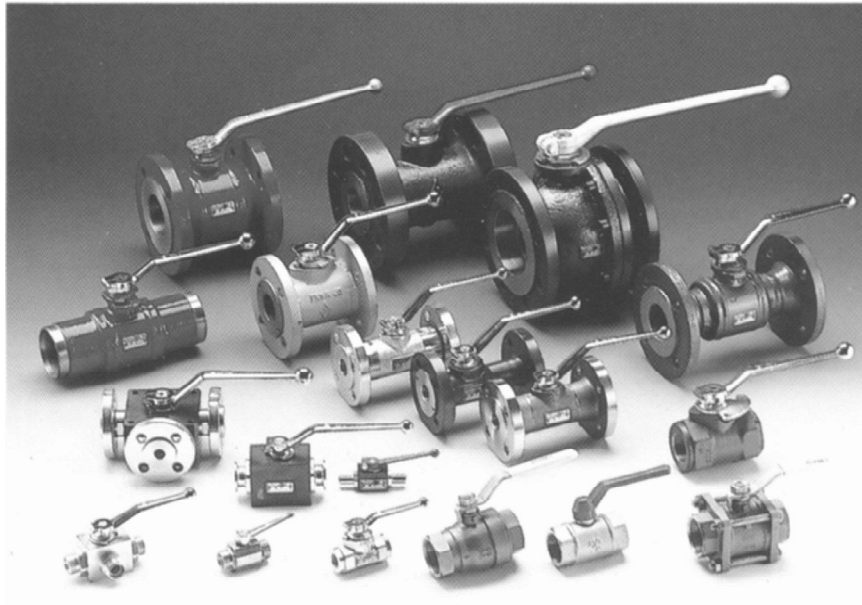




Operating instructions for ball valves

Status: 04/2003



Please read these operating instructions carefully, in order to guarantee safe operation, and store them for further usage.

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Printed in Germany

Foreword

These operating instructions help you to use the ball valve in a

- proper,
- safe and
- cost-effective manner.

Target group of these operating instructions

These operating instructions are intended for the users of ball valves. They are expressly not intended for persons who plan the use of ball valves. Information for designing and selecting suitable ball valves can be found in the BÖHMER ball valves catalogue. The choice of material is predominantly influenced by the flow medium, the operating temperature, the rated width and the rated pressure.

The information contained in these operating instructions is intended to be used by authorized, trained and familiarized personnel. We insist that these persons be equipped with general technical knowledge.

Each person who

- transports,
- installs, removes,
- operates,
- services or
- disposes of

the ball valve must have perused and understood all of the information contained in these operating instructions.

If you do not understand any of the information contained in these operating instructions, or if information is missing, please obtain this information from Werner Böhmer GmbH Maschinenfabrik before commencing the relevant activity.

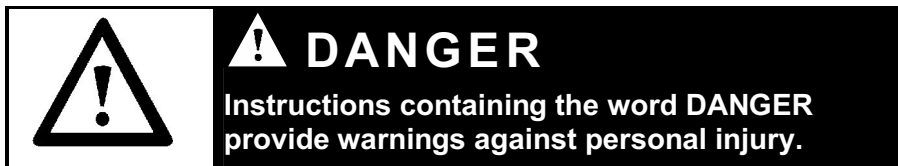
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Introduction to the operating instructions

Explanation of the safety instructions

The operating instructions contain the following categories of instructions:



ATTENTION

- Instructions containing the word **ATTENTION** provide warnings against possible material or environmental damage.



These instructions contain special information regarding the cost-effective use of the ball valves.

Availability

If these operating instructions become lost or unusable, a new copy can be requested from Werner Böhmer GmbH Maschinenfabrik.

Supplements

Regularly supplement the operating instructions with instructions based on

- legal regulations regarding accident prevention,
 - legal regulations regarding environmental protection and
 - employer's liability insurance association stipulations
- at the relevant point of usage.

The European Union and German safety regulations have been taken into consideration in these operating instructions.

Presentation features

Various elements within the operating instructions have been marked with specified presentation features. This enables you to determine whether this involves a standard text,

- lists or
- action steps.

Fundamental safety instructions

Proper usage, operating ranges

Only use BÖHMER ball valves for their intended application. Please refer to the BÖHMER catalogue and the rating plate for the operating ranges and conditions. The improper usage of a ball valve may lead to its becoming damaged and even to personal injury. An excessively weak ball valve design may, for example, lead to the ball valve's bursting. Proper usage also includes adherence to all of the information contained in these operating instructions. BÖHMER accepts no liability for damage caused as a result of improper usage.

	<p>! DANGER</p> <p>Modification of the ball valve or its construction status is prohibited.</p> <p>Safety is not guaranteed in this case, and the warranty expires.</p>
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Note that the service life of the ball valve is influenced by the type of medium and impurities in the medium. For more detailed information, please refer to the BÖHMER catalogue or speak to our customer service department (see page 23).

The planner is responsible for the design, installation position, installation and operation of the fittings. In the event of inconsistencies, speak to your planning engineer or contact our customer service department.

Only install the ball valve in the "open" position (see position indication or switching spindle marking). In the case of ball valves with a switching handle, this points in the direction of the housing axis.



ATTENTION

- Do not operate the ball valve in an intermediate position.
The ball valve gaskets may otherwise become damaged.

Duties involved in handling these operating instructions

The owner of the ball valve is responsible for the constant availability of these operating instructions during operations involving the ball valve. Store the operating instructions in the vicinity of the ball valve.

CE identification

All BÖHMER ball valves correspond to the valid EU stipulations. The CE identification can be found on the rating plate. For precise specifications, please refer to the BÖHMER catalogue.

Safety instructions



ATTENTION

- Note the specifications on the rating plate with regard to the application, pressure and media.
Further information in this regard can be found in the Böhmer ball valves catalogue.




⚠ DANGER
Risk of crushing!
Wear protective gloves during transportation and lifting operations!




⚠ DANGER
Certain media may lead to a risk of fire and explosion!
Note the valid regulations and extinguishing instructions.



⚠ DANGER
Risk of burning!
Surfaces may become heated as a result of welding operations or hot media!



⚠ DANGER
Risk of corrosion and intoxication!
Inquire whether the media which are being used are aggressive or toxic (poisonous)!
If in doubt, notify your company's technical safety specialist.

	<p>! DANGER</p> <p>Warning: Possible damage to ears!</p> <p>Wear ear protectors.</p> <p>A high level of noise may occur in the case of open systems or gaseous media.</p>
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Transportation, delivery, storage

Provide BÖHMER ball valves with adequate protection against falling or tilting during transportation. Protect the ball valves against damage via suitable belts or wedges.

! ATTENTION

- During loading and unloading, the ball valves must not be **thrown** or subjected to **hard impact**.

Beware of the weight, especially in the case of larger ball valves.

Carefully attach the ball valve to lifting gear and secure it. Only use suitable and technically flawless lifting gear and lifting equipment with sufficient load-bearing capacity.

Ball valves **as of a rated width of DN300** are equipped with lifting eyes for transportation using cranes. Use these to secure the ball valves during transportation. When using a crane, note its swiveling range.


	<p>! DANGER NEVER remain under suspended loads. Also pay attention to your colleagues!</p>
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	<p>! DANGER Transportation and lifting operations! During these operations, always wear a safety hat for your own protection.</p>
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Store all ball valves in the "open" switching position (delivery status, see position indication or switching spindle marking). The ball valve switching positions are shown in the "Operation" Chapter.

The ends of all ball valves are equipped with protective caps. The unpainted surfaces in the interior of the ball valve are coated with a film of oil in order to provide protection against corrosion.

	<p>! DANGER</p> <p>Risk due to ejected particles!</p> <p>If the protective caps are prematurely removed, particles of dirt may enter the interior</p> <p>On pressurization, particles which are ejected may cause injuries.</p>
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 Retain the protective caps for subsequent storage.

! ATTENTION

The **maximum storage period is two years**. Registration expires after this period of time. In the event of longer storage, we cannot offer any guarantee of the safe usage of the ball valves.

Store the ball valves in a dirt-free, dry and temperature-controlled environment with the supplied protective caps fitted.

Flange gaskets, nuts, bolts and union nuts are not included in the scope of delivery. Ensure that these components are of the correct design for the intended application.

Design features and functional principle

All BÖHMER ball valves are comprised of a housing, into which a ball with a cylindrical bore hole has been inlet. The ball is mounted in bilaterally pre-tensioned sealing seats. In the case of greater rated widths, the ball is centrally mounted.

Depending on the version, the ball valve can be opened or closed **manually** via

- a switching handle,
- a handwheel,

or **mechanically** via an assembly such as

- a hydraulic drive,
- a pneumatic drive, or
- an electrical drive.

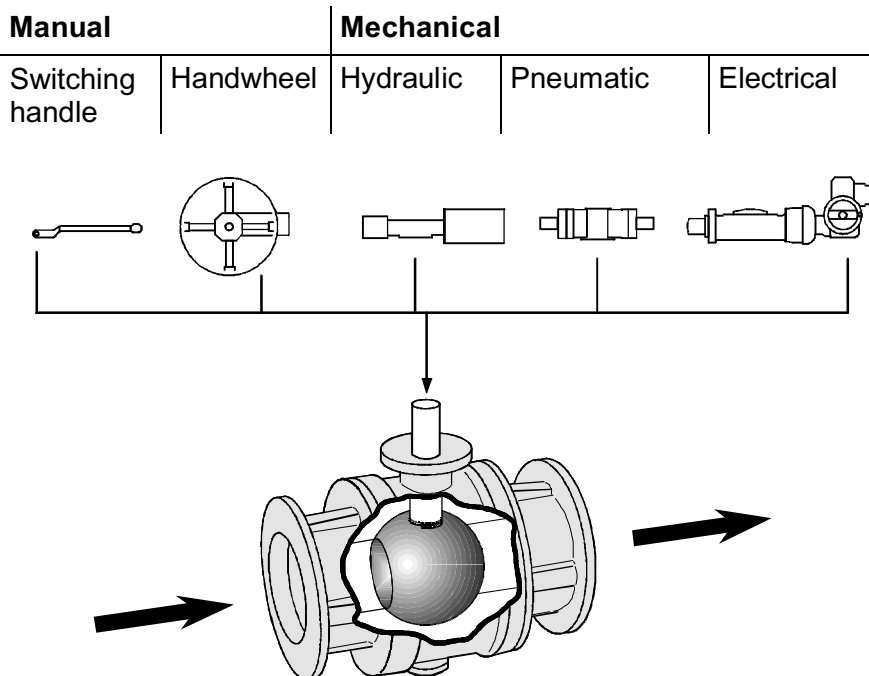


Figure 1: Ball valve with various actuating elements

All Böhmer ball valves are available in various designs for different media and applications.

Please refer to the Böhmer catalogue for the individual equipment features and designs.

Installation and removal

Installation

	<p>⚠ DANGER</p> <p>Prior to installation, secure the shutoff point and the shut-off valves against unintentional reactivation</p> <p>Affix a sign warning against reactivation in this location.</p>
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	<p>⚠ DANGER</p> <p>Risk of crushing!</p> <p>Wear protective gloves during installation.</p>
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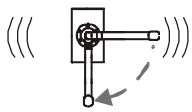
- Immediately prior to installation, remove the protective caps from the ends of the ball valve.

- !** **ATTENTION**
 - During installation, ensure sufficient spatial conditions for freedom of movement for the spindle crown, the switching handle, the handwheel or the electric, pneumatic or hydraulic drive.

! **ATTENTION**

- Only install the ball valve in the "open" position. In the case of ball valves with a switching handle, this points in the direction of flow.

Use only new gaskets!

	<p>! DANGER</p> <p>Risk due to self-actuation!</p> <p>Note that the switching handle may move independently when set to the horizontal position in the event of vibrations in the pipeline system.</p>
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- ➔ Flush the pipe system out before actuating the ball valve for the first time. Solid residues in the pipe system may otherwise damage the ball valve's gaskets.

! **ATTENTION**

- When welding to pipelines, the temperature of the ball valve housing must not exceed 150 °C!

In order not to exceed this temperature,

- ➔ the ball valve housing must be cooled and/or
- ➔ electric welding must be used instead of gas welding.



ATTENTION

- During installation, pay attention to possible damage to the flange or threads. Damage may impede imperviousness and lead to risks.



ATTENTION

- If the pipe system is drained, e.g. if there is a risk of frost, ensure that the ball valve has also been completely drained by switching it. In the event of frost, this prevents the ball valve or its gaskets from becoming damaged.

Install flanged or threaded ball valves with larger rated widths into the pipe system without tension.


In the case of ball valves which are bolted on at the flange, it must be ensured that the bolts are firmly seated.

Removal

Only remove the ball valve in a pressure-free and cooled condition (hot surfaces!).

- ➔ Switch the ball valve once in order to relieve clearance volume in the ball valve.



	<p>! DANGER</p> <p>Prior to removal, secure the shutoff point against unintentional re-activation, and affix a sign warning against reactivation in this location.</p>
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- !** **ATTENTION**
- Following removal, replace all loosened gaskets with new ones.

Operation

Manual actuation involves various types of actuation, which are explained in the following.

Ball valve with switching handle

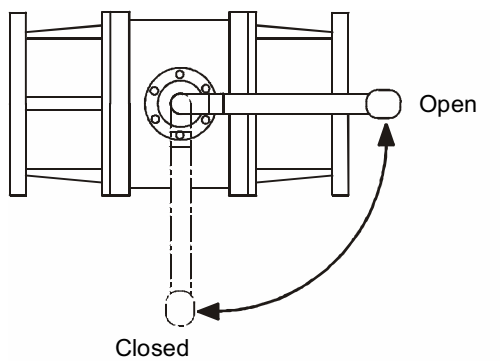


Figure 2: Actuation of the ball valve with switching handle

In the case of ball valves with a switching handle, the switching position can be seen

- on the upper spindle marking
- on the position indicator
- from the position of the switching handle.

☞ Two stops limit the 90° switching travel.

In its delivered condition, the switching handle is open.

Closing the ball valve with the switching handle

- ➔ In order to close the ball valve, turn the switching handle to stop in a clockwise direction.

In its closed condition, the switching handle is transverse to the direction of flow.

Opening the ball valve with the switching handle

- ➔ In order to open the ball valve, turn the switching handle in an anti-clockwise direction. The switching handle is now positioned in the direction of flow.



ATTENTION

Do not extend the switching handle with a tool or a length of pipe. This may lead to damage to the switching handle or the ball valve!

Ball valve with handwheel

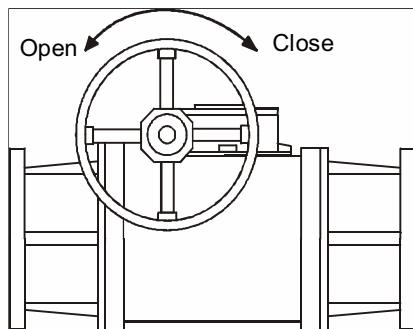


Figure 3: Actuation of the ball valve with handwheel

Closing the ball valve with the handwheel

- ➔ In order to close the ball valve, carefully turn the handwheel to stop in a clockwise direction.

Opening the ball valve with the handwheel

- ➔ In order to open the ball valve, carefully turn the handwheel to stop in an anti-clockwise direction.

Ball valve with mechanical actuation

Please refer to the operating instructions pertaining to the relevant drive modules for the switching positions, operation and safety instructions for ball valves with pneumatic, hydraulic or electric drives.

Re-commissioning



ATTENTION

- Prior to re-commissioning, check the ball valve for any possible damage or corrosion. This leads to the avoidance of malfunctions and safety defects.
Use only new gaskets in the event of re-installation.




If flawless function is not guaranteed, our customer service department may be of assistance.

Maintenance, malfunctions, customer service department

Maintenance

All BÖHMER ball valves are maintenance-free.

Check the ball valve for possible leakages or loose flange bolts every two to three weeks.

	<p>! DANGER</p> <p>Risk of bursting!</p> <p>In the case of bolted ball valves, no bolts may be loosened or tightened! The ball valve may otherwise burst or its imperviousness become impeded.</p>
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! ATTENTION


- If the ball valve's function is impeded, **only BÖHMER** may carry out the **necessary repairs**.

A pressure and functional check must be carried out following each repair, in order to guarantee the safety of the ball valve during operation.


The ball valve may burst following improper repair.

Carrying repairs out yourself may place both you and other persons at risk.



Malfunctions

	<p>⚠ DANGER</p> <p>If media escape from a ball valve at high pressure due to leakages, immediately leave the area of danger and depressurize the pipeline system.</p> <p>Secure the point at which the malfunction occurs!</p>
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	<p>⚠ DANGER</p> <p>When using aggressive media, wear personal protective equipment in order to avoid injuries.</p> <p>Immediately inform your company's technical safety specialist.</p>
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	<p>⚠ DANGER</p> <p>Risk of burning due to hot surfaces or hot media!</p> <p>Wait until the ball valve has cooled down.</p>
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If there is no danger, remove the defective ball valve from the pipeline system. Refer to the "Installation and removal" Chapter for details.

	<p> DANGER</p> <p>Have the functional safety of the ball valve checked by Böhmer. The ball valve must not be re-installed prior to this check under any circumstances, as this may endanger both you yourself and other persons.</p>
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Customer service department

Werner Böhmer GmbH Maschinenfabrik, Sales Department

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Disposal

Dispose of the ball valve via a registered waste disposal company or the public waste disposal facility. If there is a possibility of toxic or aggressive substance residues' remaining in the ball valve, comply with the relevant, applicable regulations. Pass this information on to your waste disposal facility.

Liability for delivery deficiencies

Subject to the exclusion of further claims, the supplier is liable for delivery deficiencies, which also include the absence of expressly assured characteristics, as follows:

All parts which are deemed to be unusable, or whose use is not inconsiderably impeded, within 6 months following commissioning as a result of a circumstance which precedes the passage of risk – especially due to a defective design, poor materials or defective implementation – must be improved or replaced free of charge at the supplier's discretion and as the supplier so chooses. The supplier must be immediately notified in writing of the determination of such deficiencies. Replaced parts become the property of the supplier. If delays in shipping, installation or commissioning occur through no fault of the supplier, liability expires 12 months following the passage of risk at the latest. In all cases, the ordering party's right to assert claims arising from deficiencies expires 6 months following the point in time at which the timely complaint is submitted, but on expiry of the warranty period at the earliest.

No responsibility is accepted for damage which has occurred due to the following reasons:

Unsuitable or improper use, incorrect installation or commissioning by the ordering party or third parties, natural wear, incorrect or negligent handling, unsuitable operating media, replacement materials, defective construction work, unsuitable building land and chemical, electrochemical or electrical influences, unless these are attributable to the fault of the supplier.

After reaching an agreement with the supplier, the ordering party must grant the supplier the time and opportunity to carry out all improvements and replacement deliveries which the supplier regards as necessary at his own discretion; the supplier is otherwise exempted from liability for these deficiencies. Only in urgent cases in which operating safety is at risk, and in order to prevent disproportionately excessive damage, in which case the supplier must be immediately notified, or if the supplier defaults on eradicating the deficiency, does the ordering party have the right to

eradicate the deficiency himself or have this carried out by third parties and to demand that the supplier reimburse the necessary costs.

Of those costs incurred directly as a result of improvement or replacement delivery, the supplier – insofar as the complaint is deemed to be justified – bears the costs of the replacement unit, including shipping, and appropriate removal and installation costs plus, if this can reasonably be demanded depending on the situation surrounding the individual case, any costs involved in his providing installation technicians and assistants. The ordering party bears all other costs.

The warranty period for the replacement unit and the improvement is 3 months; at the very least, however, it runs until the original warranty period for the supplied object expires. The period of liability for deficiencies in the supplied object is extended by the duration of the non-productive time caused by reworking.

In the event of any modifications or commissioning work carried out improperly by the ordering party or third parties without the prior approval of the supplier, liability for the resulting consequences is extinguished.

Further claims by the ordering party, especially claims for compensation for damage which has not been incurred on the delivered object itself, are out of the question. This exclusion of liability does not apply in the event of intent, gross negligence on the part of the owner or senior managers or the culpable violation of significant contractual duties. In the event of the culpable violation of significant contractual duties, the supplier is only liable – except in cases of intent and gross negligence on the part of the owner or senior managers – for contractually typical, reasonably foreseeable damage. Nor does the exclusion of liability apply in cases in which liability for personal injury or material damage to privately used objects applies in the event of defects in the delivered object in accordance with the German Product Liability Act. Nor does it apply in the event that characteristics, which are expressly assured, are absent if the purpose of this assurance was to protect the ordering party from damage which has not occurred in the delivered object itself.



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