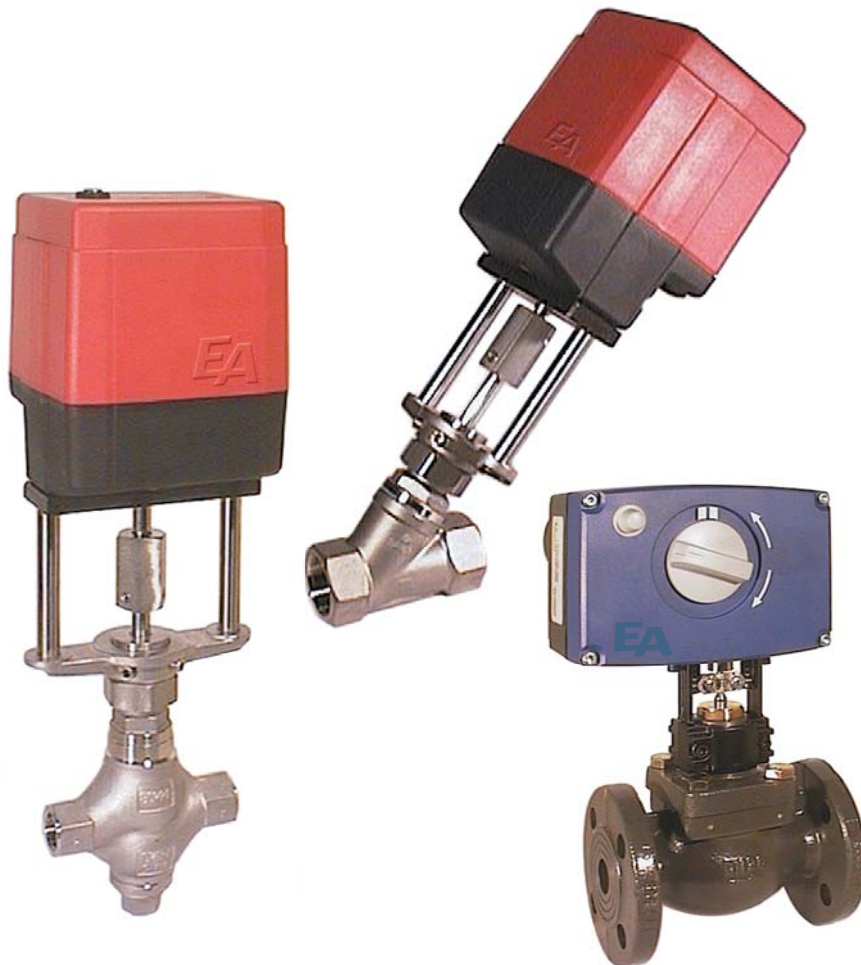




Qualität von Anfang an.

***Motor Control Valve
ETAG / ETKG
MA / MK
NA / NK
Mounting and Operating Manual***



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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 an motor control valve DG2D 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 motor control valves.

Motor Control Valves are generally used for clean, gaseous and liquid media. At critical conditions or aggressive media the material of the body, internal parts and sealings must be checked for their suitability.

If you have any questions in relation to the motor control valve, 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-Automation GmbH & Co. KG

General advice

2 General advice

2.1 Validity

These mounting and installation manual is valid for the standard version of the motor control valves and their variants with 'X' as preface to the type.

2.2 Inward monitoring

Please check

- directly after delivery the motor control 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 of 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 return, please mention the following:

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

2.4 Guarantee

For our motor control valves we give a guarantee period in accordance with the sales contract.

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

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/advice or tips.



This bullet 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 motor control valve is mounted, adjusted and commissioned, you must in each case take into account particular safety aspects!

If, for example, the motor control 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/adjustment/commissioning, you may find advice on hazards in the following descriptions which are not relevant to you .

Safety advice

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 valves and the accessories must be carried out only by trained specialist personnel having mechanical and electrical knowledge!



Secure that the machine / plant come up to the Machinery Directive after the mounting and installing of the motor control valve.



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 cause potential danger.



If appropriate, in the event of a fault in the motor control valve (in a plant which is in operation) inform the shift forman / 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, relief the pressure from pneumatic / hydraulic devices / machines / plant.



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



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



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 and starting



As a result of the starting (automatically or by hand) of a motor control valve the flow of gases, steam, liquids, etc. may be enabled or interrupted! Satisfy yourself that, as the result of the starting or the test adjustments of the valve, no potential hazards will be produced for the personnel or the environment!



If necessary, set up warning signs in order to prevent the inadvertent starting up or shutting down of the devices / machines / plant. By ending mounting check the correct function and the tightness of the valve.



Afer adjustment check the functioning of the motor control valve.



Check the functioning of the end position switches (Option)!



Check whether the the actuating element is actually 100 % closed when the controller signals the corresponding end stop.(Option).



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



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



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



When adjustments are being carried out on an opened and switch on (operational) limit switches or pilot valves, there is the risk that live parts(230V AC~) can be touched! Therefore the adjustment must be carried out only by the electrician or a person having adequate training, who is aware of the potential hazard.

3.1.3 Safety advice for maintaining / repairing



Do not carry out any maintenances / repairs if the motor control valve will be under pressure.

Before disassembling or the motor control valve some essential points should be clarified!

- Will the valve to be disassembled be replaced by another immediately?
- If appropriate, does the production process of the plant needed to be stopped?
- Is it necessary to inform specific personnel about the disassembly?



If necessary, inform the shift foreman/ safety engineer or the manager about the maintenance or repair 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!



You have to relieve the pressure in the pipes in which the valve is mounted.

Switch off the power supply and relieve the pressure in the pipes.

If necessary set up warning signs in order to prevent



- the inadvertent starting up of the devices/machines/plants in which the armature/ valve is mounted
- the switching on of pilot medium supply, pilot power supply and/or the power supply of actuators and accessories.



In case of defect in the armature/valve make contact to the supplier. The telephone number will be found on the back cover of these mounting and installation manual.



If you ascertain a damage of the motor control valve, isolate the device from the mains. Please observe the safety advices.



Do not mount, start or adjust the motor control valve if itself, the pipes or the hole device will be damaged.



After the maintenance or repair check the right function of the armature/valve and the tightness of the pipe connections.



Also check the function of the accessories e.g. actuators, limit switches, etc.

Safety advice

3.2 Device safety

The motor control valves

- are quality products which are produced in accordance to the recognized industrial regulations.
- left the manufacturer`s work in a perfect safety condition.



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

We assume, as a trained specialist you are having mechanical and electrical knowledge!



Satisfy yourself that the motor control vales will only be used within their admissible limiting value (see the technical data) .



The motor control valves must be used only for a purpose corresponding to their construction!

The motor control valves must be used within the values specified in the technical data!

The operating of the motor control valve outside the nominal temperature range could destroy the sealings and the bearings.



The operating of the motor control valves outside the nominal pressure range could destroy the inner parts and the body.

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 a cap or a other component part if the armature/valve will be under pressure.



Do not mount, start or adjust the armature/valve if itself, the pipes or a mounted actuator will be damaged.



After the maintenance or repair check the right function of the armature/valve and the tightness of the pipe connections.



Also check the function of the accessories e.g. actuators, limit switches, etc.

4 Device description

The motor control valves will be delivered in various variants. The following table explains the composition of the standard variants of our motor control valves to you. Of course we are delivering motor control valves, which are specifically adjusted to your requirements (e.g. flow rate).

4.1 Motor control needle valve NA/NK

| 1. - 2. Digit Product | 3. Digit Body material | | 4. Digit Seals material | | 5. + 6. Digit Control cone (flow rate) | |
|--|--|-----------------------------|------------------------------------|----------------|---|--|
| NA = Needle valve open-close-control NK = Needle valve continuous control | 3 = Stainless steel Body made of brass on request | | 3 = FKM 4 = EPDM | | 01 = 10 - 100 l/h 02 = 75 - 280 l/h 03 = 200 - 800 l/h measured at Δp water = 1 bar | |
| 7. + 8. Digit Actuator size | | | | | 9. - 11. Digit Connection size | 12. - 20. Digit Options |
| | power consumption [VA] | operating time [s/mm] | force [N] | voltage [V] | control | |
| actuator 21 | 7 | 4 | 1500 | 230 V AC | open/close | Other materials, additional limit switches, potentiometer and further options on request. |
| | 9 | 4 | 1500 | 24 V AC | open/close continuous | |
| Other actuators and operating times on request | | | | | | |
| Input signal 0/4 - 20 mA / 0/2 - 10 V | | | output signal 0/2 - 10 V | | | |

4.2 Motor control valve MA/MK

| 1. - 2. Digit Product | 3. Digit Body material | | 4. Digit Seals material | | 5. Digit Voltage | |
|--|---|-----------------------|-----------------------------|-------|---|--|
| MA = Motor control valve open-close-control MK = Motor control valve continuous control | 6 = GGG 40.3 body made of brass on request | | 7 = Metall / PTFE | | 02 = 24 V, 50 Hz 06 = 230 V, 50 Hz | |
| 6. + 7. Digit Actuator size | | | | | 8. - 10.(11.) Digit Connection size | 12. - 20. Digit Options |
| | Power consumption | | Operating time | Force | | |
| | Open- Close- control | continuous control | | | | |
| | [VA] | [VA] | [s/mm] | [N] | | |
| Actuator 06 | 2,15 | 4 | 11 | 500 | 015.1 = DN 15 015.5 = DN 15 020 = DN 20 025 = DN 25 032 = DN 32 040 = DN 40 050 = DN 50 065 = DN 65 080 = DN 80 100 = DN 100 | Other materials, additional limit switches, potentiometer and further options on request. |
| Actuator 05 | 2,15 | 4 | 7 | 300 | | |
| Actuator 16 | 2,15 | 4 | 11 | 1000 | | |
| Actuator 15 | 7 | 9 | 3 | 600 | | |
| Actuator 23 | 7 | 9 | 8 | 2000 | | |
| Actuator 22 | 9 | 19,5 | 4 | 1500 | Other connection sizes on request | |
| Actuator 34 | 10,5 | 12,5 | 8 | 5000 | | |
| Actuator 32 | 23 | 25 | 3 | 5000 | | |

Device description

4.3 Motor control valve ETA/ETK

| 1. - 3. Digit Product | 4. Digit Connection | 5. Digit ways | 6. Digit Operation | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---|---|---------------------|--------------------|-------|---------------------|--------------------|--------------------|------|--------------------|---------|--------------------|-------------|--------------------|-----|--------------------|---------|--------------------|-----|------------------------|---|------|--|--|
| ETA = Motor control valve open-close-control ETK = Motor control valve continuous control | G = threaded connection acc. to DIN ISO 228 T1 A = welded connection acc. to DIN 3239 L = welded connection acc. to ISO 4200 M = welded connection acc. to DIN 11850-R2 F = flange | 2 = 2/2-way 3 = 3/2-way | D = direct acting | | | | | | | | | | | | | | | | | | | | | | |
| 7. Digit Body material | 8. Digit Seals material | 9. Digit Control version | 10. Digit Voltage | | | | | | | | | | | | | | | | | | | | | | |
| 1 = brass 2 = bronze 3 = stainless steel Other materials on request | Seat / Spindle 1 = PTFE / PTFE 3 = stainless steel Other material on request | 0 = without control cone 1 = with control cone By ordering please pre-tend the following values: - medium - $Q_{max.}/Kv$ - ΔP_{min} | 2 = 24 V, 50 Hz 6 = 230 V, 50 Hz Input signal 0/4 - 20 mA 0/2 - 10 V Output signal 0/2 - 10 V | | | | | | | | | | | | | | | | | | | | | | |
| 11. + 12. Digit Actuator size | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Power consumption</th> <th rowspan="2">Operating time</th> <th rowspan="2">Force</th> </tr> <tr> <th>Open- Close-control</th> <th>continuous control</th> </tr> <tr> <th></th> <th>[VA]</th> <th>[VA]</th> <th>[s/mm]</th> <th>[N]</th> </tr> </thead> <tbody> <tr> <td>Actuator 21</td> <td>7</td> <td>9</td> <td>4</td> <td>1500</td> </tr> <tr> <td>Actuator 32</td> <td>23</td> <td>25</td> <td>3</td> <td>5000</td> </tr> </tbody> </table> | | Power consumption | | Operating time | Force | Open- Close-control | continuous control | | [VA] | [VA] | [s/mm] | [N] | Actuator 21 | 7 | 9 | 4 | 1500 | Actuator 32 | 23 | 25 | 3 | 5000 | | |
| | Power consumption | | Operating time | Force | | | | | | | | | | | | | | | | | | | | | |
| | Open- Close-control | continuous control | | | | | | | | | | | | | | | | | | | | | | | |
| | [VA] | [VA] | [s/mm] | [N] | | | | | | | | | | | | | | | | | | | | | |
| Actuator 21 | 7 | 9 | 4 | 1500 | | | | | | | | | | | | | | | | | | | | | |
| Actuator 32 | 23 | 25 | 3 | 5000 | | | | | | | | | | | | | | | | | | | | | |
| 13. - 15. Digit Connection size | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>flange / welded end</th> <th>threaded connection</th> </tr> </thead> <tbody> <tr> <td>015 = DN 15</td> <td>G 1/2</td> </tr> <tr> <td>020 = DN 20</td> <td>G 3/4</td> </tr> <tr> <td>025 = DN 25</td> <td>G 1</td> </tr> <tr> <td>032 = DN 32</td> <td>G 1 1/4</td> </tr> <tr> <td>040 = DN 40</td> <td>G 1 1/2</td> </tr> <tr> <td>050 = DN 50</td> <td>G 2</td> </tr> <tr> <td>065 = DN 65</td> <td>G 2 1/2</td> </tr> <tr> <td>080 = DN 80</td> <td>G 3</td> </tr> <tr> <td colspan="2">Other sizes on request</td> </tr> </tbody> </table> | flange / welded end | threaded connection | 015 = DN 15 | G 1/2 | 020 = DN 20 | G 3/4 | 025 = DN 25 | G 1 | 032 = DN 32 | G 1 1/4 | 040 = DN 40 | G 1 1/2 | 050 = DN 50 | G 2 | 065 = DN 65 | G 2 1/2 | 080 = DN 80 | G 3 | Other sizes on request | | | | |
| flange / welded end | threaded connection | | | | | | | | | | | | | | | | | | | | | | | | |
| 015 = DN 15 | G 1/2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 020 = DN 20 | G 3/4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 025 = DN 25 | G 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 032 = DN 32 | G 1 1/4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 040 = DN 40 | G 1 1/2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 050 = DN 50 | G 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 065 = DN 65 | G 2 1/2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 080 = DN 80 | G 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| Other sizes on request | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12. - 20. Digit Options | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other materials, additional limit switches, potentiometer and further options on request. | | | | | | | | | | | | | | | | | | | | | | | | | |

5 Mounting

5.1 General



Before you mount / disassemble, adjust or start operating of a motor control valve you have to read the

→ safety advice

If you have not yet done this, read this important advice now and then return to this point.

5.2 Corresponding use

Motor control valves will be used to control and to cut off medium flow. It should only be used clean liquids and gases, on which the material of the motor control valve will be resistant. Pollution or using outside the nominal pressure range and/or the nominal temperature range should causes damages on the motor control valve especially on the seals. .



Motor control valves with metallic seals should only be used for clean liquid media.

5.3 Mounting / Disassembly



The mechanical installation are the same by all variants of the motor control valves. It differs only by the type of connection.



Observe the flow direction, specified on the valve body.



Remove the package and the safety devices (e.g. caps or plugs). Take care that there will be no parts of the package or other parts in the valve body.



Before mounting the motor control valve clean up the pipes. Pollution will be reduce the safety and the lifetime of the valve. If necessary mount a Y- strainer in front of the motor control valve.



Avoid strains of the valve body by non align pipes.

5.3.1 Mounting with threaded connection



Before lay on sealing compounds, test the hardly screwing of the pipes into valve body.





Lay on the correct sealing compounds on the pipes end. By using PTFE-ribbon or hemp sealings observe the screw direction. Don't use sealing compounds which are not prescribed for your employment.



Screw the pipes into the connection ends of the valves. Don't use the actuator as a lever.

Mounting

-  Strike up the pipes with pressure after that time the manufacturer of the sealing compounds pretends for harden it.
-  Check the tightness of all connections.

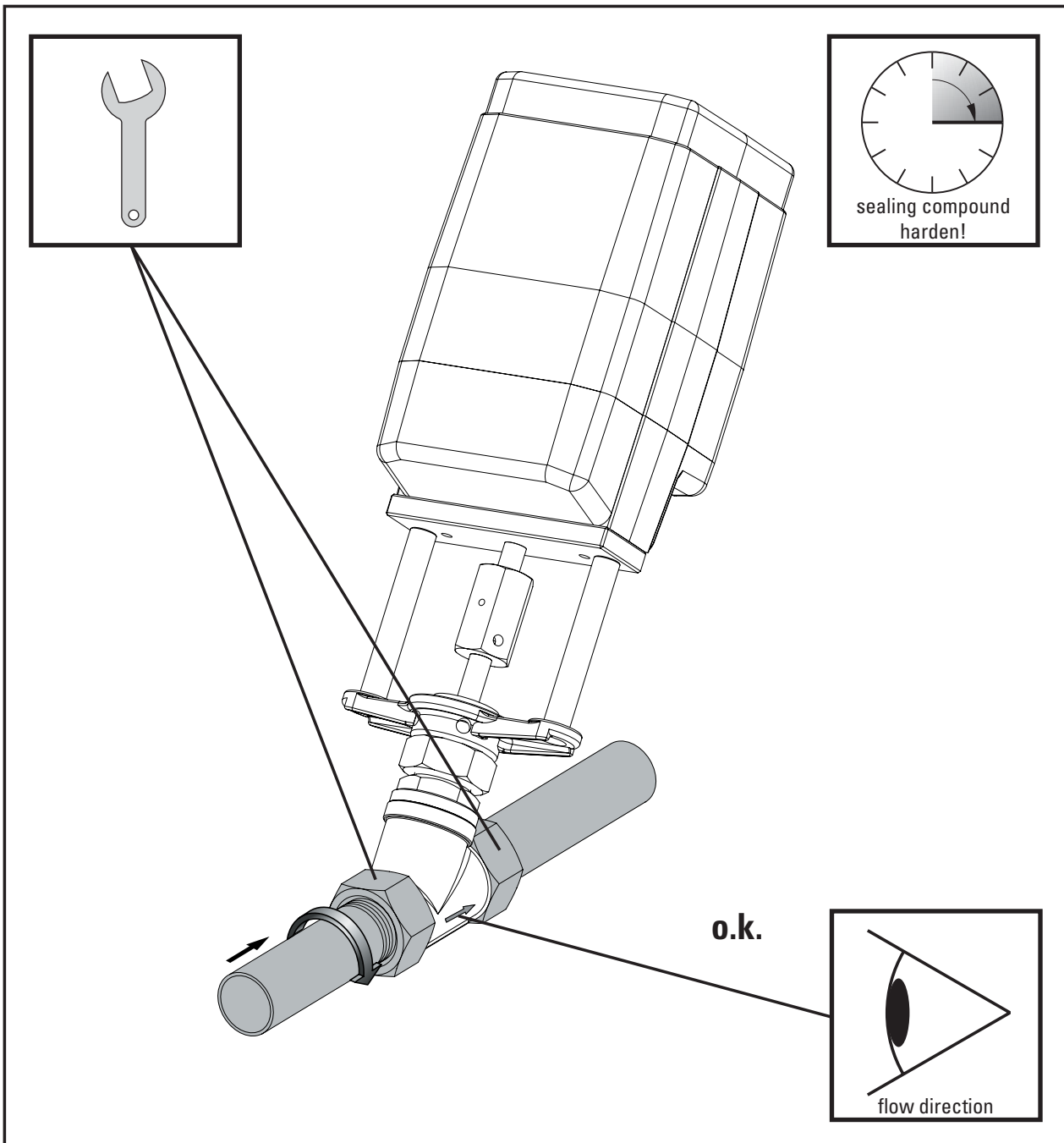


Fig. 5.1 - mounting with threaded connection

5.3.2 Mounting with welded connection



By welding the valve body between the pipes you have to disassemble the screw joint with the actuator first, to prevent the damage of the sealings

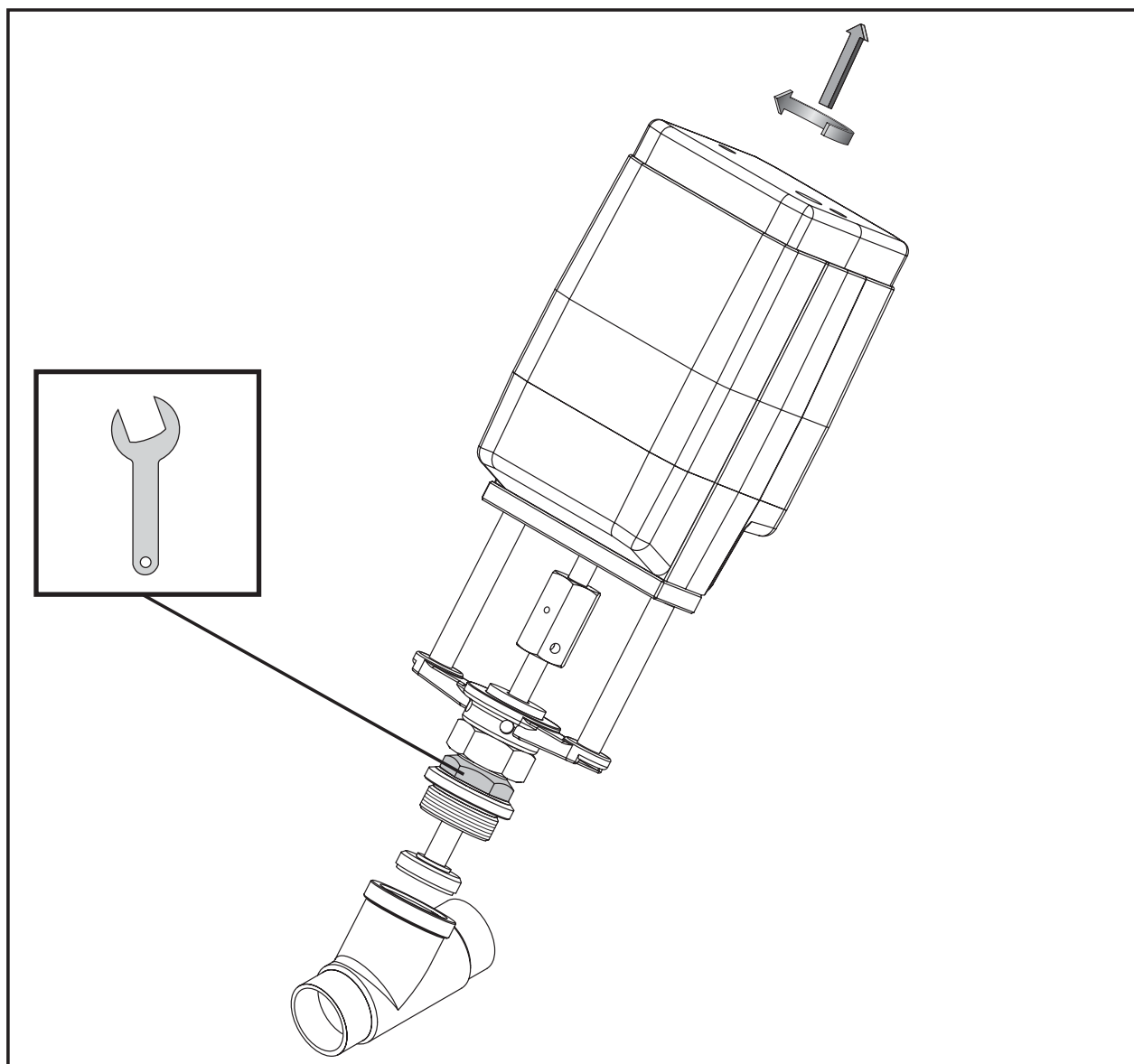


Fig. 5.2 - disassembly of the screw joint with the actuator

5.3.2.1 Disassembly of the screw joint with the actuator



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



To prevent the damage of the seat seals or the control cone bring the motor control valve in the open position by using the manual override. (Therefore observe **chapter 7: manual override**)



Loosen the screw joint with the actuator with a fit spanner. The spanner have to put on to the hexagon nut of the screw joint.



Screw out the screw joint with the actuator of the valve body and take it by side carefully. If you have to disassemble several motor control valves place a mark on the valve body and the electric actuator that you will be able to join the correct parts by a subsequent mounting of valve.

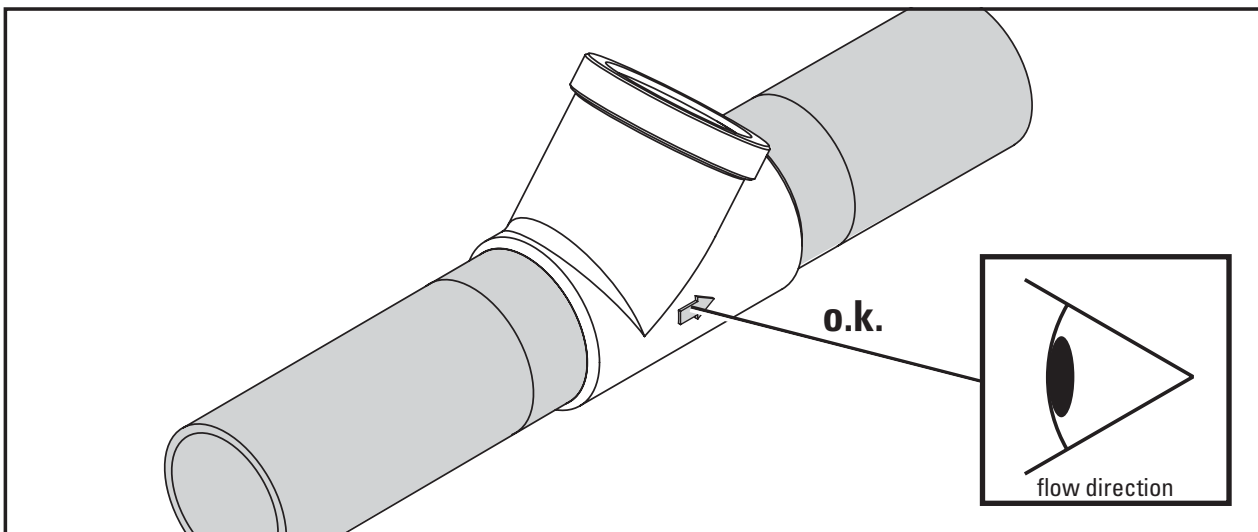


Fig. 5.3 - Welding of the valve body

5.3.2.2 Welding the valve body between two pipes



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



The safety demands by welding are depending on the place and the position of the point of weld. Welding the parts at 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 prevention of accidents.

5.3.2.3 Mounting of the screw joint with the actuator



Before mounting the screw joint with the actuator let the valve body cool down.



Screw the screw joint with the actuator top into the body.



Take care about the correct placement of the sealing into the screw joint and that there will be no pollution on the sealing or the seat.



Tighten the screw joint with the actuator with a fit spanner. The spanner have to put on to the hexagon nut of the screw joint.



Check the tightness of all the connections.

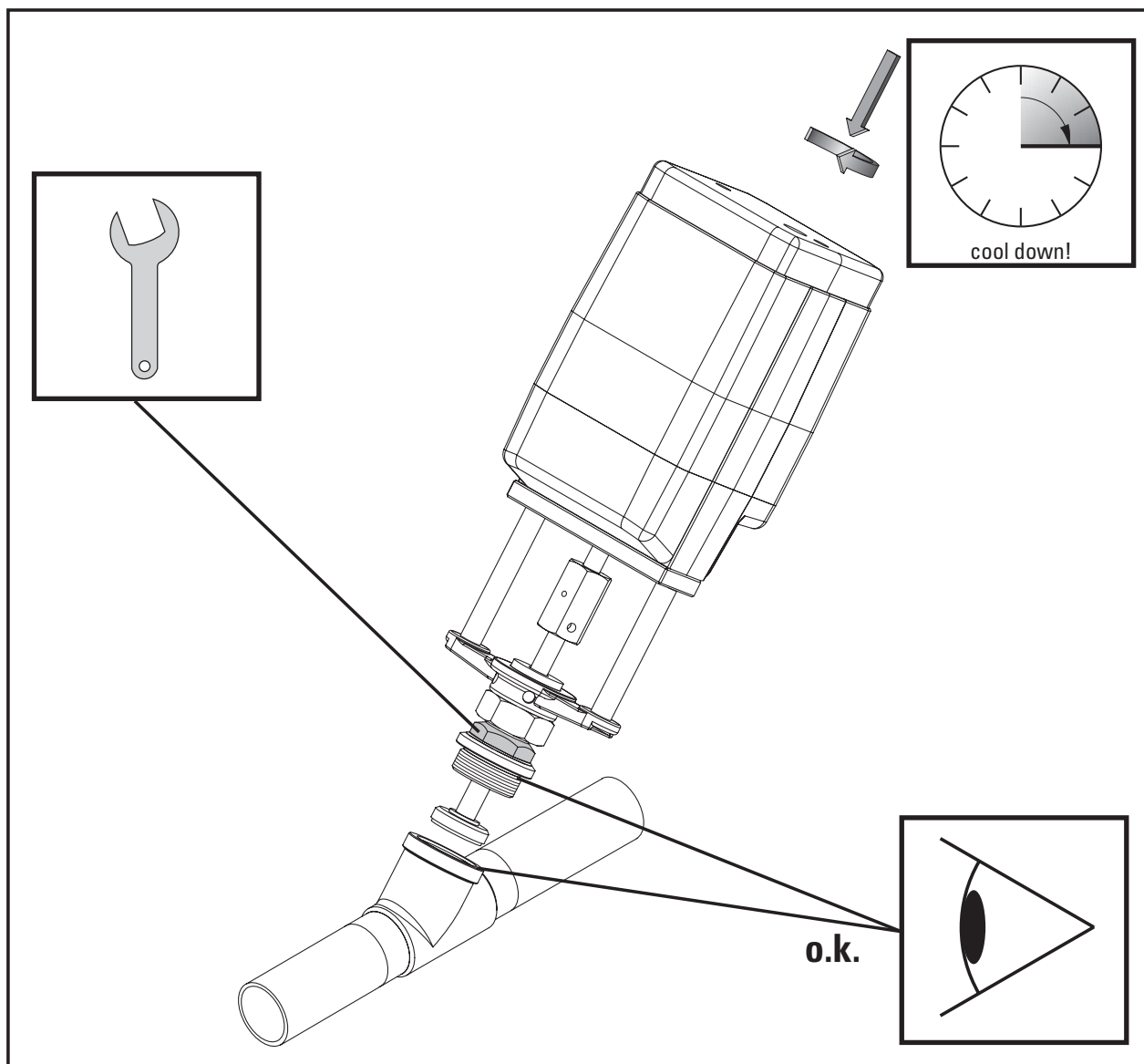


Fig. 5.4 -mounting of the screw joint with the actuator

5.3.3 Mounting with flanged connection



We assume, that you have mounted the flanges at the end of pipes and they are cooled down. (e.g. welded flanges).



Push the valve body between the flanges by using the appropriate sealings.



Aligns the flange borings and put the fit screws through the holes.



Screw the fit nuts onto the screws and tighten it up crosswise. By doing this observe the maximum torque of the screws.



Check the tightness of all connections.

Mounting

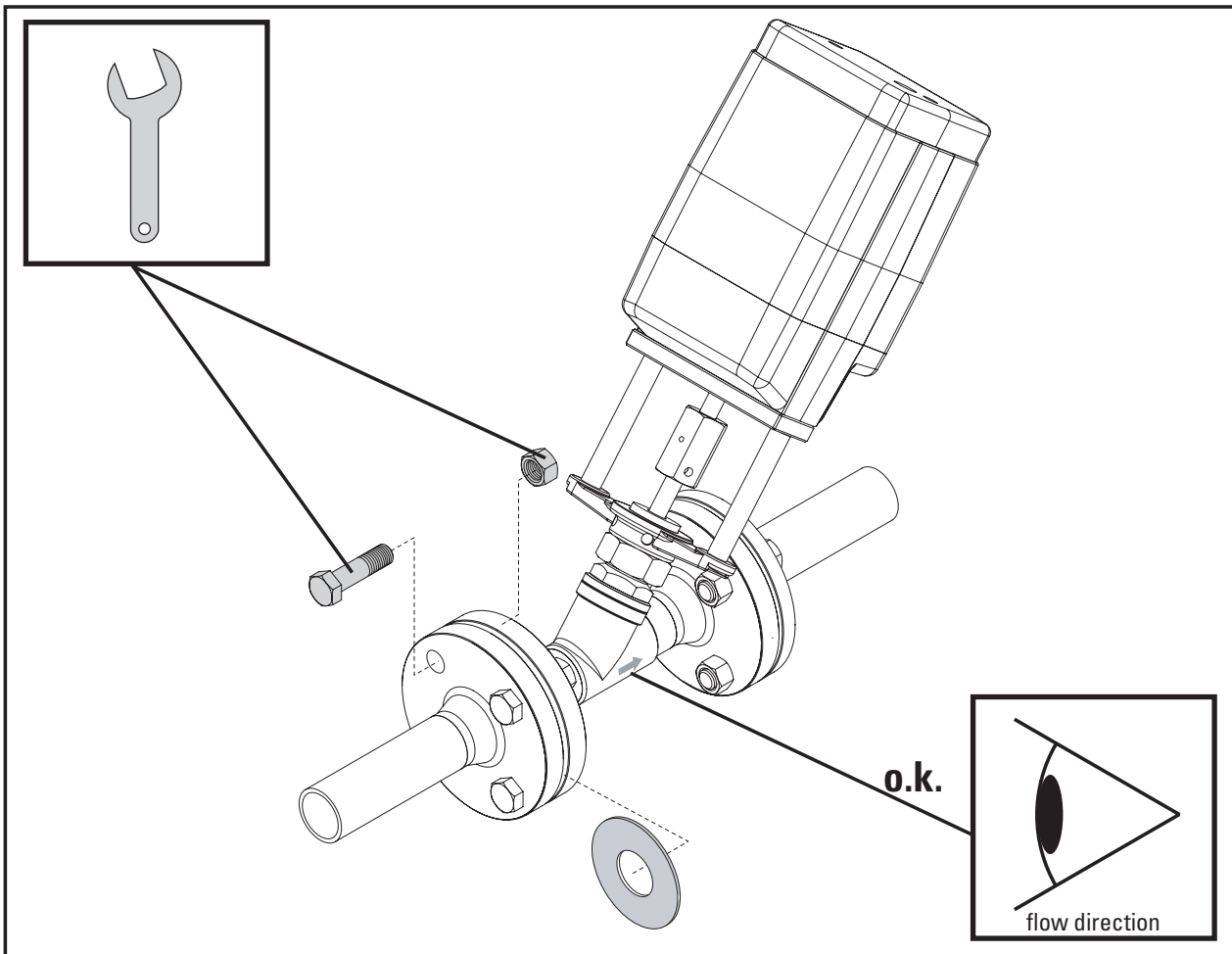


Fig. 5.5 - mounting with flanged connection

5.4 Maintenance



On normal accounts the motor control valves are maintenance free.



Check in regular turns the tightness of all connection and sealings of the motor control valve.



In case of a defect at the motor control valve make contact with the supplier. The telephone number will be found on the back cover of these operation and installation manual.



If you determine that there is a damage to the motor control valve, isolate it from the mains and the power supply. However, before doing this, it is essential to refer to the

→ safety advice

6 Electrical installation

Before you mount / disassemble, adjust or start operating of a motor control valve you have to read the



→ safety advice

If you have not yet done this, read this important advice now and then return to this point.

6.1 Actuators with continuous control

6.1.1 Wiring



At actuators with continuous control the power supply will be only 24 V AC!

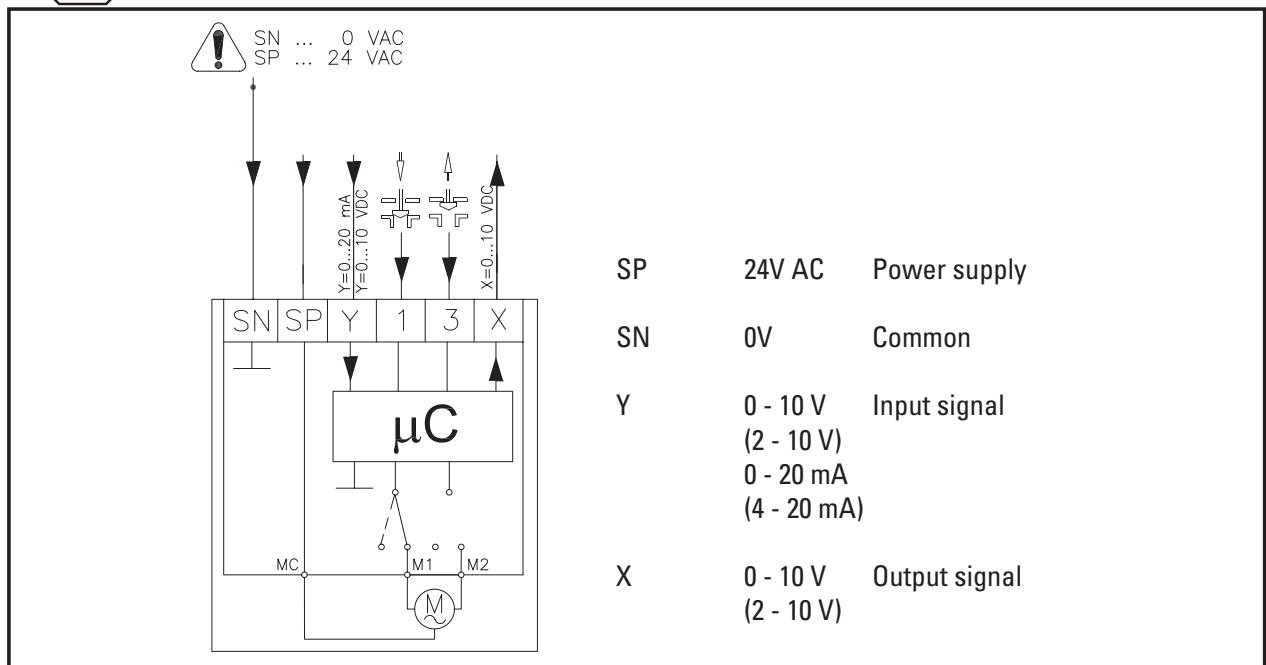


Fig. 6.1 - wiring for actuator with continuous control



At a wiring length < 50m we recommend a square of wiring of 0,75 mm², at a wiring length > 50m we recommend a square of wiring of 1,5 mm².

6.1.2 Commissioning



Complete the mechanical and electrical installation and perform the necessary checks and tests.



Isolate the control medium. Hereby observe the safety advices.



Apply the power. When power is first applied, the actuator will automatically adjust to the length of the valve stroke. Subsequently, the self stroking feature can be re-initialised by changing position of DIP switch 9.



Apply the appropriate control signal and check the valve stem direction is correct for the application.



Ensure that the actuator drives the valve over its full stroke, by applying the appropriate control signal. This action will set the valve stroke length.

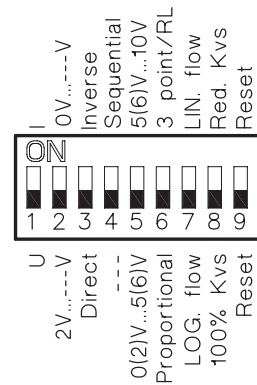
Electrical installation

6.1.3 DIP switch setting



The actuator has a function selection DIP switch under the removeable cover. In particular, if SW6 is set to ON, the actuator will perform as 3-point actuator.

The switch provide the following function:



6.1.3.1 DIP switch SW1

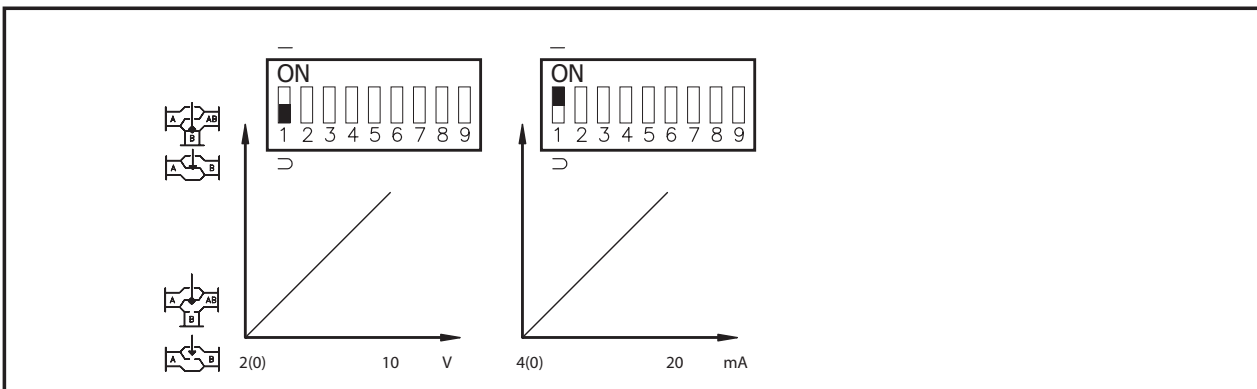


Fig. 6.2 - DIP switch setting: Switch SW1

U/I:

The actuator can responde to a voltage or current signal. With switch No.1:

U/I actuator can be set either to operate with a voltage control signal (actuator responds to signal between 0...10V), or current control signal (actuator responds to signal between 0...20mA).

Factory setting: voltage control signal (0...10V)

6.1.3.2 DIP switch SW2

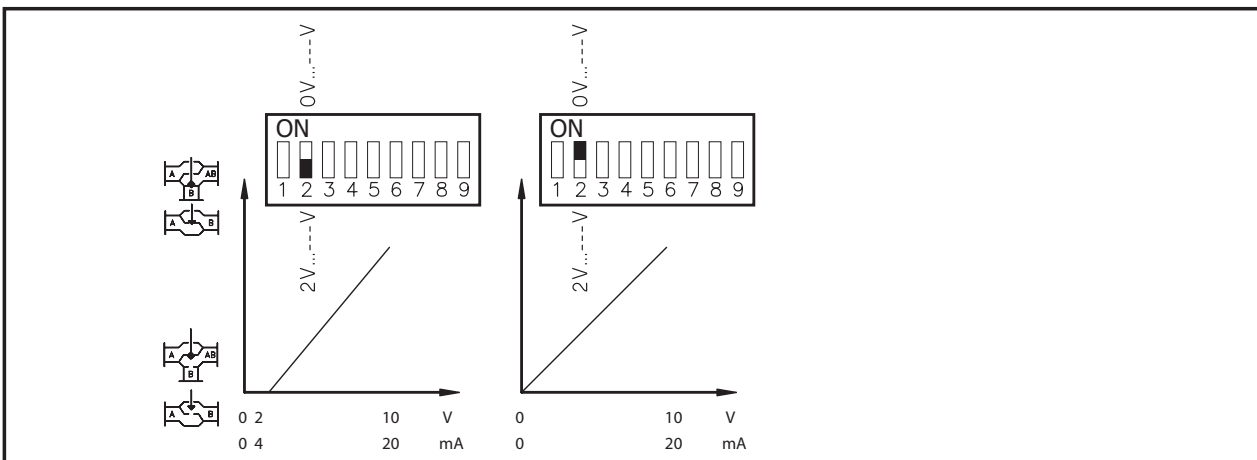


Fig. 6.3 - DIP switch setting: Switch SW2

2V...10 / 0V...10:

The actuator can be set to respond on a control signal from 2V or 0V.

If the actuator is set to a current signal than it responds to a control signal from 4mA or 0mA.

Factory setting: 2...10V.

6.1.3.3 DIP switch SW3

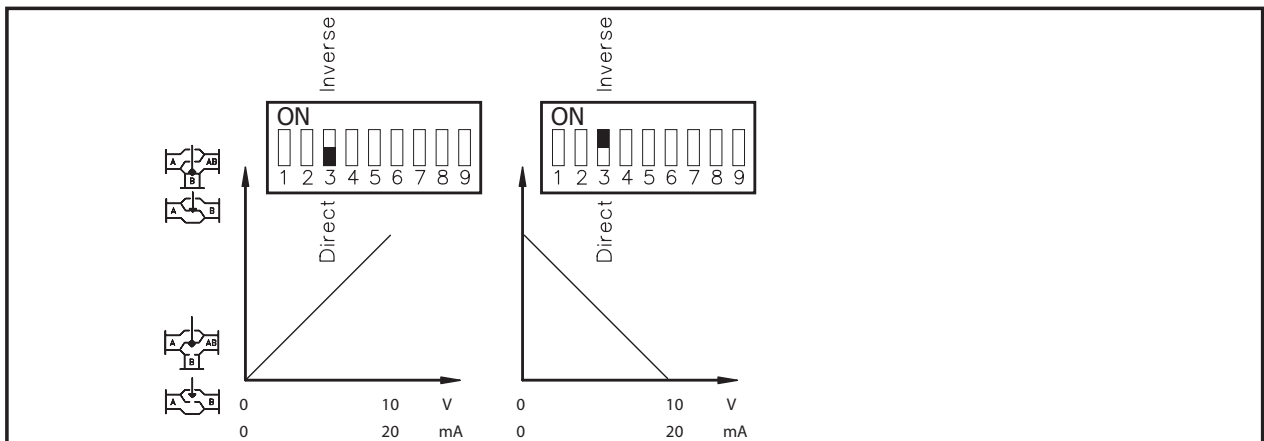


Fig. 6.4 - DIP switch setting: Switch SW3

Direct / Inverse:

The actuator can be set for spindle to travel downwards on rising control signal (DIRECT) or for spindle to travel upwards on rising control signal (Inverse)

Factory setting: DIRECT.

6.1.3.4 DIP switch SW4

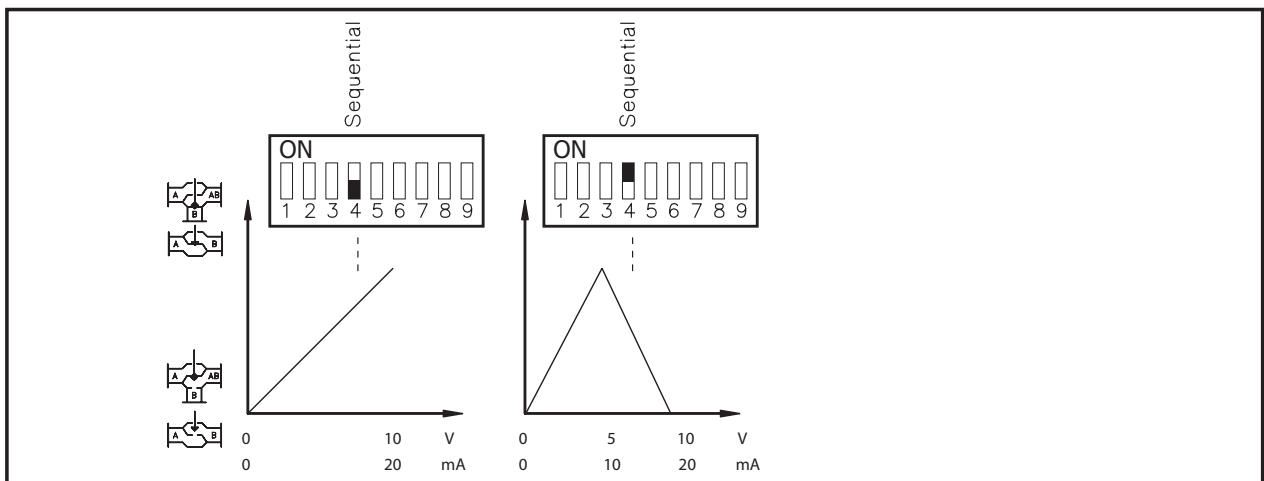


Fig. 6.5 - DIP switch setting: Switch SW 4

---- / Sequentiell:

Two actuators can be set to work parallel with one control signal.

If the SEQUENTIAL is set than an actuator responds to split control signal. (0(2)V...5(6)V / 6(6)V...10V).

Note: This option works in combination with switch No.5: 0(2)V...5(6)V / 6(6)V...10V.

6.1.3.5 DIP Schalter S5

0(2)V...5(6)V / 6(6)V...10V:

This function is available if switch No.4: is set SEQUENTIAL.

The actuator can be set to match the range of the control signal.

2...6V (Switch No. 2: 0...10V) oder 6...10V (Switch No. 2: 0...10V)

0...5V (Switch No. 2: 0...10V) 5...10V (Switch No. 2: 0...10V)

4...12mA (Switch No. 2: 0...mA) 12...20mA (Switch No. 2: 0...mA)

0...10mA (Switch No. 2: 0...20mA) 10...20mA (Switch No. 2: 0...20mA)

Electrical installation

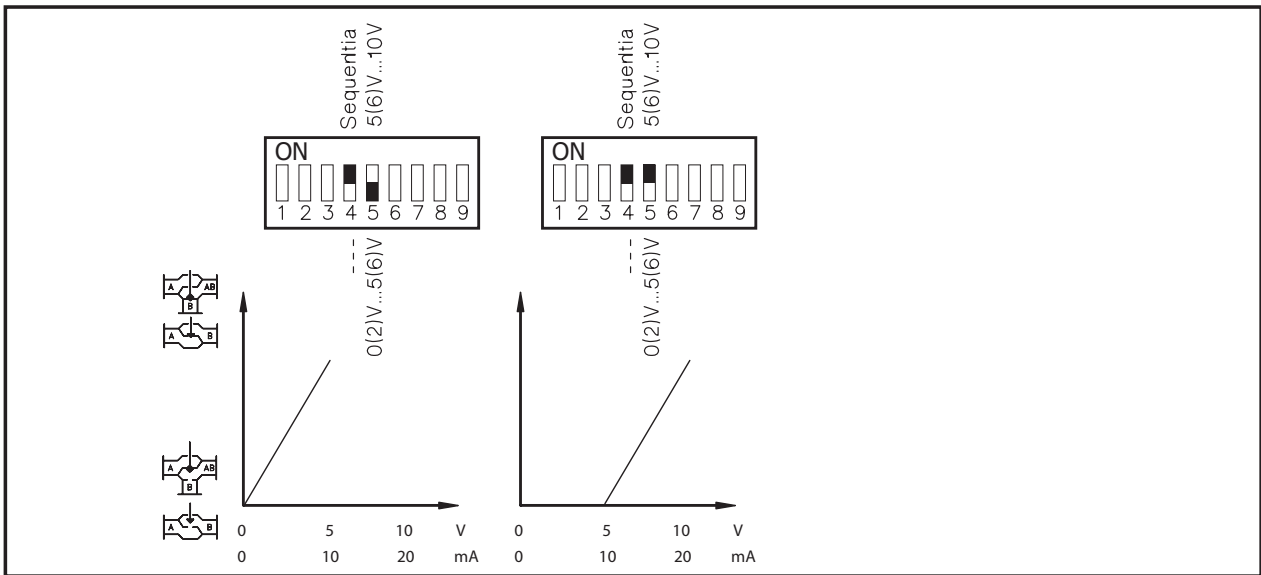


Fig. 6.6 - DIP switch setting: Switch SW5

6.1.3.6 DIP switch SW6

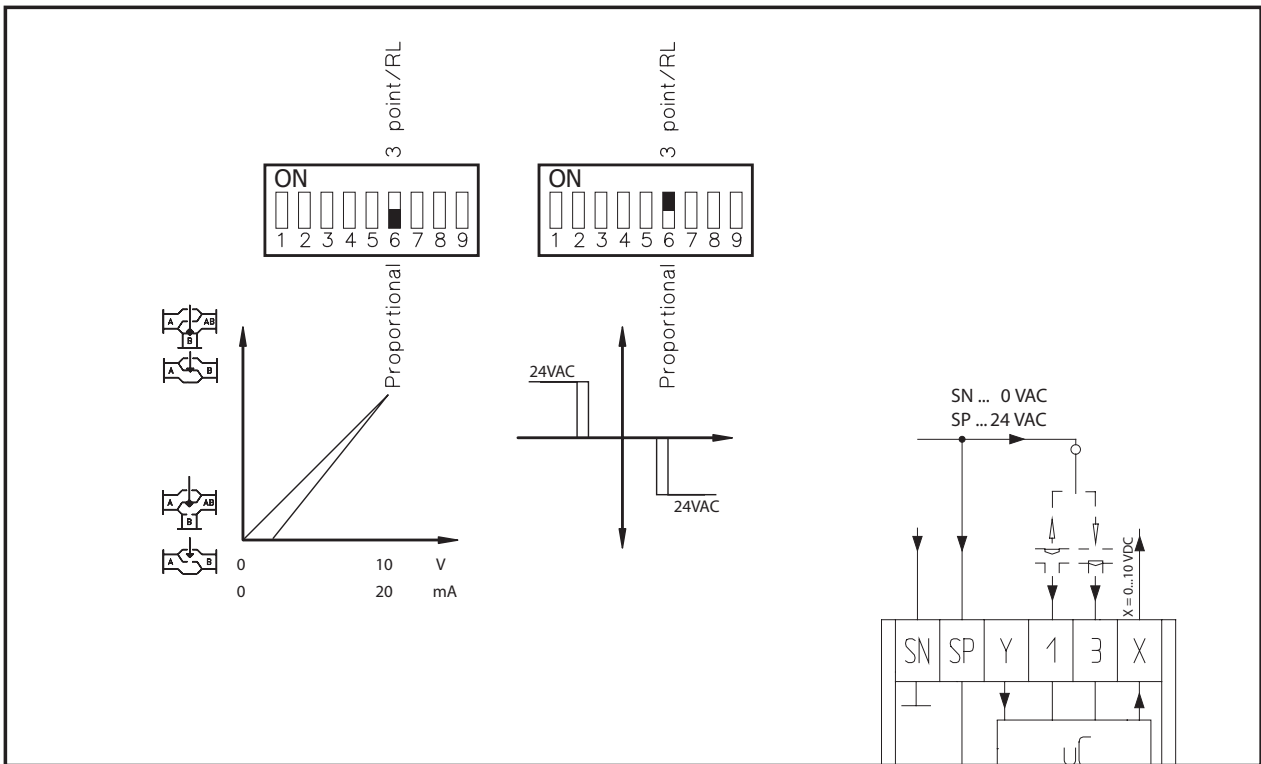


Fig. 6.7 - DIP switch setting: Switch SW6

Proportional / 3-point:

The actuator can operate as simple 3-point actuator if the 3-point function is selected. Power supply should be connected on SN and SP ports. On port 1 or 3 the 24VAC signal is connected for rising or lowering of the actuator. Return signal X indicates the correct position.

Note: If 3-point function is selected the actuator does not respond to any control signal on port Y. It only rises or lowers the spindle if power is supplied on port 1 or 3.

6.1.3.7 DIP switch SW7

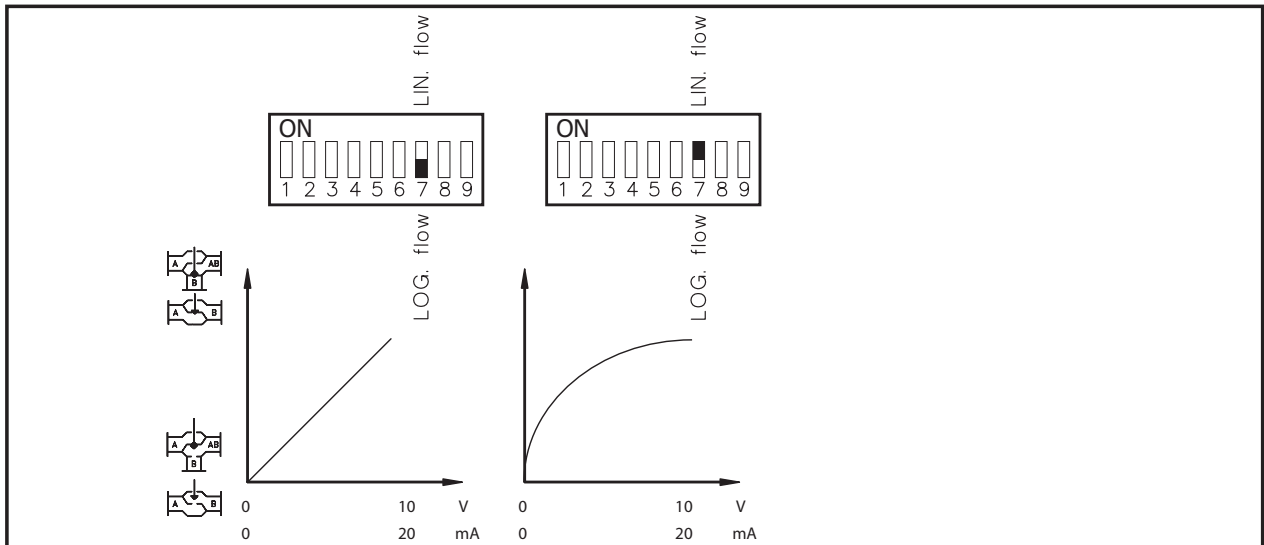


Fig. 6.8 - DIP switch setting: Switch SW7

LOG flow / LIN. flow:

Many valves that fits to the actuator have logarithmic (equal percentage) flow / position characteristic. With setting the switch to LIN. flow the characteristic of motorised valve can be affected. Combination of actuator and valve can work together as valve with LINEAR characteristic.

Factory setting:

LOG. flow (characteristic of valve is unchanged)

Note: If this function is used in combination with non-logarithmic valves, the characteristic of motorised valve will be anti-logarithm of valve's characteristic (e.g. valve with linear characteristic will be transformed to quick open characteristic).

6.1.3.8 DIP switch SW8

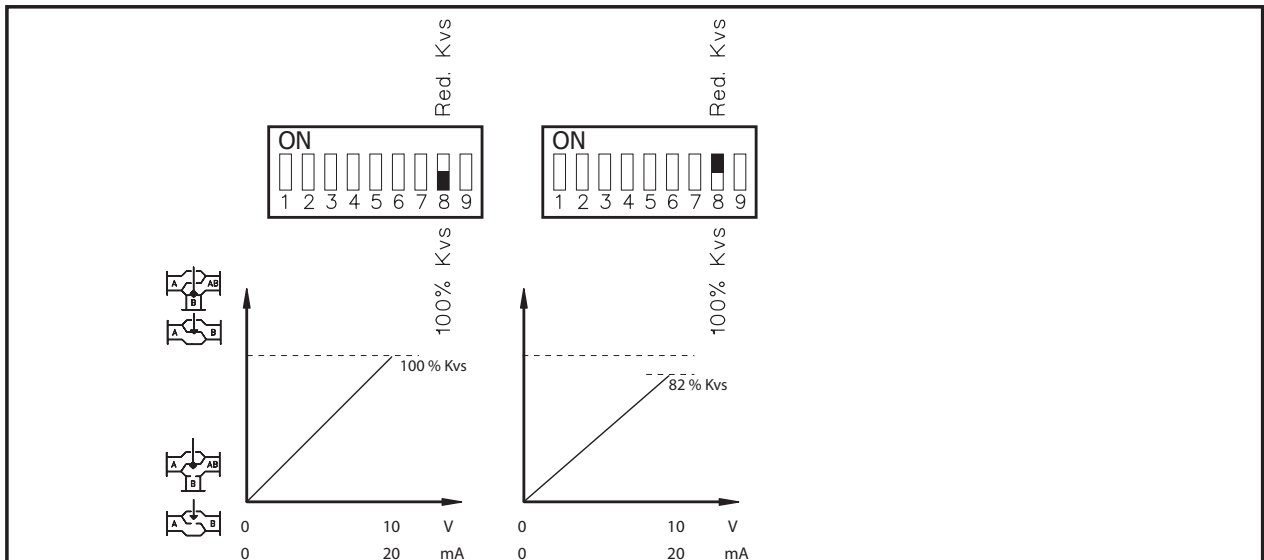


Fig. 6.9 - DIP switch setting: Switch SW8

100% Kvs / RED. Kvs:

The actuator can be set to reduce Kvs value of a valve. With setting RED. Kvs the maximal flow through of the valve is reduced for half increment towards the next smaller standard Kvs value with logarithmic characteristic. (e.g.: standard valve with Kvs 16 and function RED.Kvs causes that the motorised valves works as a valve with Kvs 13 (half way between Kvs 10 and Kvs 16).

Note: This function works proper only with logarithmic (equal percentage) valves.

Electrical installation

6.1.3.9 DIP switch SW9

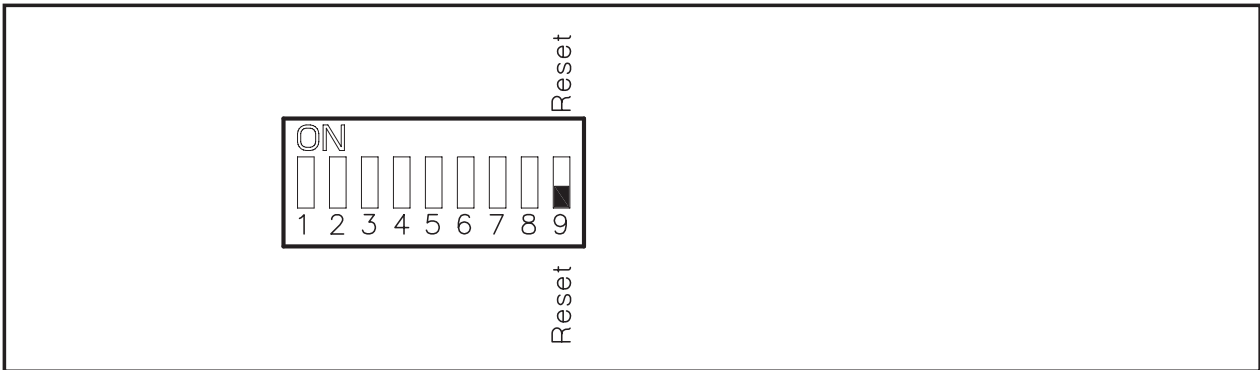


Fig. 6.10 - DIP switch setting: Switch SW9

Reset:

After the actuator has been connected to power supply the actuator will start the self adjustment procedure.

The indicator LED flashes until self adjustment is finished. The duration depends on the spindle travel on the spindle travel and will normally last a few minutes. The stroke length of the valve is stored in the memory after self adjustment has been completed. To restart self adjustment change the position of RESET switch (switch No.9). If the supply voltage is switched off or falls below 80% in more than 0,1s, the current valve position will be stored in the memory and all data remain saved in the memory also after a power supply cut-out.

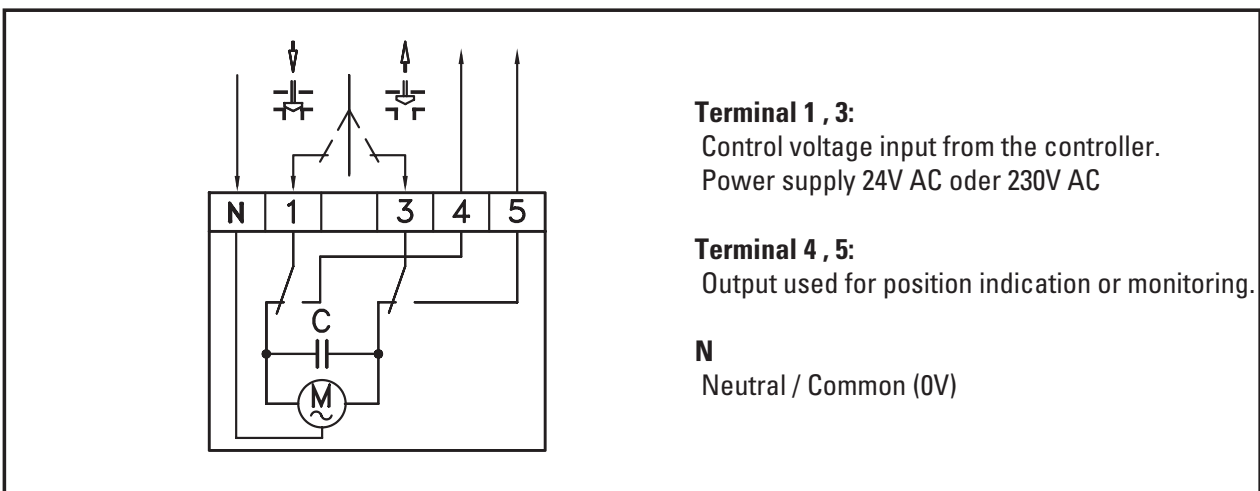
6.2 Actuators with Open- Close- Control



The actuators are available for power supply 24V AC and 230V AC.

6.2.1 Wiring

6.2.1.1 Actuator 05/06 and Actuator 15/16



Terminal 1 , 3:

Control voltage input from the controller.
Power supply 24V AC oder 230V AC

Terminal 4 , 5:

Output used for position indication or monitoring.

N

Neutral / Common (0V)

Fig. 6.11 - wiring for actuator with open-close- control: actuator 05/06 and actuator 15/16

6.2.1.2 Actuator 21 and Actuator 22/23

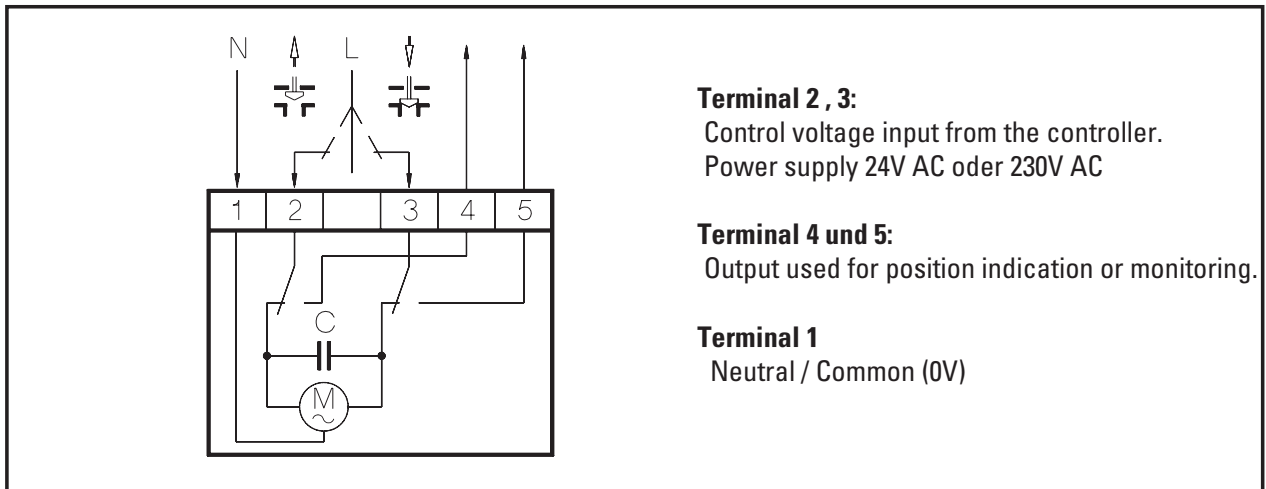


Fig. 6.12 - wiring for actuator with open-close- control: actuator 21 and actuator 22/23

6.2.1.3 Actuator 32/33

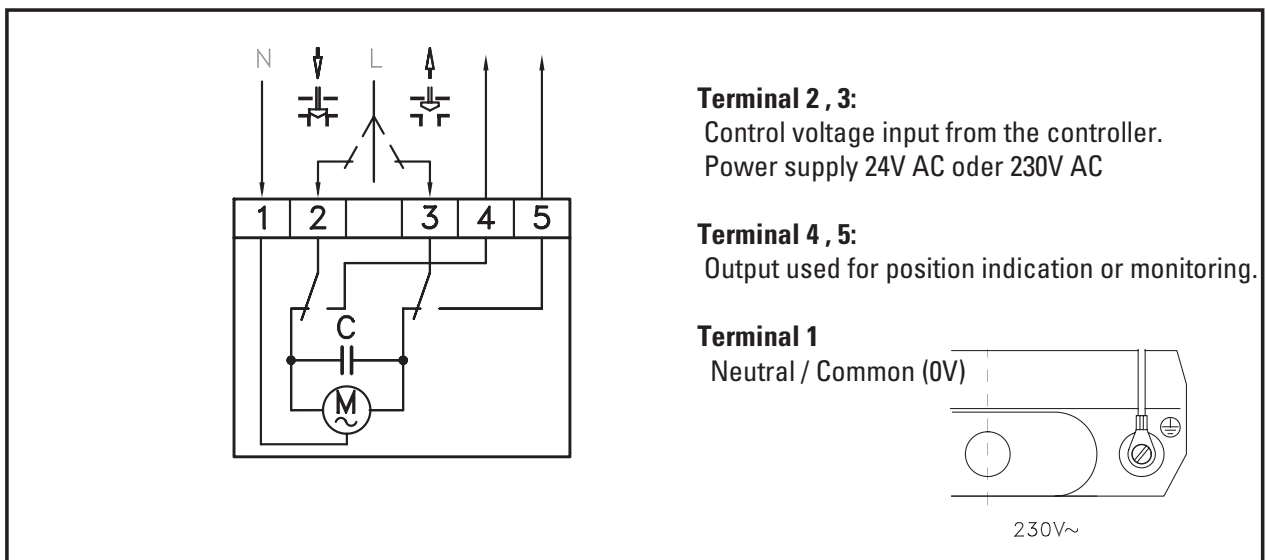


Fig. 6.13 - wiring for actuator with open-close- control: actuator 32/33

6.2.2 Commissioning



The following mechanical and electrical installation and the necessary checks and tests are to be completed in order to commission the unit.



Turn on the power supply.



Set the appropriate control signal and check the valve stem direction is correct for the application.

Manual override

7 Manual override

Before you mount / disassemble, adjust or start operating of a motor control valve you have to read the



→ safety advice

If you have not yet done this, read this important advice now and then return to this point.

7.1 Actuator 05/06

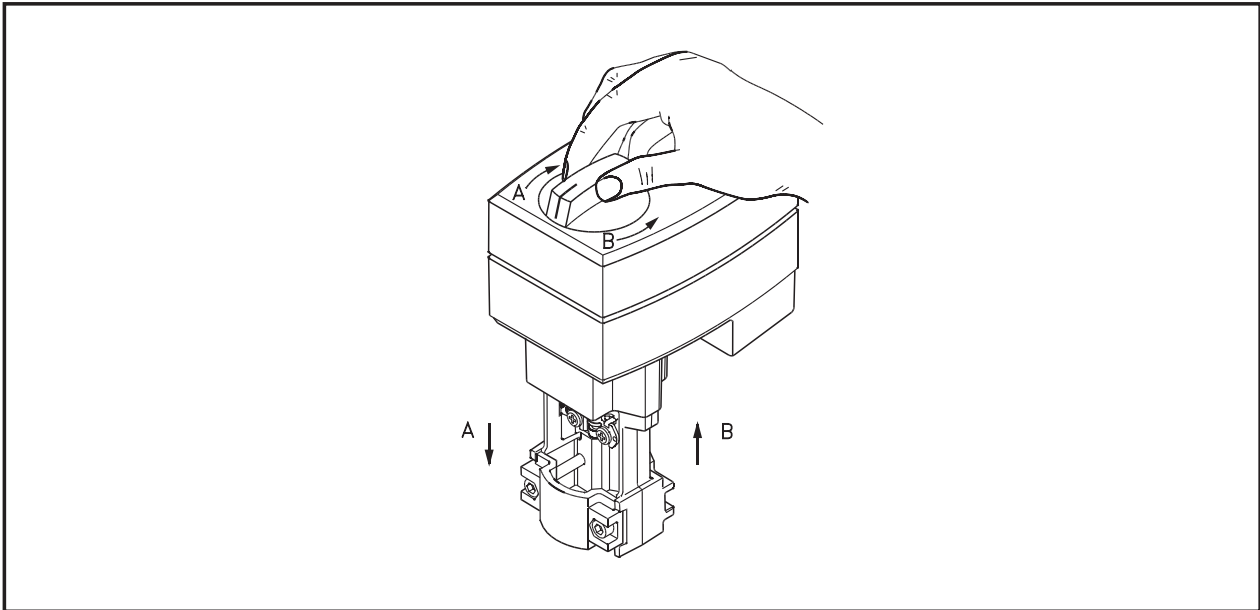


Fig. 7.1 - manual override: actuator 05/06



The manual override is achieved by turning the manual knob to the required position. Observe the direction of rotation symbol.



Disconnect the power supply.



Adjust the valve position using the control knob.



Set valve to closed position.



Restore the power supply.



Please observe:

If manual override has been used then X and Y signal are not correct until the actuator reaches its end position.

7.2 Actuator 15/16

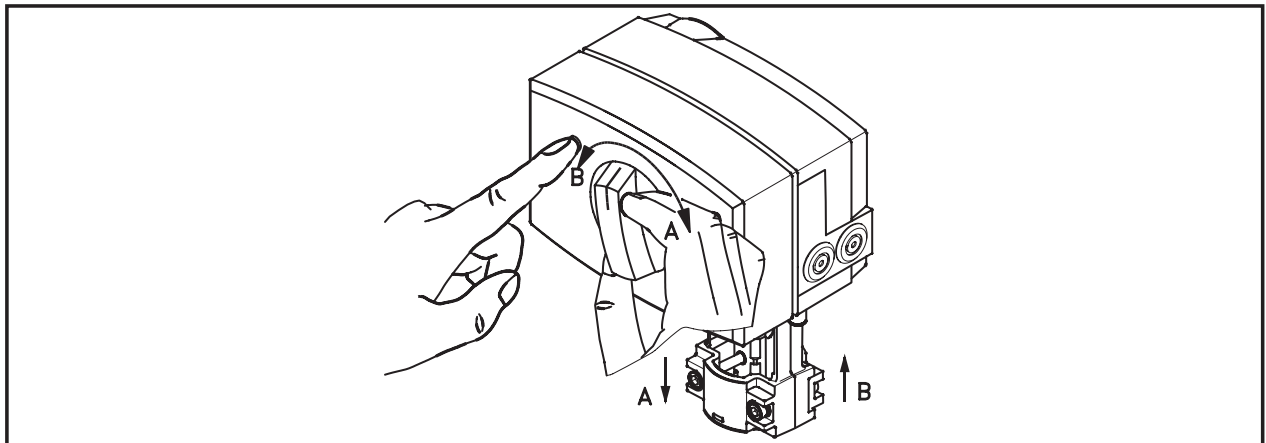


Fig. 7.2 - manual override: actuator 15/16



The manual override is achieved by turning the manual knob to the required position. Observe the direction of rotation symbol.



Disconnect the power supply.



Press rubber button.



Adjust the valve position using the control knob.



Set valve to closed position.



Restore the power supply.



Please observe:

If manual override has been used then X and Y signal are not correct until the actuator reaches its end position.

7.3 Actuator 21/22/23

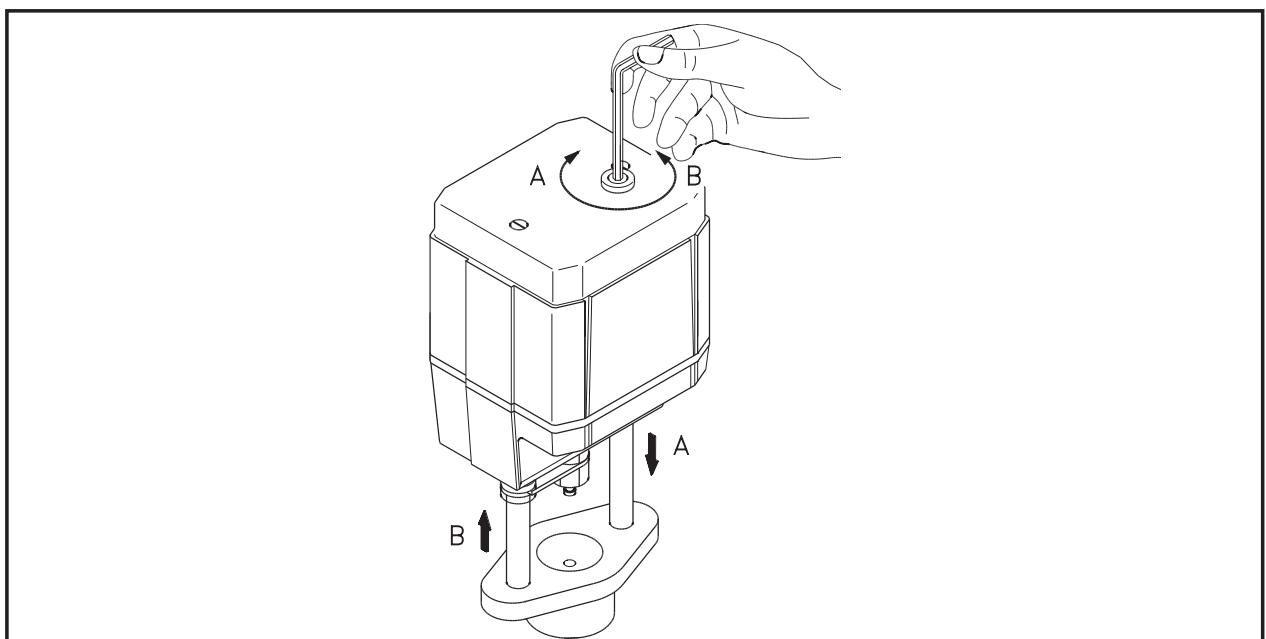


Fig. 7.3 - manual override: actuator 21/22/23

Manual override



The manual override is applied by rotating a Allen key to the required position. Observe the direction of the rotation symbol.



Disconnect the power supply.



Adjust valve position by using a Allen key.



Set valve to closed position.



Restore the power supply.



Please observe:

If manual override has been used then X and Y signal are not correct until the actuator reaches its end position.

7.4 Actuator 32/34

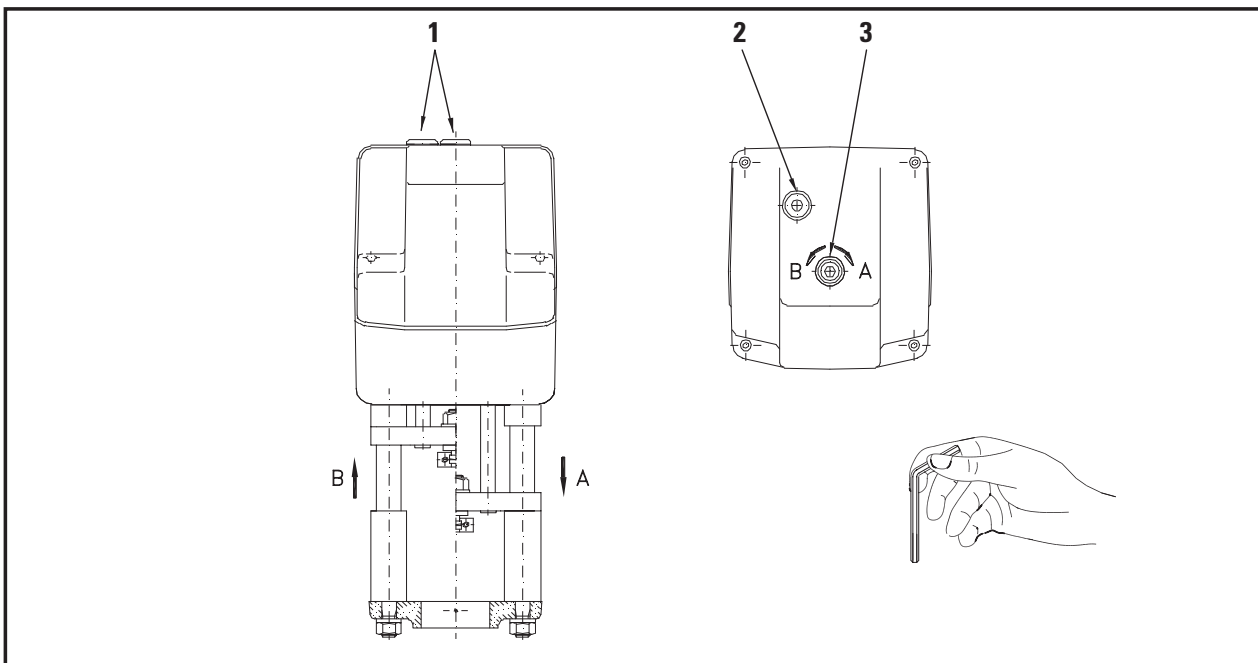


Fig. 7.4 - manual override: actuator 32/34



The manual override is applied by rotating a Allen key to the required position. Observe the direction of the rotation symbol.



Disconnect the power supply.



Remove the grommets (1) and push the button (2).



Adjust valve position by using a Allen key (3).



Set valve to closed position.



Restore the power supply.



Please observe:

If manual override has been used then X and Y signal are not correct until the actuator reaches its end position.

8 Description of the actuators

Which actuator is working on your motor control valve, you can see by the article number of the motor control valve. You will find the code number of the actuator at the following places:

- Motor control valve NA / NK : 7.+8. digit of the article number
example: NA33012**1**015 = actuator 21
- Motor control valve MA / MK : 6.+7. digit of the article number
Beispiel: MA672**1**5020 = actuator 15
- Motor control valve ETAG / ETKG : 11.+12. digit of the article number
Beispiel: ETAG2D21xx**2**1020 = actuator 21

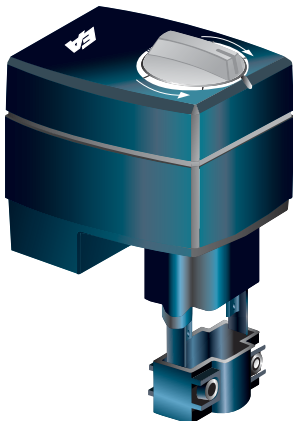


A 'X' as preface to the type of the motor control valve mentions a special variant of it. The 'X' do not take into consideration by deciding the type of the actuator.

All actuators will be available with a continuous control or open-close-control.

8.1 Actuator type 05/06

8.1.1 Technical data



| type | 05 | 06 | 05 | 06 |
|-------------------------|--|-----------|------------------------------------|-----------|
| | continuous control | | open-close-control | |
| Power supply | 24V AC (+10%/ -15%) | | 24V AC od. 230V AC (+10%/ -15%) | |
| Power consumption | 4 VA | 4 VA | 2,15 VA | 2,15 VA |
| Frequency | 50 Hz | 50Hz | 50Hz | 50Hz |
| Input signal Y | 0 -10 V (2 - 10 V) Ri = 24 kΩ 0-20 mA (4 - 20 mA) Ri = 500Ω | | 3-point | |
| Output signal X | 0 -10 V (2 - 10 V) | | - | - |
| Force | 300 N | 500 N | 300 N | 500 N |
| Speed | 7 s/mm | 11 s/mm | 7 s/mm | 11 s/mm |
| Max. stroke | 15 mm | 15 mm | 15 mm | 15mm |
| Max. medium temperature | 150 °C | 150 °C | 150 °C | 150 °C |
| Ambient temperature | 0 - 55 °C | 0 - 55 °C | 0 - 55 °C | 0 - 55 °C |
| Protection class | IP 54 | IP 54 | IP 54 | IP 54 |
| Weight | 0,80 kg | 0,80 kg | 0,70 kg | 0,70 kg |

CE-marking in accordance with the standards:

89/336/EEC
92/31/EEC
93/68/EEC
EN 50081-1
EN 50082-2

Description of the Actuators

8.1.2 Demension

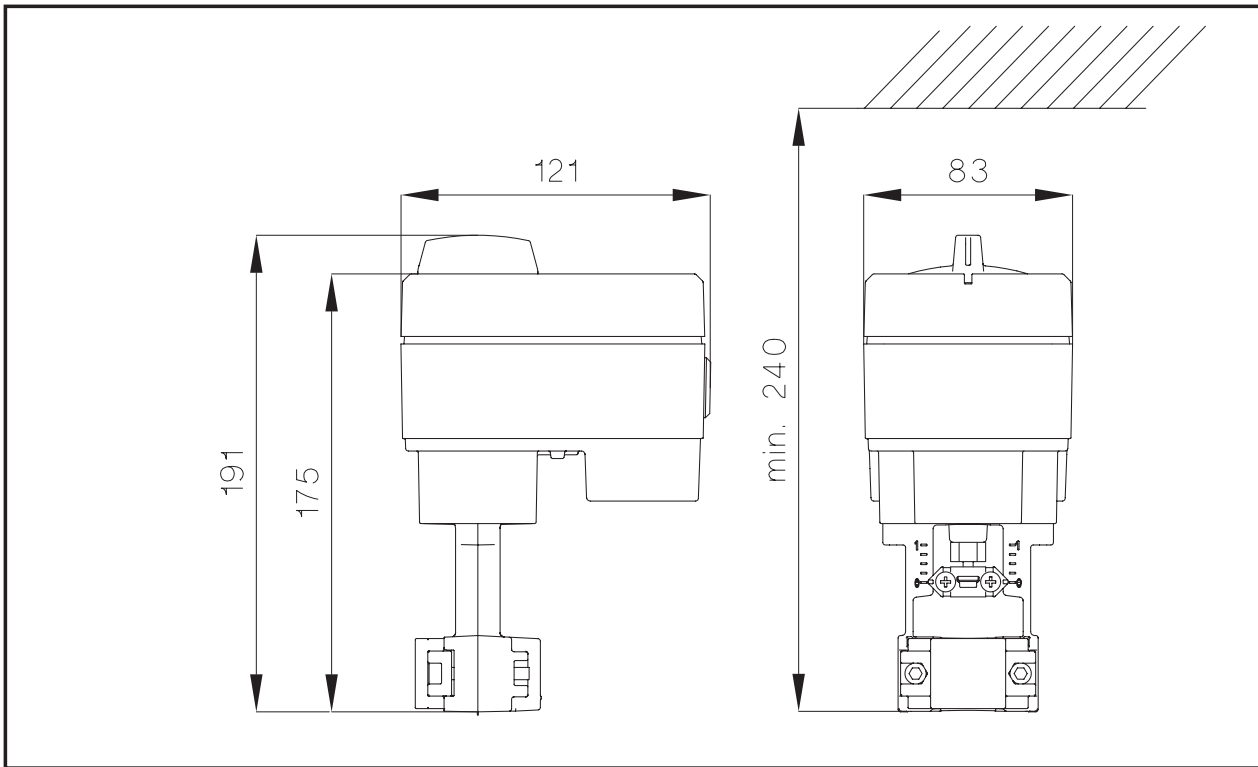


Fig. 8.1 - description of the actuators: demension actuator 05/06

8.1.3 Installation

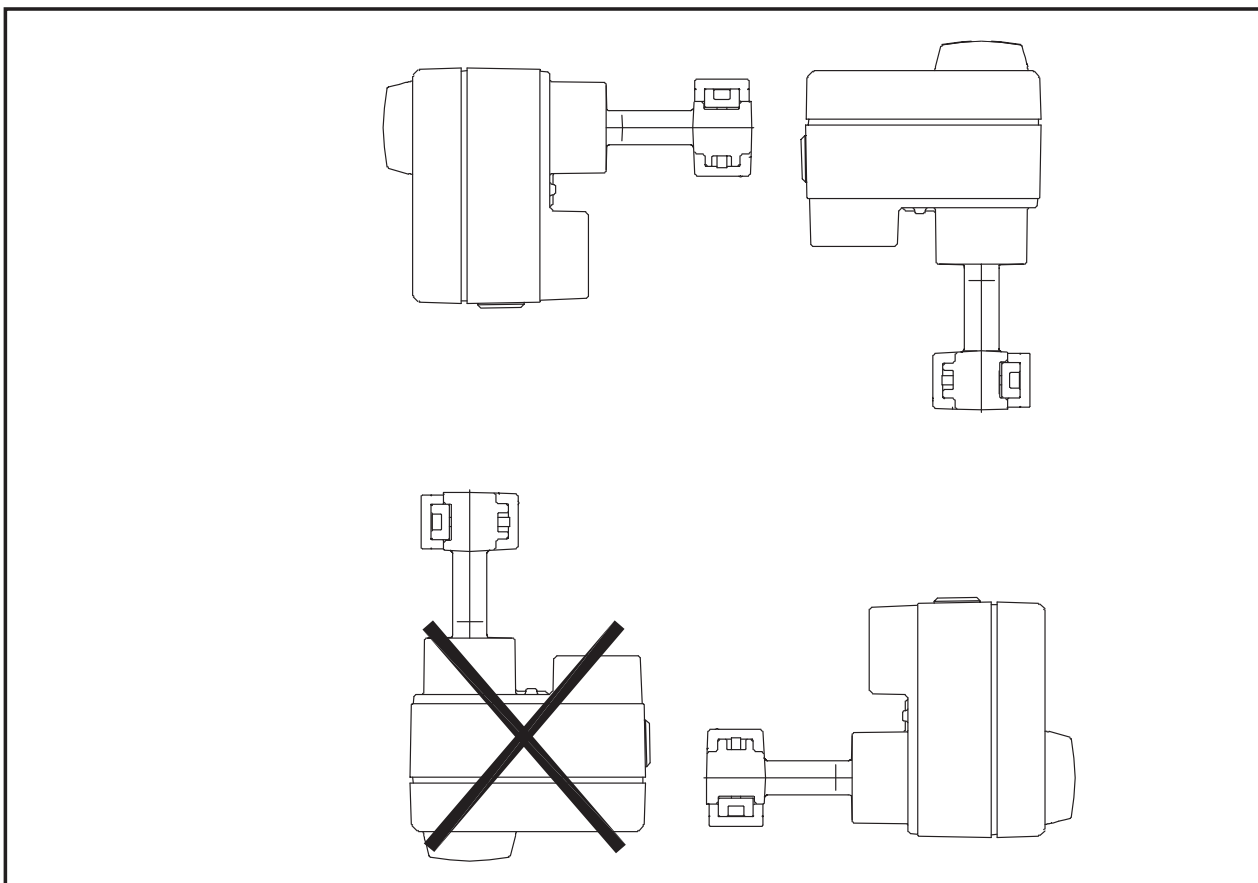


Fig. 8.2 - description of the actuators: Installation actuator 05/06

8.2 Actuator type 15/16

8.2.1 Technical data



| Type | 15 | 16 | 15 | 16 |
|-------------------------------|---|-----------|------------------------------------|-----------|
| | continuous control | | open-close control | |
| Power supply | 24V AC (+10%/ -15%) | | 24V AC od. 230V AC (+10%/ -15%) | |
| Power consumption | 9 VA | 4 VA | 7 VA | 2,15 VA |
| Frequency | 50 Hz | 50Hz | 50Hz | 50Hz |
| Input signal Y | 0 - 10 V (2 - 10 V) Ri = 24 kΩ 0-20 mA (4 - 20 mA) Ri = 500Ω | | 3-point | |
| Output signal X | 0 - 10 V (2 - 10 V) | | - | - |
| Force | 600 N | 1000 N | 600 N | 1000 N |
| Speed | 3 s/mm | 11 s/mm | 3 s/mm | 11 s/mm |
| Max. stroke | 15 mm | 15 mm | 15 mm | 15mm |
| Max.medium temperature | 150 °C | 150 °C | 150 °C | 150 °C |
| Ambient temperature | 0 - 55 °C | 0 - 55 °C | 0 - 55 °C | 0 - 55 °C |
| Protection class | IP 54 | IP 54 | IP 54 | IP 54 |
| Weight | 1,70 kg | 1,70 kg | 1,55 kg | 1,55 kg |

CE-marking in accordance with the standards:

89/336/EEC
92/31/EEC
93/68/EEC
EN 50081-1
EN 50082-2

Description of the Actuators

8.2.2 Demension

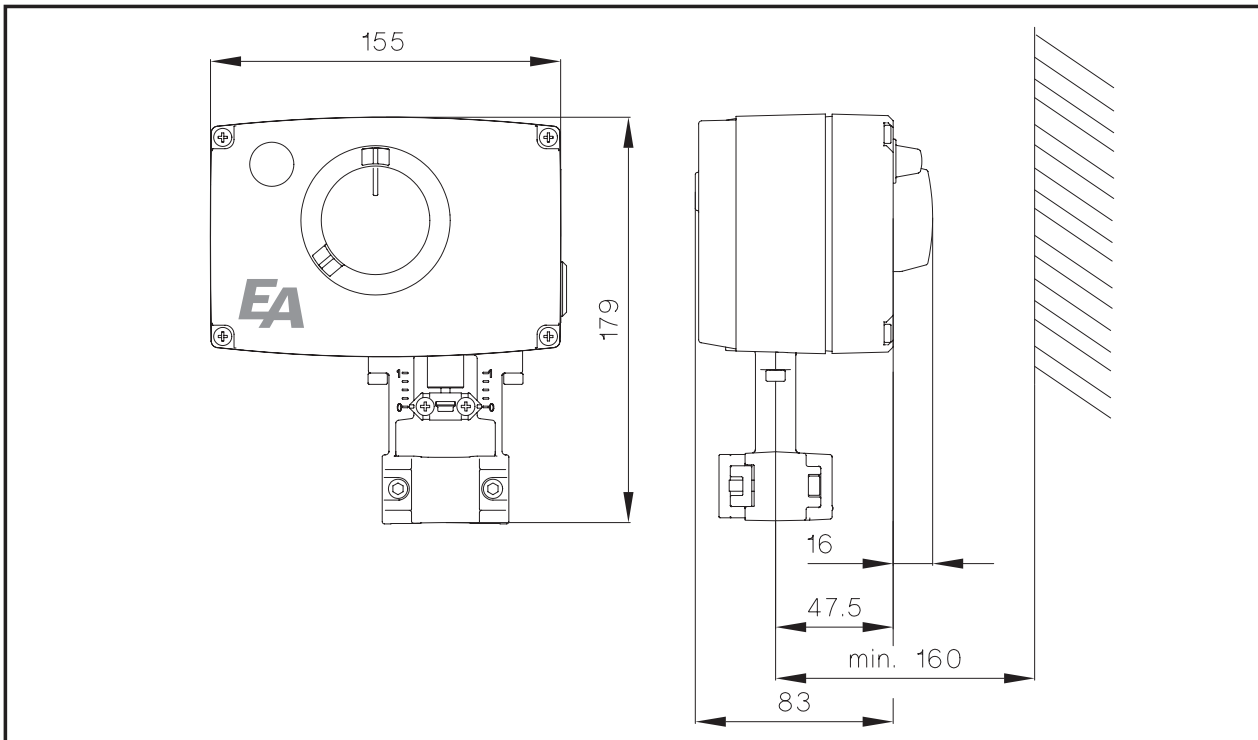


Fig. 8.3 - description of the actuators: demension actuator 15/16

8.2.3 Installation

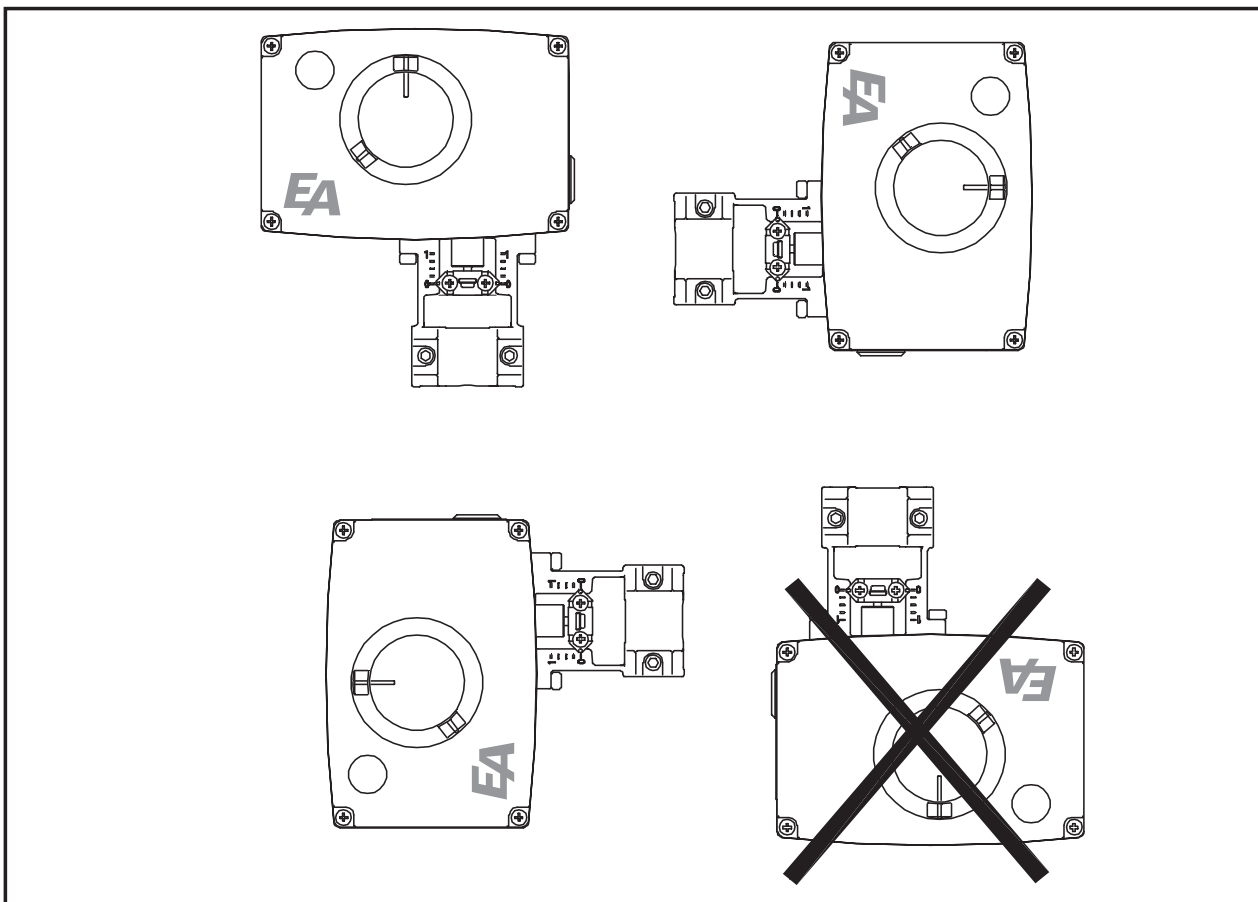


Fig. 8.4 - description of the actuators: installation actuator 15/16

8.3 Actuator type 22/23

8.3.1 Technical data



| Type | 22 | 23 | 22 | 23 |
|--------------------------------|---|-----------|------------------------------------|-----------|
| | continuous control | | open-close control | |
| Power supply | 24V AC (+10%/ -15%) | | 24V AC od. 230V AC (+10%/ -15%) | |
| Power consumption | 19,5 VA | 9 VA | 9 VA | 7 VA |
| Frequency | 50 Hz | 50Hz | 50Hz | 50Hz |
| Input signal Y | 0 - 10 V (2 - 10 V) Ri = 24 kΩ 0-20 mA (4 - 20 mA) Ri = 500Ω | | 3-point | |
| Output signal X | 0 - 10 V (2 - 10 V) | | - | - |
| Force | 1500 N | 2000 N | 1500 N | 2000 N |
| Speed | 4 s/mm | 8 s/mm | 4 s/mm | 8 s/mm |
| Max. stroke | 40 mm | 40 mm | 40 mm | 40mm |
| Max. medium temperature | 200 °C | 200 °C | 200 °C | 200 °C |
| Ambient temperature | 0 - 50 °C | 0 - 50 °C | 0 - 50 °C | 0 - 50 °C |
| Protection code | IP 54 | IP 54 | IP 54 | IP 54 |
| Weight | 3,80 kg | 3,80 kg | 3,80 kg | 3,80 kg |

CE-marking in accordance with the standards:

89/336/EEC
92/31/EEC
93/68/EEC
EN 50081-1
EN 50082-2

Description of the Actuator

8.3.2 Dimensions

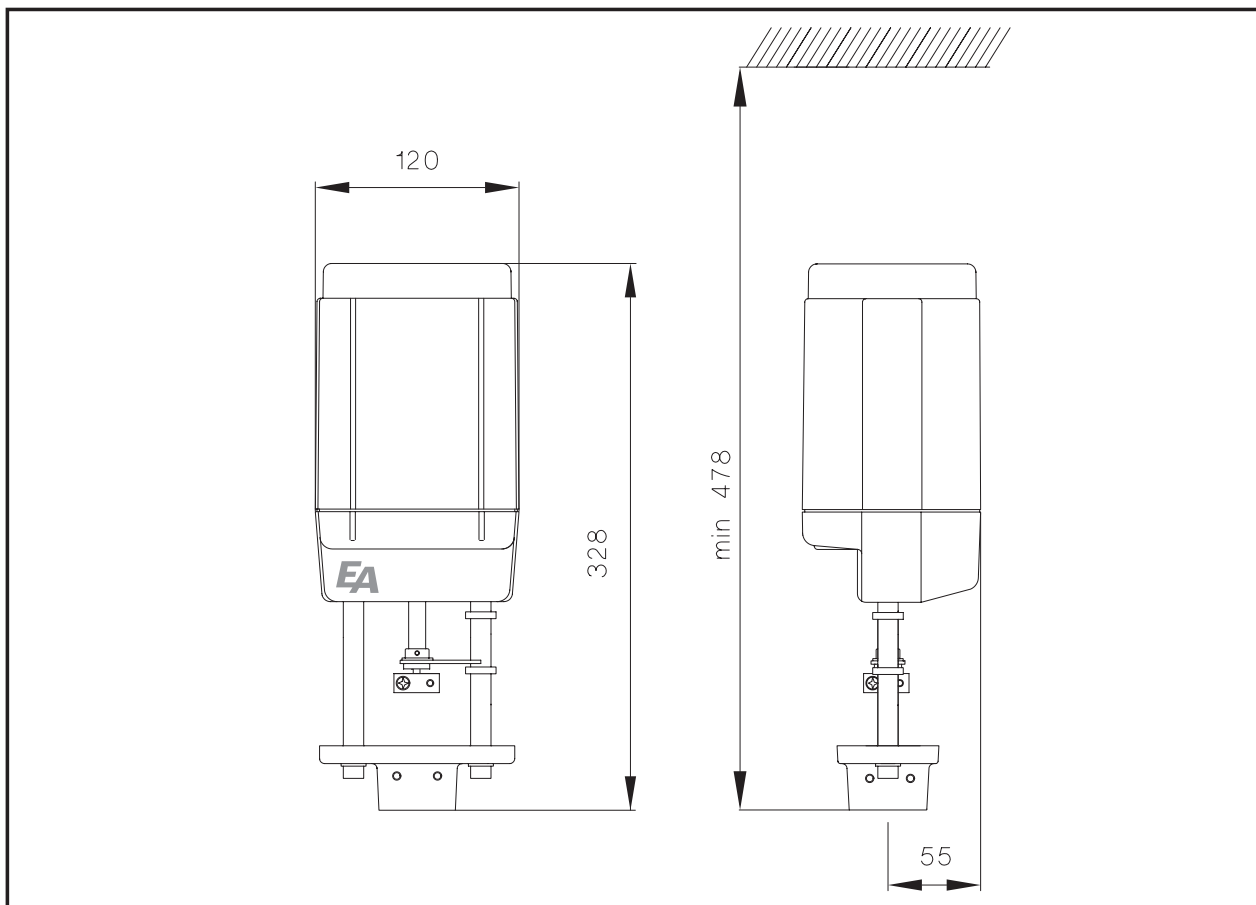


Fig. 8.5 - description of the actuators: dimension actuator 22/23

8.3.3 Installation

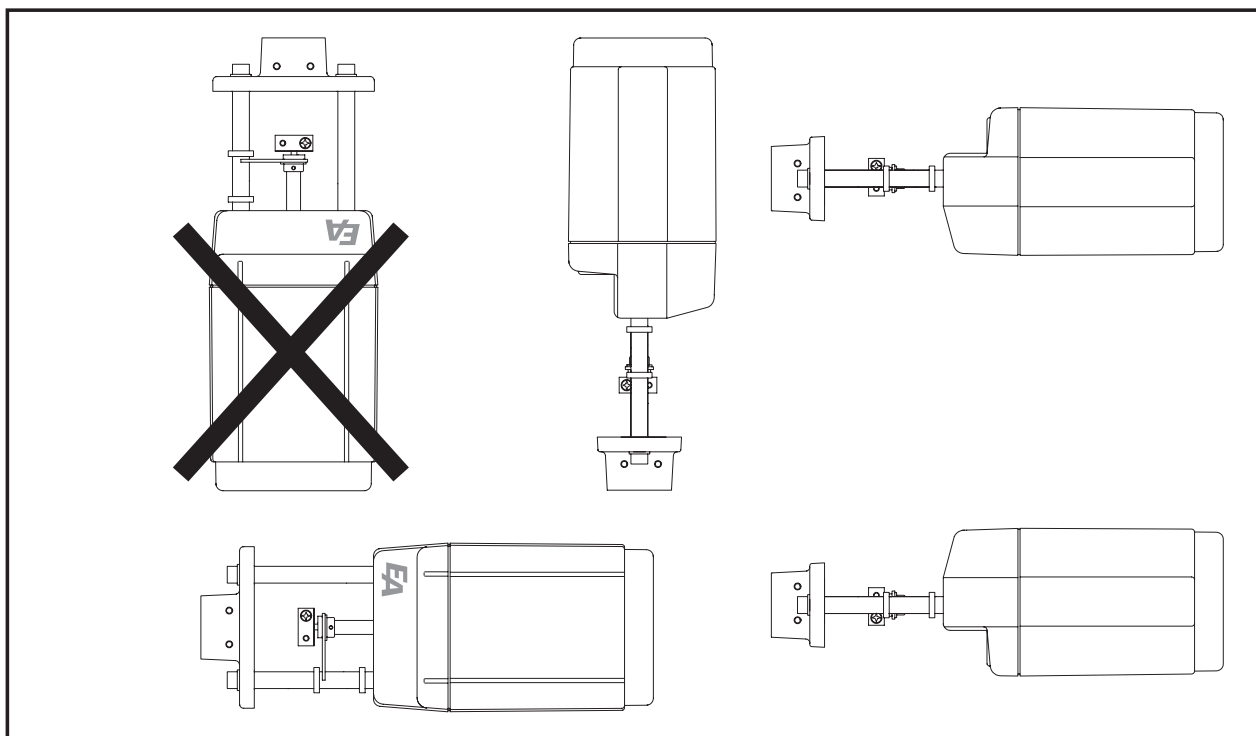
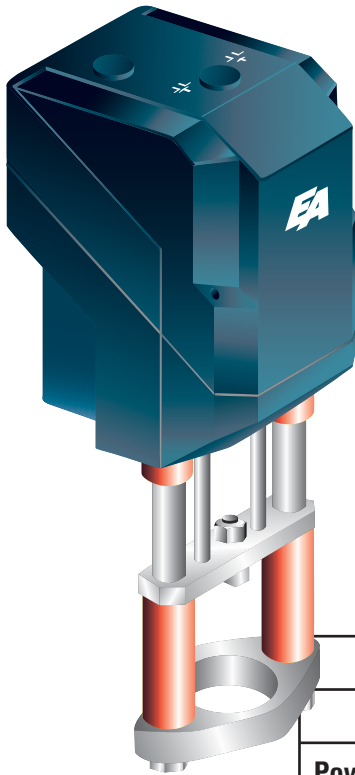


Fig. 8.6 - description of the actuator: Installation actuator 22/23

8.4 Actuator Type 32/34

8.4.1 Technical data



| Type | 32 | 34 | 32 | 34 |
|--------------------------------|--|-----------|------------------------------------|-----------|
| | continuous control | | open-close control | |
| Power supply | 24V AC (+10%/ -15%) | | 24V AC od. 230V AC (+10%/ -15%) | |
| Power consumption | 25 VA | 12,5 VA | 23 VA | 10,5 VA |
| Frequency | 50 Hz | 50Hz | 50Hz | 50Hz |
| Input signal Y | 0 - 10 V (2 - 10 V) Ri = 24kΩ 0-20 mA (4 - 20 mA) Ri = 500Ω | | 3-point | |
| Output signal X | 0 - 10 V (2 - 10 V) | | - | - |
| Force | 5000 N | 5000 N | 5000 N | 5000 N |
| Speed | 3 s/mm | 8 s/mm | 3 s/mm | 8 s/mm |
| Max. stroke | 40 mm | 40 mm | 40 mm | 40mm |
| Max. medium temperature | 200 °C | 200 °C | 200 °C | 200 °C |
| Ambient temperature | 0 - 55 °C | 0 - 55 °C | 0 - 55 °C | 0 - 55 °C |
| Protection code | IP 44 | IP 44 | IP 44 | IP 44 |
| Weight | 10,00 kg | 9,80 kg | 10,00 kg | 9,80 kg |

CE-marking in accordance with the standards:

89/336/EEC
92/31/EEC
93/68/EEC
EN 50081-1
EN 50082-2

Description of the Actuators

8.4.2 Dimensions

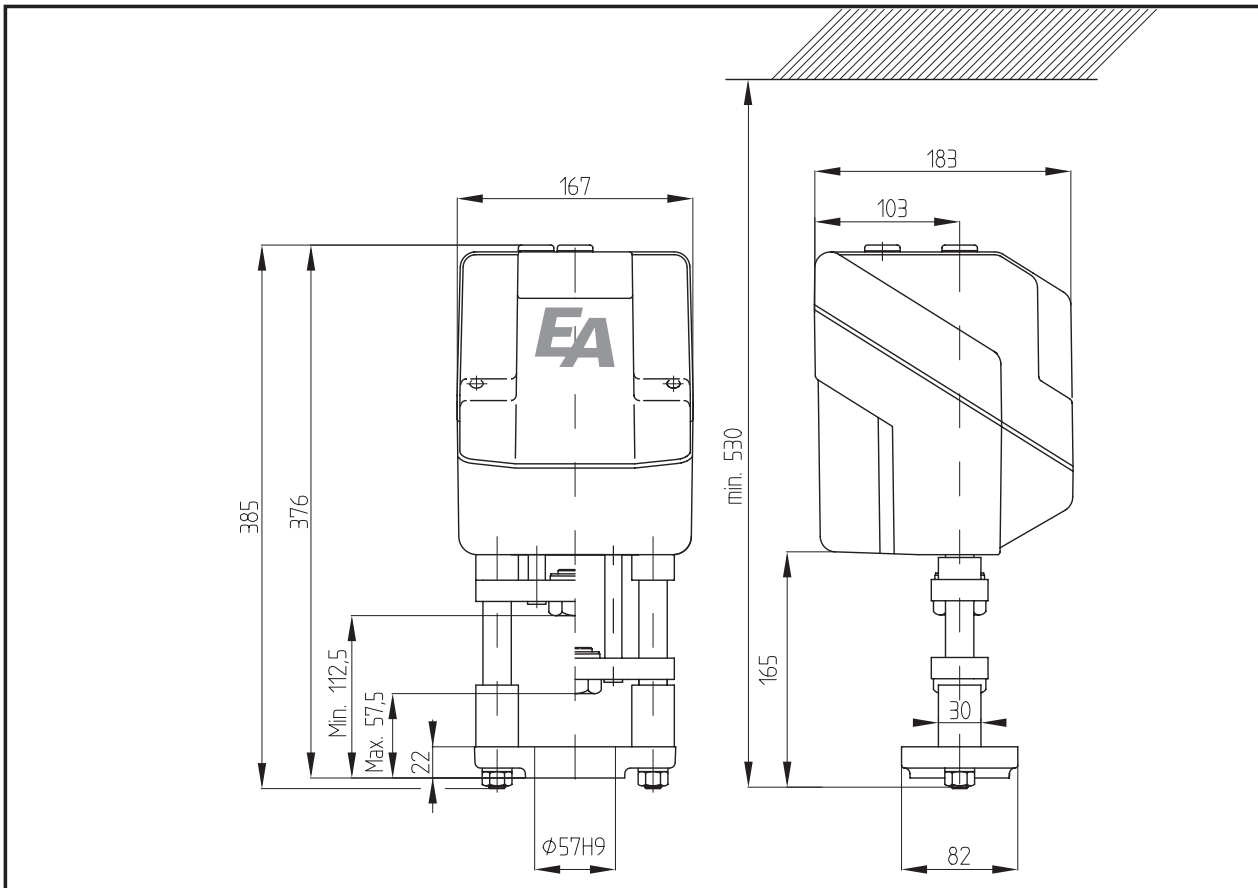


Fig. 8.7 - description of the actuators: dimensions actuator 32/34

8.4.3 Installation

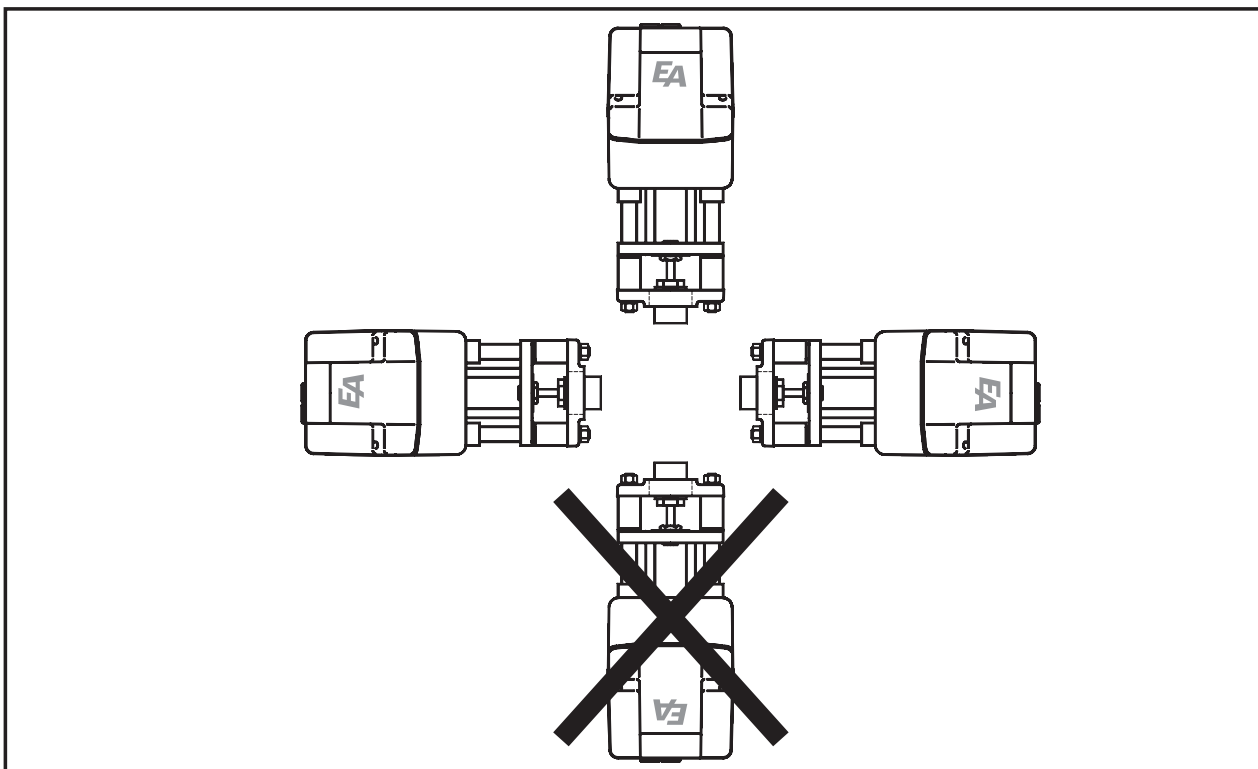


Fig. 8.8 - description of the actuators: installation actuator 32/34

8.5 Actuator Type 21

8.5.1 Technical data



| Type | 21 | 21 |
|--------------------------------|--|-----------------------------------|
| | continuous control | open-close-control |
| Power supply | 24V AC (+10%/ -15%) | 24V AC or 230V AC (+10%/ -15%) |
| Power consumption | 9 VA | 7 VA |
| Frequency | 50 Hz | 50Hz |
| Input signal Y | 0 - 10 V (2 - 10 V) Ri = 24kΩ 0-20 mA (4 - 20 mA) Ri = 500Ω | 3-point |
| Output signal X | 0 - 10 V (2 - 10 V) | - |
| Force | 1500 N | 1500 N |
| Speed | 4 s/mm | 4 s/mm |
| Max. stroke | 40 mm | 40 mm |
| Max. medium temperature | 200 °C | 200 °C |
| Ambient temperature | 0 - 50 °C | 0 - 50 °C |
| Protection code | IP 54 | IP 54 |
| Weight | 3,8 kg | 3,8 |

CE-marking in accordance with the standards:

89/336/EEC
92/31/EEC
93/68/EEC
EN 50081-1
EN 50082-2

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