General Operating Manual for Valves

Updated: 1 July 2026

müller co-ax gmbh
Friedrich-Müller-Str. 1
74670 Forchtenberg
Germany

Tel. +49 7947 828-0
Fax +49 7947 828-11
E-mail info@co-ax.com
Website www.co-ax.com

Table of contents

1 General

To ensure the successful and safe use of our valves, the entire operating manual must have been read and understood before installation and commissioning. Furthermore, particular attention is to be paid to the safety instructions. Installation, commissioning, maintenance and repairs must only be carried out by trained or instructed personnel in order to ensure safe operation.

IMPORTANT | **Read and observe the safety instructions before using our valves.**

Should any difficulties arise which cannot be resolved with the aid of the operating manual, please contact the supplier/manufacturer.
This operating manual covers the following areas: installation/commissioning, maintenance/repairs, modifications, storage, packaging, transport, recycling/disposal, spare parts and repairs. The operating manual has been compiled in accordance with the regulations of Directive 2014/68/EU on pressure equipment and the DIN EN IEC/IEEE 82079-1 standard.
The operating company is also responsible for ensuring that personnel tasked with installation comply with local security regulations. If the valve is used outside the Federal Republic of Germany, the operating company or the party responsible for the design of the system must ensure that prevailing national regulations are complied with.
At all times, the manufacturer reserves the right to make technical changes and improvements.
In order to use this operating manual and directly handle the valves, users must fulfil the qualification requirements described in section 1.1.

1.1 Target group

The operating manual is intended for persons who are entrusted with the installation planning, installation, commissioning or maintenance/repairs and who possess the corresponding qualifications for their duties and roles, i.e. who, on the basis of their technical training, knowledge and experience, as well as their knowledge of the relevant standards, are able to assess the tasks they are assigned and recognise possible dangers.
This also includes knowledge of the relevant accident prevention regulations, generally recognised safety rules, EU directives, and country-specific standards and regulations.

1.1.1 Qualification of personnel

Transport, assembly, commissioning, maintenance, and repairs are only to be carried out by trained or instructed personnel.
Electrical installations: Any work on the electrical equipment of the device is only to be carried out by a qualified electrician or by instructed persons under the guidance and supervision of a qualified electrician in accordance with good technical practices.

1.2 Structure of the documentation

The operating manual for our valves consists as standard of two main modules: "General operating manual" and "Data sheets", as well as additional supplementary modules for Ex valves and control valves (see the following sections).

1.2.1 "General operating manual"

This manual contains important basic information and safety instructions for the safe handling of all valves from müller co-ax gmbh.

1.2.2 "Data sheets"

These contain the necessary additional information and technical data for the corresponding specific valve types. The data sheets are only to be used in combination with the general operating manual. In particular, the safety instructions in the general operating manual must be observed!

1.2.3 Supplementary "specific operating manuals" for Ex valves

These contain the necessary supplementary operating instructions for individual Ex valves which are not found in the general operating manual or the data sheet. The supplementary specific operating manuals for Ex valves are only to be used in combination with the general operating manual. In particular, the safety instructions in the general operating manual must be observed!

1.2.4 Supplementary "specific operating manuals" for control valves

These contain the necessary supplementary operating instructions for individual control valves which are not found in the general operating manual or the data sheet. The supplementary specific operating manuals for control valves are only to be used in combination with the general operating manual. In particular, the safety instructions in the general operating manual must be observed!

1.3 Storage

The operator must ensure that all documents listed in section 1.2 are available in full and accessible at all times at the operation site of the valve. This includes the general operating manual, all associated data sheets and all supplementary modules required for the relevant system type.

The documents must be reviewed at least once a year and updated as necessary to ensure compliance with legal, safety-related and operational requirements.

2 Product description

2.1 Important notes on the valve

2.1.1 Intended use

After installation in a piping system (e.g. between flanges, couplings, or screw connections or similar) and after the actuator is connected to the control system, the valves are intended

exclusively for shutting off, conveying, or regulating the flow of media within the permitted pressure and temperature limits.
It must be ensured that the usual flow rates (as specified in recognised technical tables, such as the German specification sheets 1300.1306) are not exceeded in this piping system during continuous operation, and abnormal operating conditions such as vibrations, water hammer, erosion (e.g. caused by wet steam), cavitation and larger than negligible amounts of solids in the medium – particularly abrasive ones – are clarified with the manufacturer.
The nature of the medium agreed upon during placement of the order (chemical, abrasive and corrosive influence), must be complied with. Any other or additional use will be considered improper.
The valve's scope of application is the responsibility of the designer of the system. The manufacturer accepts no liability for damage resulting from improper use. The risk is borne by the operator.
Any special labelling of the valve must be observed; see section 2.1.5.

2.1.2 Valves for oxygen

DANGER Failure to comply with these regulations may result in **danger to life and limb**, as the oxygen combustion equates to an explosion!

NOTE Valves for oxygen must be cleaned and maintained in accordance with the manufacturer's instructions. Only trained personnel are permitted to carry out maintenance work.

During the goods inwards inspection, it is to be checked whether the valves supplied are furnished with appropriate certificates for oxygen cleaning and whether the valves have oxygen -clean packaging (see oxygen identification – "Clean for Oxygen Service"). The packaging is to be checked for damage. If there is damage, such valves may not be employed for oxygen applications, as there is a strong suspicion that the valves are contaminated, which could lead to an oxygen fire.
When it has been ensured that the packaging has suffered absolutely no damage during transport, the valves are to be removed from the packaging in a room suitable for this purpose. The room must be oil- and fat-free and it must also be ensured that the room has no aliphatic atmosphere. Personnel who remove the valves from the packaging and/or install the valves in the pipe must wear suitable protective clothing (grease- and oil-free gloves, grease- and oil-free clothing, etc.).
The valves removed from the packaging are to be checked once again for any contamination. An optical visual check under UV light is the minimum requirement. The valves, which have now been checked for possible contamination and which have been confirmed to be in perfect condition, are to be taken without delay to the installation site, whereby it is to be ensured that the valves have not come into contact with oil and grease or contaminated in any other manner while en route.
During installation of the valves, the usual safety regulations and the instructions in this operating manual are to be followed. In addition, it must be ensured that the pipes the flanges opposite the valve and the seals in particular are suitable for oxygen and free of any impurities, especially oil and grease.

2.1.3 Precautionary measures

WARNING Failure to comply with the operating manual may result in **serious injuries or material damage** (e.g. due to mechanical, chemical or electrical effects).

For the use of the valves, prevailing laws (e.g. EU directives and national regulations) and good technical practices must be observed, e.g. DIN standards, DVGW fact sheets and worksheets, VDI directives, VDMA standard sheets, etc.
In the case of systems requiring monitoring, the relevant laws and regulations are to be observed, e.g. trade regulations, accident prevention regulations, boiler regulations, regulations on high-pressure gas lines, regulations for flammable liquids, as well as the technical standards VDE, ATEX, TAB, TRD, TRG, TRbF, TRGL, TRAC, AD fact sheets, etc.
Furthermore, the general installation and safety regulations for pipe and plant construction apply, as do the local safety and accident prevention regulations.
During all work on the valve and any handling of the valve, the instructions in the operating manual must always be complied with.

2.1.4 Electromagnetic compatibility (EMC)

The manufacturer of the machine or system into which the solenoid valves are to be fitted must ensure the electromagnetic compatibility (EMC) of the machine or system as a whole. The solenoid valves are to be installed and connected in accordance with the instructions in this operating manual.

NOTE The EMC characteristics of a solenoid valve are influenced, amongst other things, by the wiring, cable lengths, switching devices, mains supply and the installation situation. Consequently, the EMC compliance of the machine or system as a whole cannot be determined solely on the basis of the solenoid valve's characteristics.

The machine or system manufacturer is responsible for ensuring, through appropriate measures, that the system as a whole complies with the applicable EMC requirements. To this end, the following measures, for example, may be necessary:

- Use of valve connectors with integrated EMC protection circuitry (e.g. varistor or RC circuit).
- Use of suitable mains filters or other interference suppression measures.
- EMC-compliant installation of power, control and signal cables.
- Proper earthing and equipotential bonding.
- Compliance with the EMC requirements applicable to the system as a whole.

2.1.5 Labelling of the valve

Valves bear a nameplate which contains all the required information in accordance with the Pressure Equipment Directive. This nameplate is explained in section 15.

2.1.6 Conformity

Valves from müller co-ax gmbh are state of the art and comply with Directive 2014/68/EU on pressure equipment. Information on the declaration of conformity can be found in section 14.

2.2 Technical data

The materials of the housing and the seals are selected according to the operating conditions specified by the customer when placing the order. These operating conditions significantly influence the service life of the valve, e.g. due to abrasion, chemical reactions with, or corrosive effects on the materials. The valves are designed without a wear allowance and structurally with a 1.5x safety margin against nominal pressure at the max. permissible temperature.
For the technical data (including electrical data) and the primary permissible limit values, in particular for media pressure and temperature, please consult the data sheet and, for Ex and control valves, please also consult the supplementary specific operating manual.

3 Safety instructions

This section contains important general safety instructions. In addition, the special safety instructions in the other sections must also be complied with.
Please read this section thoroughly before use and follow the instructions when using the valves.

3.1 Representation

Hazards are identified by a signal word and assigned safety colours according to ANSI Z535 depending on their severity and probability of occurrence:

DANGER	For an imminently hazardous situation that will result in serious bodily injury or even death.
WARNING	For a potentially hazardous situation that could result in serious bodily injury or even death.
CAUTION	For a potentially hazardous situation which could result in minor bodily injury or material damages.
NOTE	For a possibly harmful situation which could result in damage to the product or an object in its vicinity.
IMPORTANT	For usage instructions and other useful information.

Note that it is equally essential to observe all other instructions and information that are not specially highlighted in order to avoid malfunctions, which could in turn directly or indirectly cause injury to persons or material damages.

3.2 Product safety

The valves correspond to the state of the art and the recognised technical safety regulations; nevertheless, dangers may still arise. The valves are only to be operated when in perfect condition, in compliance with the entire operating manual. The valves are only intended for the purpose described in section 2.1.1.

WARNING Use of media incompatible with the material, exceeding the limit values for medium pressure and temperature, as well as additional mechanical stresses, e.g. from connected pipes, may lead to **failure in the valve material and bursting of the valve**.

3.3 Organisational matters, personnel

3.3.1 General

The recognised rules for work safety must be observed. Persons who are entrusted with installation planning, installation, commissioning, maintenance or repairs must possess the corresponding qualifications for their duties and roles.
They must, based on their technical training, knowledge and experience, as well as their knowledge of the relevant standards, be able to assess the tasks they are assigned, the mutual interactions between the valve and system, and recognise possible hazards.
They must also possess knowledge of the relevant accident prevention regulations, generally accepted safety rules, EC directives, and country-specific standards and regulations, as well as all operational, regional and in-house regulations and requirements.
They require qualifications or instruction in accordance with safety engineering standards for the care and use of appropriate safety and protective equipment, as well as training in first aid, etc. (see also TRB 700).
They must have read and understood the entire operating manual.
No modifications, additions or conversions are permitted to be made without the approval of the manufacturer or supplier, see section 7

3.3.2 Transport / installation / commissioning / maintenance / repairs

Only to be performed by trained or instructed personnel. For reasons of safety, a final check is to be performed before work commences to ensure that all necessary measures have been taken for the protection of persons. Valves which have come into contact with media that is hazardous to health must be decontaminated before work can commence.

3.3.3 Electrical installations

Hazards due to electrical energy are to be eliminated. Any work on the electrical equipment of the device is only to be carried out by a qualified electrician or by instructed persons under the guidance and supervision of a qualified electrician in accordance with good technical practices.

3.4 Product-specific hazards

Hazards which may arise due to the medium conveyed, the control pressure, and from moving parts are to be prevented by taking appropriate measures.
Furthermore, it must be ensured that the valves are only operated in situations where the type of medium, operating pressure, and temperatures correspond to the design criteria used as the basis for the order and which are specified on the nameplate. Proper transport and storage of the valve are also to be ensured.
The following sections list a number of product-specific hazards and measures for preventing them:

3.4.1 Use of a medium unsuitable for the valve

The valve materials are only compatible with certain media. When using them with media which require particular materials or are incompatible with certain materials, it is essential that you consult the manufacturer. For flammable, aggressive or toxic media, use valves made of suitable materials. Use non-ferrous metal valves for ammonia.

DANGER

When used with media not intended for the valve, the materials in the valve may be damaged or even combust explosively.

- Hence, only use media for which the valve is approved.
- Keep valves for oxygen free of oil and grease.

3.4.2 The required minimum wall thickness has fallen below the minimum value due to corrosion or abrasion

WARNING

Unnoticed damage to materials or holes in walls can lead to the medium leaking and cause injury or damage to the system.

- Inspections must be carried out **at least once a year** to verify the safety and proper condition of the inner walls.

The intervals for these inspections depend on the individual risk and the operating conditions. They are usually determined on the basis of a risk-based assessment that takes into account corrosion rates, the type of medium, temperature, pressure and the system's history. Specific time frames must be based on the recognised technical regulations and standards (e.g. DVGW regulations, DIN EN ISO 6509) and determined by a specialist.

Inspections should be carried out by qualified and competent specialists or certified experts who are familiar with the specific test methods (e.g. ultrasonic wall thickness measurement, magnetic particle testing or visual inspection).

3.4.3 Exceedance of the permissible pressure with danger of bursting

One possible cause of this exceedance could be, for example, so-called water hammer effects (impact when closing) or pressure waves resulting from cavitation. Water hammer effects (impact when closing) are pressure peaks that occur when a pipe is shut off using a valve. Put simply, the reason for this is the force with which the column of media being conveyed impacts

the closing valve. Pressure peaks which occur during the closing of the valve may reach several times the pressure at rest.

WARNING

Exceedance of the maximum permissible operating pressure may result in material failure, leaks or bursting of the valve.

- The operating pressure rating of the valve is to be selected such that any pressure peaks which occur in a specific installation situation do not exceed the maximum permissible operating pressure of the valve.
- Ensure that the static pressure of a liquid medium always exceeds the vapour pressure of the medium in order to prevent cavitation.

3.4.4 Excessive stress on valves

Excessive stress on valves may occur when they experience additional stresses, such as being stepped on, from other connected pipes, or high ambient temperatures.

WARNING

Unpermitted force or pressure loads can lead to malfunctions, material damage, leaks or bursting, particularly in valves operating under medium pressure.

- Install the valve without applying force
- Ensure that no additional stresses occur, e.g. from pipes or being stepped on.

No welding or heat treatment is to be carried out on pressure-bearing walls, and no holes are to be drilled for attachments. The installation of the valve and the electrical and pneumatic lines is to be performed in such a manner that they cannot be damaged and no moisture-induced short circuit can occur at electrical plug connections.

3.4.5 Opening of screw connections when the valve is under pressure

Opening screw connections when valves are under pressure leads to medium leakage and damage to the valve.

DANGER

Opening valves under pressure is **life-threatening**!

WARNING

Risk of serious or fatal injury due to pressure release, electric shock, burns or poisoning.

Before performing any work on the valve:

- The valve and all lines which are connected must be depressurised.
- Ensure that the valve is electrically de-energised. Allow the valve and medium to cool down. Allow the medium to cool until it is below its vaporisation temperature to prevent scalding.

- In the case of media which is, for example, corrosive, flammable, aggressive or toxic, flush and ventilate the piping system, wear protective goggles or a protective mask with eye protection, or take other necessary protective measures.

3.4.6 Leakage of hazardous substances

Hazardous substances may escape, for example, at relief holes or when dismantling the valve.

WARNING

Leaking substances may cause serious injury, poisoning, chemical burns or environmental damage.

- Hazardous media (e.g. leakage at relief holes or medium residue in the valve when dismantling it) must be collected and disposed of in such a manner that poses no danger to persons or the environment. Statutory regulations are to be complied with.

3.4.7 Exposed valve outlet

If a valve is opened accidentally and no line or accessories are connected to its outlet, the medium may escape unimpeded.

WARNING

Leaking medium may endanger persons, for example, through burns, chemical burns or the medium being ejected under high pressure.

- To rule out hazards at the outlet of the valve, the valve outlet is to be diverted in a controlled manner, or sealed in a pressure-tight fashion with a blind plug/blind flange.

3.4.8 Failure of actuator power

In the event of failure of actuator power, the valve may enter a state that is unsafe for its intended purpose.

CAUTION

The system may be in an unsafe condition, posing a danger to persons and property.

- Pay attention to selecting the correct valve function (NC/NO) such that the valve enters an operational state that is safe for the intended purpose in the event of failure of actuator power.

3.4.9 Painting work

When performing painting work, the valve could also be painted over, thereby affecting the heat radiation of the magnet or clogging the relief hole.

NOTE

Cover up the valves effectively if work is to be done in the area around the valves which could lead to dirt/soiling, for example, work involving cement, bricklaying, painting work, or sandblasting.

3.5 Information for emergencies

In an emergency, dial the emergency number immediately and, if necessary, alert the in-house security service. In the event of a media leak, the danger area must be evacuated immediately and suitable protective clothing must be worn.

DANGER

The use of unsuitable extinguishing agents or incorrect procedures may result in life-threatening electric shocks or uncontrolled chemical reactions.

- In the event of a fire, only use extinguishing agents that are approved for use on the electrical equipment concerned (e.g. CO_2, powder for live systems in accordance with DIN VDE 0132).
- Ensure that the extinguishing agent does not cause a dangerous reaction with any medium that escapes.

4 Functionality

For information on the functionality of your specific valve, please refer to the relevant data sheet or, in the case of Ex and control valves, also to the specific operating manual.

5 Installation / commissioning

IMPORTANT

Before the installation or commissioning, the general safety instructions in section 33.0 and the relevant sections of the supplementary specific operating manuals are to be read and observed. Always comply with the prevailing accident prevention regulations when handling the valves.

5.1 Measures and considerations before the installation

For the installation, observe the TRB 700 (Technical Rules for the Operation of Pressure Vessels) as well as the following:
Compare the material, pressure and temperature specifications of the valves with the operating conditions of the piping system to verify the material resistance and load capacity. Any pressure surges that occur must not exceed the maximum permissible pressure of the valve.

WARNING

Exceedance of the maximum permissible operating pressure may result in material failure, leaks or bursting of the valve.

- The operating pressure rating of the valve is to be selected such that any pressure peaks which occur in a specific installation situation do not exceed the maximum permissible operating pressure of the valve.
- Ensure that the static pressure of a liquid medium always exceeds the vapour pressure of the medium in order to prevent cavitation.

Install the valve such that it is easily accessible for any necessary connection and maintenance tasks in the future (e.g. connections to the actuator, sensors, and control units, replacement of

cartridge valves, etc.). Unless otherwise stated, the orientation of the installation can be chosen at will.

Suitable dirt traps should be installed upstream of the valve to ensure trouble-free operation of the valve. The installation of hand-operated shut-off valves upstream of the dirt trap and downstream of the valve is recommended so that maintenance work can be carried out on the dirt trap and the valve without having to drain the entire system.
If the plant is to remain in operation without any interruption, provide for a bypass line at the design stage of the installation.

If it is installed outdoors, protect the valve against the direct influence of the weather. In the case of flanged connections, the connecting flanges must match.

Install the valve in a manner such that no mechanical loads are exerted on the valve during and after the installation. The valve is only to be subjected to the intended internal medium pressure, without any additional mechanical stresses.

WARNING

Additional mechanical stresses can lead to malfunctions or to excessive stress and bursting, especially in the valve subjected to the media pressure.

- For an installation free of stress forces, the connecting lines must be axially aligned with the connections of the valve and have the correct clearance.
- Thermal expansion of the pipes must be compensated for with the use of expansion joints.
- The transmission of vibrations must be prevented with the use of flexible vibration compensators where necessary.

5.2 Installation of the valve

CAUTION

Damaged valves may no longer meet safety requirements, which may lead to malfunctions, leaks or danger to persons. They must therefore not be installed.

- Before the installation, inspect the valve for any transport damage.

IMPORTANT

Before installing the valve, ensure that the piping system is absolutely clean to prevent any residue from the assembly of the pipe or other foreign objects from being flushed into the valve during the commissioning.

If it is not possible to establish a safe conductive connection (low-resistance) to the connecting parts when installing the valve, the valve must be included in the equipotential bonding. The connection point provided is to be used for this purpose.

> Do not remove protective caps from the connections until immediately before the installation. The sealing surfaces must be in a technically flawless condition.

Only permissible connecting elements (e.g. in accordance with DIN EN 1515-1) and permissible sealing elements (e.g. in accordance with DIN EN 1514) are to be used.

In addition, the following also applies for high-temperature valves (HT series): Where possible, the valves are to be installed with a horizontal actuator. If this is not possible, the actuator should be installed such that it is as far from vertical as possible. Ensure that the insulation of the actuator, including the connecting cables and lines, are installed properly. The connecting cables and lines must be suitable and approved for the corresponding temperature range and intended purpose.

5.2.1 Installation with a threaded connection

Pay attention to the direction of flow specified on the valve so that the valve can fulfil its intended function.
Use a suitable sealant.
The pipe will need to be installed in such a way that the flow of forces does not take place along the longitudinal axis of the valve.
After the installation, check for leakage and proper functioning.

5.2.2 Installation with a flange connection

Pay attention to the direction of flow specified on the valve so that the valve can fulfil its intended function.
Use all the holes provided for this purpose in the flange.
Install a suitable seal and centre it between the flange.
Tighten the bolts evenly crosswise to avoid distortion. Under no circumstances should the pipe ever be pulled up to the valve. Finally, tighten the bolts up to the prescribed torque. Ensure that the seal is correctly seated.
After the installation, check for leakage and proper functioning.

5.3 Electrical connection

Any work on the electrical equipment of the valve is only to be carried out by a qualified electrician or by instructed persons under the guidance and supervision of a qualified electrician in accordance with good technical practices and in compliance with DIN EN 60204-1 (Electrical equipment of machines), VDE regulations, including the safety regulations, accident prevention regulations, and operating manual.
The electrical cables are to be laid in a permanent fashion and protected from external influences. Cable bushings are not considered as strain relief; hence, the customer will need to provide appropriate strain relief for the connecting cables.

The electrical connection is established after unscrewing the terminal box cover or at the respective plug connection. Before carrying out any electrical work on the valve, disconnect it

from the power supply and secure it accordingly. Ground the valve in accordance with the local regulations.

No protective measures are specified in the connection diagrams. When connecting the valve, these must be provided for additionally in accordance with VDE 0100 and the regulations of the responsible power supply company.

When connecting any electrical equipment, always ensure that only the specified voltage is applied and in the correct polarity in order to prevent damage or hazards.

If the valve is equipped with additional devices such as limit switches or explosion protection etc., always observe the associated / additional instructions, corresponding data sheets, and/or connection values.

Valves with an AC connection, which are designed for higher temperatures, are supplied with a separate rectifier in accordance with the state of the art. In order to prevent overheating, it should be installed outside the heating zone. Corresponding instructions can be found on our high-temperature valves.
For all DC electromagnets, a voltage tolerance of +5% and -10% for the nominal voltage applies, as well as a permissible ripple of 20%.
For the electrical parameters or a connection diagram, please consult the data sheet. In the case of Ex and control valves, also refer to the supplementary specific operating manual.

5.4 Connecting pneumatics / hydraulics

In the case of pneumatically actuated valves, use conditioned air if necessary, (install an air treatment unit upstream). For hydraulically actuated valves, observe the recognised rules for handling hydraulics.
For further information on connecting control air or control hydraulics, please consult the data sheet. In the case of Ex and control valves, also refer to the supplementary specific operating manual.

5.5 Protection against burns / frostbite

Valves and pipes which are operated at high (> 50 °C) or low temperatures (< 0 °C) must be suitably protected against contact, or the dangers of possible contact must be indicated through appropriate labelling. In the case of electromagnetically actuated valves, the touch protection must not impair the cooling of the valve due to the risk of overheating. If there is a risk or condensation or ice formation in air-conditioning, cooling and refrigeration systems, professional, diffusion-tight insulation of the entire valve is necessary. Should ice form, there is a risk of the actuator becoming blocked.
Electromagnetically actuated valves must not be installed due to the risk of overheating. In this case, only protection against dripping and splashing water is required, which must not impair the cooling of the valve.

5.6 Commissioning

IMPORTANT	**Read and observe the safety instructions in section 3 before the commissioning.**

Before commissioning the valve, the customer is obliged to check the operating parameters such as the nominal diameter, pressure rating, medium, operating temperature, control characteristics, Ex design or, in the case of a version with an additional safety valve, the trigger pressure.
Before each commissioning of a new system or recommissioning of a system following repairs or modifications, ensure the following:
The TRB 700 is observed. All installation and assembly tasks have been completed properly.
Commissioning is performed exclusively by qualified personnel as described in section 3.3.
The piping system has been thoroughly flushed with the valves fully open to ensure that any contaminants harmful to the sealing surfaces have been removed. The valve is in the correct functional position. Any existing protective devices have been reinstalled or put into operation.

6 Maintenance / repairs

DANGER	**Opening valves under pressure is life-threatening!**
IMPORTANT	Before performing any work on the valve, the general safety instructions in section 3 and the corresponding passages from the additional manuals are to be read and observed.

Our valves are largely maintenance-free. For reasons of operational safety, the connection openings on valves must be checked for leaks. The external condition of the valve must also be inspected, including accessories and connections. In addition, the specifications in the specific operating manuals are to be observed.
Valves are generally to be actuated regularly, at least every 6 months and before being put them back into service following prolonged periods of inactivity, to ensure that all moving parts are functioning correctly. Maintenance and maintenance intervals are to be determined by the operating company in accordance with the operating conditions (see also TRB 700).

WARNING	Valves which have come into contact with media hazardous to health at the customer's premises must be decontaminated prior to maintenance. There is a **risk of poisoning, infection or other health hazards if maintenance work is carried out without prior decontamination.**
CAUTION	The valve and the pipes connected may be very cold or very hot due to the temperature of the medium. Valves with magnetic actuators may also exhibit high temperatures due to the electrical power dissipation of the actuator. There is a **risk of injury** here, see section 5.5

WARNING **Serious injuries may result from a sudden drop in pressure, electric shocks, scalding, chemical exposure or spring forces. In addition, contact with toxic substances can pose health risks.**

Before performing any work on the valve, ensure the following:

- The valve and all lines which are connected must be depressurised. Allow the system and the medium to cool down to prevent scalding.
- Ensure that the actuator is in a de-energized state and that unintentional movements of the actuator cannot take place. Bear in mind that the valve still contains strongly preloaded springs.
- In the case of media which is, for example, corrosive, flammable, aggressive or toxic, flush and ventilate the piping system, wear protective goggles or a protective mask with eye protection, or take other necessary protective measures.
- Medium residue in the valve when disassembling it must be collected and disposed of in such a manner that poses no danger to persons or the environment. Statutory regulations are to be complied with. Valves which have come into contact with media that is hazardous to health must be decontaminated before work can commence.

For repair work, the valve must be returned to the manufacturer (see section 13). After consultation with and approval from the manufacturer, such work may – in exceptional cases – be carried out on site by qualified and specially trained personnel. The valves must not be dismantled without the prior approval of the manufacturer.
When dismantling the valve, observe the generally applicable assembly guidelines and the TRB 700. Assembly and disassembly work is only be carried out by qualified personnel (see section 3.3) in accordance with the manufacturer's instructions. Always use new spare parts after the dismantling/conversion of parts. Use only original spare parts from the manufacturer müller co-ax gmbh.

NOTE Before the recommissioning, read and observe 5.6 Commissioning. After maintenance, the valves must undergo a strength and leak test in accordance with DIN EN 12266 before being put back into operation.

7 Modifications

Unauthorised modifications, alterations or conversions to the valve are not permitted. This applies in particular to:

- mechanical or electrical tampering with the valve or its actuator
- the replacement of parts with unapproved components

⚠ CAUTION	Unauthorised modifications may compromise the functional reliability, leak-tightness and operational safety of the valve and cause **hazards to persons, systems and the environment** .
IMPORTANT	Any unauthorised modification will result in the immediate loss of all warranty and guarantee entitlements.

Only modifications approved by the manufacturer or original spare parts from the manufacturer, müller co-ax gmbh, may be used. In case of any uncertainty, please consult the manufacturer/supplier in advance.

8 Storage

During storage, protect the valves against external influences and contamination. Avoid the formation of condensed water through sufficient ventilation, using desiccant, or installing heating. Protect connection openings against the ingress of dirt.
The valves must be stored in such a way that their proper function is maintained even after prolonged storage. In particular, the guidelines for the storage of elastomers (DIN 7716) are also to be observed:
The storage room should be dry, dust-free and moderately ventilated. Storage temperatures are to be frost-free and not exceed +25 °C. Existing inventory should be used up first in order to achieve the shortest possible storage times. Store spare parts so that no sunlight or UV light from other sources can reach elastomers. In the event of long-term storage (> 6 months), seals and moving parts must be inspected at intervals of no more than 6 months for signs of ageing or corrosion.
Before installation, the valve must be checked for mechanical damage and to ensure it is clean.

9 Packaging

⚠ WARNING	Valves which have come into contact with media hazardous to health at the customer's premises must be decontaminated prior to packaging. There is a **risk of poisoning, infection or other health hazards if maintenance work is carried out without prior decontamination.** Always comply with the prevailing accident prevention regulations when handling the valves.

Pack the valves in such a way that any coatings or accessories such as plugs, regulators and sensors cannot be damaged by subsequent transport. Protect connection openings against the ingress of dirt. Choose a packaging class in accordance with the applicable regulations and observe country-specific regulations. Labelling and marking of the packaging must comply with the applicable transport and dangerous goods regulations.

10 Transport

WARNING

Valves which have come into contact with media hazardous to health at the customer's premises must be decontaminated prior to transport. There is a **risk of poisoning, infection or other health hazards if maintenance work is carried out without prior decontamination.** Always comply with the prevailing accident prevention regulations when handling the valves.

Valves that can no longer be moved by hand must be transported using lifting equipment that is suitable for the weight to be moved.
Transport valves properly on this equipment using eyebolts or eyelets. Do not attach lifting gear to accessories such as handwheels, control lines, pressure gauges or to flange holes. When using retaining straps, lay them around the valve body, provide edge protection, and ensure even weight distribution. Transport temperature: -20 °C to +65 °C. Protect valves against external forces (impact, shock, vibrations, etc.). Protect any sealing surfaces at the connections against damage. Be sure not to damage the anti-corrosion coating.
After transport, the valves must be checked for external damage and to ensure they are complete. If any damage is detected, the valve must not be installed or put into operation; the manufacturer must be informed.

11 Recycling and disposal

WARNING

Valves which have come into contact with media hazardous to health at the customer's premises must be decontaminated prior to disposal. There is a **risk of poisoning, infection or other health hazards if maintenance work is carried out without prior decontamination.**

Care must be taken to ensure that the valve and its components are disposed of and recycled in an environmentally friendly manner.

The following requirements must be taken into account:

- Valves, packaging and accessories must be disposed of in accordance with the applicable national and regional environmental regulations.
- The valve must be completely drained, cleaned and – if necessary – decontaminated before disposal, particularly if it has come into contact with hazardous or environmentally harmful media.
- Materials and components must be separated by material type (metals, plastics, seals, electronics) to enable recycling by type.
- Electrical or electronic components must be disposed of in accordance with the provisions of Directive 2012/19/EU (WEEE) or the relevant national transpositions.
- Metal components can be returned to the material cycle.
- Seals and plastic parts must be sent for energy recovery or to an authorised disposal facility, provided they cannot be reused.

- Packaging materials should preferably be reused or, if this is not possible, recycled in the correct manner.
- Waste disposal records must be retained where required by law.

12 Spare parts

If spare parts are required, please contact the supplier/manufacturer. Use only original spare parts from the manufacturer müller co-ax gmbh.

13 Repairs

NOTE

Repairs may only be carried out by the manufacturer, müller co-ax gmbh. Attempts to carry out repairs incorrectly may result in malfunctions, hazardous situations and the loss of warranty entitlements.

Before sending a valve in for inspection or repair, the following steps must be followed:

- The valve must be properly drained, cleaned and – if necessary – decontaminated. Any risks posed by adhering or ingressing media must be reliably ruled out.
- The repair and returns form is available to download from the website www.co-ax.com . Please download the form and send it to us completed, either in the post or by e-mail. We will carry out an assessment straight away and, if necessary, send you a quotation for the work.
- A technical assessment will only be carried out once all the documents have been received in full and the cleaned valve has been submitted.
- Once the assessment has been completed, the customer will receive a quotation for the work to be carried out.

IMPORTANT

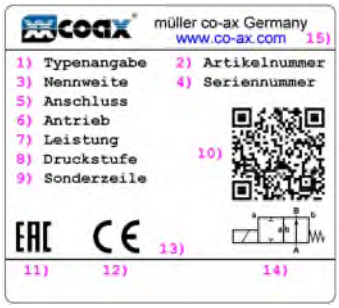
If the repair and returns form has not been completed correctly, or if the products have not been cleaned sufficiently, the manufacturer may refuse to accept them for safety reasons.

When sending the valve for repair, the guidelines set out in sections 9, Packaging, and 10, Transport, must be followed. The valve must be properly packed, labelled and secured in accordance with the instructions described therein. The sender is responsible for any damage caused by improper transport or inadequate packaging.

14 Declaration of conformity

The latest declarations of conformity can be viewed and downloaded from the website www.co-ax.com.

15 Nameplate



1) Type designation (with nominal diameter and version)
2) Item number
3) Nominal diameter
4) Serial number. This number includes the year of manufacture and uniquely identifies a valve. It can be used by all customers as an item number for reordering. This number is also referenced to the exact technical design and parts list with all individual parts and seal variants used for each application scenario.
5) Definition of connection
6) Voltage connection and voltage type of the magnetic actuator or control pressure of the pneumatic/hydraulic actuator.
7) Output data for solenoid valves
8) Medium pressure rating
9) Additional information such as TÜV no., DVGW no., SIL no.
10) QR code
11) EAC mark
12) CE mark
13) Number of notified authority according to the Pressure Equipment Directive (PED)
14) Circuit symbol
15) Manufacturer's address

Depending on the classification according to the Pressure Equipment Directive, there are **3 types** of nameplates:

Type A:
For all valves which fall under section 4(3) of the PED Directive and are not allowed to bear the CE mark.
The CE mark is missing, as well as the information in 13).

Type B:
For all category I valves which are awarded the CE mark.
The information in 13) is absent.

Type C:
For all category II, III, and IV valves, as well as for equipment parts with a safety feature.
All of the aforementioned information is indicated.

16 Legal information

The manufacturer will be liable for damage to property and personal injury in accordance with the statutory provisions, insofar as such damage is attributable to demonstrable design or manufacturing faults in the valve.

We accept no liability for damage caused by incorrect assembly, use for purposes other than those intended, failure to follow the operating manual, inadequate or incorrect maintenance, or the use of unauthorised spare parts and wear parts.

Liability for indirect damage, consequential damage, business interruption or loss of profit is excluded to the extent permitted by law.

The warranty is governed by the contractual agreements and the applicable statutory provisions.

The user is obliged to use the valve solely for its intended purpose and in accordance with this operating manual, and to comply with the prescribed maintenance and inspection requirements.

The information contained in this operating manual reflects the state of the art at the time of printing. We reserve the right to make technical changes and correct any errors.

17 Manufacturer and enquiries

müller co-ax gmbh
Friedrich-Müller-Str. 1
74670 Forchtenberg
Germany
Tel. +49 7947 828-0
Fax +49 7947 828-11
E-mail info@co-ax.com
Website www.co-ax.com

For all enquiries related to directional valves, please provide the following information:

- Order number, item number, or serial number
- Type designation
- Pressure rating
- Medium pressure upstream and downstream of the valve
- Medium conveyed
- Medium temperature
- Flow rate in m^3/h
- Installation sketch and/or actual operating conditions.

For all enquiries related to control valves, please provide the following information:

- Order number, item number, or serial number
- Type designation
- Pressure rating
- Medium pressure upstream and downstream of the valve
- Medium conveyed
- Medium temperature
- Flow rate in m^3/h
- Control accuracy
- Setpoint inputs
- Installation sketch and/or actual operating conditions.