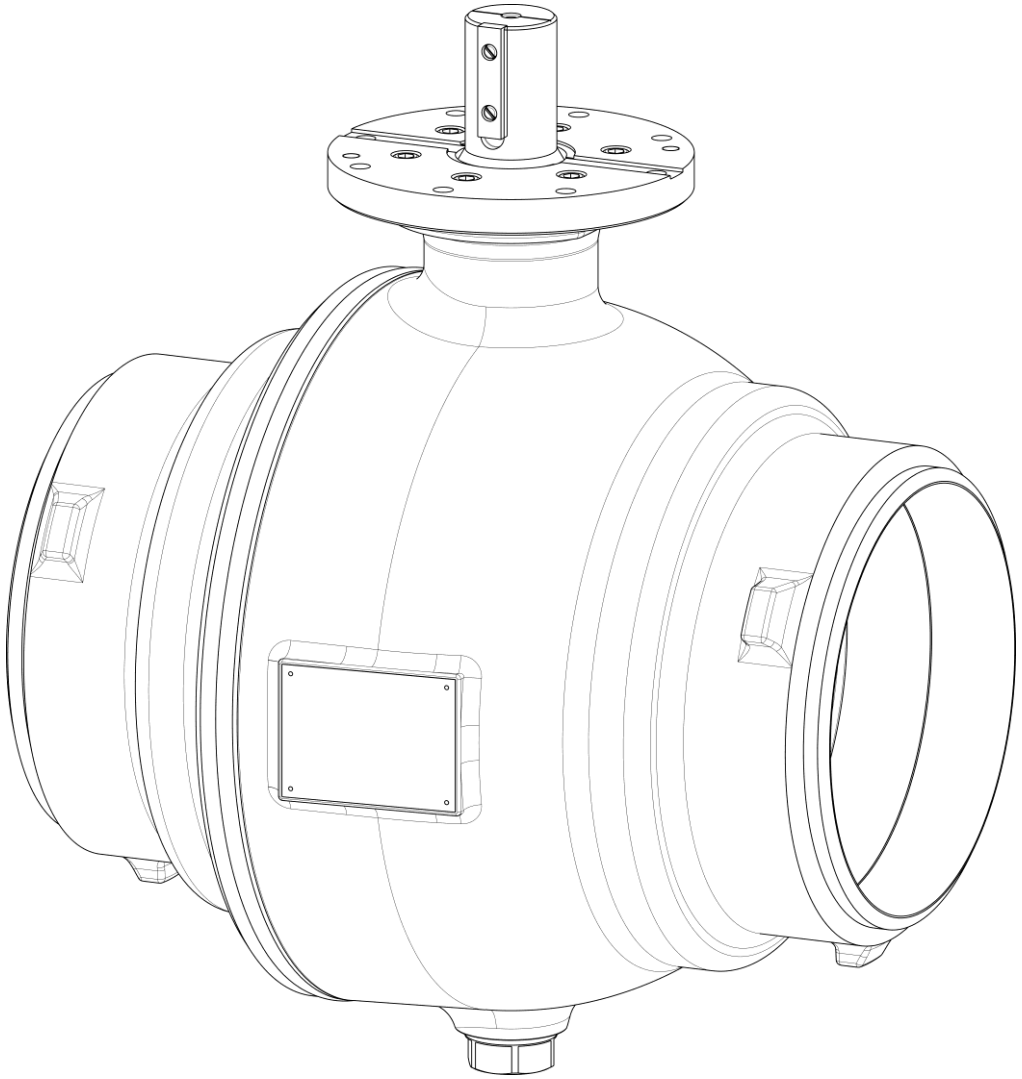
STANDARD OPERATION MANUAL FOR

KLINGER VALVES

BALLOSTAR® KHSVI VVS BALL VALVES
STANDARD- AND HIGH-TEMPERATURE VERSION
NOMINAL PIPE SIZE: DN 150 – DN 800
TYPE: FULLY WELDED



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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: **KHI (welded and split version)**
Size: **DN 150 - 1000**
Connection: **Welding ends, flange**

to which this declaration is refering 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 13445-3 (only point 11), EN 16668 and AD 2000 (B7, B8)

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)

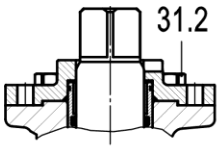
Gumpoldskirchen, 01.08.2017
(place and date of issue)

Manfred Stockinger
(managing director)

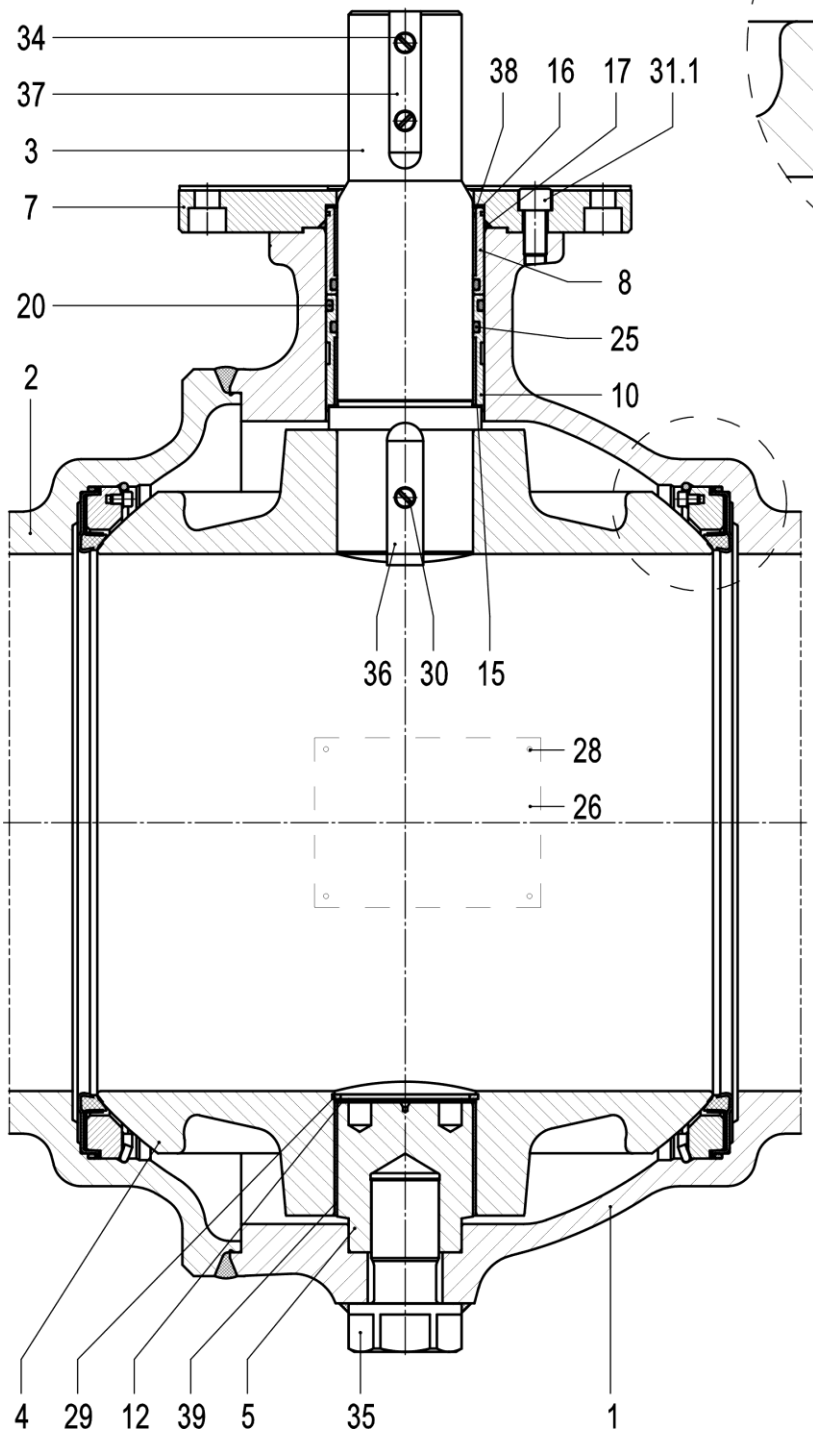
Rev: 08/2017

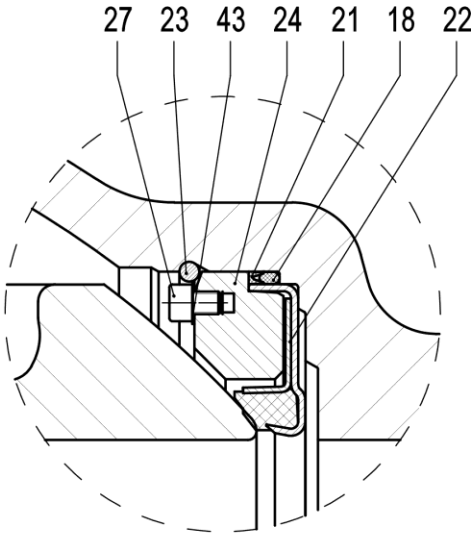
2 Individual Parts Designation

DN 150-200



DN 250-800





1 Body
2 Weld end piece
3 Operating stem
4 Balll
5 Trunnion
7 Flange
8 Bush insert, upper part
10 Bush insert, lower part
12 Disc
15 Cushion joint
16 Cushion joint
17 O-ring
18 O-ring
20 O-ring
21 U-sleeve
22 Sealing element
23 Wire ring
24 Back-up ring
25 O-ring
26 Type plate
27 Fillister head screw
28 Groove pin
29 Circlip
30 Fillister head screw
31.1 Fillister head screw
31.2 Hexagon head screw
34 Fillister head screw
35 Trunnion hexagon head screw
36 Fitting key
37 Fitting key
38 Bearing bush
39 Bearing bush
43 Serrated washer

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	**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.** Please contact the manufacturer under +43 2252 600-0 for further details.

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. KHI	Manufacturer's type designation
Size	DN and numeric value	Numeric value in mm, e.g. DN 150
PN / class	Numeric value for PN / class	Provides the max. permissible pressure at ambient temperature, e.g. PN 40
FA-No.	Numbers / letters	FA-No. serves identification purposes
Material	e.g. 1.0619 or VIII	In accordance with material codes
	CE	Market approval symbol

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

! Danger to Life	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.**
! Danger to Life	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.**

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 °C or < -20 °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 (inflammable, 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

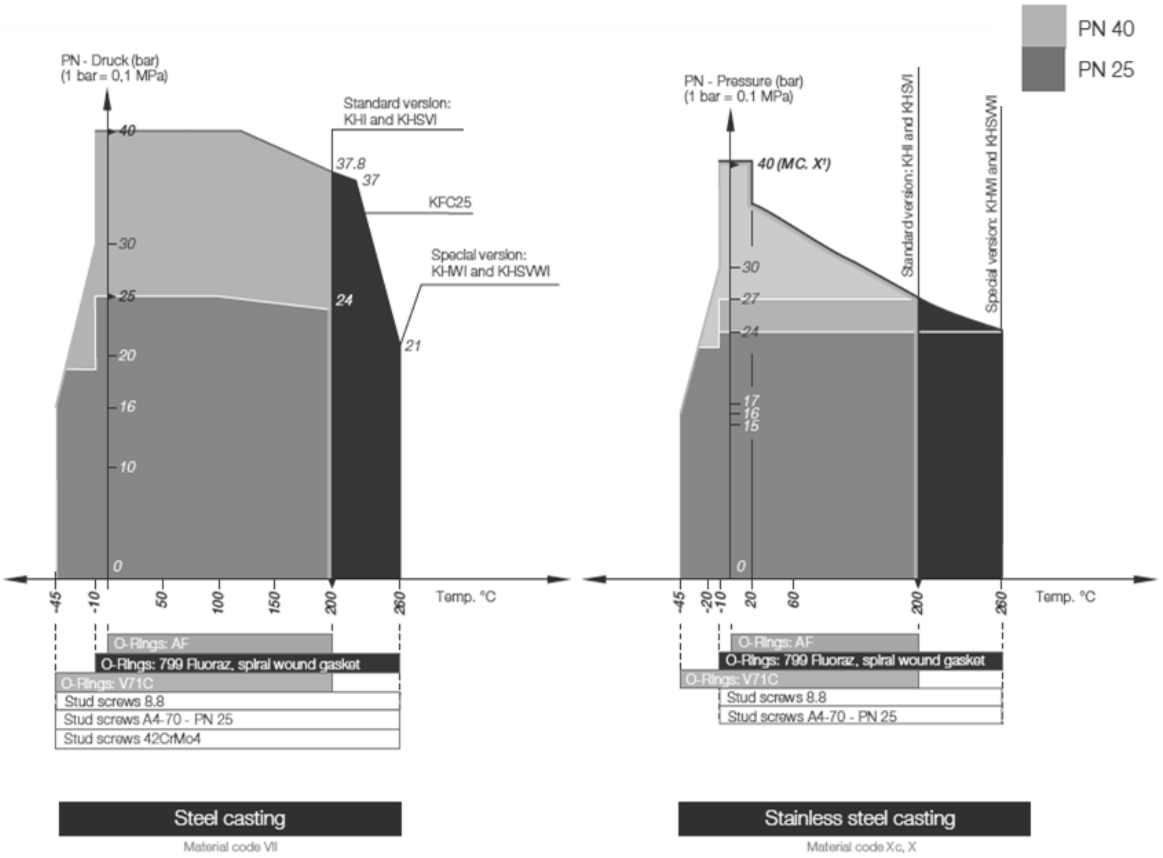
The main criterion of the material codes is the basic material of the body.

Symbol	Body	Interior Parts
III	Grey cast iron	Without nonferrous metal parts
IV	Brass	Nonferrous metal parts possible
VI	Spheroidal 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.



! CAUTION	The diagrams illustrate all possible limitations of use of KLINGER valves. **The area of application for standard valves is from -10 °C up to +200 °C.** Special designs with a suitable sealing system exist for the temperature range from **-45 °C to -10 °C** as well as from **200 °C to 260 °C**.

7.3 Tightening Torques

Tightening torques of the top flange head screws (Pos. 31):

Nominal Size	Dimension	Tightening torque (Nm)
		VII, VIII
150	M 12	28
200	M 16	68
250,300	M 16	220
350,400	M 20	428
500,600	M 20	428
700,800	M 30	1,478

7.4 Table of Weights

This table provides a weight estimation of a PN 40 ball valve with flange connection (full bore).

DN	Weight (excl. gear box)	Weight (incl. gear box)
150	73 kg	91 kg
200	138 kg	158 kg
250	196 kg	242 kg
300	274 kg	332 kg
350	442 kg	507 kg
400	575 kg	689 kg
500	985 kg	1,190 kg
600	1,642 kg	1,847 kg
700	2,678 kg	3,070 kg
800	3,796 kg	4,188 kg

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 notified immediately of any kind of deviations. Regarding damage obviously resulting from transportation, please contact the freight forwarder in charge of delivery.

Ballostar® KHI 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.

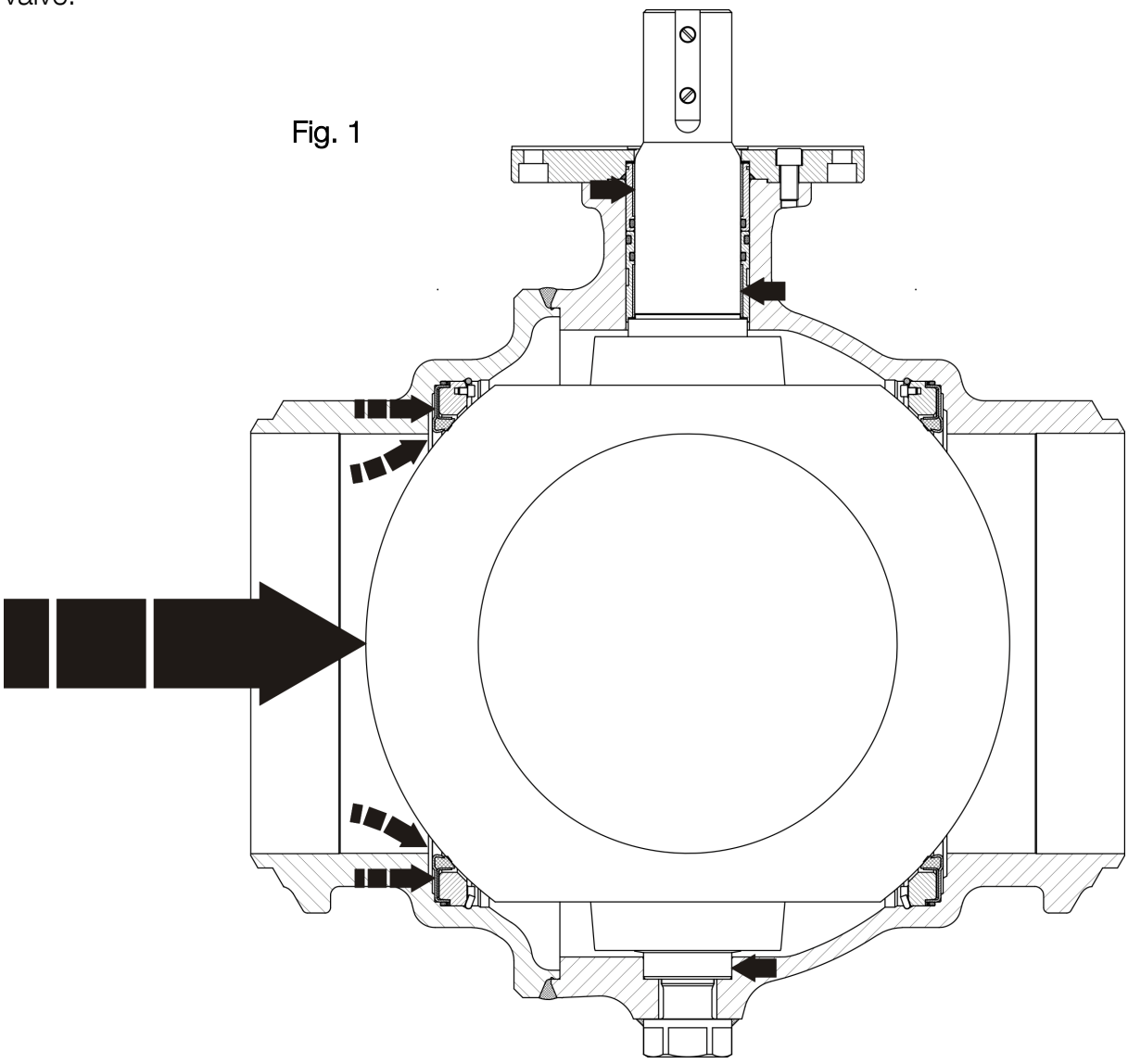
- Storage in the default factory packaging.
- The valves are to be stored in closed rooms, in a non-aggressive atmosphere, and protected against humidity and contaminants.
- In the event that protective sheeting or shrinking foils are used, it must be ensured – through adequate measures – that the atmosphere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

Thanks to its **"elastic sealing system"** the ball valve guarantees absolute tightness in both high-pressure and lowest-pressure scenarios. This is achieved by means of two elastic sealing elements, which work independent of each other. The necessary contact force is achieved a) through pre-stressing during assembly and b) by means of the differential pressure created in the valve (Fig. 1).
The forces generated at the ball, comprising the shut-off section multiplied by the prevailing differential pressure, are not transmitted to the sealing rings, but instead onto the trunnions for the ball, installed for this purpose. As a consequence, in terms of construction, the trunnion-mounting and sealing function are decoupled from each other. The torque required to pivot the shut-off element is therefore kept low.
This mode of construction reduces wear and tear and increases the service life of the valve.

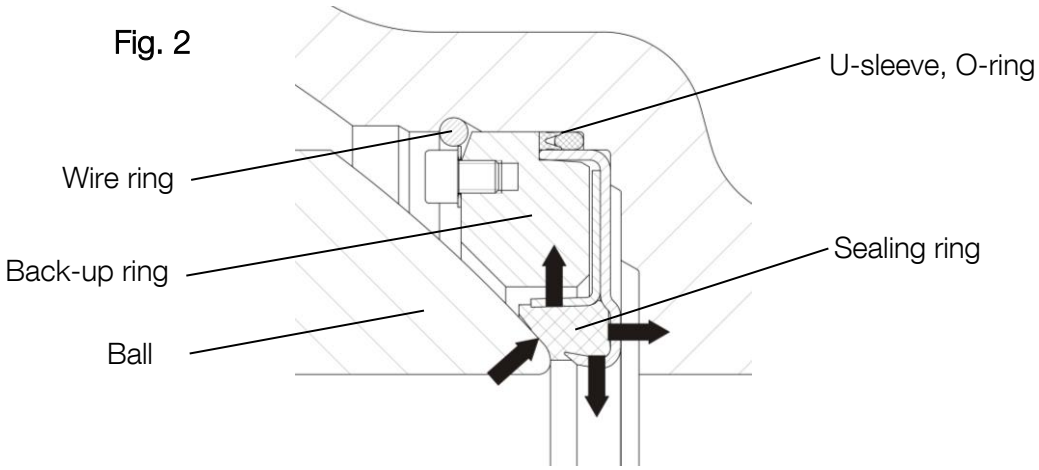
Fig. 1



10 Mode of Operation

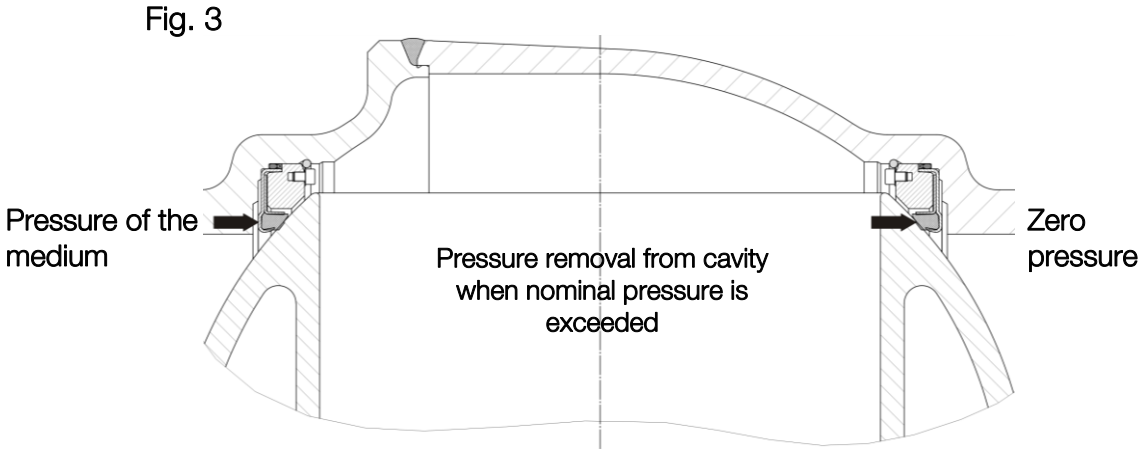
During assembly of the body and the end piece, the sealing system is elastically deformed. The two pre-stressed, elastic sealing elements made of stainless steel, together with the sealing rings and a seal at the periphery, create a sealing system with the ball both upstream and downstream of the ball valve. A back-up ring protects the elastic sealing element against overstressing, a wire ring serves to lock the sealing unit. (Fig. 2)

Fig. 2



Due to the elasticity and up to a certain pressure, two primary sealing points are continuously maintained in the bore. The differential areas at the sealing element cause the pressure of the medium on the upstream side of the ball valve to press the sealing ring onto the surface of the ball. If pressurization, exceeding the nominal pressure, originates from the cavity between the sealing rings, then the sealing element on the non-pressurized side or the downstream side is lifted from the ball surface. (Fig. 3)

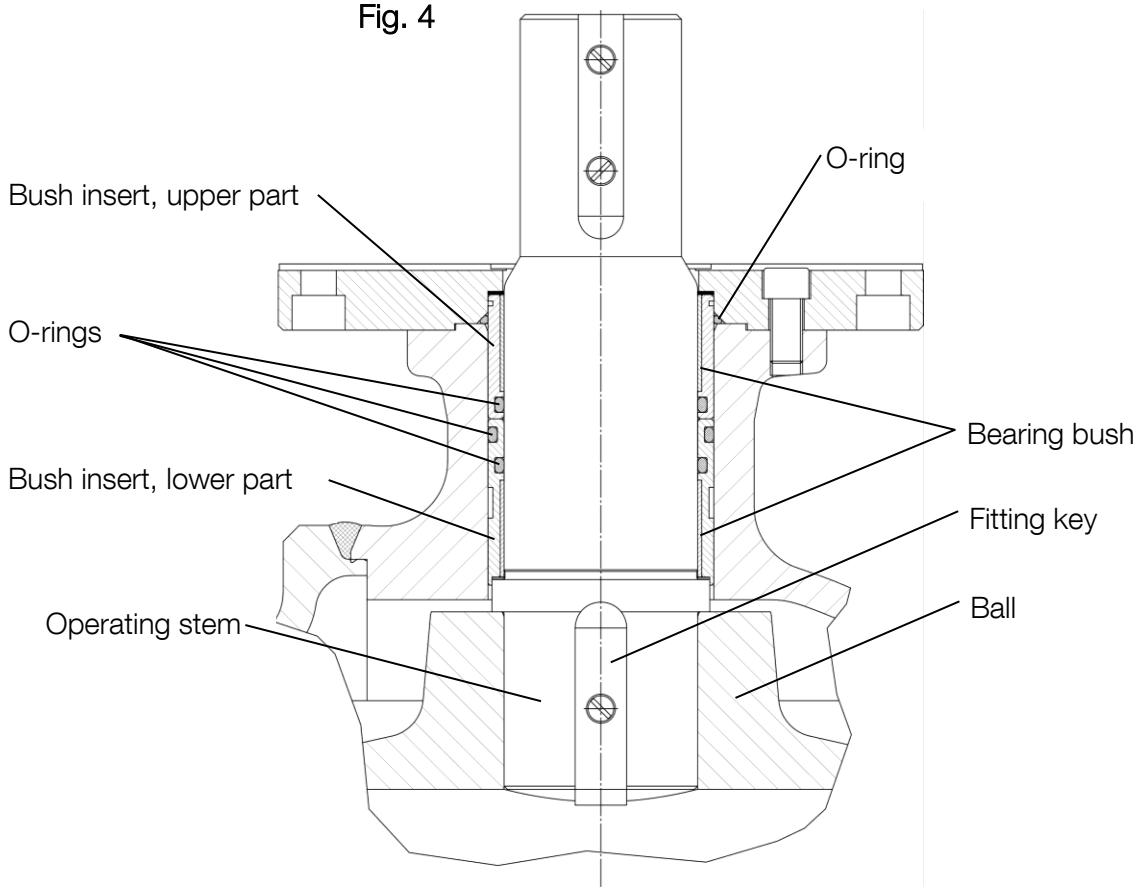
Fig. 3



The ball valve can be pressurized in both flow directions.
Thermal expansions are compensated by the elasticity of the sealing elements.

An operating stem is utilized to operate the ball. The connection stem-hub is achieved via fitting keys. The tightness to atmosphere is ensured by means of consecutively arranged O-rings. In order to simplify their replacement, they are located in the bush inserts. The occurring bearing forces are absorbed by the bearing bushes.

Fig. 4



All seals and bearings are MAINTENANCE-FREE

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® KHI ball valves can be installed in any given orientation. Installation should be executed in the "open" position (supplied state) in order to avoid damaging the surface of the ball.

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.

Installation of valves with flange ends may only be carried out by qualified personnel in accordance with EN 1591. It must in this case be observed that no additional tension is exerted on the valve, such as for example as the result of selecting a too large distance between the to be bolted 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 x PN if the valve is in a closed state. The valve must be open when testing the pipe pressure (1.5 x 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

The ball valve must be in the OPEN position during the entire welding process. This ensures that damaging the ball surface is avoided.

The applicable welding and quality-technical requirements and their respective standards must be complied with during welding.

The welding temperature may not exceed 200 °C at a distance of 115 mm from the welding seam for nominal sizes of up to DN 350, and, with regard to nominal sizes ≥ DN 400, this temperature may not be exceeded at a distance of 170 mm.

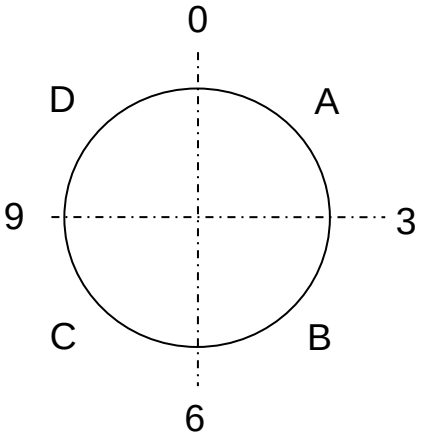
The preferred welding methods for the creation of welding seams are:

- Manual electro-welding
- TIG
- MAG / MIG

The welding seam sequence is defined as follows:

Vertical-down weld: A - C - D - B

Rising weldt: A - C - B - D



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 tightness to atmosphere not being achieved at certain positions, the tightening torques at the corresponding positions should be checked for their conformity with the tightening torque table.

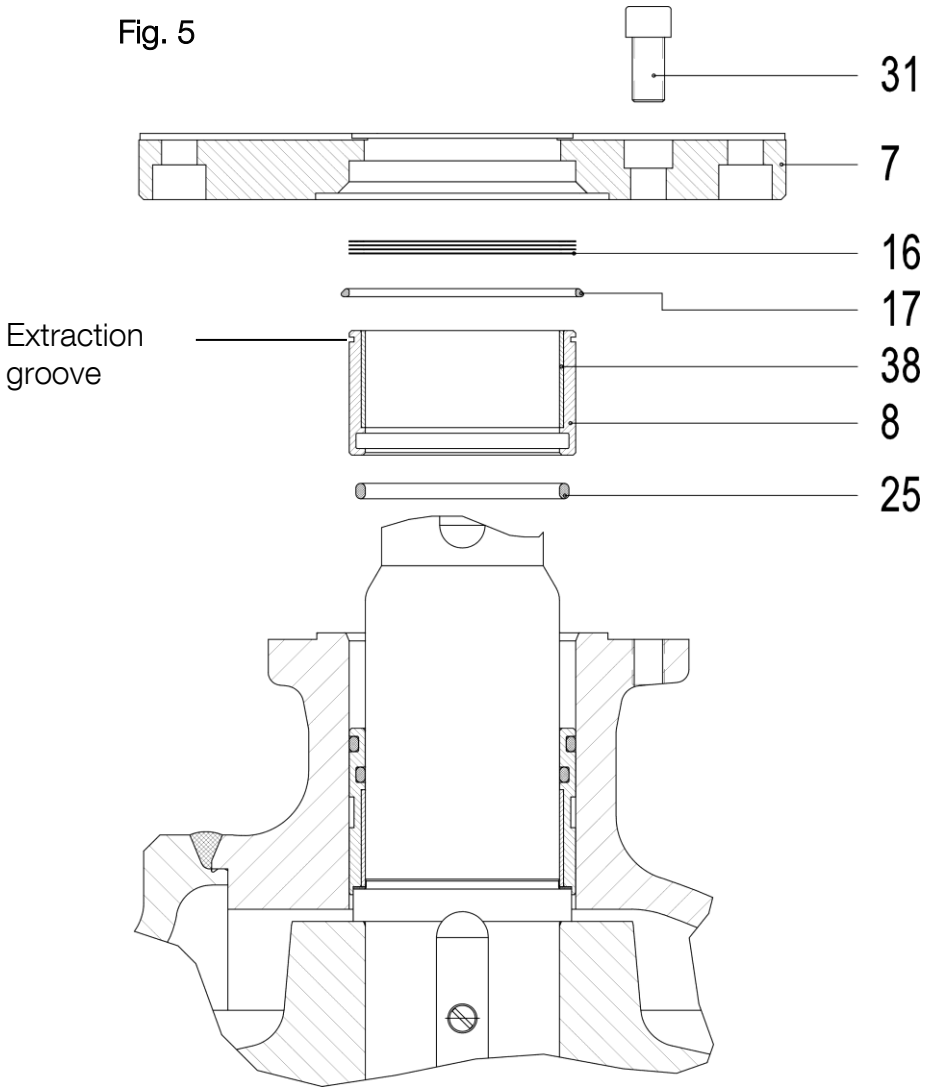
When removing an actuator, it is necessary to protect it against rotation prior to loosening of the connecting screws.

12.1 Seal Exchange

12.1.1 Seal exchange for in-line valves

» Depressurize the pipe system
» Bring the valve into the OPEN position
» Remove valve lever and actuating unit respectively
» Loosen top flange head screws (Pos. 31) and lift top flange (Pos. 7) with the sealing ring (Pos. 17) over the end of the operating stem
» Remove washer (Pos. 16) – please note that these must be reinstalled in the correct amount and strength during assembly
» Pull the bush insert – upper part (Pos. 8) out of the body – use the extraction groove
» Exchange the seals (Pos. 25, 17) in accordance with the spare parts list. Clean the spare parts and treat them with a suitable type of grease to simplify installation
» Inspect the bearing surface (Pos. 38). Should any damage be found – exchange the bearings
» Installation in the reverse order

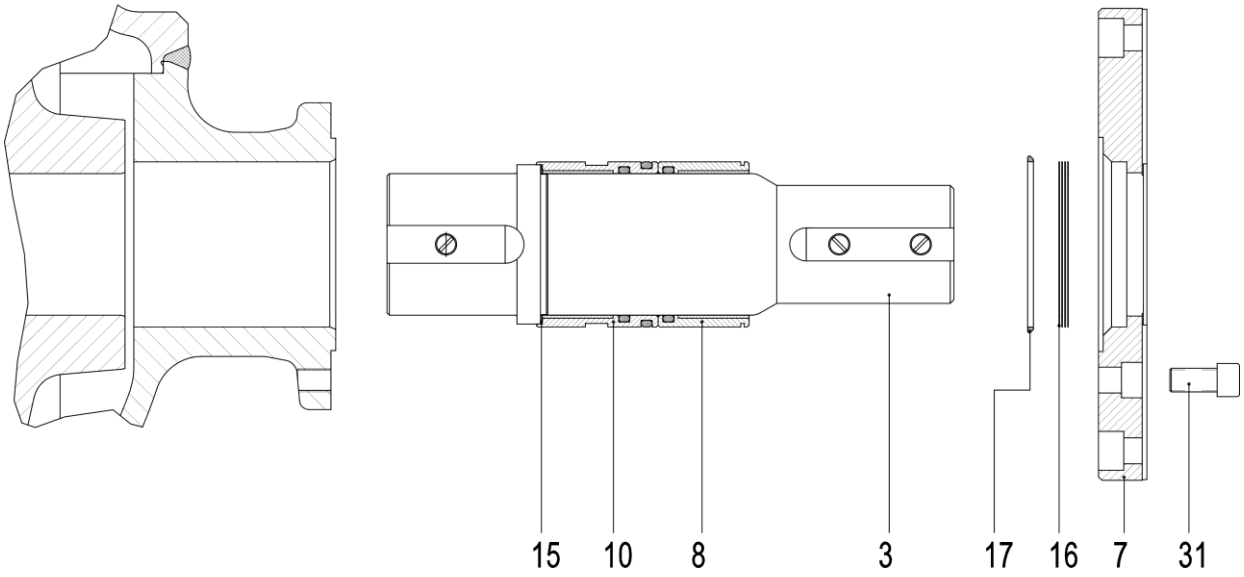
Fig. 5



12.1.2 Seal exchange for dismantled valves

» Remove consoles, etc.
» Withdraw head screws (Pos. 31) and pull out flange (Pos. 7) together with sealing ring (Pos. 17) over end of operating stem. Remove washer (Pos. 16).

Fig. 6



» Carefully remove operating stem (Pos. 3) and bush inserts (Pos. 8, 10) together with sealing rings and bearing bushes out of the body

! CAUTION	All individual parts, especially seals and sealing surfaces, must be diligently checked prior to installation and must be replaced by new parts in the event of damage. Visible pollution on the machined surface must be cleaned. Cleaned individual parts are to be treated with a thin layer of grease prior to installation.

12.1.3 Standard Lubricants

O-Rings: Silicon grease OKS 1110
Other parts: MOLYKOTE 55 M

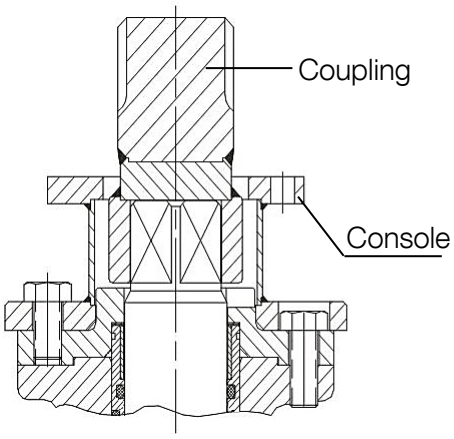
In special cases, the lubricants designated in the course of the order must be utilized.
e.g.: Oxygen applications **Klüberalfa YV93-302**
Gas applications **Klüber Nontrop ZB91**
Sterile steam applications **Klüberalfa YV91**

13 Actuator Mounting

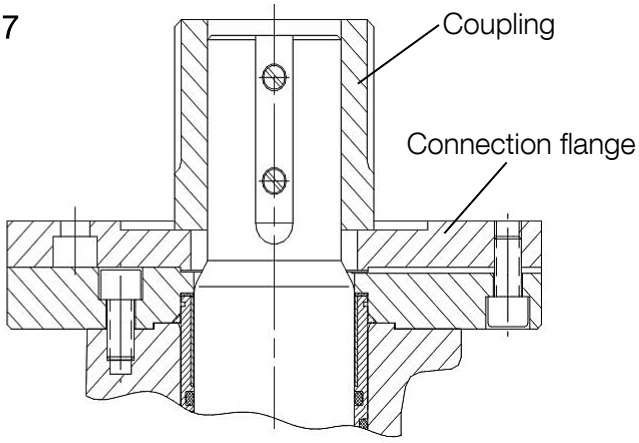
Subsequent mounting of an actuator is possible at any given time and does not require disassembly of the valve. The actuator is to be executed with a torque in accordance with the nominal size. The values are to be defined with the manufacturer following a technical query (pressure, sealing material, media etc.). The couplings must be manufactured in accordance with the actuator size.

Connection flanges are designed and manufactured in accordance with ISO 5211 as a standard.

Fig. 7



DN 125 – 200



DN 250 – 800

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® KHSVI VVS 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.
- » Mount the coupling element
- » Attach the console to the ball valve (DN 150, DN 200) or mount the actuator flange on the gear box/actuator (DN 250-DN 800)
- » Place the actuator in the correct positional arrangement and screw together. If necessary, bolt.
- » Set the end positions.
- » Function test.

! CAUTION	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.

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

14 Spare Parts List

Ball Valve Ballostar® DN 150

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		45/54x1
16	3	Cushion joint	K-Sil		46/58x0.3/0.5
17	1	O-ring	*)		56.75x3.53
20	1	O-ring	*)		47x5.33
25	2	O-ring	*)		Identical with Pos.20
38	2	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	45/50x20

Ball Valve Ballostar® DN 200

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		60/70x1
16	3	Cushion joint	K-Sil		61/75x0.3/0.5
17	1	O-ring	*)		72.62x3.53
20	1	O-ring	*)		59.7x5.33
25	2	O-ring	*)		Identical with Pos.20
38	2	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	60/65x25

Ball Valve Ballostar® DN 250

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		70/80x1
16	3	Cushion joint	K-Sil		71/85x0.3/0.5
17	1	O-ring	*)		82.14x3.53
20	1	O-ring	*)		69.2x5.33
25	2	O-ring	*)		Identical with Pos.20
38	2	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	70/75x40

Ball Valve Ballostar® DN 300

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		70/80x1
16	3	Cushion joint	K-Sil		71/85x0.3/0.5
17	1	O-ring	*)		82.14x3.53
20	1	O-ring	*)		69.2x5.33
25	2	O-ring	*)		Identical with Pos.20
38	2	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	70/75x40

*) O-Ring compound in accordance with areas of utilization
Subject to modification of design and dimensions.

Ball Valve Ballostar® DN 350

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		90/105x1
16	3	Cushion joint	K-Sil		91/110x0.3/0.5
17	1	O-ring	*)		110.73x3.53
20	1	O-ring	*)		91.45x5.33
25	2	O-ring	*)		Identical with Pos.20
38	2	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	90/95x48

Ball Valve Ballostar® DN 400

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		90/105x1
16	3	Cushion joint	K-Sil		91/110x0.3/0.5
17	1	O-ring	*)		110.73x3.53
20	1	O-ring	*)		91.45x5.33
25	2	O-ring	*)		Identical with Pos.20
38	2	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	90/95x48

Ball Valve Ballostar® DN 500

Pos.	St.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		120/135x1.5
16	3	Cushion joint	K-Sil		122/140x0.3/0.5
17	1	O-ring	*)		139.06x5.33
20	1	O-ring	*)		126.36x7.00
25	2	O-ring	*)		120.2x7
38	2	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	120/125x60

Ball Valve Ballostar® DN 600

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		120/135x1.5
16	3	Cushion joint	K-Sil		122/140x0.3/0.5
17	1	O-ring	*)		139.06x5.33
20	1	O-ring	*)		126.36x7.00
25	2	O-ring	*)		120.2x7
38	1	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	120/125x60
	1	Bearing bush			120/125x100

*) O-Ring compound in accordance with areas of utilization
Subject to modification of design and dimensions.

Ball Valve Ballostar® DN 700

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		150/180x2
16	3	Cushion joint	K-Sil		151/190x0.3/0.5
17	1	O-ring	*)		189.87x5.33
20	1	O-ring	*)		177.16x7
25	2	O-ring	*)		151.76x7
38	3	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	150/155x60

Ball Valve Ballostar® DN 800

Pos.	Pcs.	Individuals Parts Designation	Material		Dimension
			VII	VIII	
15	1	Cushion joint	KFC-25		150/180x2
16	3	Cushion joint	K-Sil		151/190x0.3/0.5
17	1	O-ring	*)		189.87x5.33
20	1	O-ring	*)		177.16x7
25	2	O-ring	*)		151.76x7
38	1	Bearing bush	St/Bz/Flon	AISI 316 L/PTFE 90	150/155x60
	2	Bearing bush			150/155x80

*) O-Ring compound in accordance with areas of utilization
Subject to modification of design and dimensions.

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.