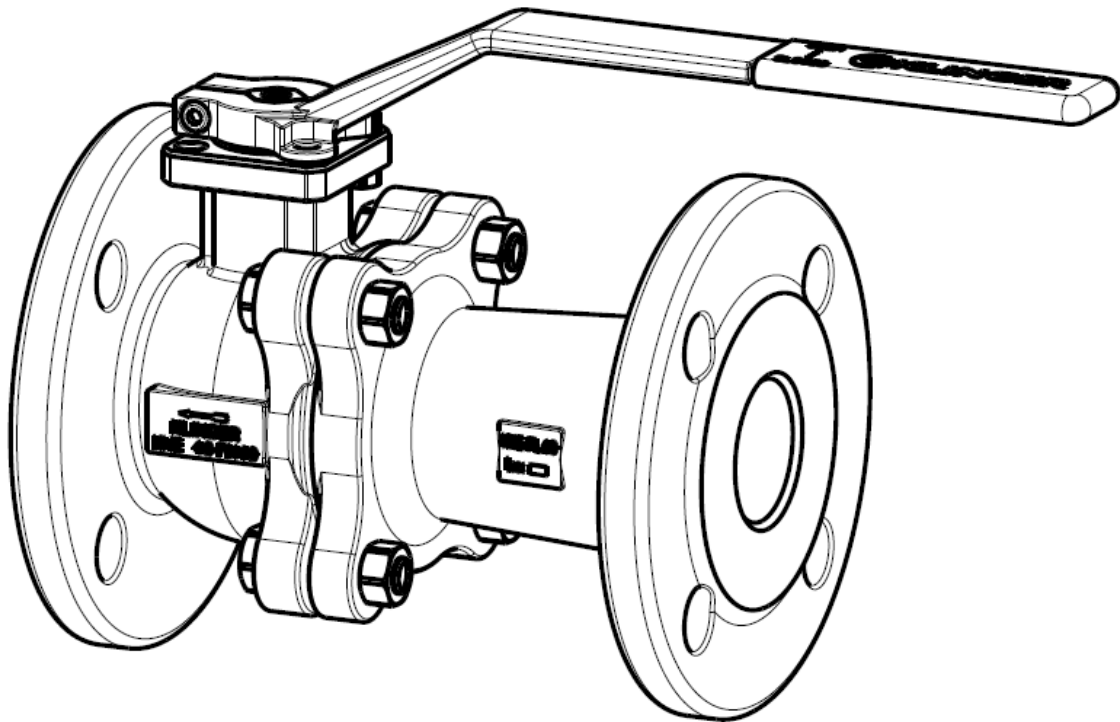


## STANDARD OPERATION MANUAL FOR

# KLINGER VALVES

**BALLOSTAR® KHE BALL VALVES**  
**NOMINAL PIPE SIZE: DN 15 – DN 200 / ANSI ½" – 8"**  
**TYPE: 2-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: **KHE**  
Size: **DN 32 - 200 und 1 1/4" bis 8"**  
Connection: **Flange**

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

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

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:

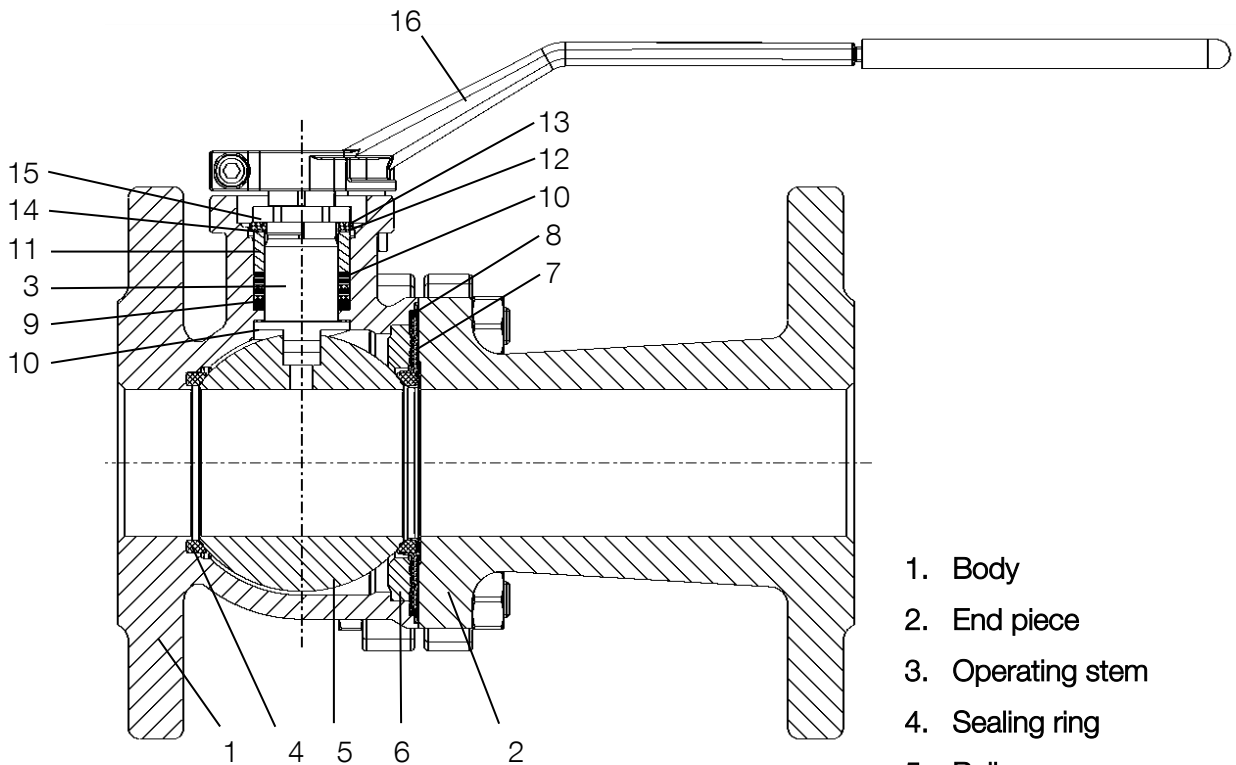
TÜV Süd Landesgesellschaft Österreich GmbH  
Tiwagstraße 7  
6200 Jenbach  
(notified body No. 0531)

Gumpoldskirchen, 01.08.2017  
(place and date of issue)

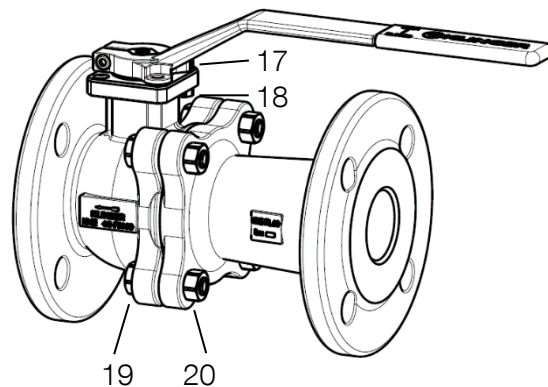
  
Manfred Stockinger  
(managing director)

Rev: 08/2017

## 2 Individual Parts Designation



1. Body
  2. End piece
  3. Operating stem
  4. Sealing ring
  5. Ball
  6. Supporting ring
  7. Sealing element
  8. Body sealing
  9. Stuffing box
  10. Antistatic disc
  11. Female support ring
  12. Slip ring
  13. Loading ring
  14. Belleville washer
  15. Stuffing box nut
  16. Lever
17. Hexagon socket head cap screw
  18. Hexagon nut
  19. Hexagon screw
  20. Hexagon nut



### 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!

<p><b>!</b> <b>CAUTION</b></p>	<p><b>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.</b></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	<b>KLINGER</b>	Please see the operation manual for the address
Model	e.g. <b>KHE</b>	Manufacturer's type designation
Size	<b>DN and numeric value</b>	Numeric value in mm, e.g. DN 80 or inches, e.g. 3"
PN / Class	<b>Numeric value</b> for PN / Class	Provides the <b>max.</b> permissible pressure at ambient temperature, e.g. PN 40, Class 150
FA-No.	<b>Numbers / letters</b>	FA-No. serves identification purposes
Material	e.g. <b>1.0619 or VIII</b>	In accordance with material codes

## 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;"><b>!</b> <b>Danger</b> <b>to Life</b></p>	<p>A valve with a permissive pressure/temperature range that is <b>not</b> 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. <b>Ignoring this regulation can result in life-threatening situations and can cause damage to the pipeline system.</b></p>
<p style="text-align: center;"><b>!</b> <b>Danger</b> <b>to Life</b></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. <b>Ignoring this regulation can result in life-threatening situations and can cause damage to the pipeline system.</b></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.
- » it is prohibited to open screw connections (with the exception of those on hand levers and handwheels), when pressurized (medium).
- » 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.
- » 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

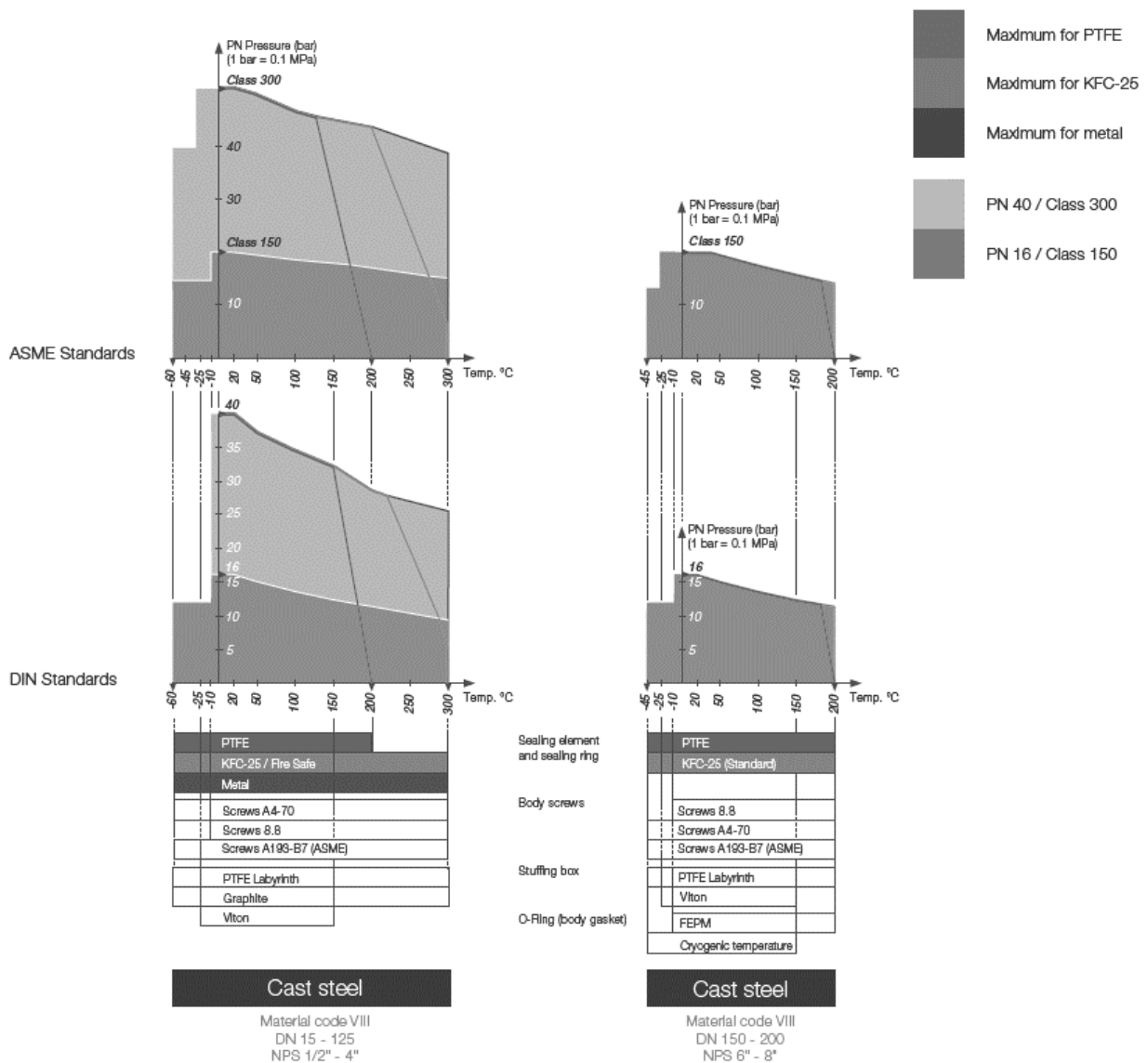
The main criterion of the material codes is the basic material of the body.

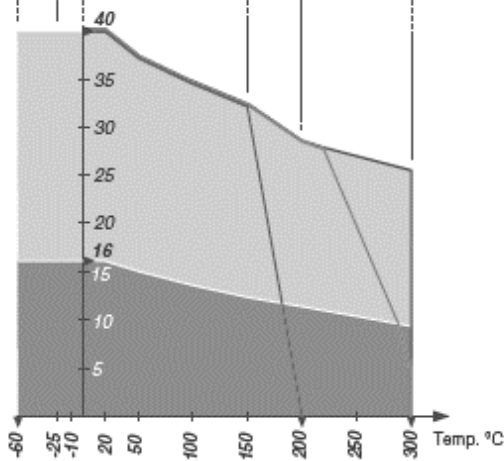
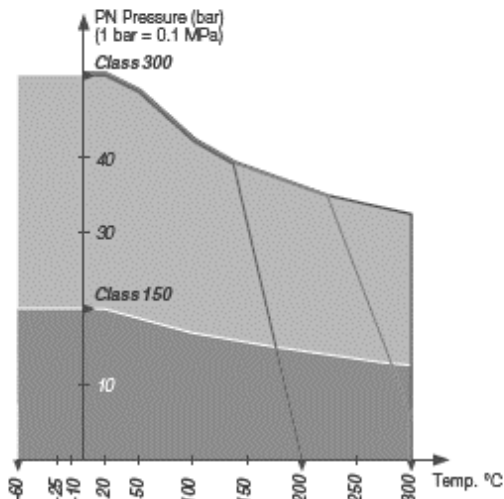
Symbol	Body	Interior Parts
VIII	Cast steel	Without nonferrous metal part
X	Stainless steel	Parts coming into contact with the medium are acid-resistant
Xc	Stainless steel	All parts acid-resistant

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.





PTFE	
KFC-25 / Fire Safe	
Metal	
Screws A4-70	
PTFE Labyrinth	
Graphite	
Viton	

Sealing element and sealing ring

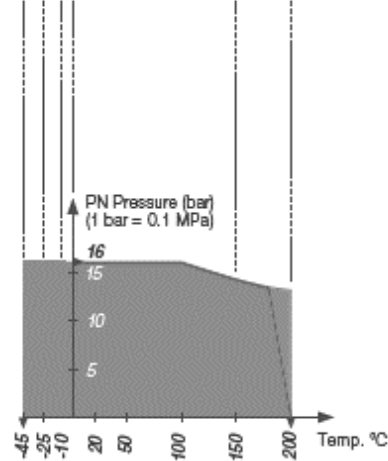
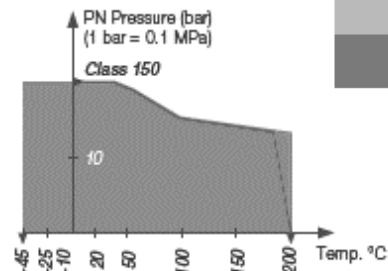
Body screws

Stuffing box

O-Ring (body gasket)

**Stainless steel casting**

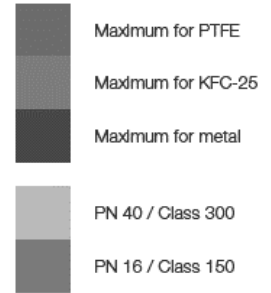
Material code Xc  
DN 15 - 125  
NPS 1/2" - 4"



PTFE	
KFC-25 (Standard)	
Screws A4-70	
PTFE Labyrinth	
Viton	
FEPM	
Cryogenic temperature	

**Stainless steel casting**

Material code VIII  
DN 150 - 200  
NPS 6" - 8"



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

### 7.3 Tightening Torques and Width Across Flats

Nominal width	DN	15	20	25	32	40	50	65	80	100	125	150	200
	NPS	½"	¾"	1		1 ½"	2"	2 ½"	3"	4"		6"	8"
Tightening torque (Nm) Stuffing box		5	15	15	25	25	20	20	40	40	40	40.	40
Tightening torque (Nm) Body screws		9	20	20	30	40	60	60	80	110	120	180	180
AF of stuffing box													
DN-Version		16	22	22	24	24	36	36	46	46	50	50	50
ANSI-Version		5/8"	7/8"	7/8"		15/16"	1 7/16"	1 7/16"	1 13/16"	1 13/16"		2"	2"
AF operating stem		8	11	11	14	14	17	17	22	22	27	27	27

Tolerance for stuffing box nut tightening torque + 10 %

Tolerance for body screw tightening torque ± 10 %

### 7.4 Table of Weights

This table features a weight approximation for a PN 40 valve with flange connection (full bore).

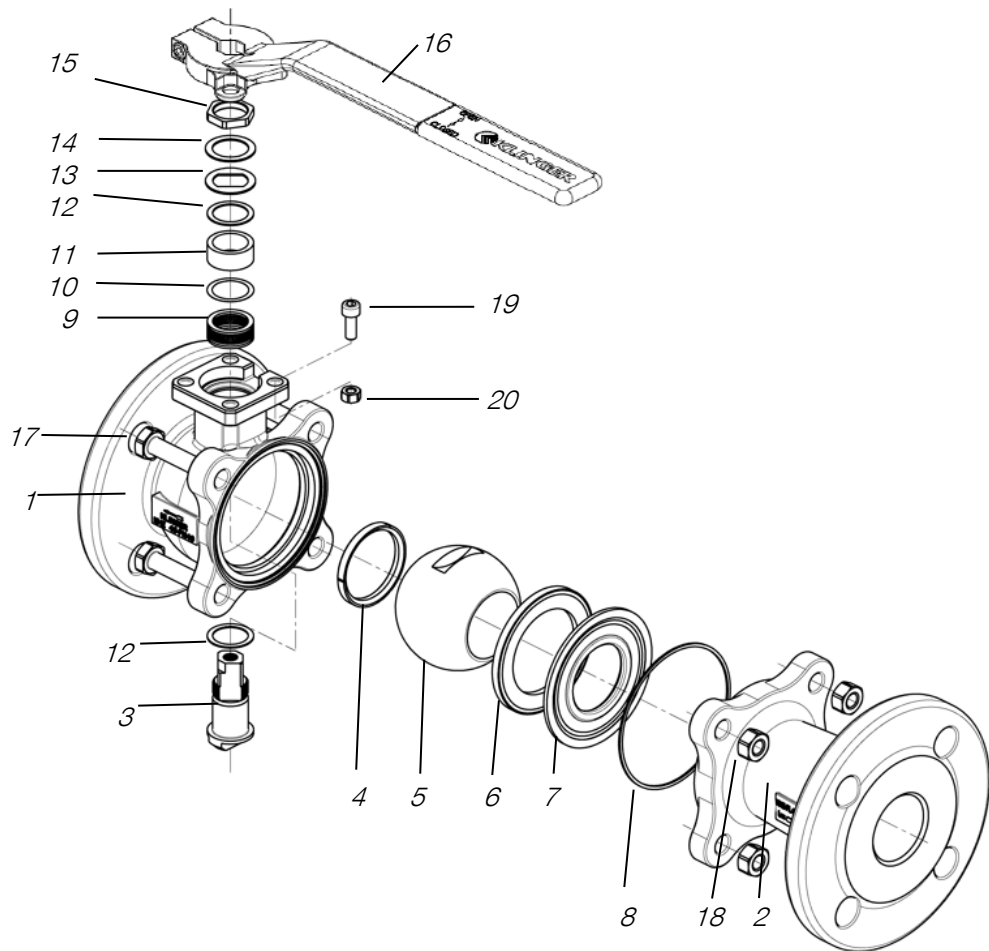
Nominal size	Weight
15	2.4 kg
20	3.6 kg
25	4.5 kg
32	6.9 kg
40	8.8 kg
50	13.6 kg
65	19.5 kg
80	28.4 kg
100	38.7 kg
125	67.4 kg

The table below contains weight approximations for a PN 16 valve with flange connection (full bore).

Nominal size	Weight
150	62.7 kg
200	99.8 kg

Detailed weight specifications on the individual designs are listed in the KLINGER KHE product catalog.

## 7.5 Material Combinations



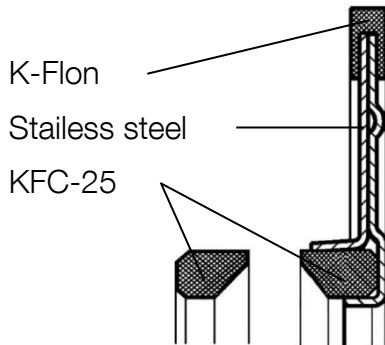
Pos.	Standard Individual Parts	Materials	
		VIII	Xc
1	Body	1.0619 (WCB) Zn/Fe phosphated	1.4408 (CF8M) pickled
2	End piece	1.0619 (WCB) Zn/Fe phosphated	1.4408 (CF8M) pickled
3	Operating stem	1.4104	1.4571
4	Sealing ring	KFC	
5	Ball	1.4401 (316) (1.4408 (CF8M) from DN 65 upwards)	
6	Supporting ring	Sint D10 / Sint C39	1.4404 (316L)
7	Sealing element	Xc - KFC	
8	Body sealing	Graphite	
9	Labyrinth stuffing box	K - Flon / 1.4401 / Graphite	
10	Antistatic disc	1.4401	
11	Female support ring	1.4404	
12	Slip ring	KFC - 15	
13	Loading ring	1.4404	
14	Belleville washer	1.4310	
15	Stuffing box nut	1.4404	
16	Lever	1.4006 / 1.4408	
17	Hexagon screw	8.8 - A2L	A4 - 70
18	Hexagon nut	8 - A2L	A4 - 70
19	Hexagon socket head cap screw	A4 - 70	
20	Hexagon nut	A4 - 70	

*Subject to technical change*

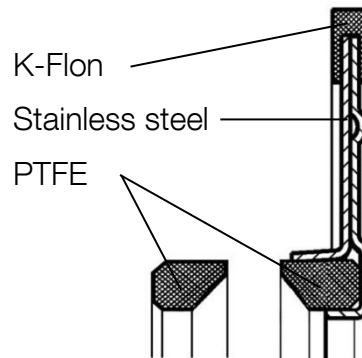
## 7.6 Sealing Element for Special Requirements

Making use of the modular kit of components, the sealing system of the ball valve can easily be retrofitted to meet the requirements of special applications. Individual sealing element designs are available, allowing for utilization of the ball valve in different application scenarios, operating conditions and media.

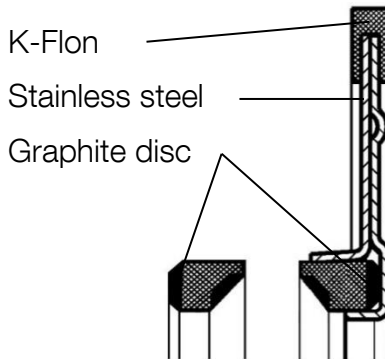
**KFC-25**  
(standard)



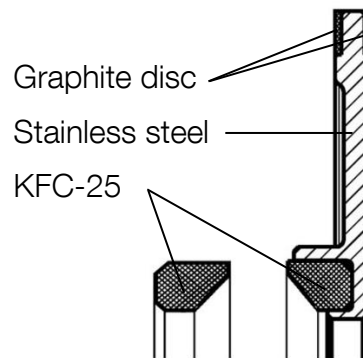
**PTFE**  
(chemical industry)



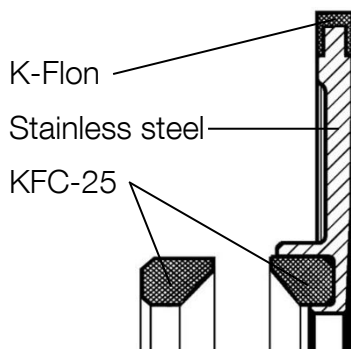
**Metal**  
(abrasive media)



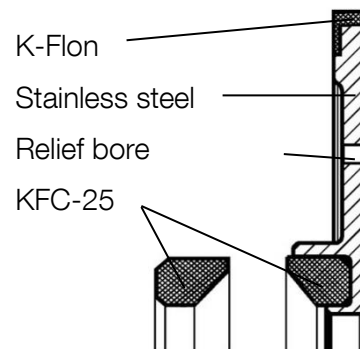
**Fire Safe**



**Single-part**  
(high temperature fluctuations)

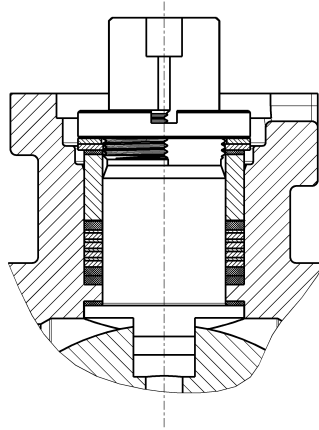


**Single-part with relief bore**  
(highly expanding media)



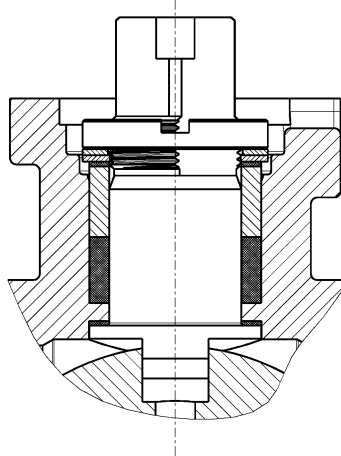
## 7.7 Special Requirements Stuffing Box

Labyrinth stuffing box



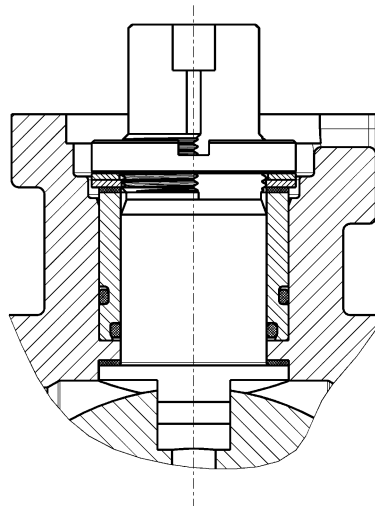
**Area of application:**  
- Ideal for most applications

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.

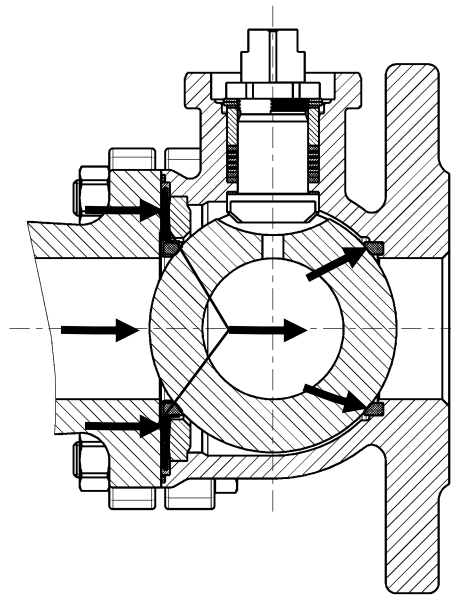
- » Storage in the default factory packaging.
- » The valves are to be stored in closed rooms, in a non-aggressive atmosphere, and protected against humidity and contaminants.
- » In the event that protective sheeting or shrinking foils are used, it must be ensured – through adequate measures – that 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.



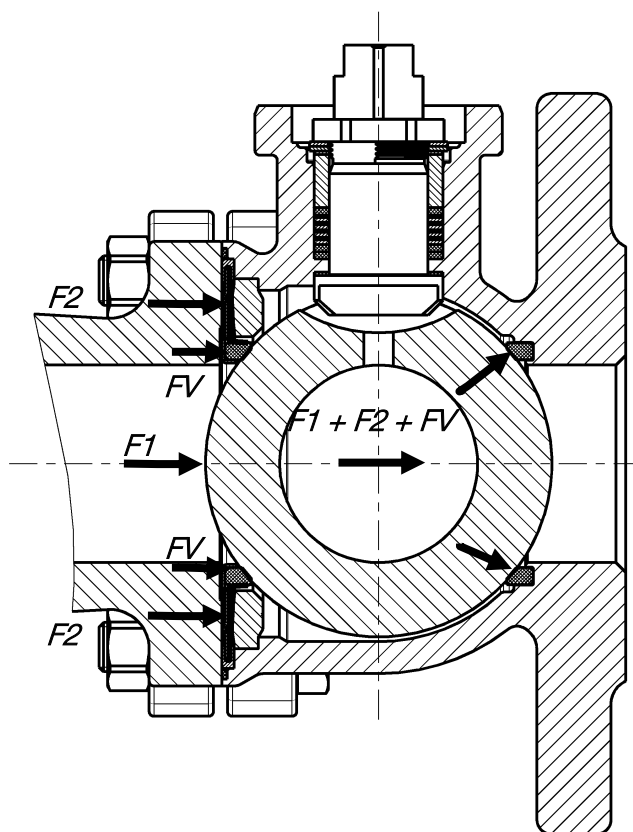
## 10 Mode of Operation

The Ballostar® KHE ball valve is maintenance-free and can be operated in both flow directions. For standard applications, KLINGER Fluid Control recommends the flow direction in accordance with the arrow on the body. The U-sleeve attached to the outer circumference of the sealing element is fully chambered and provides tightness to atmosphere. Furthermore, a secondary seal made of graphite ensures additional sealing versus the environment.

The sealing system comprises different parts: First, a pre-stressed elastic sealing element made of stainless steel and featuring a KFC sealing ring and a K-Flon U-sleeve on the upstream or downstream side of the ball valve. Second, an identical and static sealing ring, which is held directly in place in the body within a chambered nut and third, the ball itself. As a result of this sealing system and depending on the mounting direction, the following operating states apply:

### Operating State 1:

The **elastic** sealing element is installed on the **upstream side**. The pressure forces the ball on the downstream sealing ring, while the upstream element is simultaneously pushed against the ball. Thanks to the elasticity of the KLINGER sealing system, **two sealed areas** are constantly present.



#### Exerted forces:

$F_1$ ...Force of the medium exerted on the ball

$F_2$ ...Force of the medium exerted on the sealing element

$F_v$ ...Pre-stress force of the sealing element

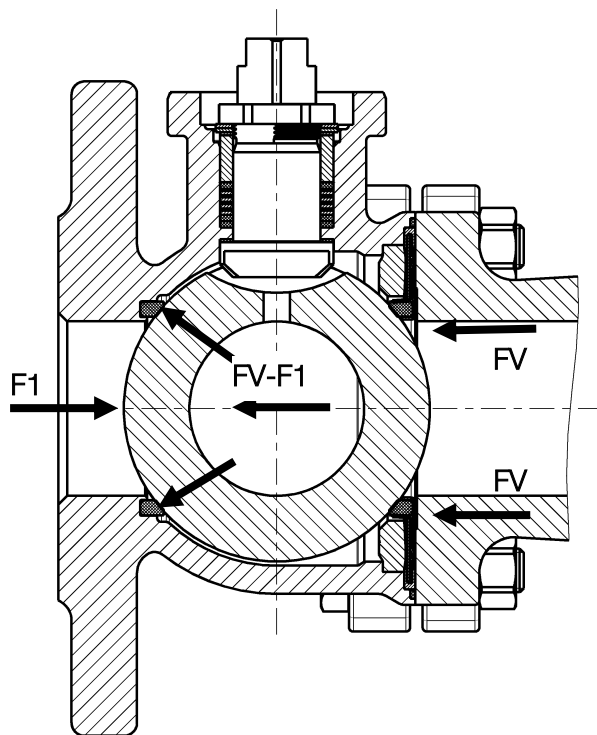
$F_1 + F_2 + F_v$ ...Total force exerted on the sealing ring

## Operating State 2:

The **fixed** sealing element is installed on the **upstream side**. Pressure is exerted against the pre-stress force of the elastic sealing element on the downstream side.

If the exerted pressure becomes greater than the pre-stress force of the sealing element, the ball is lifted away from the upstream sealing ring and only the downstream sealing element remains in operation. Only one **sealing area** is present in this state.

As this state occurs in combination with relatively high pressure differentials, the contact pressure between the ball and the sealing element is sufficient to ensure effective sealing. With regard to lower pressure differentials, the pre-stress force of the elastic sealing element is high enough to also push the ball against the upstream sealing ring and to create a second sealing area, thus enabling highly effective sealing.



### Exerted forces:

$F_1$ ...Force of the medium exerted on the ball

$F_v$ ...Pre-stress force of the sealing element

$F_v - F_1$ ...Total force exerted on the sealing ring and against the pressure of the medium

### High pressure differential:

$F_v - F_1 < F_1$ , upstream sealing element is lifted.

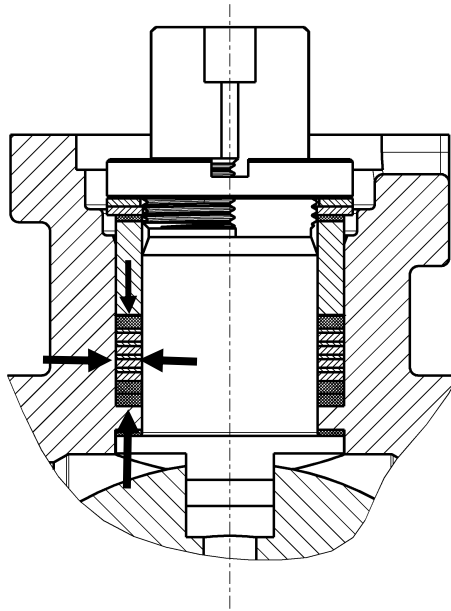
### Low pressure differential:

$F_v - F_1 > F_1$ , upstream sealing element in function.

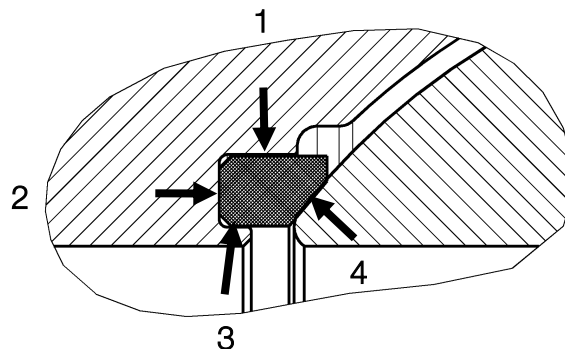
Sealing of the operating unit (operating stem) is achieved by means of a **STUFFING BOX** supported by a plate spring.

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

The plate spring is oriented in a manner that a contact force is permanently exerted on the stuffing box in order to compensate fluctuations of both temperature and pressure.



The contours of the sealing ring negate movement in radial direction (1), against the rear (2) and the bore (3). The ball pushes against the sealing ring (4). The sealing ring can therefore neither relax nor shift, as it is surrounded on all sides.



## 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.

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.

## 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

<p><b>!</b> <b>CAUTION</b></p>	<p>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.</p>
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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 washer, loading ring, slip ring, female support 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

- » 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 for DN 150 and 200

- » Bring valve into OPEN position
- » Depressurize line
- » Remove valve from line
- » Remove the body connection screws and the end pieces
- » Remove the graphite seal and the O-ring
- » Bring the ball into the CLOSED position and remove it
- » Remove the sealing ring from the body and replace with a new one
- » Reinstall the ball
- » Remove the sealing element, O-ring and circlip from the end piece
- » Install a new sealing element, a new O-ring, and the existing circlip
- » Install a new graphite seal and O-ring in the body
- » 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

## 12.2 Standard Lubricants

**O-Rings:** Silicon grease OKS 1110

**Screw thread:** MOLYKOTE 1000

**Other parts:** MOLYKOTE 55 M

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

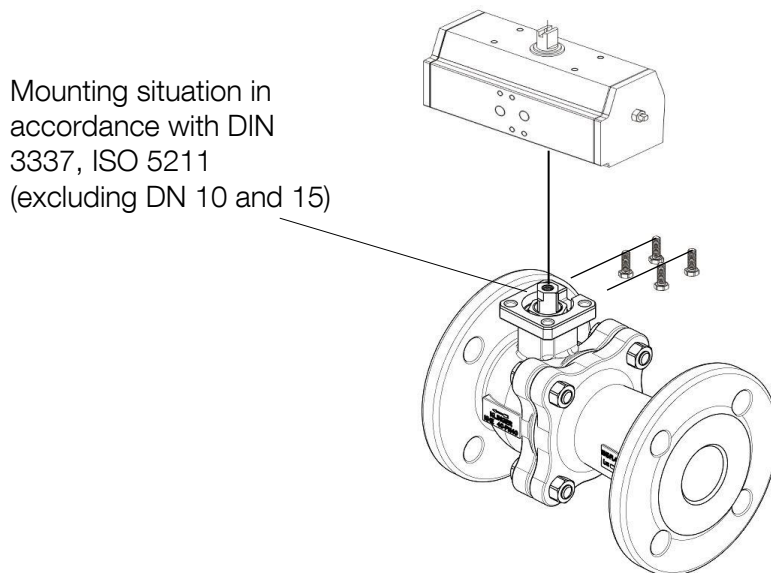
e.g.: **Oxygen applications** Klüberalfa YV93-302

**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® KHE 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.

<b>!</b> <b>CAUTION</b>	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.
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<b>!</b> <b>CAUTION</b>	The valve is closed clockwise. It is to be ensured that the 90° movement is precisely complied with in its OPEN-CLOSED end positions.
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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
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.