

1. General

- This Instruction and Operating Manual comprises the prescribed instructions for safe installation and operation of the ball valve. The manufacturer of the ball valves assumes no liability when this operating manual is not observed. Retain the operating manual.
- According to the user's indication of medium, pressure, temperature, vibrations, duty cycles, explosive zones, antistatic and other details, the manufacturer selects the material of the housing, the seats and the seals of the ball valve (requirement specification).
- For damage caused by incorrect installation, implementation or use at wrong application (e.g. other media, pressures, temperatures as specified) as well as incorrect handling by unqualified personnel or any modification of the ball valve design (e.g. drilling of mounting holes, attachments of plates by welding etc.), the manufacturer of the ball valve assumes no liability or warranty.
- Ball valves must only be used for indicated specifications as media, pressure and temperature, see also marking on ball valve.
- Follow and control the instructions of this manual to avoid physical or material damages and personal injury or death.
- In the event of difficulties, which cannot be overcome with the aid of this manual please consult the manufacturer or distributor.
- Qualified personnel are necessary to the application of this manual. It is the responsibility of the operator or planner to ensure that national regulations for accident prevention such as local safety regulations of the operating company are not replaced by this manual, they should rather be considered with priority.
- Ball valves can be operated by handles or actuators. The operating method has to be defined when ordering the ball valve. Accessories such as actuators or limit switches always refer to the operating manual of the respective manufacturer.
- A repair is realisable by the manufacturer only.
- The manufacturer maintains all rights for technical changes and improvements at any time.



- Safety warnings:

Danger!

Ignoring this information may cause physical or material damages and could cause personal injury or death.

2. Technical Information, Safety Warnings



Danger!

Follow the instructions below to avoid property damage and personal injury.

- The standard ball valves are designed for temperatures between -10°C and +50°C. Semifluid or hardening media must not be used. Contaminated media lead to damage of the sealing elements. Leakage will lead to breakdown of the ball valve. Exceeding the nominal pressure and exceeding or undercutting the working temperature leads to leakage and destruction of the ball valve.
- The operator or planner must take into account different operating pressures. The pressure values listed in the catalogue are static pressures (loading case I). The operating pressures must be reduced for turgescence and alternated pressures (loading cases II and III). The operator or planner must take into account that the operating pressure of the ball valve decreases with increasing temperature.
- When ball valves come into operation in explosive zones, they are considered as non-electrical equipment, because there is no ignition source acc. to EC directive 94/9EG and therefore ball valves are not subject to ATEX. In explosive zones the number of duty cycles is limited to 10 per minute to avoid self-heating.
- In case of malfunction the ball valve has to be replaced by qualified personnel.
- When draining the depressurised pipe system, in order to prevent it from frost damage or for a cleaning process, the cavity of the ball valve has to be drained by opening the valve to the mid-position (45°).

3. Transportation and Storage

- Protect against external forces (shock, vibration etc.).
- Do not damage the surface (corrosion-protection).
- Storage- and transport-temperature: -20°C to +50°C, dry and free of dirt.
- Bulk ball valves must be protected against direct UV-rays and/or solar radiation.



Danger!

Follow the instructions below and in the other chapters to ensure proper function of the ball valve.

4. Application

- The standard 2- and 3-way ball valves BKH and BK3 with spring return function are operated by actuator systems installed by the customer. A spring below the handle turns the ball back to the initial position.
- The maximum differential pressure for the spring return function is 40 bar. At

higher differential pressures the torque to operate the ball valve will be too high so that the spring force is not sufficient to operate the ball valve to the initial position.

- To avoid damages of the spring and the detent it is forbidden to operate the ball valve without pressure.

Operating Requirements, Installation Instructions



Danger!

To avoid damages of the stem and leakages, the operating angle has to be limited to 90°. Operating elements installed by the customer must avoid over-travel and resulting forces to the handle in the end positions.

- Allowable working temperature: -10°C to +50°C.
- Allowable media are hydraulic oils HLP 30-46. The maximum particle diameter is limited to 20µm. We recommend strictly to use a filter!
- Avoid shearing forces on the handle!
- Protect the ball valve against environmental impact.
- Ensure that additional safety devices are installed to avoid physical or material damages and personal injury or death caused by malfunction of the ball valve.
- Consider the guideline 98/37/EC when operating an application with this ball valve.

5. Installation



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Ignoring this information may cause physical or material damages and could cause personal injury or death. See also chapter Technical Information, Safety Warnings.

- Ball valves must be reviewed for damage before installing. **Damaged ball valves must not be installed.**
- Check, if the ball valve meets all the requirements regarding version and application (see also marking on ball valve).
- The installation of ball valves has to be done by qualified personnel only when pipe (and ball valve) are depressurized. Start-up by third party must be excluded.
- The pipe system and the ball valve has to be drained completely, when dealing with noxious, combustible or explosive media. If necessary vent the pipe system. **Danger of poisoning, burns danger, corrosive fluids danger caused by dropping residues! Wear protective clothes! Cool down pipe system.**
- Remove protection caps from ball valve connections.
- The ball valve must be free of dirt.
- All pipes and hoses must be rinsed before installing the ball valve. Impurities

in the pipe system damage the sealing elements and cause leakage and malfunction of the ball valve.

- Ensure installation of ball valve in pipe system without tension and torque. Do not use the valve as a step or fixation point. Only piping supports it.
- The ball valve and the accessories (spring and handle) must not be used as a fixing point of external forces (e.g. stair, fixing point for hoisting devices).
- The operating position of the ball valve must be in accordance to the layout of the pipe system.
- Pressure rating, connections and overall-length of the pipe system must be in accordance with the ball valve.
- When tightening the fittings (customer connections) it is absolutely necessary that the end connection of the ball valve is counter-secured with an adequate tool, see figures.
- The end connections of the ball valve must not be tightened or unscrewed, because this will increase the operating torque or will cause leakage.
- Any modification of the ball valve design as drilling of mounting holes or attachments of plates by welding etc. is strictly forbidden! Such modifications could cause leakage and malfunction of the ball valve.
- Tools such as gripper, hammer, wrench, extensions etc. are inapplicable for ball valve operation. The use of such tools might cause damage to the stem and housing of the ball valve. It is strictly forbidden to operate ball valves with brute force.

Secure end connection



No welding, drilling etc.



Don't remove under pressure



Don't dismantle



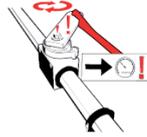
Don't operate a ball valve with a tool or an extension



Risk of injury by remainders



Don't operate unpressurised



6. Initial Operation, Operation

Danger!
Ignoring this information may cause physical or material damages and could cause personal injury or death. See also chapter Technical Information, Safety Warnings and Installation.

- Before the initial operation and after each inspection the proper function of the ball valve has to be checked by qualified personnel only.
- Before the initial operation all instructions must be read. Check the installation work done and that the ball valve meets the requirements of the application.
- The pipe system must be vent. Air bubbles in the pipe system might cause explosions when pressurised abruptly, so decrease pressure slowly.
- If ball valves are installed as pipe-line-ends the open ball valve connection must be closed properly to avoid the danger of flying shrapnel due to handling errors.
- Burns danger when operating ball valve with high or deep media temperatures. Check allowed operating temperature, observe security warnings and wear protective clothes. If necessary cool down pipe system and ball valve.
- After a long-time storage or long shut-down-time in one operating position, the operating torque for the first operation could be much higher compared to the real breakaway torque.
- When installed in explosive zones the operation frequency is limited to 10 cycles per minute to prevent the valve from self warming.
- Danger of flying shrapnel! Exceeding or undercutting the allowed working pressure and temperature could cause leakage and destruction of the ball valve.
- Check proper function of the ball valve by at least one full operating cycle. Refer to the operation manual of the respective manufacturer if an actuator is mounted onto the ball valve.

7. Maintenance, Inspection

Danger!
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- Check ball valves periodically of function, leakage and damages (at least every 2 months). At extreme stress inspections have to be carried out in shorter time intervals. Ball valves are maintenance-free.
- Defective ball valves (leakage, immobile or corroded) must be replaced immediately by qualified personnel.
- Dismantling and repair of ball valves are not allowed. A repair is realisable by the manufacturer only!
- Provisionary seals at ball valves are not allowed!

8. Removal Instructions

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The ball valve must be removed by qualified personnel at depressurised and drained ball valve and pipe system.

- Shut-off the application. Start-up of the application by third party must be excluded.
- The ball valve must be in mid-position (45°) in order to drain the pressure and remainders in the ball valve housing.
- Burns danger when operating ball valve with high or deep media temperatures. Check allowed operating temperature, observe security warnings and wear protective clothes. Cool down pipe system and ball valve.
- The pipe system and the ball valve has to be drained completely, when dealing with noxious, combustible or explosive media. Danger of poisoning, explosion, corrosive fluids danger caused by dropping residues! Wear protective clothes! Decrease pressure slowly. If necessary vent pipe system.