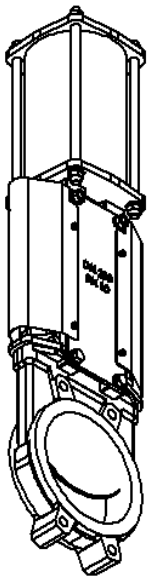
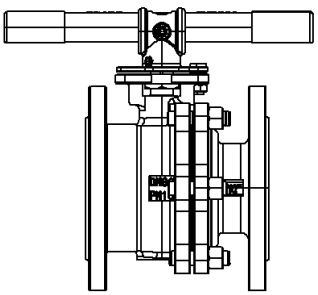
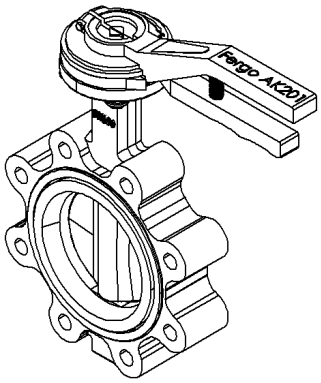
Installation, Operation & Maintenance Instruction

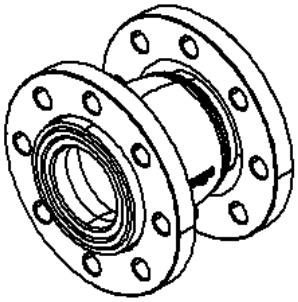
Compact ball valve with longer length KH138

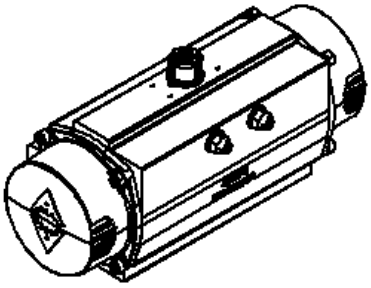
English











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1. SCOPE

This document applies to the compact ball valve Type KH138 from **FERGO Armaturen GmbH**.
This instructions manual contains important information concerning the installation, operation, maintenance and storage of the valve. Please read carefully these instructions and keep them for future occasions. It is important that only well-informed and qualified people operate the valves.

2. APPLICATION

Long life and best results are obtained with ball valves if the normal operating conditions suggested and the basic installation and maintenance conditions of the process lines are observed. Bear in mind that the best valve seal is obtained only with a perfect coupling of the ball lapped surface with the seat made of soft material. Dirt, slag, sand etc. generate adhesion, abrasion, scoring phenomena that damage the sealing surfaces with consequent leaks from the seats. For this reason it is very important that during installation and maintenance works fluids, lines and tools are perfectly clean and any foreign material is removed from the plant before it is started up.
All ball valves are controlled, tested and certified, upon request, according to the project data and customer's needs.
The use of these valves under pressures/temperatures other than those required by the instructions, non-conforming installation and other causes may damage objects and/or persons. We accept no responsibility for damages caused by improper use of the product.

3. GENERAL INFORMATION

• Ball valves are always to be installed with the ball in open position.
• As for the manual valves the handle position indicates the real valve position (open/closed):
- OPEN : the handle is aligned with the valve and the pipe.
- CLOSED : the handle crosses the pipe.
In the three-way type the ball position is engraved in the stem head.

• As for the motor-driven valves the open/closed position is determined by the direction of the notch on the stem protruding part or by the indicators of the fittings mounted.
• The valves are supplied with the ball slightly greased. Grease can be removed with a suitable solvent.
• The use with oxygen, hydrogen, chlorine or for food application must be specified when placing the order to be sure that the valves are supplied perfectly clean.
• The protection caps must be removed ONLY at valve installation.
• The valves are of bidirectional type and can be mounted on the pipe in any space direction, unless otherwise specified.
• Pipes are not to be subject to stress due to expansion and/or other phenomena.

4. INSTRUCTIONS BEFORE INSTALLATION/MAINTENANCE

• Before carrying out any operation read thoroughly the instructions.
• If the packing glands or body-coupling connections are to be tightened, maintenance works can be carried out with the valve under pressure by using the normal protections suggested such as goggles, gloves etc. according to the type of fluid running through the plant.
• If a valve or part of it are to be mounted, the pipe has NOT to be under pressure. In particular:
- Make sure of the fluid nature, ascertaining if it is toxic, polluting, flammable etc.
- Make sure that valve and pipe are not under pressure.
- Use protective gloves, helmet, protective clothing, safety glasses or protective visor.
- Make sure that running water is available nearby as well as efficient extinguishers.
- For motor-driven valves refer also to the actuator operating manual.

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5. INSTALLATION

• Make sure that the valve supplied corresponds to the type ordered.
• Remove the caps from the valve ends.
• Check that the ball is in totally open position.
• Position the valve, paying attention that the max distance between flanges is not > 3mm and put the packings between the flanges.
• Insert the bolts in the flanges.
• Tighten the nuts using suitable wrenches. To obtain a correct assembly see the table indicating the max tightening force to be applied to the screws (resistance class 8.8).

Screw	Preload (N)	Tightening moment (N/m)
M12	37800	84.8
M16	70300	205

• During the tightening operations consider that the stress due to the pipe traction on the plants may cause problems, therefore consider that the space between the installation flanges and the valve must be as small as possible.

6. MAINTENANCE

• Ball valves do not need maintenance, if correctly used.
• The seal can be replaced with simple operations, if necessary.
• If packing glands or the body/flange connection need repairs, follow the instructions in point 4 - „Instructions before installation / maintenance".
• For repairs operate as follows:

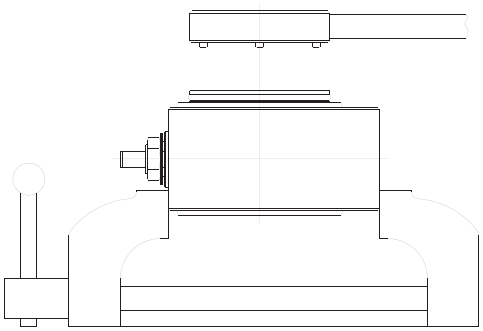
» **Elimination of a leak from the stem**
- Adjust the Belleville washer clamping using the nut, after removing the nut stop.
- Should this be insufficient to stop the leak, disassemble the valve, remove the ball and the stem and replace the damaged parts following the instructions in point „Disassembly".

» Elimination of a leak between body and connections
- Check for bolts tightening and correct it, if necessary, paying attention not to damage screws/nuts.
- Should this be insufficient to eliminate the leak, disassemble the valve and replace the damaged parts as specified in point „Disassembly".

» Elimination of a leak inside the valve
- Check that the valve is totally closed and control the tightening of screws and/or ring nut.
- If the leak is still present, disassemble the valve and replace the seats paying attention that seats are encapsulated and if the containing metal lip is damaged, the valve seal could be jeopardized in case of fire. The valve has to be disassembled according to the instructions in point „Disassembly".
- Remove the valve from the line with the ball in open position.

• Disassembly

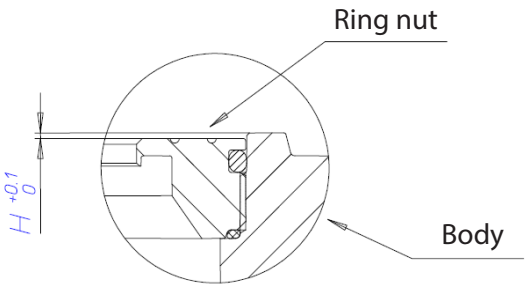
» After removing the valve from the line disassemble the valve as follows:
- Remove the upper nut and the lever, put the valve directly in the vice and unloose the ring nut using a suitable wrench (rotate anticlockwise).



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- Remove ring nut, ball and packings. WARNING: handle the ball with care to avoid damaging it.
- Position the valve vertically in the vice and remove nut, Belleville washers and rotation stops from the stem.
- Remove stem and seal seat from the valve body.
- Carefully clean the valve body and the other elements using alcohol or other suitable material: do not use abrasive products not to damage the sealing surfaces.
- Replace all packings/seats etc. and any other damaged parts. Only use original spare parts.
- Remount stem, rotation stops, Belleville washers by tightening the nut.
- Mount a new seat in the valve body keeping the valve in horizontal position in the vice, grease the seats; mount the ball and the ring nut with the relevant packings and the sealing seat.
- Manually screw the ring nut and then tighten with a suitable wrench: the screwing operation must be effortless.



- Check for correct operation running some full opening/closing cycles.
- Complete the assembly with the lever and the nut and test the valve according to the applicable standards, if possible.
- Remount the valve on the line as described in point 5.

7. TROUBLESHOOTING

The following table describes the risks correlated with the use, installation or handling of equipment under pressure produced by the valve in compliance with the Directive 97/23/CE (PED) annex 1.2; it also contains the instructions to avoid the generation of the risks described.

Classification of the solutions adopted:

1. Solution to eliminate the risk.
2. Implementation of protection measures against constant risks.
3. Information of residual risks for users.

Cause	Effect	Danger	Solution
Overpressure exceeding nominal pressure (NP)	Elastic strain, permanent set, cracks, breaking, explosion	Modest leaks, fluid spillage, projection of metal splints	1. Element sizing using suitable safety factors 2. Minimal safety measures to be observed during plant construction using suitable safety valves 3. Instructions for the use and proper marks indicating the NP
Overheating over the max running temperature	Inner overpressure and possible deformations	Elastic strain, permanent set, fluid spillage	1. Safety systems to control the running temperature (T°) 3. Instructions for the use with indication of the max running T°

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Cause	Effect	Danger	Solution
Outer stress	Deformation, structural failure	Elastic strain, permanent set, fluid spillage, explosion	1. It is forbidden to apply external loads to the valve; both installer and user must protect the valve from outer stress 3. Instructions for the use with the requirement stated in point 1
Installation and/or use non complying with the regulations in force	Improper installation, corrosion, brittleness, breakage of the valve	Valve malfunction, fluid spillage	1. It is forbidden to apply external loads to the valve; both installer and user must protect the valve from outer stress. The instructions given in the technical data sheet are to be strictly observed 3. Instructions for the use with the requirement stated in point 1
Incorrect tightening during installation	Deformation, structural failure of valve and seals	Elastic strain, permanent set, fluid spillage, explosion	3. Instructions for the use with indication of max driving torque
Impact	Permanent deformations, breakages and structural failure	Modest leaks, fluid spillage, explosion	1. The valve is protected by suitable packaging and has to be handled with suitable tools 2. The valve has to be installed in protected environment 3. The valve has to be installed and used according to the Instructions for the use and maintenance
Corrosion of valve components	Corrosion and thinning of the pressure resistant walls and sealing elements	Malfunction, leaks and blow-by, fluid spillage, explosion	1. Use of the valve only with the fluids specified in the technical instructions and within the T° and PS limits required 2. Definition of chemical compatibility with the materials used for the construction of pressure elements 3. Instructions to the user on the use of pressure equipment according to the requirements of the technical specifications
Valve maintenance with plant under pressure	Fluid spillage, explosion	Risk of fluid spillage and projection of metal splints	1. Maintenance works are to be carried out when the plant is not under pressure 3. The instructions require that maintenance (if necessary) is carried out when the plant is not under pressure
Seal wear	Seal deformation	Malfunction, leaks and blow-by, fluid spillage, explosion	1. Periodical check of the valve 2. Valve replacement, if necessary 3. Check for valve minimum guarantee in the instructions
External fire	Deformation and structural failure of the valve and seals	Valve malfunction and explosion	1. The plant must include suitable devices that trip in case of fire, unless the valve is already provided with them 3. The instructions contain information on the need of suitable precautionary measures

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8. GUARANTEE

Guarantee is indicated in the edition of „General Business Conditions of FERGO Armaturen GmbH“ valid at the date of delivery or is indicated differing from this in the contract of sale.
For damages, which occur by improper handling or disregard of these fitting and operating instructions, of the standards EN, DIN, VDE and other standards, no guarantee claims can be enforced. Damages which occur during operating caused by working conditions diferent to those of data sheet or other agreements are also no subject for guarantee. Claims which exceed the guarantee are also excluded. Claims for spare delivery do not exist.
The installation of external parts, changes of the construction as well as natural wear and tear are also excluded from the guarantee. We are not responsible for any transport damage, this must be reported immediately to your freight forwarder, railway company or carrier to avoid the loss of any claims for compensation against such companies.

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