	0.30-0.60	0.50-1.10	≤ 0.30		
Xc	G-X6CrNiMo1810	1.4408 **)	≤ 0.07	≤ 1.5	≤ 1.5	18.0-20.0	2.5-3.0	10.0-12.0

*) The P content may only be max. 0.020 %, the S content may only be max. 0.015 %

***) The P content may only be max. 0.045 %, the S content may only be max. 0.030 %

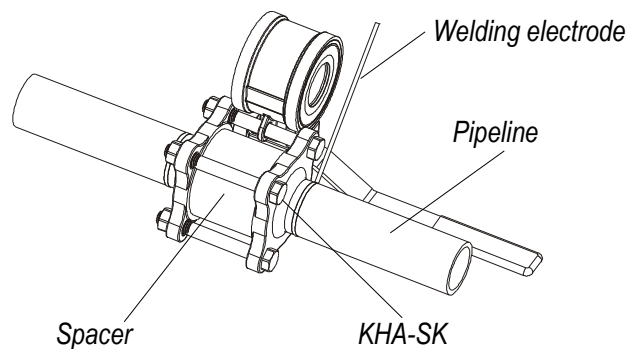
11.1.1 Welding Instructions for Short Design (KHA-SK)

The temperatures generated during the welding process may lead to damaging of the sealing elements. As a consequence, the ball valve body must be swung out and replaced by a spacer. Due to the three-component valve design, this can be easily achieved for short periods.

Welding ends must be welded in with mounted spacer!

Following completion of the welding operation, the spacer must be removed and the body section swung into its original position and mounted. The connecting pieces must be parallel and aligned to the center of the axis! Shift the ball valve into the CLOSED position and tighten the connecting screws crosswise on the basis of the tightening torque listed in the table.

Swinging out the ball valve body is not required in the case of KHA-SK ball valves with Fire Safe sealing elements!



Nominal size	L	Pipe
15	26.8 ^{+0,1}	33.7 x 2.6
20	35.6 ^{+0,1}	42.4 x 2.6
25	41.9 ^{+0,1}	48.3 x 2.6
32	49.9 ^{+0,1}	60.3 x 2.9
40	63.4 ^{+0,1}	76.1 x 2.9
50	77.9 ^{+0,2}	88.9 x 3.2
65	93.9 ^{+0,2}	114.3 x 3.6
80	111.8 ^{+0,2}	139.7 x 4.0
100	132 ^{+0,2}	177.8 x 5.0
125	171.8 ^{+0,2}	219.1 x 6.3

Spacer lengths

11.1.2 Welding Instructions for Long Design (KHA-SL)

At a distance of 20 mm from the edge of the body, a temperature of +200 °C may not be exceeded. Carry out temperature checks. Cooling the ball valve body during welding is advisable. Following cooling down, the tightening torques of the connection screws must be checked against the values from the table.

12 Service and Maintenance

Maintenance and inspection intervals are to be determined by the operator dependent on the operating mode, as these valves can be utilized under a number of different operating conditions.

In order to increase service life at low activation counts, we recommend carrying out an activation from time to time. For this purpose it is fully sufficient to only shift the ball by a few angular degrees.

Maintenance and inspection work may only be carried out by trained personnel.

Prior to the start of service and maintenance work, it must be ensured that the pipeline system is depressurized and that no medium residues are contained within.

In the event of possible leakages to the atmosphere, the tightening torques at the affected positions must be checked against the values of the tightening table.

When removing an actuator, it is necessary to protect it against rotation prior to loosening of the connecting screws.

12.1 Seal Replacement

! ACHTUNG	Prior to installation, all individual parts, especially seals and sealing surfaces, must be carefully checked and replaced if damaged. Visible contamination on the machined surfaces must be cleaned off.
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12.1.1 Seal Replacement on the Operating Stem

- » Bring the valve into the OPEN position
- » Depressurize the line
- » Remove the valve from the line
- » Remove the body connection screws
- » Remove sealing elements and supporting rings (to the extent present) from the body midsection
- » Bring the ball into the CLOSED position and remove it
- » Remove the handle
- » Remove the stuffing box nut
- » Remove the operating stem and the washer
- » Remove the Belleville spring washer, dis, washer, pressure ring and antistatic disc
- » Remove the stuffing box and replace with a new one
- » Inspect washers and if necessary, replace
- » Assemble in reverse sequence (tightening torques in accordance with table)
- » Function test

12.1.2 Replacement of Sealing Elements (Flange Connection)

- » Bring valve into OPEN position
- » Depressurize line
- » Remove valve from line
- » Remove body connection screws
- » Remove sealing elements and supporting rings (to the extent present) from the body midsection
- » Bring the ball into the CLOSED position
- » Install new sealing elements and supporting rings (in the case of single-part sealing elements, do not install supporting rings)
- » Reconnect body sections by means of body connection screws and tighten lightly
- » Tighten screws crosswise with required tightening torque as listed in the table
- » Function test

12.1.3 Replacement of Sealing Elements (Welded and Threaded Ends)

- » Bring valve into OPEN position
- » Depressurize line
- » Loosen body connection screws and remove the three screws not stuck through the body midsection eyelet
- » Swing out the body midsection
- » Remove sealing elements and supporting rings (to the extent present)
- » Bring the ball into the CLOSED position
- » Install new sealing elements and supporting rings (in the case of single-part sealing elements, do not install supporting rings)
- » Reinsert body midsection between the connectors and tighten lightly
- » Tighten screws crosswise in accordance with required tightening torque as listed in the table
- » Function test

12.2 Standard Lubricants

O-Rings: Silicone grease OKS 1110

Screw thread: MOLYKOTE 1000

Other parts: MOLYKOTE 55 M

In special cases, the designated lubricant must be used for the order.

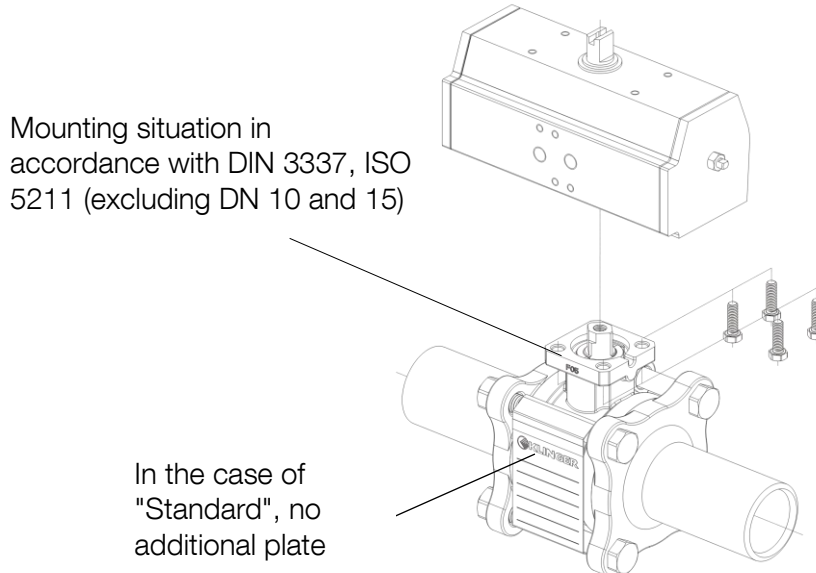
e.g.: **Oxygen applications** Klüberalfa YV93-302

Gas applications Klüber Nontrop ZB91

Sterile steam applications Klüberalfa YV91

13 Actuator Mounting

The actuator is to be executed with a torque in accordance with the nominal size. The values are to be defined with the manufacturer following a technical query (pressure, sealing material, media etc.).



Direct mounting of an actuator (as illustrated in the image above) is only recommended for operation temperatures under 80 °C.

KLINGER Fluid Control recommends the utilization of superstructure elements (console and coupling) if the connection holes of drive and valve do not fit or if higher temperatures occur.

13.1 Fitting the Actuator

When fitting actuators, the requirements of the actuator manufacturer have to be mandatorily complied with. The manufacturer of the KLINGER Ballostar® KHA assumes no liability for damage resulting from improper actuator installation. In case of doubt, it is recommended to discuss every actuator installation with the manufacturer of the actuator and the valve. Installation work may only be carried out by qualified personnel.

- » Bring ball valve into the "OPEN" position.
- » Place the actuator in the correct positional arrangement and screw together. If necessary, bolt.
- » Set the end positions.
- » Function test.

<p>! CAUTION</p>	<p>With regard to electrical actuators, it must be ensured that the end positions are limited by the path end switches and not by the torque end switches.</p>
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<p>! CAUTION</p>	<p>The valve is closed clockwise. It is to be ensured that the 90° movement is precisely complied with in its OPEN-CLOSED end positions.</p>
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14 Spare Parts List

The table below provides an overview of the available spare parts variants. During ordering, the precise designation of the valve, the stuffing box, the sealing elements and the material code of the valve must be provided.

Nominal Width	Stuffing Box	Stuffing Box & Sealing Elements	Sealing Elements
10	•	•	•
15	•	•	•
20	•	•	•
25	•	•	•
32	•	•	•
40	•	•	•
50	•	•	•
65	•	•	•
80	•	•	•
100	•	•	•
125	•	•	•

• = available

X = not available

15 Disposal

To the extent that other laws do not require a deviating treatment, the utilized materials should be separated in accordance with their properties and entered into the raw materials recycling process. The pre-requirement in this regard is that the raw materials have been correspondingly decontaminated on the order of the operator.