

Types:

FK76

FK79

FK79/F

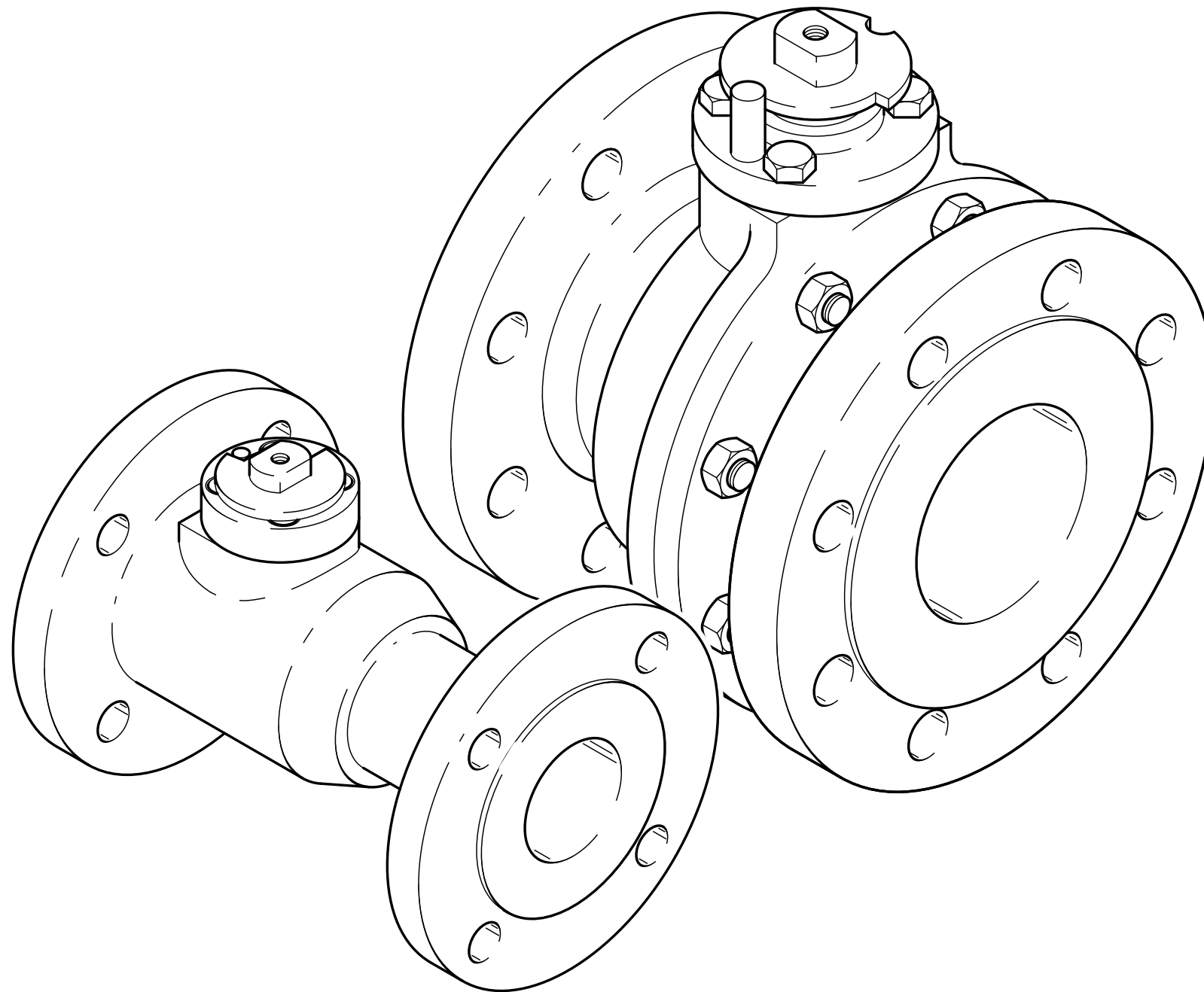


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Designed Use

Series EK, FK and HK ball valves are used as shut-off devices in pipelines associated with processing, handling and transporting liquid or gaseous as well as solid materials.

Application Areas

- Chemical industries
- Petrochemical industries
- Gas industries

Design

- Type EK ball valves have a unibody end-entry with an axial screw-type connection.
- FK and HK ball valves have a two-piece split-body de-sign with flanged connection in between the two halves.

Installation

The ball valves can be installed in pipelines by means of flanged connections or by welding.

Material requirements for welding must be ascertained from the manufacturer and must comply with customer specifications.

The ball valves are designed for a normal load during service in pipelines. Under certain preconditions, the ball valves can also be used for more severe operating conditions, although in such cases, the manufacturer should be consulted in advance.

Impermissible Operating Procedures

To exclude any harmful effects on the seals, the substance to be used must comply with the ARGUS technical specifications.

Consult ARGUS beforehand if necessary.

The combination of medium temperature and pressure are decisive factors for the choice of sealant materials.



Danger!

It is essential that the limit values are not exceeded; these values can be taken from ARGUS diagrams.



Warning!

The specified service pressures and temperatures must not be exceeded, even as individual loads.



Caution!

The user is responsible for ensuring compliance with the guidelines, regulations, safety standards and laws applicable to the use of these ball valves.

Maintenance

Ball valves are maintenance-free. It is advisable, however, to actuate them at least once or twice a year.

Safety Information



Information

Please read the safety instructions carefully!

General instructions

Installation and maintenance may be performed only by trained, qualified personnel.

The media to be used must comply with the ARGUS technical specifications in order to exclude any harmful effects on the seals. Contact ARGUS for further information.



Danger!

It is essential that the limit values are not exceeded; these values can be taken from ARGUS diagrams (see Section **Fehler! Ungültiger Eigenverweis auf Textmarke.**).



Warning!

The specified service pressures and temperatures must not be exceeded, even as individual loads (see Chapter **Fehler! Ungültiger Eigenverweis auf Textmarke.**).



Caution!

The user is responsible for ensuring compliance with the guidelines, regulations, safety standards and laws applicable to the use of these ball valves (see Chapter **Fehler! Ungültiger Eigenverweis auf Textmarke.**).



Danger!

Local safety regulations must be complied with for transport to the place of installation. Make sure that the valves cannot tilt or slip in any way (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).



Warning!

After installation, the pipeline and ball valve must be rinsed through before the ball valve is actuated (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).



Danger!

The local welding regulations and specifications must be complied with when carrying out welding work (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).



Caution!

Use temperature measuring strips to check that the temperature does not rise beyond the permissible limits (100°C). The strips must be fitted to the connection near the soft inserts (see

Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Caution!
The temperature measurement strip must be monitored constantly throughout the welding work (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Caution!
If any change of colour is noticed, the welding work must be interrupted immediately and the weld allowed cooling (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Caution!
Before start-up of the ball valve, the pipeline must be rinsed (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Warning!
Before start-up of the ball valve a leak test must be performed (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Warning!
The ball valve must be set to the OPEN position in order to avoid any damage (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Danger!
For safety reasons, the position of the wrench must clearly reflect the OPEN position of the ball valve (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Danger!
Do not disassemble the valve under pressure. Before disassembly operate valve so that possible pressure behind the ball may escape (see Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Caution!
Do not loosen the fixing nuts (see Chapter Stuffing Box Assembly).



Danger!
The ball valve must be depressurized! To release encaptured pressure, turn ball. Take care of any hazardous materials that might escape! Risk of explosion, fire and acid burn! (see Chapter Stuffing Box Assembly)



Danger!
De-pressurize the ball valve by turning the ball at 90° before removing drain and ventilation plug (see Chapter Drain Plug).



Danger!
Care must be taken when hazardous materials are involved! Risk of explosion, fire and acid burn! (see Chapter Drain Plug)



Warning!
The plug may only be opened but not unscrewed by force (see Chapter Drain and Ventilation Safety Plug).



Warning!
Keep away from the outlet! Risk of injury! See Chapter Drain and Ventilation Safety Plug.



Warning!
The medium is ejected sideways! See Chapter Drain and Ventilation Safety Plug.

Safety Standards

Depending on the type and pressure rating, ARGUS ball valves are designed to conform with national and international regulations, such as DIN 3357, AD and VdTÜV-Merkblätter, TRbF, TRGL, TRD, TRG, DVGW, BS 5351, API6D and ANSI B16.34.

Design certifications and DIN-DVGW certificates are available. The acceptance of the fittings is carried out according to DIN 3230 or specific customer requirements.

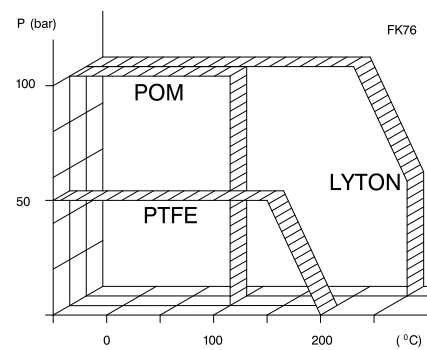
The reliability of fittings sealed with soft materials in case of fire, or even at temperatures above +600 °C is confirmed by the Fire-Safe Certificate and can be verified using BS 6755and/or API 607.

Authorized testing institutions such as TÜV, German Lloyd, BS, Lloyds Register, DNV, Bureau Veritas, etc., carry out further tests on behalf of ARGUS or customers at regular intervals.

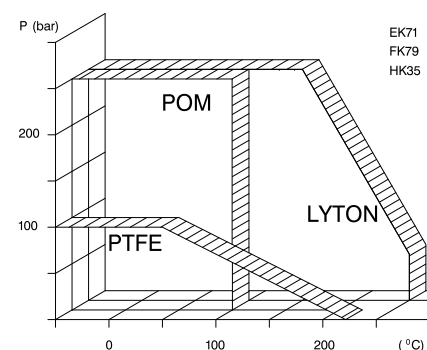
Compliance with Quality Assurance procedures under ISO 9001 was certified by DQS (German Society for Quality Assurance).



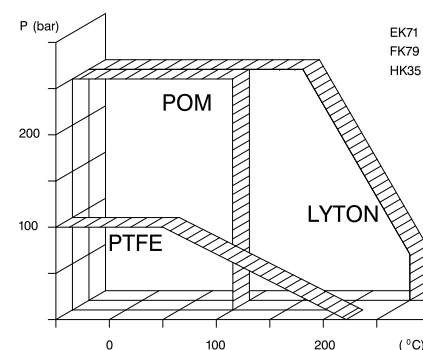
Pressure-Temperature Diagrams



FK76-01-001



0000-01-001



0000-01-002

Delivery/Storage

Check on Delivery

Lieferschein
delivery note
bordereau de livraison

Bestellnummer: 0 NR 5100003347-0010
order number:
numØrode commande:

ARGUS TYPE MADE IN GERMANY
E-K 71

PN/CLASS 40 DN 32

MATERIAL
 CS/CR-CR-TFE

PB/WOG TEMP °C
+200

NO. 00559692 DAT. 300198 FABR. NO. 815189001
0 NR 5100003347-0010

0000-00-002

At delivery compare the order number on the delivery note with the number on the rating plate (see figure above). In addition check that the correct item has been delivered and that the delivery is complete.

Complaints submitted at a later date cannot be accepted.

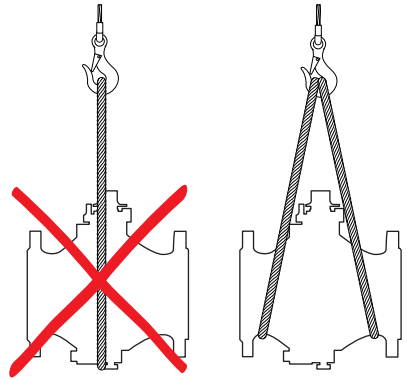
Storage of the Ball Valves

- Ball valve must be set to OPEN.
- Store ball valve in dry rooms.
- Protect ball valve against dirt.
- Protective caps must remain in position until the valves are finally installed.

Transport

**Danger!**

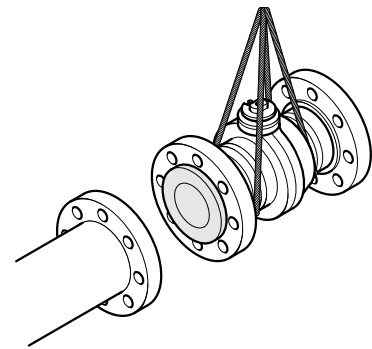
Local safety regulations must be complied with for transport to the place of installation.
Make sure that the valves cannot tilt or slip in any way (see figure below).



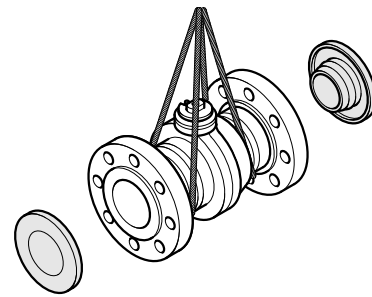
0000-00-002

The user is liable for any damage resulting from incorrect transport.

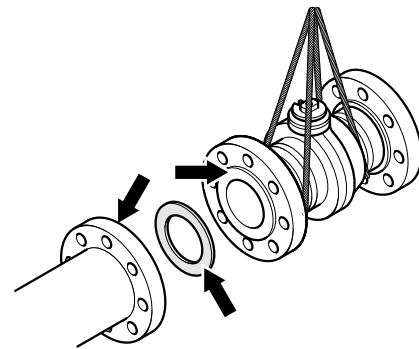
Installing the Flanged Connection



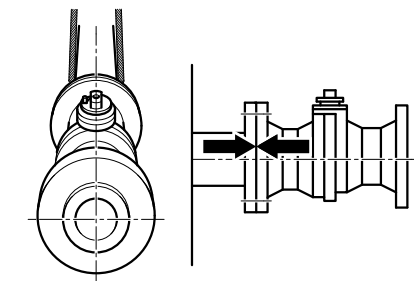
0003-00-002



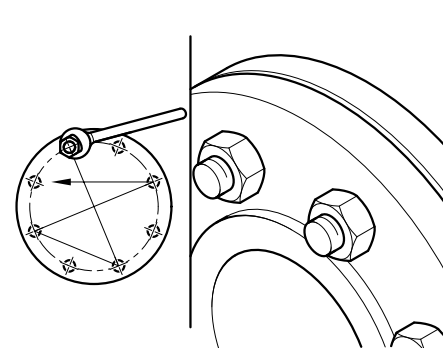
0003-00-004



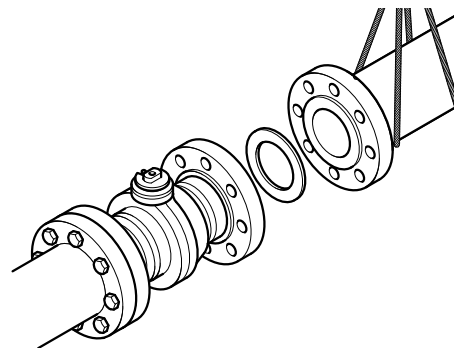
0003-00-001



0003-000-003



0005-00-001



0003-00-005

Installing the Ball Valve

- ▶ Transport the ball valve safely to the installation site using suitable hoisting gear dimensioned in accordance with the weight and size of the ball valve (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ Remove protective caps (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ Clean pipeline, seal and connecting flange (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).

Connecting the first Flange

- ▶ Position the seal carefully.
- ▶ Secure the ball valve to the pipeline flange with a few bolts
- ▶ Check that the ball valve and gaskets are correctly located in relation to the pipeline flange.
- ▶ Check the alignment of the ball valve and pipeline (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ Correct any discrepancies.
- ▶ Tighten the bolts crosswise (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).

Connecting the second Flange

- ▶ The second flange is installed in the same way as the first flange (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ Tighten the bolts crosswise (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ After installation, check for any leaks.
- ▶ After installation, the pipeline and ball valve must be rinsed through before the ball valve is actuated.

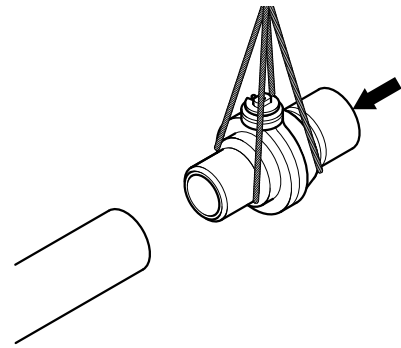


Warning!

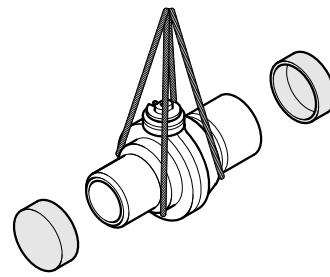
After installation, the pipeline and ball valve must be rinsed through before the ball valve is actuated.

Installing the Welding Connection

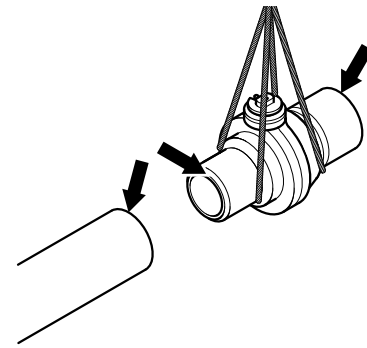
Installing the Ball Valve



0002-00-002

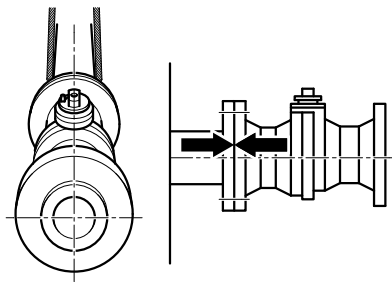


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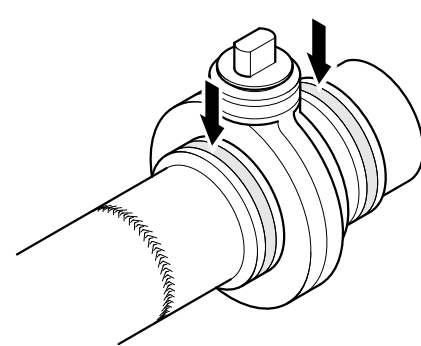


0002-00-001

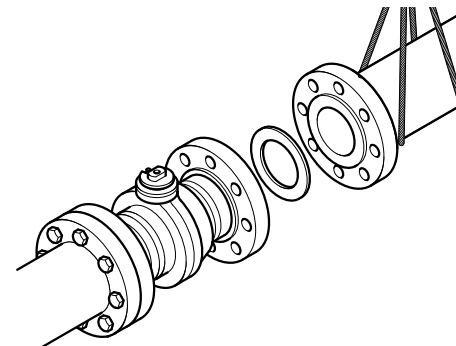
Welding the Connections



0003-00-003



0002-00-006



0003-00-005



Danger!

The local welding regulations and specifications must be complied with when carrying out welding work.

- ▶ Transport the ball valve to the installation site using suitable hoisting gear dimensioned in accordance with the weight and size of the ball valve (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ Remove the protective caps (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ Clean the pipeline and connecting socket (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ Remove any paint and rust around the weld area on the pipe and welded end of the ball valve. Ensure that a bright metal surface is obtained.
- ▶ Check that the ball valve is correctly positioned and aligned with the pipeline.

The permissible tolerances and specifications in accordance with the agreed proposed use for the ball valve must be complied with (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).

Due to the short length of the welded ends, there is a risk that the soft inserts may be destroyed during the welding work.



Caution!

Use temperature measuring strips to check that the temperature does not rise beyond the permissible limits (100°C). The strips must be fitted to the connection near the soft inserts (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).

These temperature measurement strips are designed so that, when a type-dependent temperature is reached, the colour irreversibly changes from white to black.



Caution!

The temperature measurement strip must be monitored constantly throughout the welding work.



Caution!

If any change of colour is noticed, the welding work must be interrupted immediately and the weld allowed cooling.

The temperature measurement strips can be stored at temperatures up to + 35 °C for an unlimited period of time and are resistant to oils, greases, water and steam.

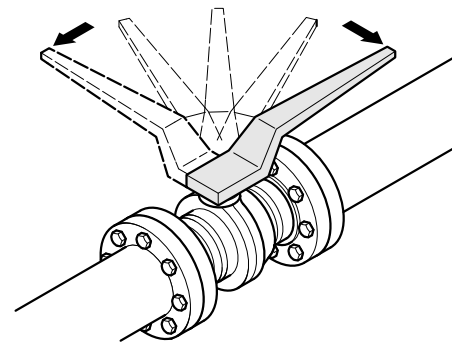
- ▶ Connect the second socket in the same way as the first one, as described before (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).
- ▶ After installation, check for any leaks.



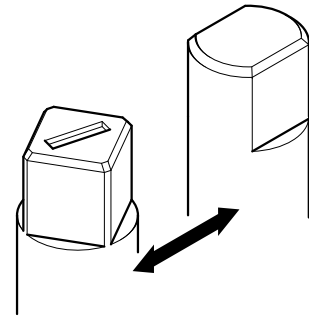
Caution!

Before start-up of the ball valve, the pipeline must be rinsed.

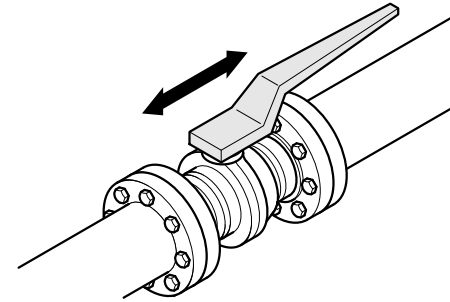
Start-up



0001-00-001



0001-00-002



0001-00-003



Warning!

Before start-up of the ball valve a leak test must be performed.

Before start-up of the ball valve, the pipe-line must be tested under pressure, rinse and dried.



Warning!

The ball valve must be set to the OPEN position in order to avoid any damage.

The flange connections must be checked again after rinsing.

- ▶ If necessary, retighten the bolts.

Actuating the Ball Valve

Only 2 positions (open/closed position with 90 °C turn) are allowed to prevent any damage to the seals (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).

Ball valves are not control valves.

Open Position of the Ball Valves

The ball valves are open when the flat edges or visible notches on the stem are parallel to the direction of flow (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).

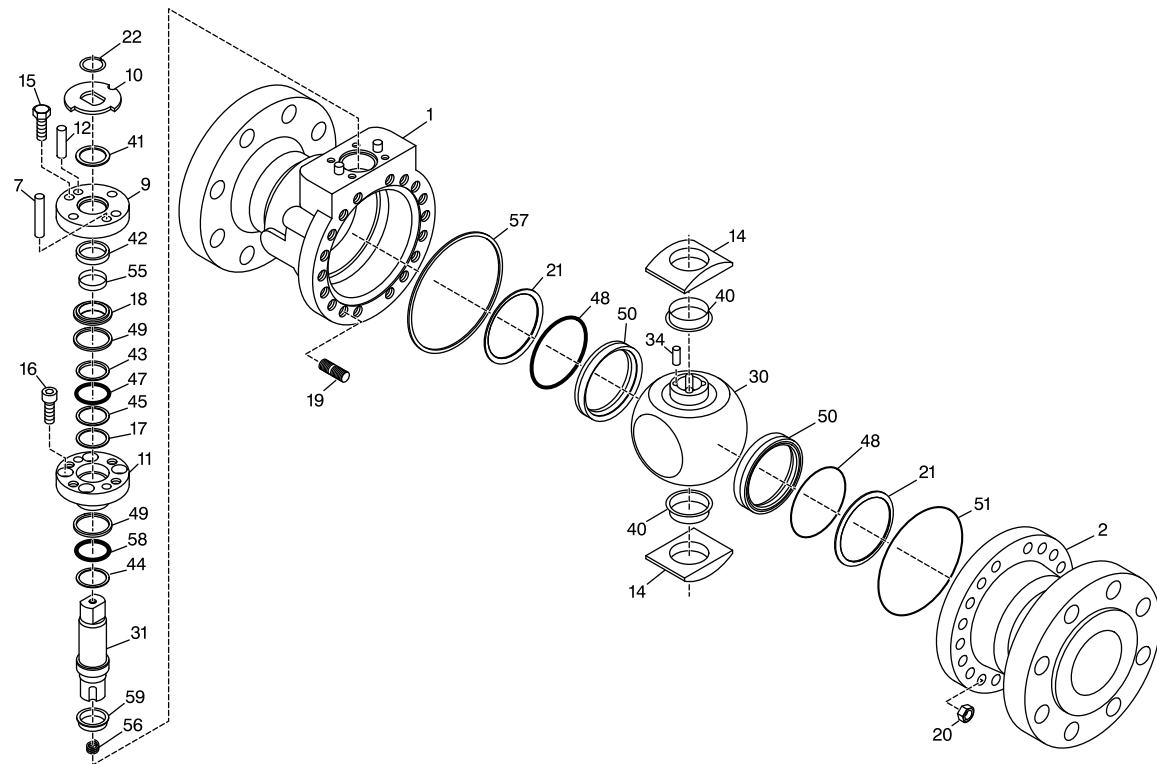
When using a valve wrench:



Danger!

For safety reasons, the position of the wrench must clearly reflect the OPEN position of the ball valve (Figure Fehler! Verweisquelle konnte nicht gefunden werden.).

Type FK76



FK76-02-001



Danger!

Do not disassemble the valve under pressure. Before disassembly operate valve so that possible pressure behind the ball may escape.

Disassembly

- ▶ Stem (31) should be in CLOSED position.
- ▶ Remove snap ring (22) and stop disk (10).
- ▶ Unscrew hexagon screws (15). Take off plate (9) with wiper ring (41), thrust ring (18) with bearing tape (55) and sealing ring (49) as well as dowel pins (7, 12). **
- ▶ Unscrew cheese-head screws (16).
- ▶ Take off plate (11) with ring (43), O-ring (47), ring (45), Belleville spring washer (17), sealing ring (49), ring (44) and stem (31), flange sleeve (59) and compression spring (56).
- ▶ Unscrew hexagon nuts (20) from body (2).
- ▶ Remove body (2), O-ring (51) and sealing ring (57) from body (1).
- ▶ Remove ball (30) with 4 round keys (34), counter-bearing (14) with flange sleeve (40), annular piston (50) with optional O-ring (48) and belleville spring washers (21).

Metallic System

Sealing Variants A

- ▶ Remove ball (30) with 4 round keys (34), counter-bearing (14) with flange sleeve (40), annular piston (50) with O-ring (48), thrust ring (53) and belleville spring washers (21).

Sealing Variants B

- ▶ Remove ball (30) with 4 round keys (34), counter-bearing (14) with flange sleeve (40), annular piston (50) with sealing ring (48), thrust ring (53) and belleville spring washers (21).

Sealing Variants C

- ▶ Remove ball (30) with 4 round keys (34), counter-bearing (14) with flange sleeve (40), annular piston (50) with sealing ring (48), thrust ring (72), thrust ring (53) and belleville spring washers (21).

Exchanging the Stem Sealing

Proceed as per Disassembly until (**).

- ▶ Take off ring (43), O-ring (47) and exchange.
- ▶ Ring (45) and compression spring (17) can be left in cover plate.

When using a PTFE seal instead of O-ring (47), item (43) can be left out.

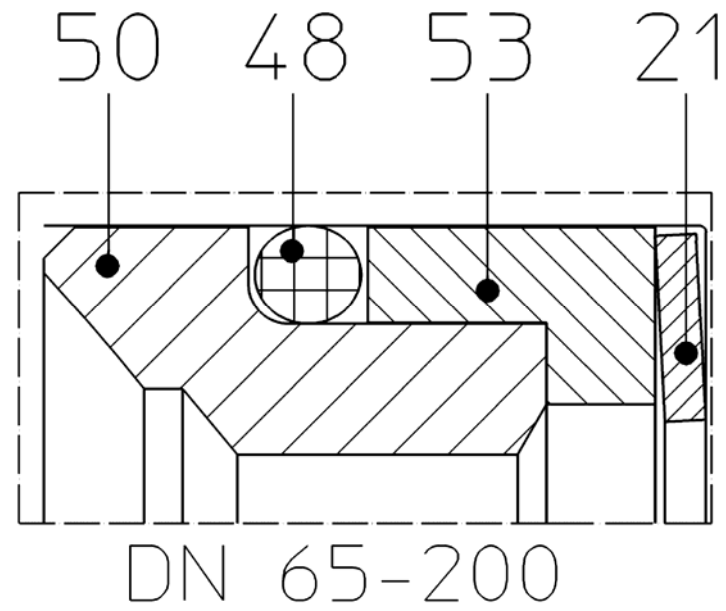
Items (45) and (17) will then be replaced by a fill ring.

Depending on the requirements, a partial disassembly of the ball valve may be sufficient.

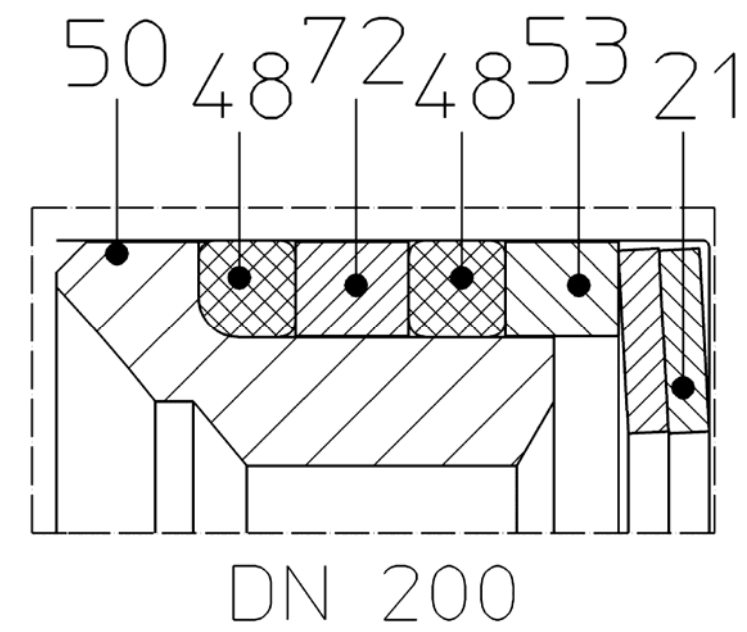
- ▶ To reassemble, proceed in reverse order.

Metallic System Type FK76

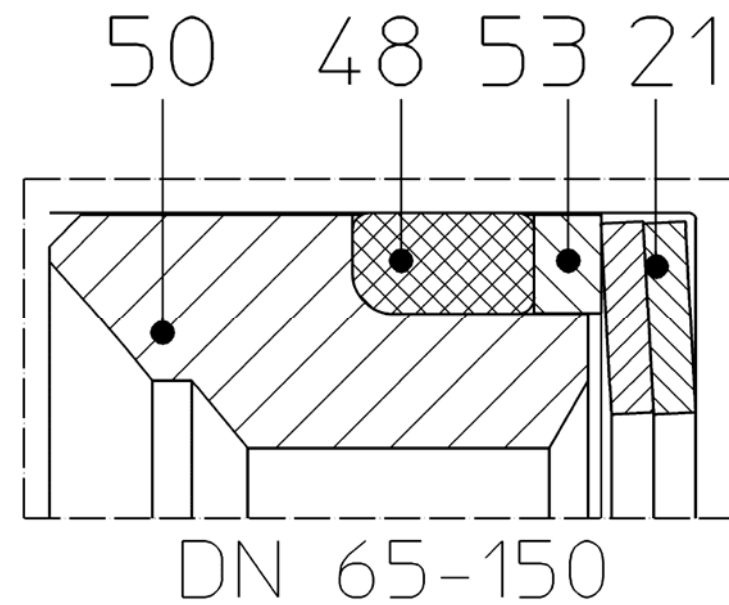
**Sealing Variants A
O-Ring**



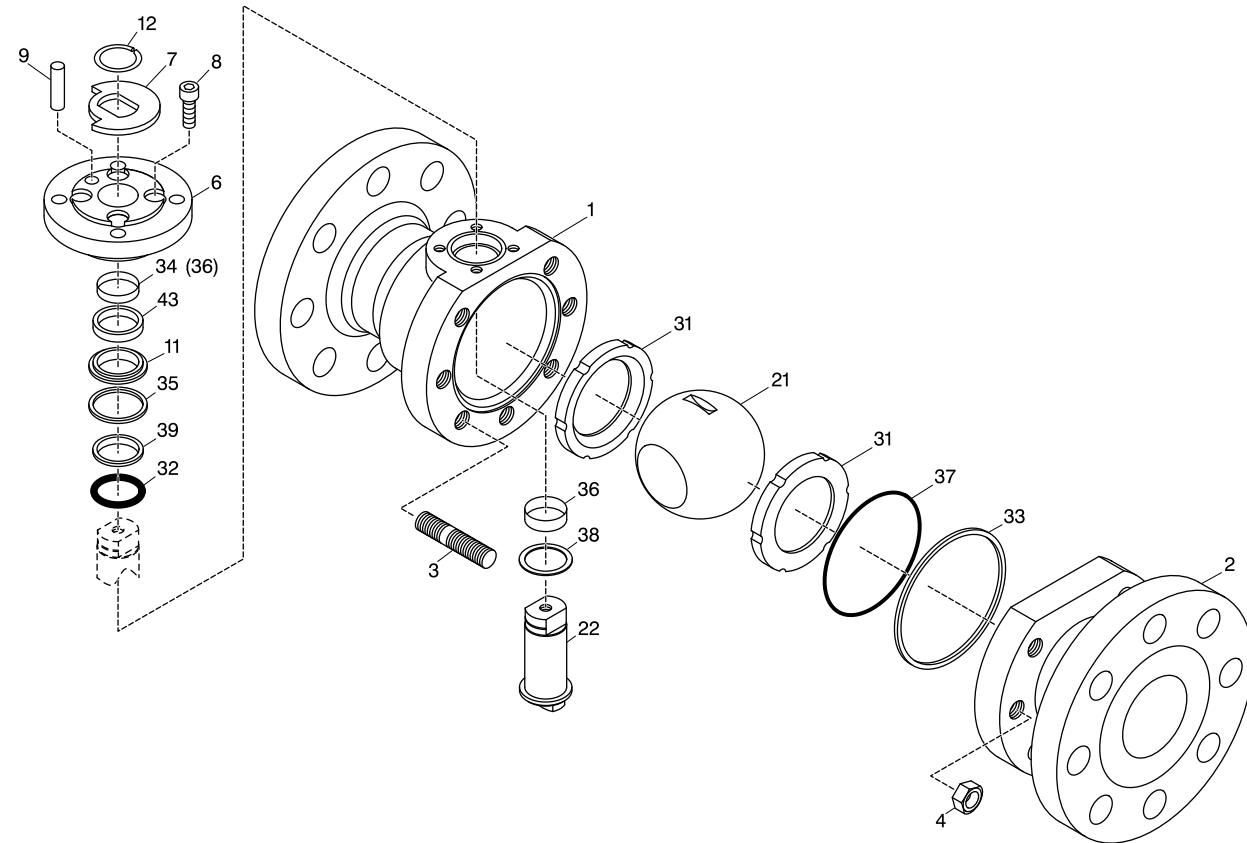
**Sealing Variants C
Graphite**



**Sealing Variants B
Graphite**



Type FK79



FK79-02-001



Danger!

Do not disassemble the valve under pressure. Before disassembly operate valve so that possible pressure behind the ball may escape.

Disassembly

- ▶ Stem (22) should be in CLOSED position.
- ▶ Remove snap ring (12) and stop ring (7). Unscrew cheese-head screws (8).
- ▶ Take off plate (6) with sealing ring (43) and bush (36) on DN 20 and 25 or bearing tape (34) and dowel pin on DN 32-50 as well as thrust ring (11) with sealing ring (35). **
- ▶ Unscrew hexagonal nuts (4) from body (2).
- ▶ Take off body (2), O-ring (37) and sealing ring (33) from body (1).
- ▶ Remove ball (21) and sealing rings (31).

Metallic System

Sealing Variants A

- ▶ Remove ball (21) and sealing ring (50), ring (53) and sealing ring (48) from body 1, thrust ring (73) and belleville washer (21) from body 2.

Sealing Variants B

- ▶ Remove ball (21) and sealing ring (50), sealing ring (48), thrust ring (53) and belleville washer (21).
- ▶ Press stem (22) downwards and take it out of the body together with bush (36) and washer (38).
- ▶ Removed O-ring (32) and washer (39) upwards.

Exchanging the Stem Sealing

Proceed as per Disassembly until (**).

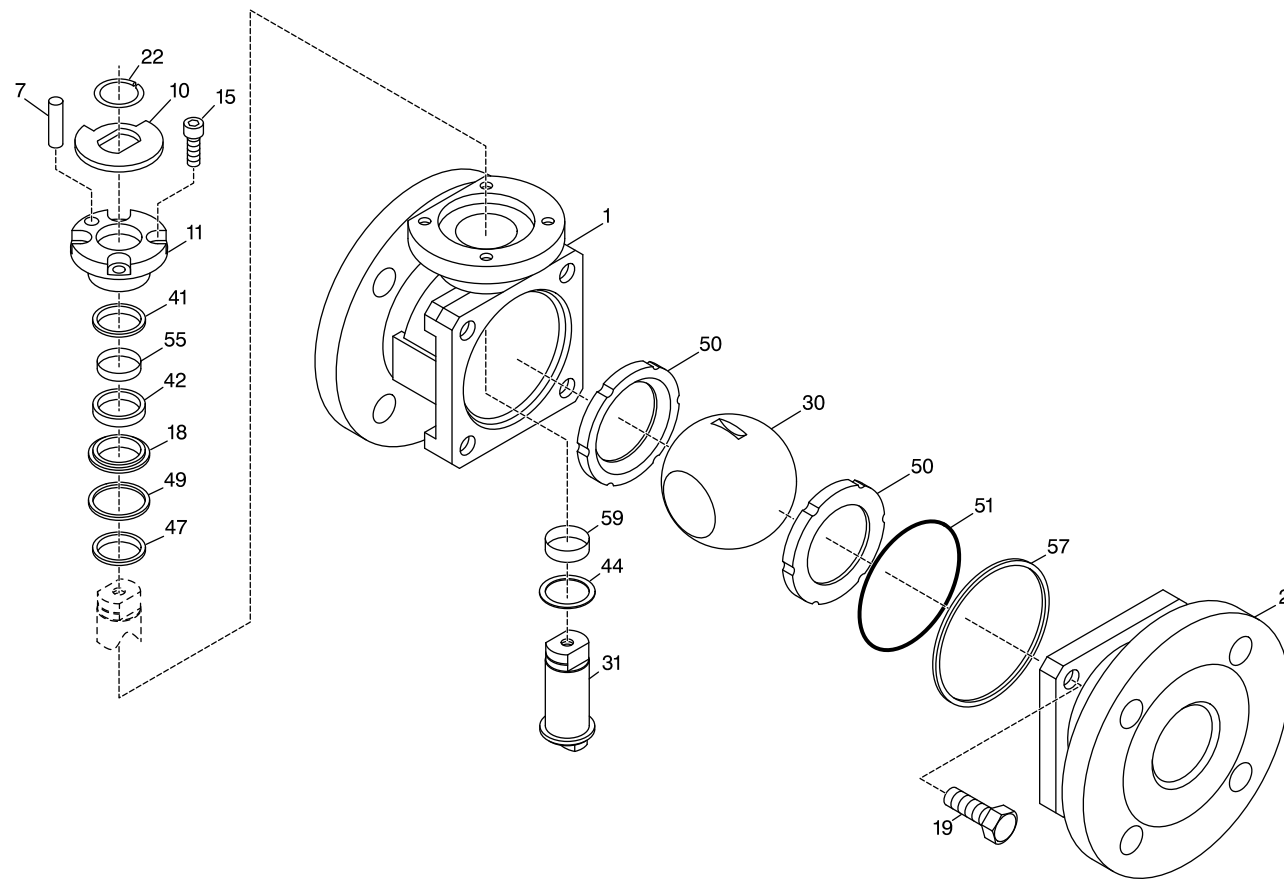
- ▶ Take off O-ring (32) and exchange bearing ring (39).

When using a PTFE seal instead of O-ring (32), item (39) can be left out.

Depending on the actual requirements, a partial disassembly of the ball valve might be sufficient.

- ▶ To reassemble, proceed in reverse order.

Type FK79/F



FK79-02-002



Danger!

Do not disassemble the valve under pressure. Before disassembly operate valve so that possible pressure behind the ball may escape.

Disassembly

- ▶ Stem (31) should be in CLOSED position.
- ▶ Remove snap ring (22) and stop ring (10).
- ▶ Unscrew cheese-head screws (15).
- ▶ Take off plate (11) with dowel pin (7), sealing ring (42), bearing tape (55), on DN 80 and 100 with wiper ring (41) as well as thrust ring (18) with sealing ring (49). **
- ▶ Unscrew hexagon nuts (19).
- ▶ Take off body (2), O-ring (51) and sealing ring (57) from body (1), remove ball (30) and sealing rings (50).

Metallic System

Sealing Variants A

- ▶ Remove ball (21) and sealing ring (50), ring (53) and sealing ring (48) from body 1, thrust ring (73) and bellville washer (21) from body 2.
- ▶ Press stem (31) downwards and take it out of the body together with bush (59) and washer (44).
- ▶ Remove the seal (47) upwards.

Exchanging the Stem Sealing

Proceed as per Disassembly until (**).

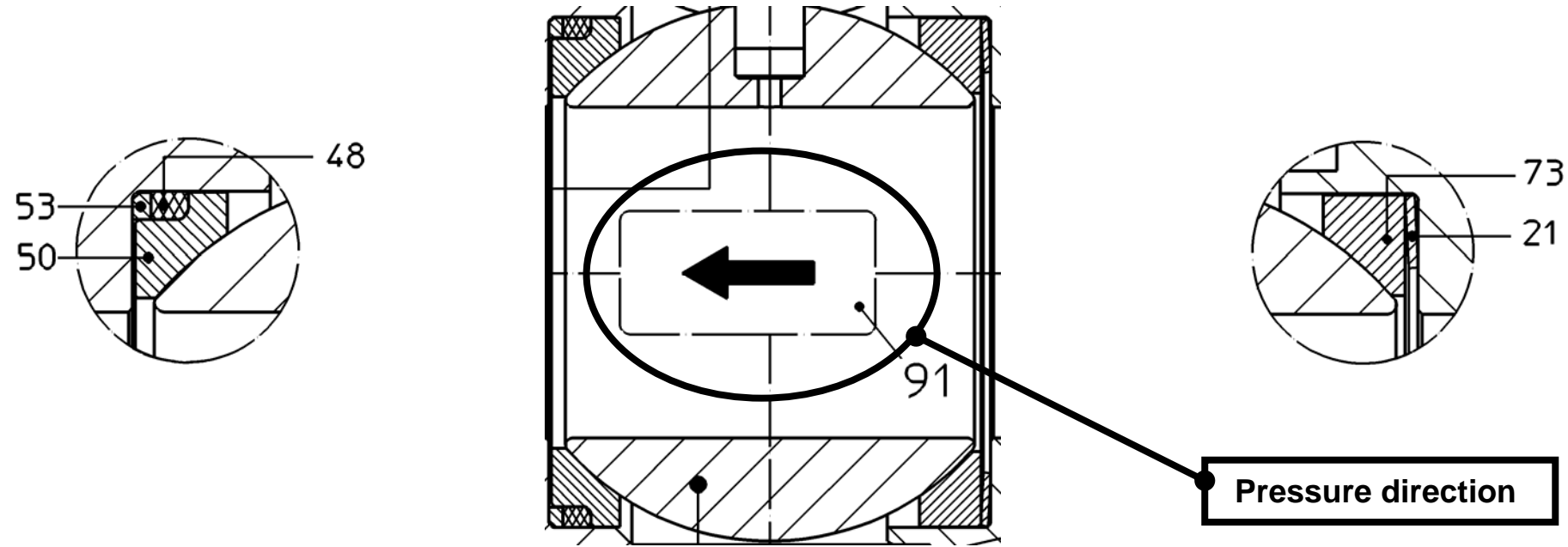
- ▶ Replace seal (47).

Depending on the requirements, a partial disassembly of the ball valve may be sufficient.

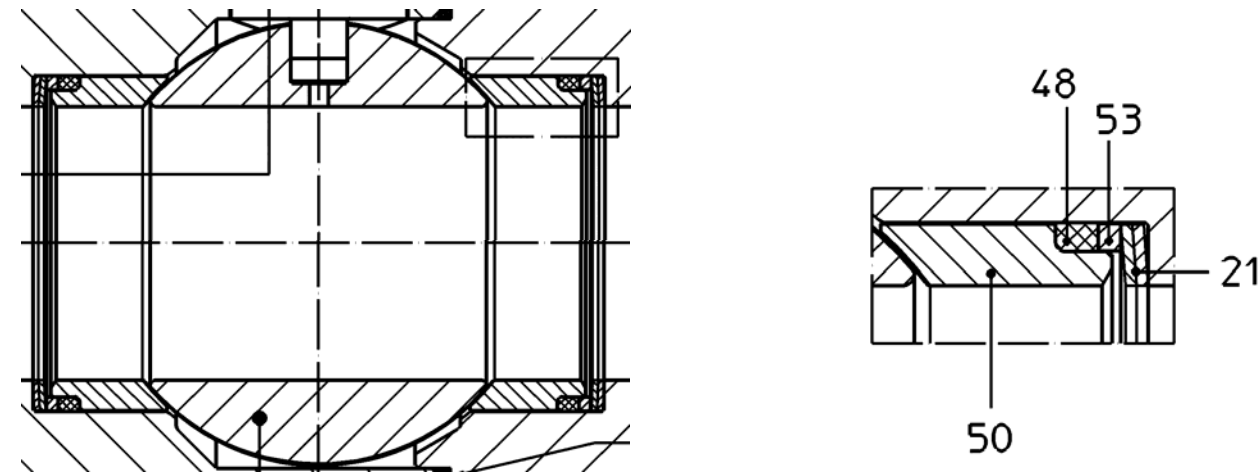
- ▶ To reassemble, proceed in reverse order.

Metallic System Type FK79

**Sealing Variants A
Type M**



**Sealing Variants B
Type N**



Metallic Sealing System

Result

- ▶ After disassembly the ball valve, look for a result of ball surface and seat ring surface
- ▶ Depending on the coating and the degree of abrasion you have following options:
 - Repair lapping - hand.
 - Repair lapping - by machine.
 - Removing the coating and new coating.
 - Repair lapping is not possible - Change the ball and seat rings.

Repair lapping

- ▶ There is no timing for the lapping procedure.
The lapping time relates to the damages / scratch.
- ▶ Hand lapping is very sensible procedure and it's getting more difficult by hand even on bigger size and big scratches.
- ▶ We approve - When you have coating Nikadur, ENP or Crabide it's better to lapped by a machine.
The coating is lower.

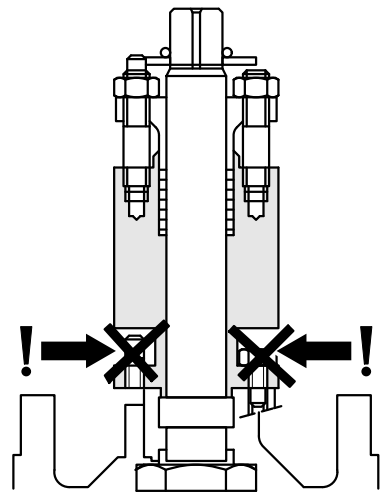


**Ball seats and ball have to be lapped together for perfect match
e.g. ball 2.2 / ball seat 2.2.**

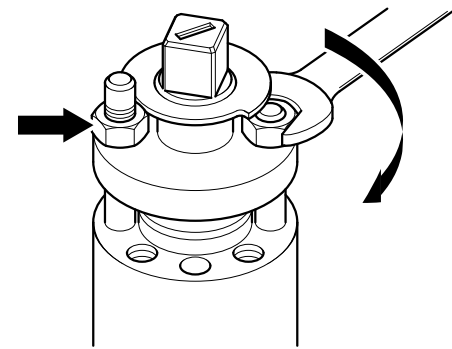


Accessories

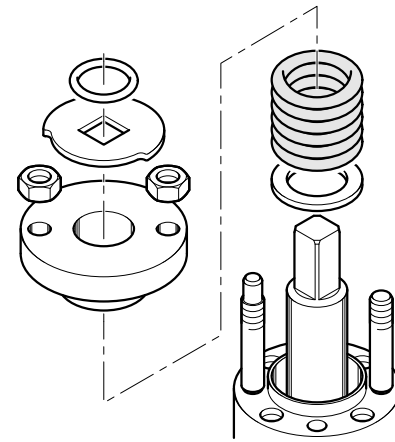
Stuffing Box Assembly



0104-03-001



0104-00-001



0104-00-002

For use at high temperatures, ball valves are fitted with an extension for the stem and a stuffing box assembly (see sectional drawing, 0104-03-001).

Re-tensioning the Seal

The stuffing box seal can be re-tensioned if necessary.

- ▶ For this purpose, turn the nuts on the head-less pins clockwise to retighten them (Figure 0104-00-001).



Caution!
Do not loosen the fixing nuts (Figure 0104-03-001).

Changing the Seals

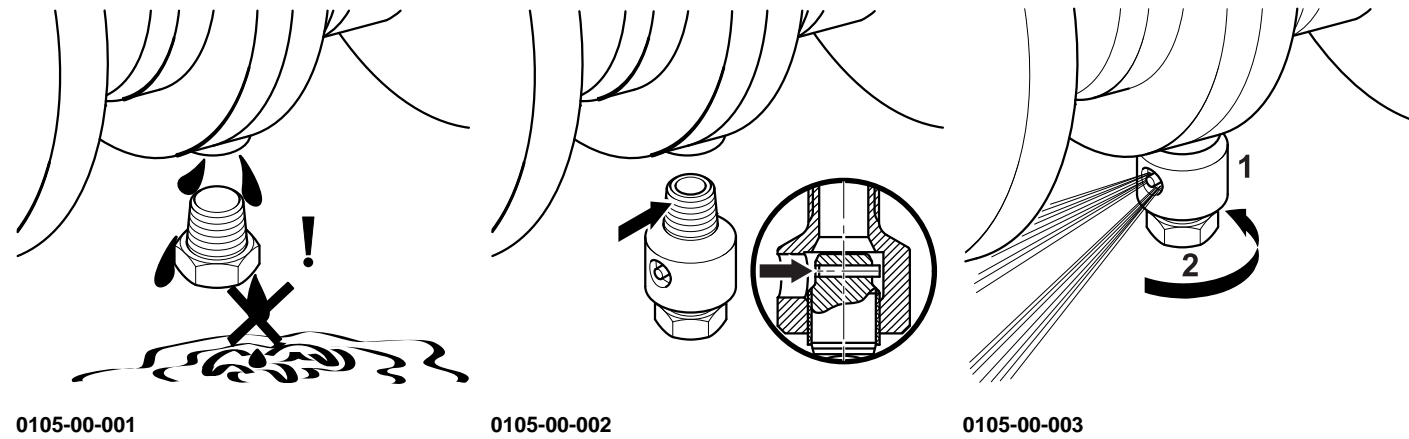


Danger!
The ball valve must be depressurized! To release pressure, turn ball.
Take care of any hazardous materials that might escape! Risk of explosion, fire and acid burn!

The seal is exhausted after being re-tensioned several times.

- ▶ Unscrew the nuts on the headless pins.
- ▶ Remove the stuffing box support.
- ▶ Lift the seals off carefully using a suitable tool
- ▶ Fit a new sealing assembly (Figure 0104-00-002).
- ▶ Replace the stuffing box support.
- ▶ Screw the nuts into position and tighten them uniformly.

Drain Plug



The drain plug is used to drain remaining media from the ball valve.

Danger!
De-pressurize the ball valve by turning the ball at 90° before removing drain and ventilation plug.

Danger!
Care must be taken when hazardous materials are involved!
Risk of explosion, fire and acid burn!

Place an appropriate vessel underneath the ball valve before opening the valve. The drain and ventilation plug can easily be loosened and removed. Damage can occur if it is not treated correctly (Figure 0105-00-001).

Drain and Ventilation Safety Plug

The safety plug is a special-purpose design to prevent the drain and ventilation plug from accidentally being lost. In addition, it allows the drain and ventilation plugs to be closed immediately if the ball valve is still accidentally pressurized (Figure 0105-00-002).

Installation

The complete safety plug is screwed into position using a chemical agent, such as Loctite.

Warning!
The plug may only be opened but not unscrewed by force (Figure 0105-00-003).

Warning!
Keep away from the outlet! Risk of injury!

Warning!
The medium is ejected sideways (Figure 0105-00-003)!

Supplementary Equipment

Valve Actuators (Adjusting Range 90°)

Valve actuators are used for ball valve automation. They are available in an electric or pneumatic/hydraulic version.

Position Control Systems

In automatic operation the drives of the ball valves are controlled by position control systems. Such position control systems are realized by process-controlled operations for in-stance.

Gearbox with Hand Wheel

Manually operated gears are used for large actuating torques. They are available in mechanical version.

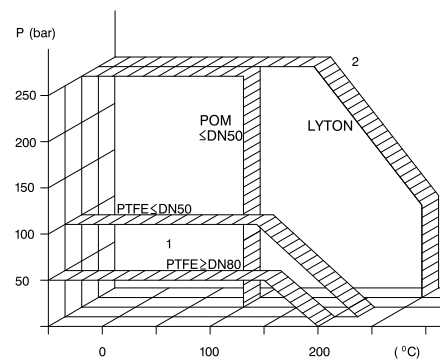
Position Limit Switch

Position limit switches are used to indicate the valve position in controlled areas.

Underfloor Fittings

Underfloor fittings are necessary for installing ball valves in the ground.

Metal Seals



0106-01-001

- 1 Seals with Soft Inserts
- 2 Metal Seals

Metal seals are used when the limits of use of seals with soft inserts are exceeded (see pressure-temperature diagram above), or for abrasive or aggressive substances. Please consult ARGUS in case of need.

Safety Devices

Safety devices are used to lock the ball valves to prevent unauthorized use.

Forced Shut-off Circuits

Forced shut-off circuits are used in processes and can be coded with keywords.

Safety Control Circuits

Safety control circuits, e.g. dead man's button, are used to cause the valve to automatically reach the safety position in processes.

Heating Jackets

Heating jackets are used to heat ball valves.

Secondary Sealing Systems

Secondary sealing systems are emergency sealings which restore the sealing effect of damaged seals by injecting a plastic sealing compound.



Argus

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