



*Qualität von Anfang an.*

# Operation and Installation Manual

## Globe valves

## Gate valves

## Needle valves



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# Foreword

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## 1 Foreword

Dear customer,  
Dear assembler / user,

these operation and installation manuals are intended to give you the knowledge, which is necessary for you to be able to carry out the mounting and adjustment of the valves rapidly and correctly.



**Please read these instructions carefully and pay particular attention to the advice and warning notes.**

Only instructed and qualified mechanician should mount, adjust or maintain the valves.

If you have any questions in relation to the globe valves, gate valves or the needle valves we shall be pleased to answer them.

The telephone number will be found on the inside cover of these operation and installation manual.

Yours

**END-Armaturen GmbH & Co. KG**

## 2 General advice

### 2.1 Validity

These mounting and installation manual is valid for the standard version of the valves

### 2.2 Inward monitoring

Please check

- directly after delivery the valve for any transport damages and deficiencies.
- with reference to the accompanying delivery note the number of parts.

Do not leave any parts in the package.

### 2.3 Complaints

Claims for replacement or goods which relate to transport damage can only be considered valid if the delivery company is notified without delay.

In case of returns (because of transport damage / repairs), please make a damage protocol and send the parts back to the manufacturer, if possible in the original packaging.

In case of a return, please mention the following:

- Name and address of the consignee
- Stock-/ ordering-/ article-number
- Description of the defect

### 2.4 Warranty

For our globe valves, gate valves and needle valves we give a warranty period in accordance with the sales contract.

The end of the normal duration of life of the wearing parts represents no defect.

The warranty and guarantee rules of **END-Armaturen GmbH & Co. KG** are applicable.

## Symbols and their signification

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### 2.5 Symbols and their signification



Paragraphs which are identified with this symbol contain very important advices; this also includes advices for averting health risks. Observe these paragraphs without fail!



Paragraphs which are identified with this symbol contain very important advices, this also includes how to avoid damage to property. Observe these paragraphs without fail!



This symbol indicates paragraphs which contain comments / advices or tips.



This spanner identifies the description of actions which you should carry out.

### 3 Safety advice

Depending on the technical circumstances and the time under and at which the globe valve, gate valve, needle valve is mounted, adjusted and commissioned, you must in each case take into account particular safety aspects!

If, for example, the valve works in an operational chemical plant, the potential hazards of commissioning have another dimension from that when this is only being carried out for test purposes in a „dry“ part of the plant in the assembly room.

Since we do not know the circumstances at the time of the mounting / adjusting / commissioning you may find advice on hazards in the following description which are not relevant to you.

Please observe (only) the advices which applies to your situation!

#### 3.1 Personal protection

##### 3.1.1 Safety advice for mounting



**We wish to point out expressly that the mounting, the electrical installation and the adjustment of the globe valve, gate valve, needle valve and the accessories must be carried out only by trained specialist personnel having mechanical and electrical knowledge!**



**At first switch off all the devices / machines / plant affected by mounting or repair!**



**If appropriate, isolate the devices / machines / plant from the mains.**



**Check (for example in chemical plants) whether the switching off of devices / machines / plant will causes potential danger!**



**If appropriate, in the event of a fault in the globe valve, gate valve, needle valve (in a plant which is in operation) inform the shift foreman / safety engineer or the works manager without delay about the fault, in order, for example, to avoid an outflow / overflow of chemicals or the discharge of gases in good time by means of suitable measures!**



**Before mounting or repair, remove the pressure from pneumatic / hydraulic devices / machines / plant! Empty the conduit from medium.**



**If necessary, set up warning signs in order to prevent the inadvertent starting up of the devices / machine / plant.**



**Observe the respective relevant professional safety and accident prevention regulations when carrying out the mounting / repair.**



**Check the correct functioning of the safety equipment (for example the emergency push off buttons / safety valves, etc.!**

##### 3.1.2 Safety advice for adjustment / starting



**As a result of the operation of a globe valve, gate valve or needle valve the flow of gases, steam, liquids, etc. may be enabled or interrupted. Satisfy yourself that, as a result of the starting or the test adjustment of the valve, no potential hazards for the personnel or the environment will be produced!**

## Safety advice

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If necessary, set up warning signs in order to prevent the inadvertent starting or shutting down of the devices / machine / plant.



By ending mounting check the correct function and the tightness of the globe valve / gate valve / needle valve.



Through suitable measures, prevent links being trapped by moving actuating elements.



Check the right function of all safety devices (for example emergency push off buttons / safety valves, etc.)



Carry out the starting and the adjustments only in accordance with the instructions described in this documentation.

### 3.1.3 Safety advice for maintaining / repairing

**Never try to repair or maintain a globe valve, gate valve, needle valve under pressure.**

Before disassembling the globe valve, gate valve, needle valve some essential points should be clarified:



- Will the valve to be disassembled be replaced immediately by another?
- Could the valve remain in the pipe?
- If appropriate, does the production process of the plant need to be stopped?
- Is it necessary to inform specific personnel about the disassembly? etc.



If necessary, inform the shift foreman / safety engineer or the manager about the disturbance without delay in order, for example, to avoid an outflow / overflow of chemicals or a discharge of gases in good time by means of suitable measures!



Observe that some valves / armatures are able to enclose the pressured medium e.g. the ball in the ball valve. You have to release the pressure in the pipes in which the armature / valve is mounted.



If necessary, set up warning signs in order to prevent

- the inadvertent starting up of the devices / machines / plants, or
- the switching on of the medium.



In case of a defect in the globe valve, gate valve, needle valve make contact to the supplier. The telephone number will be found on the back cover of these operation and installation manual.



If you determinate that there is a damage to the globe valve, gate valve, needle valve isolate it from the device/ machine. However before doing this, it is essential to refer to the safety advice.



Don't mount or start the globe valve, gate valve, needle valve or carry out any adjustments on it if the globe valve, gate valve, needle valve, the supply lines or the part of the plant on which it is mounted is damaged!



After a repair / maintenance check the right function of the globe valve, gate valve, needle valve and the tightness of all connections.

### 3.2 Device Safety

The globe valve, gate valve, needle valve

- is a quality product which is produced in accordance with the recognized industrial regulations.
- left the manufacturer`s work in a perfect condition!



**In order to maintain this condition, as installer / user you must carry out your task in accordance with the descriptions in these instructions, technically correctly and with the greatest possible precision!**



We assume that you have, as a trained specialist, sound mechanical and electrical knowledge!



**The globe valve, gate valve, needle valve must be used only for a purpose corresponding to its construction!**

**The globe valve, gate valve, needle valve must be used within the values specified in the technical data.**



**Operate the globe valve, gate valve, needle valve only inside the allowed temperature range.**



**Don`t operate the globe valve, gate valve, needle valve with a pressure as higher as the nominal pressure**



The mentioned data are experience values only and describe the general condition of our product. They should be used as a guideline to evaluate the suitability of the non-concrete individual case, but without any guarantee for the suitability given by END-Automation.

The final responsibility to proof and confirm the suitability of our products, for which we confirm the perfect (faultless) quality by our delivery- and payment terms, lies in the dependance with your constructive responsibility to the end-user.



**Never remove the bonnet or other parts from the globe valve, gate valve, needle valve if it is under pressure.**



**Don`t mount or start the globe valve, gate valve, needle valve or carry out any adjustments on it if the globe valve, gate valve, needle valve the supply lines or the part of the plant on which it is mounted is damaged!**



**By ending mounting check the correct function and the tightness of the globe valve, gate valve, needle valve and check the correct function.**

# Name-plate

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## 4 Name-plate

The globe valve, gate valve, needle valve will be provided with a name-plate, which permits a definite identification of the valves and shows the most important technical data to you. The name-plate should not be displaced or changed

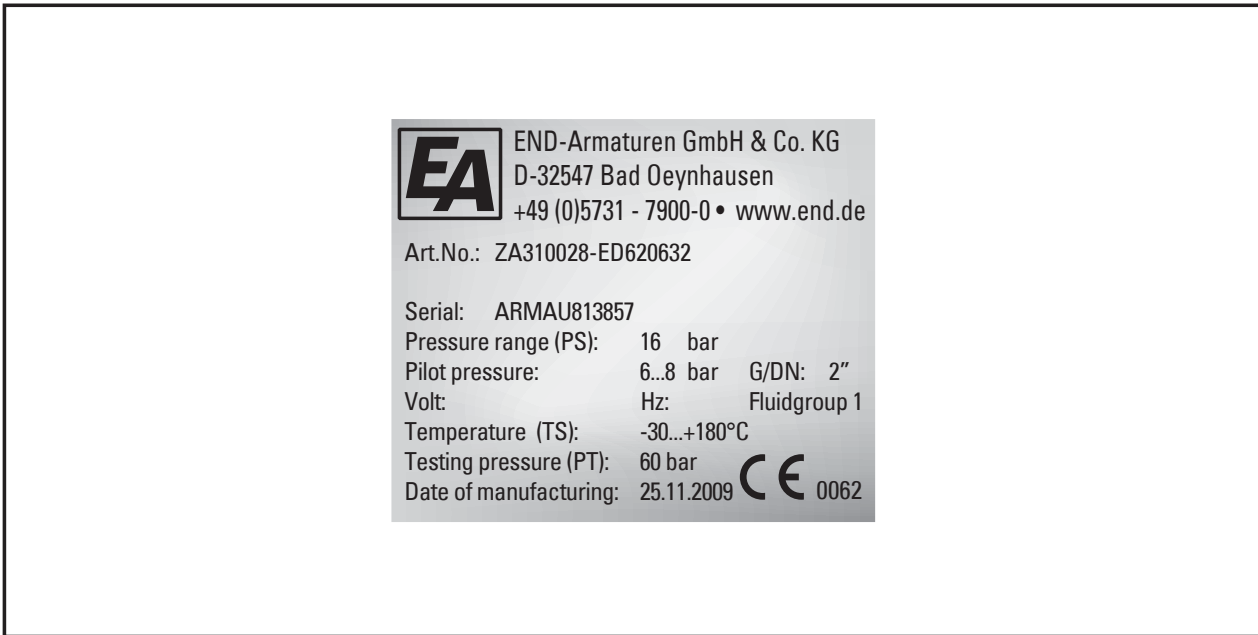


Fig. 4.1 - Name plate

|                              |  |
|------------------------------|--|
| <b>Art.No.</b>               | article number of the valve  |
| <b>Serial</b>                | order- or production-number  |
| <b>Pressure range (PS)</b>   | max. admissible working pressure of the valve [bar]  |
| <b>Pilot pressure</b>        | recommend pilot pressure for correct function of the valve / armature [bar]<br>(only at pneumatic actuated valves / armatures) |
| <b>Temperature (TS)</b>      | temperature range of the valve   |
| <b>G / DN</b>                | connecting size of the valve   |
| <b>Testing pressure (PT)</b> | testing pressure of body   |
| <b>Fluidgroup</b>            | allowed fluid group of the valve   |
| <b>Date of manufacturing</b> | manufacturing month and year of manufacturing  |

### 5 Globe valves, Gate valves, Needle valves

#### 5.1 General

**Before you mount /disassemble, adjust or commission a globe valve, gate valve, needle valve you must have read the**



→ **Safety advice**

**If you have not read the safety advices until now please read these important advices now and turn back to this point.**

#### 5.2 Corresponding use

Globe valves, gate valves and needle valves will be used to cut off medium flow.

It should only be used clean liquids and gases, on which the material of the valves and the material of the seals will be resistant. Pollution or using outside the nominal pressure range and/or the nominal temperature range should causes damages on the valves especially on the seals.



Metallic sealed valves should only be used for liquid media.

#### 5.3 Operation

Globe valves, gate valves and needle valves should be actuated by turning a handwheel or a hand knob.

By non totally opening / closing of the valve you will be able to control the media flow.



**During the operation of the valve take care that there won't be insert any objects or limbs into the armature. Heavy injuries or damages will be the consequence. If it is necessary you have to install a protective device.**

#### 5.4 Mounting / Disassembly



The mechanical mounting is identical in all variants. It differs only by the type of connection.



Observe the flow direction which is specified on the valve body.



Remove all transport safety devices (e.g. plugs or caps). Observe that there won't be any parts of the package or other pollution in the armature.








Before mounting the solenoid valve clean up the pipes. Pollution will reduce the safety and the duration of life of the valve. If necessary mount a Y- strainer in front of the valve.



Avoid strains on the body by non align pipes.

## Globe valve, Gate valve, Needle valve

### 5.4.1 Mounting of the valve with threaded connection

-  Before lay on sealing compounds, check the hardly screwing of the pipes into the valve body.
-  Lay on the correct sealing compounds on the pipes end. By using PTFE- ribbon or hemp seals observe the screw direction. Don't use sealing compounds which are not prescribed for your employment.
-  Screw the pipes into the connection ends of valve. Don't use the handwheel as a lever.
-  Strike up the pipes with pressure after that time the manufacturer of the sealing compounds pre-tends for harden it.
-  Check the tightness of all connections.

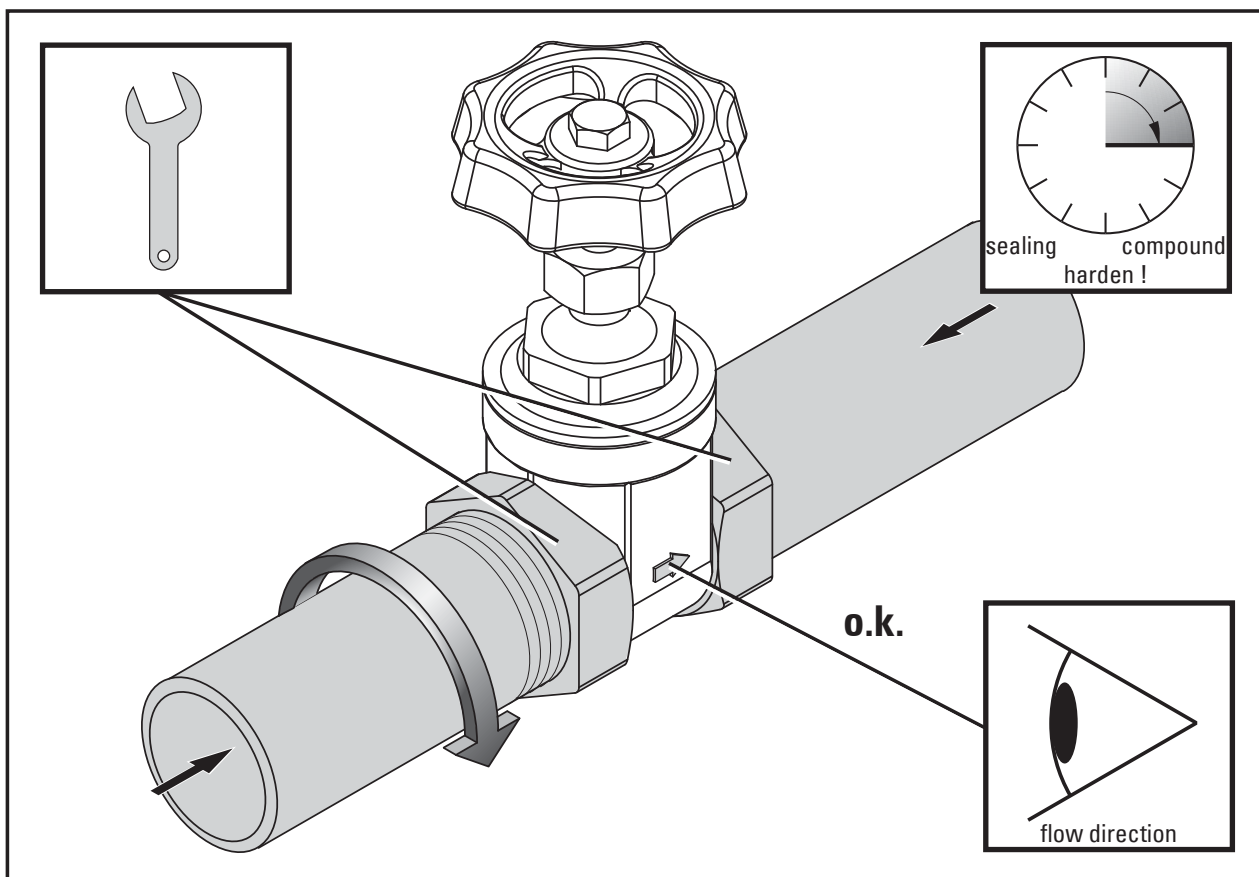


Fig. 5.1 - Globe valve, Gate valve, Needle valve, mounting threaded connection ( Art. TC101025)

### 5.4.2 Mounting of the valve with welded connection



Before welding the valve between the pipes you have to disassemble the valve top first, to prevent the damage of the seals.

### 5.4.2.1 Disassembly of the valve`s top



Clamp the valve between a vice carefully. By using guard plates you can prevent the damage of the ends of the valve body.



Loosen the valve top by using a fit spanner. Put the spanner onto the hexagon of the screw joint and not onto the hexagon of the gland screw.



Screw the valve top out of the valve body and put it aside. Place a mark on the valve top and the body that you will be able to join the correct parts by a subsequent mounting of the valve.

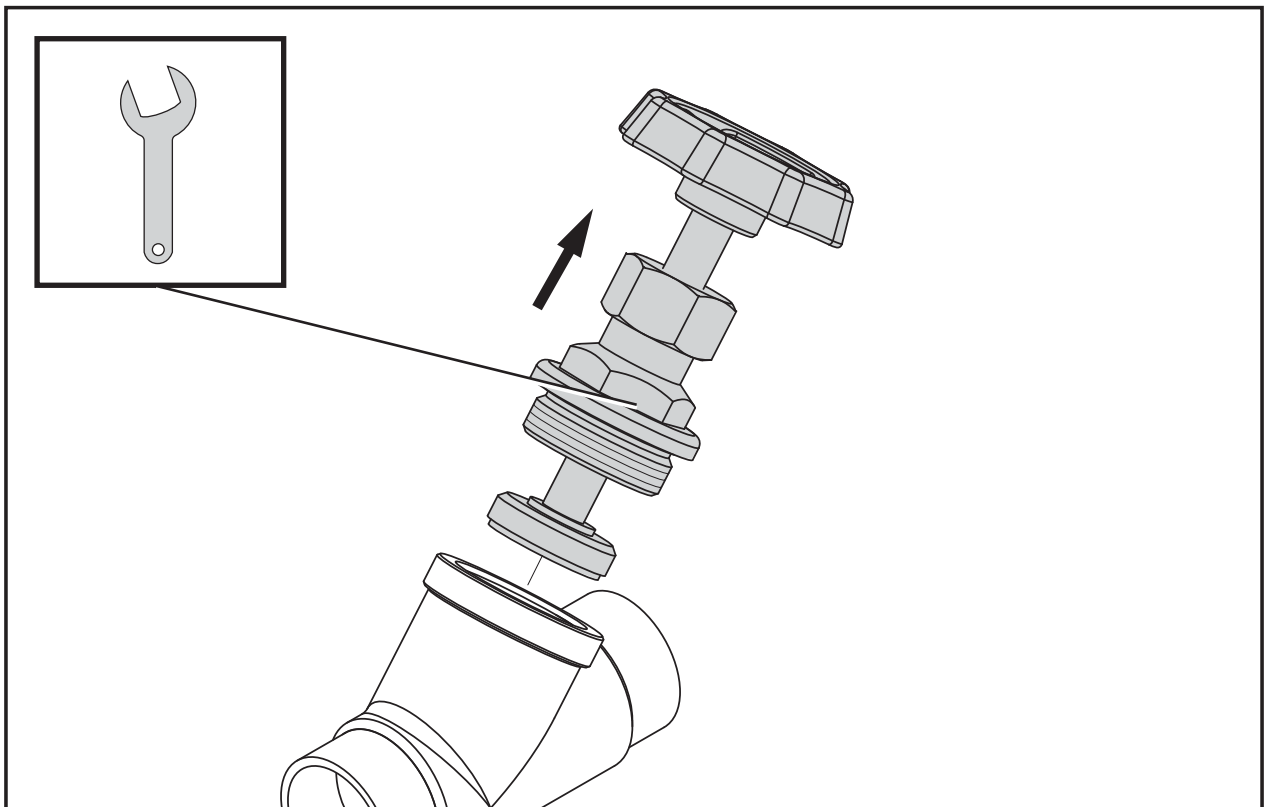


Fig. 5.2 - Globe valve, Gate valve, Needle valve, disassembly of the valve top (Art. AD311064)

### 5.4.2.2 Welding the body between pipes



By welding the valve body with the pipes observe appropriate demands and guide lines.



**The safety demands be welding are depending on the place and the position of the point of weld. Welding the parts in a serviceable device/machine/plant the potential of danger is as higher as welding the parts in a welding room.**



**If appropriate inform the shift foreman / safety engineer or the works manager and the fire brigade of your factory.**

**By welding observe your own national guide lines about safety and the prevention of accidents.**

## Globe valve, Gate valve, Needle valve

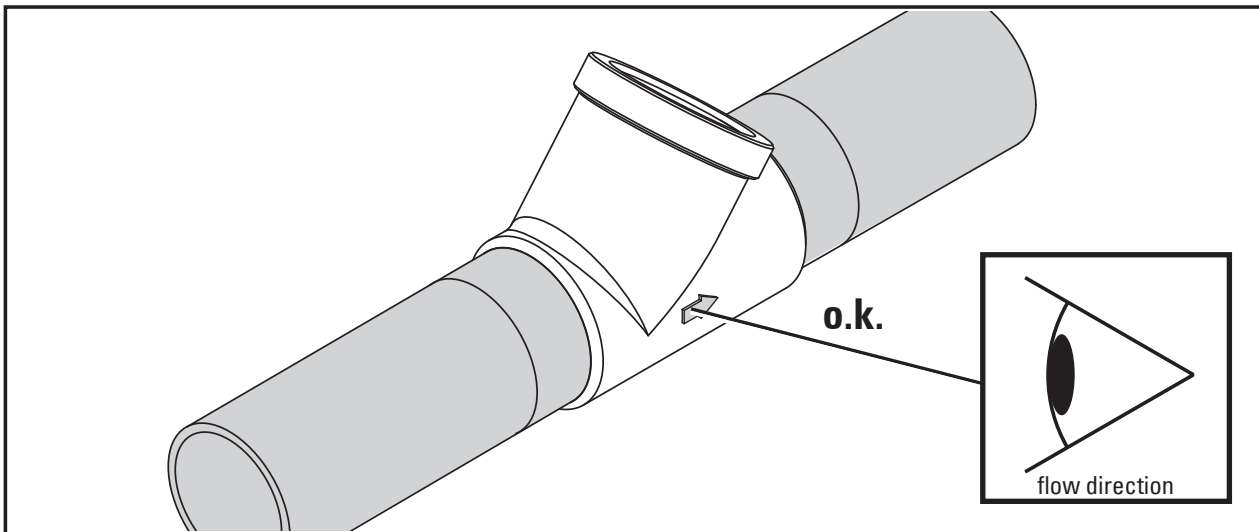


Fig. 5.3 - Globe valve, Gate valve, Needle valve, mounting with welded connection (Art. AD311064)

### 5.4.2.3 Mounting of the valve top



Before mounting let the valve body cool down.



Screw the valve top into the body.



Check the correct position of the sealing at the screw joint and take care that there will be no pollution on the sealing or on the seat.



Fasten the valve top with a fit spanner. Put the spanner onto the hexagon of the screw joint and not on the hexagon or the gland screw.



Check the tightness of all connections.

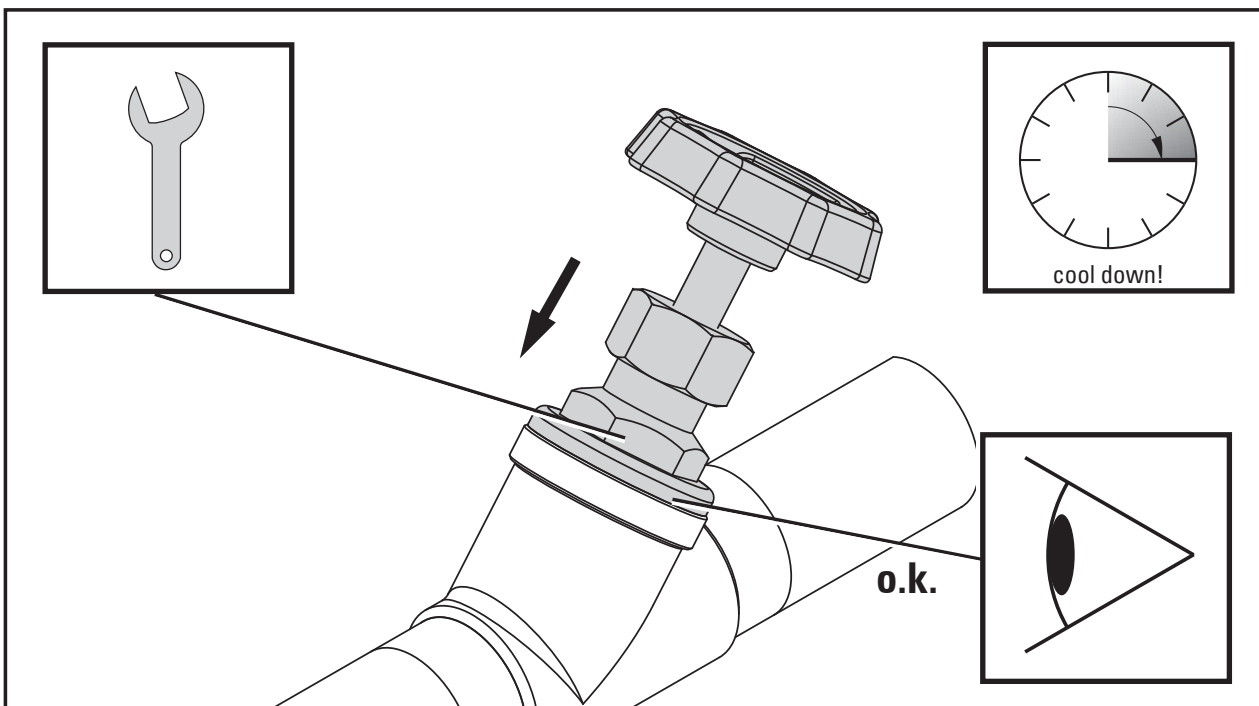


Abb. 5.4 - Globe valve, Gate valve, Mounting of the valve top(Art. AD311064)

### 5.4.3 Mounting of the valve with flanged connection



In the following description we assume that you have mounted the flanges at the end of the pipes and the valve (welded flanges) and they are cooled down.



Push the valve between the flanges by using the appropriate seals. This process must happen easily to avoid the damage of the seals. (Please refer to Fig. 5.5)



Align the borings of the flanges and put some fit screws through the holes.



Screw the fit nuts onto the screws and tighten them up crosswise.



Fasten all screws crosswise and check the function of the valve. Observe the maximum torque of the screws.



Check the tightness of all connections.

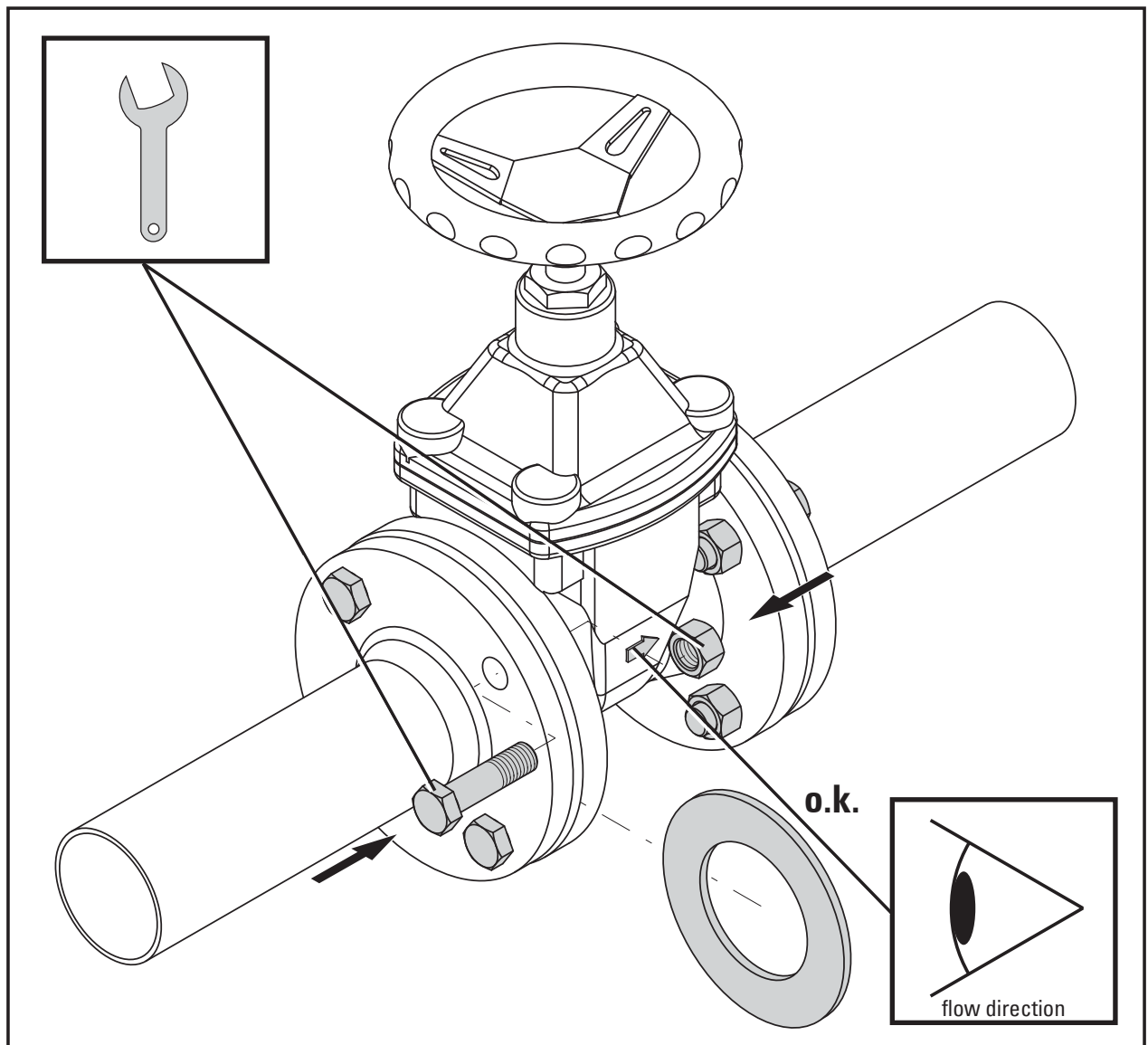


Fig. 5.5 - Globe valve, Gate valve, mounting with flanged connections (Art. CA521408)

# Globe valve, Gate valve, Needle valve

## 5.5 Maintenance

Before you maintain or shut down the globe valve, gate valve, needle valve you have to read the



→ Safety advice

If you have not read the safety advices until now, read this important advices now and turn back to this page.

In periodical turns the controlling of the function and the tightness should happen:



- Check the tightness of the gland packing
- resp. readjusting of the gland packing

In case of a defect of the valve make a contact to the supplier. The telephone number will be found on the back or these operation and installation manual.



If you determinate that there is a damage to the valve switch off the device/ machine/ plant! However before doing this, it is essential to refer to the

→ Safety advice

### 5.5.1 Gland

The sealing of valve takes place by a gland packing. For decreasing tightness the gland could be readjust. By keeping the nominal pressure you have to tighten up the screw of the gland until the tightness of the the gland will be restored. (Please refer to Fig. 5.6)



After the readjusting the handwheel of the valve must be able to move slightly.

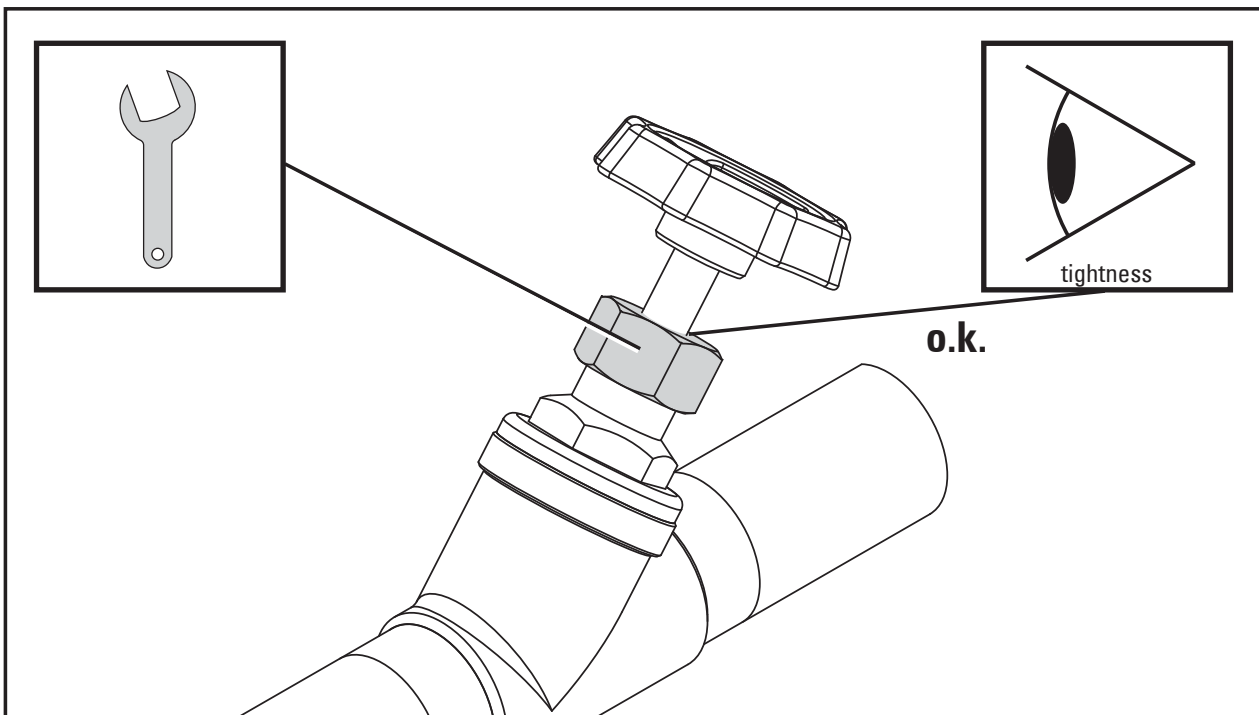


Fig. 5.6 - Globe valve, Gate valve, Needle valve; Readjusting of the gland (AD311064)





Qualität von Anfang an.

(1) **Declaration in conformity**  
(2) **as defined by Pressure-Equipment-Directive 97/23/EC**

(3) This declaration apply to the article groups with the nominal sizes:

| Articles                      | Nominal size      | Articles           | Nominal size      | Articles | Nominal size   | Articles                 | Nominal size   |
|-------------------------------|-------------------|--------------------|-------------------|----------|----------------|--------------------------|----------------|
| <b>Butterfly valves</b>       |                   | NG                 | DN32 ... DN100    | VO       | DN32 ... DN200 | <b>Non-return valves</b> |                |
| HA                            | DN50 ... DN300    | <b>Ball valves</b> |                   | VS       | DN32 ... DN200 | AR                       | 1 1/4" ... 2"  |
| TA                            | DN40 ... DN300    | AG                 | 1 1/4" ... 2"     | VT       | DN32 ... DN100 | CK3003                   | DN65 ... DN200 |
| WA                            | DN50 ... DN300    | BK                 | DN32 ... DN100    | VU       | 4"             | CK5003                   | DN32 ... DN200 |
| WM                            | DN50 ... DN300    | IK                 | 1 1/4" ... 2"     | ZA       | 1 1/4" ... 4"  | CK5100                   | DN65 ... DN250 |
| <b>Gate valves</b>            |                   | IL                 | 1 1/4" ... 4"     | ZA       | DN32 ... DN100 | CK5200                   | DN65 ... DN250 |
| AB                            | 1 1/4" ... 2"     | IW                 | 1 1/4" ... 2"     | ZB       | 1 1/4" ... 2"  | CW5400                   | DN65 ... DN250 |
| AE                            | 1 1/4" ... 3"     | KA                 | 1 1/4" ... 3"     | ZB       | DN32 ... DN50  | EB                       | 1 1/4" ... 3"  |
| AE                            | DN32 ... DN80     | PD                 | 1 1/4" ... 2"     | ZD       | 1 1/4" ... 4"  | EB                       | DN32 ... DN80  |
| CA5014                        | DN100 ... DN300   | TB                 | 1 1/4" ... 4"     | ZD       | DN32 ... DN100 | RG1300                   | DN32 ... DN100 |
| CA5015                        | DN65 ... DN300    | TF                 | DN32 ... DN200    | ZE       | 1 1/4" ... 4"  | RG33xx                   | DN32 ... DN200 |
| CA5214                        | DN40 ... DN200    | TH                 | 1 1/4"            | ZE       | DN32 ... DN100 | RK                       | DN32 ... DN400 |
| CD5010                        | DN32 ... DN200    | VD                 | 1 1/4" ... 4"     | ZF       | 1 1/4" ... 4"  | TD                       | 4"             |
| CV3010                        | DN32 ... DN150    | VD                 | DN32 ... DN100    | ZG       | 1 1/4" ... 2"  | <b>Strainer</b>          |                |
| CV5010                        | DN32 ... DN200    | VH                 | 1 1/4" ... 2"     | ZH       | 1 1/4" ... 2"  | AS                       | 1 1/4" ... 3"  |
| CV5020                        | DN32 ... DN200    | VH3100             | 1 1/4" ... 2"     | ZK       | DN32 ... DN100 | AS                       | DN32 ... DN200 |
| <b>Pressure reducer</b>       |                   | VK                 | DN32 ... DN200    | ZL       | 1 1/4" ... 3"  | EA                       | 1 1/4" ... 3"  |
| SD                            | 3/4" ... 2"       | VK/PN40            | DN32 ... DN200    | ZM       | 1 1/4" ... 2"  | EA                       | DN32 ... DN80  |
| <b>Pressure relief valves</b> |                   | VL                 | 1 1/4" ... 2", 3" | ZP       | DN32 ... DN200 |                          |                |
| NG                            | 1 1/4" ... 1 1/2" | VN                 | 1 1/4" ... 2"     | ZU       | 1 1/4" ... 3"  |                          |                |

and all variations of these articles

(4) of the company **END-Armaturen GmbH & Co. KG**  
D-32547 Bad Oeynhausen  
Germany

(5) Herewith we declare that the above-mentioned articles in the conditions of our delivery are in conformity with the regulations of the Pressure Equipment Directive 97/23/EG.

(6) Applied conformity assessment procedure: Modul H.

(7) Notified body for conformity assessment PED an Quality-Management-System:



**Bureau Veritas S.A.**  
Paris / Frankreich  
Kennzeichen 0062

(8) Certificate numbers: Quality Management System: INT110198DE  
Certificate of System approval PED: 2011/70.10.1777/P

(9) Applied harmonized standards, in particular:

**DIN EN 12516:2005      Industriearmaturen - Gehäusefestigkeit**

(10) On behalf




**Friedhelm König**  
 Technical Manager

**Michael End**  
 Quality Manager

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Declaration without signature or company stamp shall not be valid. The declaration may be circulated only without alternation. Extracts or alternations are subject to approval by END-Armaturen GmbH & Co. KG.





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(1) **Declaration in conformity**  
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(3) This declaration apply to the article groups with the nominal sizes:

| Articles                      | Nominal size             | Articles | Nominal size              | Articles                 | Nominal size             | Articles                  | Nominal size              |
|-------------------------------|--------------------------|----------|---------------------------|--------------------------|--------------------------|---------------------------|---------------------------|
| <b>Gate valves</b>            |                          |          |                           |                          |                          |                           |                           |
| AA                            | ½" ... 2"                | BT       | ½" ... 1"                 | VN                       | ¼" ... 1"                | CK3003                    | DN15 ... DN50             |
| AB                            | ¼" ... 1"                | BV       | ¼" ... ¾"                 | VO                       | DN25                     | CK5000                    | DN40 ... DN250            |
| AC                            | ¾" ... 2"                | CB       | ¼" ... 2½"                | VS                       | DN15 ... DN25            | CK5003                    | DN40 ... DN25             |
| AD                            | ½" ... 2"                | CO-CO    | ½" ... 2"                 | VT                       | DN15 ... DN25            | CK5100                    | DN40 ... DN50             |
| AE                            | ½" ... 1", DN15 ... DN25 | HF       | ¼" ... 1"                 | ZA                       | ¼" ... 1", DN10 ... DN25 | CK5200                    | DN40 ... DN50             |
| AV                            | ¼" ... 1"                | HO       | DN10 ... DN15             | ZB                       | ¼" ... 1", DN15 ... DN25 | CW5400                    | DN40 ... DN50             |
| BE                            | ¾" ... 3"                | IB       | ¼" ... 2"                 | ZD                       | ½" ... 1", DN15 ... DN25 | DR                        | DN50 ... DN300            |
| BF                            | ¼" ... 3"                | IK       | ¼" ... 1"                 | ZE                       | ¼" ... 1", DN10 ... DN25 | EB                        | ½" ... 1", DN15 ... DN25  |
| BS                            | ½" ... 1¼"               | IL       | ¼" ... 1"                 | ZF                       | ¼" ... 1"                | MR                        | ¼" ... 3"                 |
| CA5014                        | DN40 ... DN80            | IW       | ¼" ... 1"                 | ZG                       | ¼" ... 1"                | RG                        | DN15 ... DN25             |
| CA5015                        | DN40 ... DN50            | KA       | ½" ... 1"                 | ZH                       | ½" ... 1"                | TD                        | ¾" ... 3"                 |
| CA5214                        | DN40 ... DN32            | KFE      | ¾" ... ¾"                 | ZK                       | DN15 ... DN25            | TG                        | ½" ... 2"                 |
| CD5010                        | DN15 ... DN25            | NK       | ¾" ... 4", DN10 ... DN100 | ZL                       | ¼" ... 1"                | TR                        | ¾" ... 4"                 |
| CV3010                        | DN15 ... DN25            | PB       | ½" ... 2"                 | ZM                       | ¼" ... 1"                | VB                        | ¼" ... 2"                 |
| CV5010                        | DN15 ... DN25            | PD       | ½" ... 1"                 | ZP                       | DN15 ... DN25            | ZR                        | DN15 ... DN200            |
| CV5020                        | DN15 ... DN25            | SK       | ½" ... 3", DN10 ... DN80  | ZU                       | ¼" ... 1"                | <b>Sight glasses</b>      |                           |
| IC                            | ¼" ... 4"                | TB       | ¼" ... 1"                 | <b>Pipe fittings</b>     |                          | SG                        | ¼" ... 2", DN15 ... DN150 |
| MV                            | ½"                       | TE       | ½" ... 2"                 | FG                       | ¾" ... 4"                | <b>Strainer</b>           |                           |
| TC                            | ¼" ... 4"                | TF       | DN20 ... DN25             | FS                       | DN15 ... DN150           | AS                        | ¼" ... 1"                 |
| <b>Pressure reducer</b>       |                          | TH       | ½" ... 1"                 | GE                       | Ø6 ... Ø20               | AS                        | DN15 ... DN25             |
| ID                            | ¾" ... ¾"                | TT       | ¾" ... 1"                 | GR                       | Ø8 ... Ø28               | BG                        | ¾" ... 2"                 |
| MB                            | ½" ... 2"                | TV       | ¾" ... 1"                 | GV                       | Ø6 ... Ø20               | CU                        | DN15 ... DN250            |
| MC                            | ½" ... 2"                | VD       | ¼" ... 1"                 | TE                       | Ø6 ... Ø25               | EA                        | ½" ... 1", DN15 ... DN25  |
| <b>Pressure relief valves</b> |                          | VD       | DN10 ... DN25             | TV                       | Ø6 ... Ø20               | IG                        | ¼" ... 4"                 |
| NG                            | ¾" ... 1", DN15 ... DN25 | VE       | ¼" ... 1"                 | WE                       | Ø6 ... Ø38               | KU                        | DN15 ... DN100            |
| <b>Ball valves</b>            |                          | VF       | ¾" ... ½"                 | WV                       | Ø6 ... Ø20               | <b>Water-shock damper</b> |                           |
| AG                            | ¼" ... 1"                | VH       | ½" ... 1"                 | <b>Non-return valves</b> |                          | TS                        | ½"                        |
| BC                            | ¼" ... ¾"                | VH3100   | ½" ... 1"                 | AH                       | ¼" ... 1½"               |                           |                           |
| BK                            | DN15 ... DN25            | VK       | DN15 ... DN25             | AR                       | ½" ... 1"                |                           |                           |
|                               |                          | VL       | ¼" ... 1"                 | BH                       | ¾" ... 3"                |                           |                           |

and all variations of these articles

(4) of the company **END-Armaturen GmbH & Co. KG**  
D-32547 Bad Oeynhausen  
Germany

(5) Herewith we declare that the above-mentioned articles in the conditions of our delivery are in conformity with the regulations of Article 3 Part 3 of the directive 97/23/EG. These products bear no CE mark, but are in line to the good engineering practice designed and manufactured.

(6) Applied harmonized standards, in particular:

**DIN EN 12516:2005**

**Industriearmaturen - Gehäusefestigkeit**

(7) On behalf

*F. König*



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Bad Oeynhausen, 04. July 2011

*Michael End*

Friedhelm König  
Technical Manager

Michael End  
Quality Manager

Declaration without signature or company stamp shall not be valid. The declaration may be circulated only without alteration. Extracts or alternations are subject to approval by END-Armaturen GmbH & Co. KG.





*Qualität von Anfang an.*

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