

Operating / Installation Instructions

Automated ball valves / flap valves (pneumatically or electrically operated)

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2 Introduction

These instructions are intended to support the user in the installation, operation and maintenance of ball valves and flap valves fitted with pneumatic or electric actuators. In addition to these instructions, the instructions for the actuators (pneumatic or electric) as well as the data sheets for the respective valves and the complete unit must also be observed. You can find them at www.tri-matic.ch.



If the following **notes and warning notices** are not observed, hazards may result and the manufacturer's warranty may be invalidated. If you have any questions, please do not hesitate to contact us

Important note: For units with electric actuators, it must be ensured that the supply voltage corresponds to the motor type and that the electrical connection is carried out in accordance with the separate assembly and operating instructions. Dry and clean compressed air in accordance with ISO 8573-1 must be used for units with a pneumatic actuator.

3 Intended use

These check valves are exclusively intended for shutting off, passing through or regulating media within the approved pressure and temperature limits after installation in a pipeline system and after the actuator has been connected to the controls. The respective data sheets for the units describe the approved pressure and temperature range for these check valves in detail and must be observed in addition to these instructions.



No valve may be operated whose approved pressure/temperature range (rating) according to the respective data sheet does not satisfy the operating conditions. In addition, only suitable media may be used.

Failure to observe these precautions may result in danger to the user and damage to the pipeline system or plant

- ⇒ A small quantity of a medium is enclosed in the body of a ball valve when it is open and closed. If there is a possibility that heat may be introduced into this enclosed space from the outside when a ball valve is installed and this medium is heated, a ball valve with a relief bore must be used in order to prevent an impermissible increase in pressure.
- ⇒ Wear parts are excluded from the warranty.
- ⇒ Intended use of the products described here also includes observance of Section 2 "Safety Instructions".

4 Safety Instructions

4.1 General Safety Instructions

The same safety regulations apply to ball valves and butterfly valves (hereinafter referred to as valves) as well as to the pipeline system in which they are installed and to the control system to which the actuator is connected.

These safety instructions are only intended to provide additional safety information for valves. The instructions for the actuators (pneumatic or electric) and the valves must be observed.

You can find them at www.tri-matic.ch.

4.2 Safety Instructions for the Operator

The operator, not the manufacturer, is solely responsible for ensuring that

⇒ when using the unit or fitting, the fitting is only used for its intended purpose as described in Section 3.



Danger

Protection against incorrect use of the valve

In particular, it must be ensured that the valve is suitable for the media used as well as the respective pressures and temperatures.

Failure to observe these precautions may result in danger to the user and damage to the pipeline system or plant, for which the manufacturer will accept no responsibility.



Attention

The valve may only be operated and maintained by personnel who are qualified to work on pressurised pipelines:

According to these operating instructions, qualified personnel are persons who are capable of assessing the work assigned to them and identifying possible hazards due to their technical training, knowledge and experience as well as their knowledge of the relevant standards.

- ⇒ an actuator unit, which has been retrofitted to the valve, has been adapted to the ball valve and the maximum torque has been observed and that it is correctly adjusted in the end positions, in particular, in the open position of the ball valve,
- ⇒ the pipeline system and control system are properly installed and regularly inspected.
- ⇒ the valve is properly connected to these systems,
- ⇒ the normal flow rates in continuous operation are not exceeded in this pipeline system.
and that any abnormal operating conditions, such as vibrations, hydrostatic locks, cavitation and larger amounts of solids in the medium, have been discussed with the manufacturer.



Danger

We recommend operating the valve at regular intervals. The valve should be operated several times a year, taking the design into account.

Depending on how long the valve has not been actuated, the breakaway and actuating torques to be applied may deviate considerably from the torque specifications stated on the data sheet. In order to take this circumstance into account when dimensioning the actuator, the duration of non-actuation must be specified in the inquiry. If the actuator is retrofitted by the operator, the manufacturer is no longer responsible for the correct actuator design with regard to the duration of non-actuation

- ⇒ As a rule, modifications or adaptations to the valves are only permitted after consultation with TRI-MATIC. The actuators are matched to the valves and changes may have consequences for the valve, the actuator or the entire system.
- ⇒ Valves which are operated at operating temperatures higher than +50°C or below -20°C must be protected *against contact along with the pipeline connections.*



Danger

During test runs on valves that are not installed in the pipeline, never reach into the valve during the switching process, since this can result in serious injuries.

4.3 Special Hazards



Before removing the valve from the pipeline, the **pressure in the pipeline must be completely relieved** so that the medium does not escape from the pipeline in an uncontrolled manner.



If a valve has to be removed from a pipeline, medium can escape from the pipeline or from the valve. In the case of harmful or hazardous media, the pipeline must be completely drained before a valve is removed. Be careful with **residues flowing from the pipe** or remaining in dead spaces.



The screw used to connect body sections may only be loosened or unscrewed after the valve has been removed. When reassembling, the screws must be tightened with a torque wrench. **The permissible torque for tightening the connection of the ball valve's body halves can be requested from TRI-MATIC. -->Work must only be carried out by qualified personnel.**



The stem of the valve is sealed by a packing gland (sealing package). Before the nuts on the packing gland are loosened or unscrewed, the pressure in the pipeline must be completely relieved so that no medium escapes from the packing gland.



For valves which are used as end valves:
During normal operation, especially with gaseous, hot and/or hazardous media, **a blank flange/blank cover must be fitted to the free connection pipe** or the valve must be **reliably secured against unauthorised operation.**



If a valve must be opened as an end valve in a pressurised line, this must only be carried out with the utmost care in such a way that the spraying medium does not cause any damage.
It must be taken into account that the pipelines usually convey hazardous media.

4.4 Marking of the valve/units

Each automation unit has a unique article number and article designation. For more information, see the corresponding data sheets under www.tri-matic.ch.

Markings on the body and on the type plate must be preserved so that the valve can be identified.

5 Transport and Storage

Automation units must always be handled, transported and stored with care:

- ⇒ The valve must be stored in its protective packaging and/or with the protective caps at the connection ends. Ball valves that weigh more than approx. 10 kg should be stored on a pallet (or similarly supported) and transported (also to the installation location).
- ⇒ When stored before installation, the valve should normally be stored in a closed room and protected from harmful influences, such as dirt or moisture.
- ⇒ In particular, the actuator and the sealing surfaces of flange ends/threads and weld ends for the pipeline connection must not be damaged by mechanical or other influences. Do not stack units.
- ⇒ The valves are generally supplied in the open position. They must be stored in the same way as they were delivered. The actuating device should not be operated.

6 Installation in the Pipeline

6.1 General

When installing automation units in a pipeline system, the same instructions apply as for connecting pipes and similar pipeline elements. The following instructions also apply to ball valves. For transport to the installation site, [Section 5](#) (above) must also be observed.



The valve is equipped with flanges or clamp connections:
Handle the valve with particular care and observe the instructions for the flange connection.



The counterflanges must have smooth sealing surfaces. Other flange shapes must be agreed with the manufacturer. Thread and weld-on ends must comply with the same standards as the standards of the valve.



If an actuator unit is retrofitted, the torque, direction of rotation, actuating angle and the setting of the "OPEN" and "CLOSED" end stops must be adapted to the ball valve.
Failure to observe this precaution may result in danger to the user and damage to the system.



The actuating device is adjusted for the operating data specified in the order:
The user is responsible for setting the "OPEN" and "CLOSED" end stops.



If the valve is equipped with weld-on ends:
The weld-on ends must be removed from the valve for the welding work. Welding work is not permitted with mounted weld ends, as the seals will be damaged or destroyed.



Particularly for valves with an electric actuator
The separate instructions for the respective electric actuators must be observed. Personnel at the factory have ensured that the actuator is switched off in the end positions via the signal from the limit switch, and tampering with the limit switches is prohibited. TRI-MATIC will otherwise accept no liability for damage and the warranty will no longer apply.

Please note the following for all actuators:



Actuators are not "stepladders":
Actuators must not be subjected to external loads, since this may damage or destroy the valve.



Actuators whose weight is greater than the weight of the valve.
Such actuators must be supported if they generate a bending load on the valve due to their size and/or their installation situation.

6.2 Work steps



The valve must be transported to the installation site in its original packaging and be unpacked only at the place of assembly to avoid the contamination of abrasive particles.

- ⇒ Check valve and actuator for transport damage. Damaged valves or actuators must not be installed.
- ⇒ Make sure that only valves are installed whose pressure class, type of connection, type of lining and connection dimensions comply with the operating conditions. See the corresponding marking on the valve. Further information can be found on the respective data sheet of the unit or its individual components.



No unit may be installed whose approved pressure/temperature range (= rating) does not satisfy the max. permissible operating conditions: the application limits are marked on the valve or on the corresponding data sheet. The permitted *range* is defined in [Section 3 "Intended use"](#).

Failure to observe this precaution may result in danger to the user and damage to the system.

- ⇒ The connection ends of the pipeline must be aligned with the connections of the valve and have plane-parallel ends. Non-parallel connection flanges may damage the valve during installation or cause leaks.
- ⇒ The connection data for the actuator unit must match the data of the control unit. See type plate(s) on the actuator unit.
- ⇒ Before installation, the valve and the connected pipeline must be carefully cleaned to remove dirt, especially hard foreign bodies.
- ⇒ The valve can always be installed in any installation position. However, the actuator must not be located directly below the valve.
- ⇒ The sealing surfaces on the flange connection (and any flange seals used) must be completely free of dirt during installation.
- ⇒ If an arrow is marked on the body of the valve, the direction of the arrow must correspond to the direction of flow or pressure in the pipeline. In special cases, it may be necessary for a valve to be leak-proof against the direction of flow. Please consult TRI-MATIC for installation in such special cases.
- ⇒ When inserting the valve (and the flange seals) into a pipeline that has already been installed, the distance between the pipeline ends must ensure that all sealing surfaces (and seals) remain undamaged.



Since PTFE plastic sealing surfaces tend to flow, it is strongly recommended that after prolonged storage of the valves, the body screws are tightened with the respective tightening torques according to separate documents after installation. You can find these at www.tri-matic.ch.

- ⇒ The relevant instructions apply for connecting the actuator unit (electric or pneumatic) to the customer's control system.
- ⇒ At the end of the installation, a functional test must be carried out with the signals from the controller: The valve must close and open correctly according to the control commands. All detectable malfunctions must be eliminated before commissioning. See also [Section 9 "Help in case of faults"](#).



Control commands that are executed incorrectly could result in danger to life and limb and cause damage to the system

7 Pressure Test of the Pipeline Section

When installing automation units in a pipeline system, the same instructions apply as for connecting pipes and similar pipeline elements. The following instructions also apply to ball valves. For transport to the installation site, [Section 5](#) (above) must also be observed.

- ⇒ First, carefully flush newly installed pipeline systems to remove all foreign bodies.
- ⇒ **Valve open/closed:** the test pressure must not exceed the nominal value of the valve (according to type plate).

If a valve leaks, [Section 9 "Help in case of faults"](#) must be observed.

8 Normal Operation and Maintenance

- ⇒ Depending on the design, the seals used for the stem are maintenance-free.
- ⇒ The stem seal with a PTFE seal is preloaded with a packing gland and only needs to be readjusted as required. Please refer to the separate instructions which can be found in www.tri-matic.ch.
- ⇒ Normal manual forces are sufficient for manually overriding the actuator (if fitted). The use of extensions to increase the actuating torque is prohibited.
- ⇒ It is not necessary to carry out regular maintenance work on valves. When checking the pipeline section; however, no medium must escape from the flange, the screw connections on the housing and the seal of the stem.
- ⇒ In the case of a leaking valve, [Section 9 "Help in case of faults"](#) must be observed.



9 Help in case of faults

When troubleshooting, [Section 4 «Safety Instructions»](#) must be observed.



If a used valve is sent to TRI-MATIC for servicing, the valves must be correctly decontaminated beforehand and the medium must be specified upon delivery. The corresponding return form can be found on www.tri-matic.ch under company / [Forms](#).

Danger

Type of fault	Measure	Comment
Leak in the closing position Section 4.3 "Special Hazards"	Remove the valve (observe the instructions in Section 4.3 "Special Hazards") and inspect it. If the valve is damaged: Repair necessary: Remove ball valve, refer to Section 4.3 "Special Hazards". Request spare parts from TRI-MATIC AG or send us the unit for repair.	Note Spare parts must be ordered with all the data as indicated on the valve. Only original parts that we have supplied may be installed.
Leak on the stem seal Section 4.3 "Special Hazards"	Remove the valve (observe the instructions in Section 4.3 <Special Hazards>). For ball valves with stem seal package: Tighten the hexagon head screw on the stem packing gland alternately and in small increments of 1/4 turn clockwise until the leak stops. If the leak cannot be eliminated in this way: It must be repaired. Please contact us in this case. If the nut on the packing gland needs to be loosened or unscrewed (anticlockwise):  Danger to life In order to protect the operating personnel against hazards, make sure that the pipeline on both sides of the valve is completely depressurised before use. Observe the instructions in Section 4.3 "Special Hazards".	
Malfunction Section 4.3 "Special Hazards"	Check actuator unit and control commands. If the actuator and control are OK: Remove the valve (observe the instructions in Section 4.3 "Special Hazards") and inspect it. If the valve/actuator is damaged: Repair necessary: Remove the valve, observe Section 4.3 "Special Hazards". Request spare parts and the necessary instructions from TRI-MATIC.	
A pneumatic actuator with spring must be disassembled.	 Attention: Risk of injury Before removing the actuator from the valve, disconnect the connection to the control pressure.	

In case of malfunctions on the actuator unit (pneumatic or electric), please observe the corresponding separate instructions.

10 Additional Information

The data sheets, operating instructions and additional information are available on our webpage – tri-matic.ch