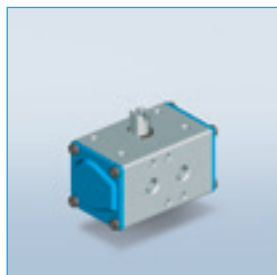




bar

actubar[®]
The intelligent actuator



Operating, mounting and adjusting instruction

Safety Instructions:



Read these instructions carefully and keep them near to the device. Read, understand and follow the safety instructions.

Manufacturer:

bar pneumatische

Steuerungssysteme GmbH

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Operating instruction

Pneumatic actuator actubar®

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1 In General

These operating instructions are an integral part of the device. The operating instructions have to be kept with the device for the whole of its service life.

If there is a change of owner, then the operating instructions have to be handed over with the device.

In addition to these operating instructions, all generally valid, legal and other regulation and other relevant legislation – even in the operator's country – as well as valid environmental stipulations have to be adhered to!

Locally valid stipulations from the trade organisation or other governing bodies are always to be adhered to!

1.1 Reference Documents

These instructions, the so-called data and layout sheets, additional assembly and maintenance instructions as well as further information and advice – even in other languages – are available from:

bar pneumatische Steuerungssysteme GmbH

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1.2 General Safety Instructions

The below-listed safety and danger notices in this document are there for your protection, the protection of others and lastly to protect the product. This is reason enough to make sure you understand and practice everything in these instructions.

1.2.1 Signal Words and Symbols

DANGER!



Non-adherence to these instructions will result in irreversible injury to persons, and in some cases death.

WARNING!



Non-adherence to these instructions can result in injury to persons and/or damage to machinery i.e. the environment.

ATTENTION!



Non-adherence to these instructions can result in damage to machinery and/or damage to the environment.

Operating instruction

Pneumatic actuator actubar®

1 In General

1.2.2 Description of the structure of safety instructions for example DANGER:

DANGER!



Source of Danger
Result of Danger
Remedy



Notes give you helpful tips as well as additional information about the device. Notice text contains no safety-relevant content.

1.2.3 Operational Conditions

- Operational conditions, especially deployment limits are to be found in chapter 14.
- For reasons of safety and certification (CE) self-made moderations and/or changes to the device are not permitted.

1.2.4 Owner/Operator Responsibility

- Assembly, electrical and pneumatic connection as well as commissioning of the device may only be carried out by suitably qualified skilled persons and exactly according to the instructions laid down in these operating instructions.
- The device may only be operated by and maintained by persons who have rea-

ched the minimum legal age to operate such devices.

- These operating instructions are an integral part of the device and must be permanently available to operating personnel. Read these instructions before initially commissioning the device.
- Operating and maintenance persons are to be informed safety facilities for the device as well as about safe working methods.
- The device may only be operated in a perfectly operational condition. Safety facilities must not be removed i.e. deactivated.

1.2.5 Personnel

Operating personnel are persons, who are responsible for operating and cleaning the device. Operating personnel are obliged to take note of and adhere to the following points:

- The listed safety measures contained in the operating instructions are to be adhered to in all forms of work!
- All work in whatever form which can hinder safety, is forbidden!
- It is best to wear close-fitting clothes. The wearing of personal jewelry, such as chains and rings is forbidden!
- Make sure that only suitable authorized persons have access to danger zones!
- Changes to the device in whatever form which endanger the safety of the device,

1 In General

are to be registered at the owner/operator!

Skilled persons are persons with specialised training in electrical/electronic engineering and mechanics. These are the persons to be responsible for installation, care, maintenance and device settings. Skilled persons, due to their skilled training, knowledge and experience, as well as their knowledge of the corresponding stipulations can take decisions regarding the necessary working practices and recognise possible dangers. Skilled persons are obliged to adhere to the following points:

- The listed safety measures contained in the operating instructions are to be adhered to in all forms of work!
- Repair and maintenance work: all protective covers which were removed before working, have to be replaced before recommissioning!

1.2.6 Electrical equipment

Work on the electrical equipment of the device may only be carried out by skilled persons or by instructed persons under the control and supervision of skilled persons and in accordance with electro-technical regulations.

1.2.7 Deployment in Ex-protected areas

DANGER!



In Ex-protected areas, install the automatic valve in the pipework with conductive electro-potential connection on the side of the equipment.

In Ex-protected areas, it could be necessary to install protection against direct sunlight, in order to protect the surface from possible overheating effects of direct sunlight.

DANGER!



In Ex-protected areas the following has to be observed: Take special care in the combination with Ex-certified products, especially in the

selection of pneumatic valves and the positioners.

When working in Ex-areas: do not make sparks with tools.

Deployment in Ex-protected areas: avoid the formation of dust layers (layers > 5 mm) by sweeping-off the dust or the use of vacuum cleaners.

In Ex-protected areas: do not look for leaks with ultra-sonic devices.

1 In General

1.3 Product Information

1.3.1 Product and Functional Description

The pneumatic actuator actubar® is driven on the principle of compressed air with a rack and pinion. The range of pivoting angle amounts to 90°, 120° or 180° and both end positions can be set (0° and 90°) von +5° to -10° during production in the factory.

An optical positioner for the automatic valve is a standard accessory.

As option, the automatic valve can be fitted with control valves, end position indicators and positioners. Please refer to the product catalog from bar GmbH.

Mounting, pneumatic connection and commissioning of the actuator / automatic valve may only be carried out by qualified skilled persons and exactly in accordance with the instructions laid down in these operating instructions.

1.3.2 Interfaces for the whole system

- Pneumatic interface for the actuator acc. to VDI/VDE 3845 (Nimur)
- Interface to the end position indicators as well as positioners acc. to VDI/VDE 3845 (Nimur)
- Interface valve side acc. to EN ISO 5211

1.3.3 Scope of Delivery/Transport Damage

- Pneumatic actuator actubar®

At the time of delivery, the following points must be checked:

- Are the numbers of transport boxes the same as on the delivery note?
- Is the packaging free from visible signs of damage?
- Are the device and accessories free from visible signs of damage?
- Are there any signs of incorrect handling during transport (e.g. burns, scratches, paint)?

To be able to present all claims against the transport companies, you should document all possible transport damage (e.g. with photographs and a written report), before you unpack the unit.

bar GmbH is not responsible for transport damage and accepts thereby no liability.

1 In General

1.3.4 Transport, Packaging and Storage

ATTENTION!



Danger of damage to the device. Should lifting material be needed for transport, then it must be applied so that the device does not get damaged. If lifting material is attached to the actuator, then it is to be used for transporting the actuator and not for the compound device as a whole.

The device must be handled, transported and stored carefully:

- The manufacturer carries no liability for transport inside the premises of the customer or to the singly deployment locations.
- The device should be transported in its original packaging i.e. on a pallet (or supported accordingly) to the point of deployment and then taken out of the packaging just before installation.
- Correct disposal of the packaging lies with the customer.
- When storing before installation, the devices are to be stored in a closed room and be protected against damaging influences such as dirt or moisture.
- Devices are to be stored in their original packaging and protective cover if so required.

2 Safety

2.1 General Safety Instructions

Local regulations for safety and prevention of accidents in all cases are valid for installation, operation and care and maintenance of the products!

2.2 State of the Art

This product from bar GmbH has been constructed according to the state of the art and recognised safety-related technical regulations. However, under certain circumstances there could be a danger to life and limb of the user or 3rd parties i.e. possible damage to machine/valve and other property, if:

- the product is not used in accordance with the designated use,
- the product is used or maintained by unauthorized persons,
- the product is changed without prior permission or modernized and/or
- the safety instructions are not adhered to.

Therefore, every person, who is entrusted with the assembly, operation, inspection, care and maintenance and repair, has to have read, understood and complied with the complete operating instructions and especially the safety instructions.

Operating instruction

Pneumatic actuator actubar®

2 Safety

2.3 Operation for Deployment

This product may only be put to use when:

- in technically perfect condition,
- in accordance with its designated use,
- functioning safely and safety-consciously acc. to operating instructions and
- when all safety facilities are available and functioning.

Faults/malfunctions especially, which can endanger safety, are to be eradicated!

2.4 Organisational Measures

2.4.1 Keeping the Operating Instructions

Operating instructions must be kept in an easily accessible place.

2.4.2 Additional Regulations

In addition to these operating instructions, generally valid legal and other safety-related regulations for the prevention and avoidance of accidents have to be adhered to! Do not forget to inform and warn the operating persons accordingly!

2.4.3 Controls

Awareness of safety and dangerous working practices by personnel operating under adherence to the operating instructions is to be controlled regularly.

2.4.4 Protective equipment

When necessary, protective equipment is to be used.

2.4.5 Alterations or Changes to the Valve

Do not make alterations or changes to the valve which could possibly hinder the safety of the valve.

2.4.6 Exchange of Faulty Components

Components from the ball valve or actuator, which are not in a faultless condition, are to be exchanged immediately with original spare parts. Use only original spares and consumables from bar GmbH!

If non-original parts are used, then there is no guarantee that they are designed and constructed to meet the performance of the device.

2.4.7 Personnel Selection and Qualification

Operation, care and maintenance and repair require specialist knowledge and may only be carried out by suitably trained persons who are authorized by the owner/operator.

2 Safety

2.5 Designated Use



All usage that is not specifically designated by the manufacturer is seen as non-designated use!

The manufacturer is neither responsible nor liable for damage resulting from non-designated use! Do not forget that designated use also includes adherence to the stipulations laid down by the manufacturer relating to the operation, care and maintenance and repair measures!

2.5.1 Pneumatic actuator actubar®

The product is suitable for deployment in process-related technical equipment for the following applications:

- Shut-offs for liquids and gases in pipework and containing vessels

The quoted operational and limiting values, such as

- Temperature
- Max. permitted pressure
- Differential pressure
- Thru-flow amount
- Permitted control pressure range
- Medium combination etc.

are to be adhered to.

Individual information about operational and limiting values are contained in data sheet „Pneumatic Actuator actubar®“ in [chapter 15](#).

All listed operating values, limiting values and setting data must not deviate from the values indicated in the data sheet contained in these operating instructions without prior consultation and written consent from the manufacturer! The manufacturer takes on no liability whatsoever for damage in any form which results from non-adherence to the operating instructions.

The pneumatic actuator actubar® is responsible for continuous automatic actuation movement between the end positions of industrial valves through the use of compressed air. Operation with other gases or fluids is to be agreed upon with the manufacturer.

Dewpoint of the control medium must lie min. 10°C lower than the lowest operating temperature! Max. incoming air temperature must be 45°C!

Special versions are fitted with end position or hydraulic damping or enable positioning of the valve actuating element between end positions.

The actuator is neither designed nor suited for taking external cross-sectional forces at the pinion, as well as for continuous rotational oscillations in the end positions.

Operating instruction

Pneumatic actuator actubar®

2 Safety

Operating valves can create considerable kinetic energy, which can be carried over to the actuators.

The operator must make sure that the actuator is correspondingly protected and the below-listed switching times for soft-sealing flaps and standard ball-valves for purely 90° rotational movement are not exceeded.

The switching time is set accordingly per throttle or through the use of the above-mentioned special model variations.

For other valve types, especially large volume valves with a small torque requirement, please consult the manufacturer for advice over actuator deployment conditions.

We will be only too pleased to help.

The following minimum times for rotational movement of 90° are to be adhered to:

Sizes

AD/AS 001, 004, 006	0,1 sec
AD/AS 008, 011, 018	0,1 sec
AD/AS 026, 037, 050	0,2 sec
AD/AS 076, 110	0,4 sec
AD/AS 160, 230	0,7 sec
AD/AS 350, 510, 750	1,0 sec

All other usages of this device are classified as non-designated. If you have any questions, such as using other pressure media such as fluids or would like to use the device for another deployment, then please get in contact with our service dept.

We can help in the search for possible necessary configurations.

2.6 Liability in case of non-designated usage

Other or further-reaching usage is seen as non-designated. bar GmbH is in no way responsible nor liable for resulting damage or damages. The risk carried is the sole liability of the user.

2.7 Safety Notices

DANGER!



You are not permitted to use a valve whose permitted pressure/temperature range is insufficient for operating conditions:

Ignoring this regulation means danger to life and limb and can cause damage to the pipework system.

DANGER!



Inform yourself about the characteristics of the medium. Protect yourself and your environment against dangerous or poisonous chemicals.



Organize yourself according to safety instructions in the safety data sheets from the

2 Safety

manufacturer. Make absolutely sure that no medium gets into the pipework during maintenance work.

DANGER!



Work on electrical connections may only be carried out by suitable skilled electricians in the presence of a switched off voltage supply which is also protected against switching on again.

WARNING!



Danger of Injury!

No hands and fingers in the areas around moving parts on the valve when the pneumatic actuator is connected to the compressed air supply.



When the compressed air supply is closed or removed, it is possible that the single-acting actuators can move automatically into the „open“ or „closed“ position without warning.

WARNING!



Always remove the compressed air supply from the actuator before starting maintenance or repair work on the

valve, before installing or removing the ball-valve in or out of the pipework.

WARNING!



Make absolutely sure that personnel, who are about to work on the valve, install the valve i.e. maintain it, possess the corresponding qualification. This avoids unnecessary accidents and damage or injury to persons.



Maintenance and installation persons must be familiar with the process of installing and removing the valve in process pipework, all special and risks of the process and the most important safety regulations. Maintenance and assembly personnel must be familiar with the dangers of working with industrial equipment under pressure, hot and cold surfaces, dangerous and health-endangering substances.

WARNING!



Do not dismantle or remove the valve from the pipework as long as it is under pressure! Dismantling or removal of a valve which is under pressure leads to an uncontrolled pres-

Operating instruction

Pneumatic actuator actubar®

2 Safety

sure loss. Always isolate the corresponding valve when it is in the pipework system. Make the valve pressure free and then remove the medium, before starting to work on the valve.

WARNING!



Before mounting or removing the actuator for a valve in the piping system, always make the respective valve pressure-free, isolate the valve in the piping system and remove the medium, before starting work on the ball-valve or actuator. The medium standing under pressure can lead to injury of personnel.

WARNING!



Danger of injury!

Watch out for movement of the ball/disc. Keep your hands, other limbs, tools and other objects away from the pivoting area of the ball/disc. Do not allow foreign objects to get into the pipe-work.



The ball/disc in the valve acts as separation facility. Here it makes no difference whether an actuator is fitted or not. The position der ball/disc can change in the course of transport or handling.

WARNING!



Watch out for extremely hot or cold surfaces!



The body of the valve can get either extremely hot or cold during operation.



Protect yourself against either hot or cold burns.

WARNING!



Pneumatic actuators can develop extremely high torques during operation. It is therefore very necessary to adhere exactly to the valid national and international safety stipulations, in order to avoid accidents.

2 Safety

WARNING!



Never set the mechanical end positions at the actuator as long as connection A or B is under pressure. Make sure for yourself that the drive pinion on the actuator moves in the right direction.

ATTENTION!



Never use the actuator as a lever to get movement, this can lead to damage to the valve spindle.

ATTENTION!



Never install actuators in pits where there is a possibility for dust to collect.

ATTENTION!



Before starting any form of welding work, make sure you have done all the prescribed safety-related preparations (where required, information to the relevant safety-related persons such as security personnel, shift-foreman, factory fire brigade, getting a written welding permission, positioning of fire extinguishers etc.).

ATTENTION!



It must be ascertained whether the selected materials for the parts of the valve contacting the medium are indeed suitable for the medium used.

2.8 Residual Dangers

Danger of entanglement, crushing and danger of blockages

- through moving machine/valve parts, that can only come into contact during disassembly, removable covers at openings for functional controls, removal of samples etc.,
- through automatically operated valves.

Danger of burns through devices and plant components, which come into contact with mediums with high temperatures ($>40^{\circ}\text{C}$).

- Operating temperatures $>65^{\circ}\text{C}$
short contact (ca. 1 s) for skin with the surface of the machine/valve can lead to burns (DIN EN ISO 13732-1).
- Operating temperatures $= 60^{\circ}\text{C}$
long contact (ca. 3 s) for skin with the surface of the machine/valve can lead to burns (DIN EN ISO 13732-1).
- Operating temperatures $55^{\circ}\text{C} - 60^{\circ}\text{C}$
a longer contact (ca. 3 bis 10 s) for skin with the surface of the machine/valve can lead to burns (DIN EN ISO 13732-1).

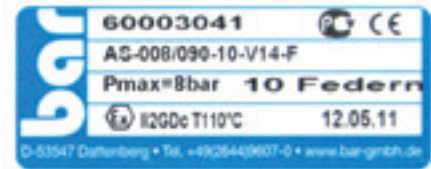
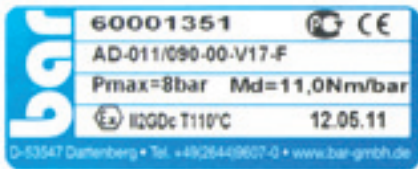
Operating instruction

Pneumatic actuator actubar®

2 Safety

Danger of injury through escaping medium caused by leakages (scalding, dangerous chemicals).

3 Nameplate



Explanation:

60001351/60003041	bar Article number
AD-011/090-00-V17-F	Article/order description (see datasheet)
Pmax=8bar	max. permitted control pressure for pneumatic actuator
Md=11,0Nm/bar	Torque per 1 bar control pressure
10 springs	Number of safety springs for single-acting actuators
Last line	ATEX identification and date of manufacture

3.1 Additional Identification



- 1 High temperature to +160°C
- 2 Low temperature version to -40°C
- 3 Seals made from FKM

4 Technical Data

Technical Data can be seen in [chapter 15](#).

5 Operating and Display Elements



I = Position indicator Pos. 1

II = Position indicator Pos. 2

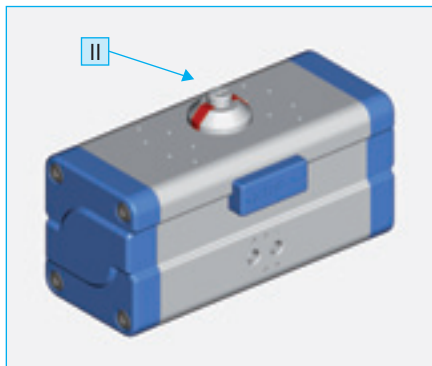


Fig. 5-1 | Operation and display elements of the actuator actubar®

Operating positions of the valve are displayed by a top-mounted optical position indicator on the actuator. It is standard procedure to install the pneu-

matic actuator actubar® longitudinally along the pipework. In this case then, the positions shown by the indicator are as follows (see):

- Pos. (1) shows closed position
- Pos. (2) shows open position



Take special care to see that the optical position indicator together with a ball-valve always corresponds with the path through the ball or a butterfly valve always corresponds with the disc position.

6 Functional Description

Generally speaking, the pneumatic actuator actubar® is operated almost exclusively with compressed air or another suitable control medium through a control valve. The pneumatic actuator comes supplied in either double-acting or single-acting function (with safety springs, which return the actuator to basic position) in accordance with client wishes.

A manual emergency operation is not part of the regular actubar® version. The individual valve setting is indicated via optical position indicator (see chapter 5) and optionally via electronic positioner.

Operating instruction

Pneumatic actuator actubar®

6 Functional Description

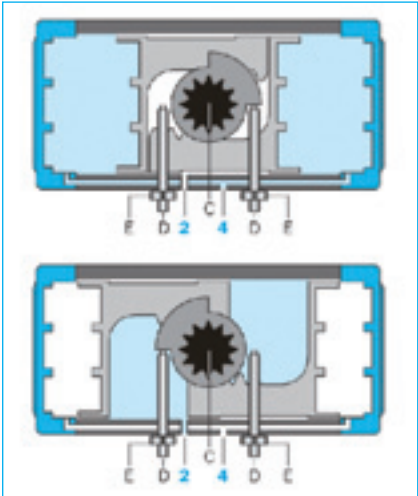


Fig. 6-1 | Actuator type actubar® Function „double-acting“

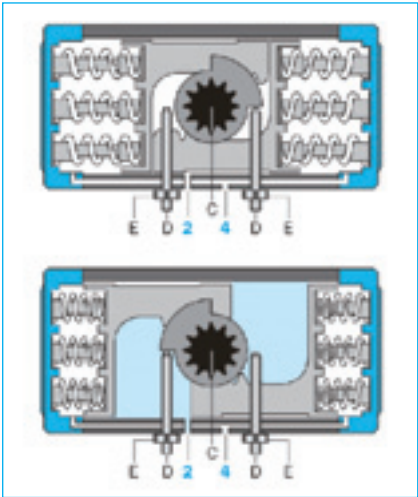


Fig. 6-2 | Actuator type actubar® Function „single-acting“

7 Mounting

7.1 Mounting conditions

The minimum space required can be taken from the dimensioned drawing i.e. table of dimensions in [chapter 15](#).

7.2 Mounting variations for actuator actubar®





























Grundstellung			Schwenk- richtung	Geschaltete Stellung			MV
... der Kolben	Ritzelstellung			... der Kolben	Ritzelstellung		
	oben	unten			oben	unten	
							F
							E
							G
							H

Table 1 | Mounting variations for actuator actubar®

7.3 Connections

- Pneumatic interface for the actuator acc. to VDI/VDE 3845 (Namur)
- Interface to the end positioner as well as positioner acc. to VDI/VDE 3845 (N-mur)
- Interface valve-side acc. to EN ISO 5211

7 Mounting

7.3.1 Pneumatic connections

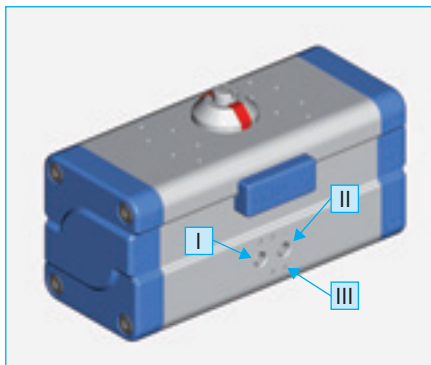


Fig. 7-1 | Pneumatic connections for the actuator actubar®

I = Port 2 (A); II = Port 4 (B);
III = Bore M5

Single-acting actuators are fitted in the factory with a silencer in port 4 (B). Do not forget to remove this before connecting a NAMUR control valve.

Pneumatic connection for single-acting actuators:

- Remove silencer from port 4 (B).
- Connect port 2 (A) with the compressed air supply.

Pneumatic connection for double-acting actuators:

- Connect ports 2 (A) and 4 (B) with the compressed air supply.

7.3.2 Pressure testing a section of pipework

Pressure testing of valves has already been carried out by the manufacturer.

For pressure testing a section of pipework with integrated valve, the following is to be observed:

Firstly, rinse through the newly installed system of piping thoroughly, to wash out all foreign bodies.

Valve open:

Test pressure must not exceed the value $1.5 \times PN$ acc. to identification on the housing.

Valve closed:

Test pressure must not exceed the value $1.1 \times PN$ acc. to identification on the housing.

7.4 Setting

It is standard practice to fit the actuator AD/AS actubar® with mechanical end position setting at both ends.

Fully completed automatic valves are supplied with mechanical end positions set to 0° and 90° in the factory and tested for correct function.

Should you wish to carry out a new setting or adjustment of the mechanical end positions to the actuator AD/AS actubar®, take note of the setting range of the mechanical

7 Mounting

pivoting angle acc. to (Fig. 7-2) as well as the following instructions and description:

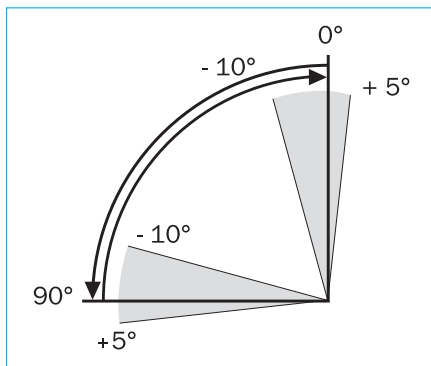


Fig. 7-2 | Settable mechanical pivoting range of the actubar® Version 90°

WARNING!



Never make adjustments to the mechanical end positions at the pneumatic actuator, when there is pressure to port 2 (A) or 4 (B).

Make sure that the drive pinion at the actuator moves in the correct direction.

7.4.1 End position setting actubar® AD/AS sizes 004 to 230

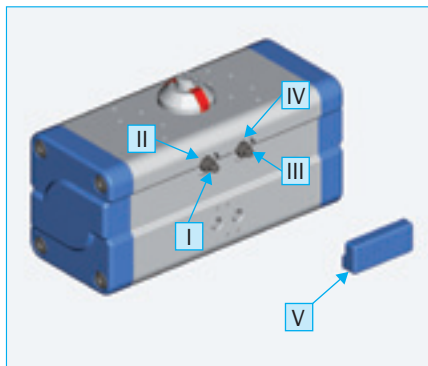


Fig. 7-3 | Setting the actuator actubar® AD/AS-004 to 230

Setting the end positions takes place after loosening locking nuts (2) and (4) under the cover cap (5) through adjusting the setting screws (1) and (3).

- I Setting screw
- II Locking nut
- III Setting screw
- IV Locking nut
- V Cover cap

7 Mounting

Tightening torques of the locking nuts actubar®

Type (AD/AS)	Nut size	Torque [Nm]
004/90	M6	9
006/90	M6	9
008/90	M6	9
011/90	M8	17
018/90	M8	17
026/90	M8	17
037/90	M10	32
050/90	M10	32
076/90	M12	62
110/90	M12	62
160/90	M16	140
230/90	M16	140
350/90	M20	400
510/90	M20	400
750/90	M24	750

Table 2 | Tightening torques of the locking nuts actubar®

Generally speaking, the following is valid: Setting screws have a right-handed thread

Screw inwards = turning clockwise reduces the pivoting angle

Screw outwards = turning anticlockwise increases the pivoting angle

In the case of ball-valves with pneumatic actuator, end positions are set to 0° and 90° in the factory. In the case of butterfly valves with pneumatic actuator, end positions are set in the factory so that the butterfly valve displays ca. 4° opening angle in the closed position, and 90° in the open position.

The setting screws may only be screwed out or screwed in max. 1–2 turns compared to the positions as delivered for reasons of safety and depending on the size of the actuator.

Turning inwards or outwards by 1 rotation corresponds to a change in angle of up to 5°.

Setting screws may only be screwed out so far, that the head of the screw protrudes a couple of millimeters outside the locking nut at the side of the housing. When turning inwards, care is to be taken to ensure that setting screws still have full threaded contact with the locking nut at the side of the housing.

7 Mounting

7.4.1.1 Setting the pivoting angle of a left-handed rotating actuator AD/AS (double-acting and spring-force closing variation for mounting F/E)

Setting the closed valve setting

1. Take hold of and remove the cover cap (Fig. 7-3.5, if present).
2. Let the actuator swing into the closed position (double-acting actuators: apply compressed air to port 4 (B), then release the air).
3. Loosen the locking nut (Fig. 7-3.4) at the adjusting screw (Fig. 7-3.3).
4. Carry out the setting of the closed valve position with the setting screw (Fig. 7-3.3) and then fix the setting screw in position with the locking nut.
5. Open and close valve 2–3 times and check the setting.
6. Replace the cover cap (Fig. 7-3.5, if present).

Setting the opened valve setting

1. Let the actuator swing into the open position (port 2 (A) apply compressed air).
2. Check the opening angle (guide value ca. 90°).
3. If the opening angle is correct, then release air from actuator. Double-acting actuator: apply compressed air to port 4 (B), until the closed end position is reached, then release the air. Let the

spring-force closing actuators swing into the closed position without compressed air. End of sequence.

4. If you would like to change the setting, then remove the cover cap (Fig. 7-3.5).
5. Let the actuator swing into the closed position (double-acting actuator: apply compressed air to port 4 (B), then release the air. For single-acting actuators: release air to port 2 (A)).
6. Loosen the locking nut (Fig. 7-3.2) for the setting screw (Fig. 7-3.1) and make the adjustment with the setting screw. Then lock the setting screw in position with the locking nut.
7. Let the actuator swing into the open position (port 2 (A) with the application of compressed air).
8. If the opening angle is correct, then release air from actuator.
9. Double-acting actuator: apply compressed air to port 4 (B), until the closed end position is reached, then release the air. Let the spring-force closing actuators swing into the closed position without compressed air.
10. Open the valve again and check the setting.
11. If the adjustment has to be corrected again, then repeat the sequence as of point 5.
12. Replace the cover cap (Fig. 7-3.5, if present).

7 Mounting

7.4.1.2 Setting the pivoting angle of a right-handed rotating actuator AD/AS (spring force opening variation for mounting H)

Setting the opened valve position

1. Take hold of and remove the cover cap (Fig. 7-3.5, if present).
2. Let the actuator swing into the open position (port 2 (A) releasing air).
3. Loosen the locking nut (Fig. 7-3.2) for the setting screw (Fig. 7-3.1).
4. Make the adjustment of the opened valve position with the setting screw (Fig. 7-3.1) and lock the screw in position with the locking nut.
5. Close the valve and open it again, then check the setting.
6. Replace the cover cap (Fig. 7-3.5, if present).

Setting the closed valve position

1. Let the actuator swing into the closed position (port 2 (A) by applying compressed air).
2. Check the degree of opening (for ball-valves guide value ca. 90°/ butterfly valves guide value ca. 86°).
3. If the closing angle is correct, remove air from actuator (port 2 (A)), until the opened end position is reached. End of sequence.

4. If you would like to change the setting, then remove the cover cap (Fig. 7-3.5, if present).
5. Let the actuator swing into the open position (for single-acting actuators: port 2 (A) release air).
6. Loosen the locking nut (Fig. 7-3.4) for the setting screw (Fig. 7-3.3) and make the adjustment with the setting screw then lock the setting screw in position with the locking nut.
7. Let the actuator swing into the closed position (port 2 (A) with the application of compressed air).
8. If the closing angle is correct, release the air from the actuator, until the opened end position is reached.
9. Check valve 2–3 opening and settings.
10. If the adjustment has to be corrected again, then repeat the sequence as of point 5.
11. Replace the cover cap (Fig. 7-3.5, if present).

7 Mounting

7.4.2 End position setting actubar® AD/AS sizes 350 to 750

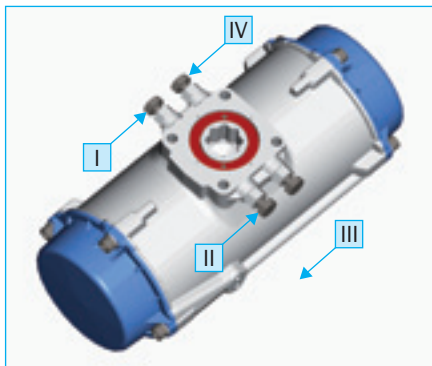


Fig. 7-4 | Setting the actuator actubar® AD/AS-350 to 750

- I Setting screw + Locking nut
- II Setting screw + Locking nut
- III Setting screw + Locking nut
- IV Setting screw + Locking nut

Generally speaking, the following is valid:
Settings are made with setting screws, which limit the pivoting angle by coming in contact with the limiting cam of the drive pinion.

In order to set the end positions, each of 2 diagonally opposing setting screws are to be set in the same rotational direction.

Setting screws have a right-handed thread
Screw inwards = turning clockwise reduces the pivoting angle

Screw outwards= turning anticlockwise increases the pivoting angle

For ball valves with pneumatic actuators, end positions are set in the factory at 0° and 90°.

In the case of butterfly valves with pneumatic actuators, the end positions are set in the factory so that the butterfly valve in a closed position shows ca. 4°, and in open position shows 90°.

Screwing-out or screwing-in by 1 turn corresponds to an adjustment of up to 5°.

7.4.2.1 Setting the pivoting angle of a left-handed rotating actuator AD/AS (double-acting and spring force closing variation for mounting F/E)

Setting the closed valve position

1. Let the actuator swing into the closed position (double-acting actuator: port 4 (B) with the application of compressed air, then release the air).
2. Loosen the locking nuts of the diagonally opposing setting screws (Fig. 7-4.2) and (Fig.7-4.4). Make the setting for the end position at both setting screws with closed valve.
3. Apply compressed air to port 4 (B). (This step is ignored for spring force closing actuators)

7 Mounting

4. Make sure that both setting screws lie on the limiting cam of the actuator shaft.
5. Tighten the locking nuts.
6. Check the valve by opening and closing 2–3 times.

Setting the opened valve position

1. Let the actuator swing into the open position (port 2 (A) with the application of compressed air).
2. Check the degree of opening (guide value ca. 90°).
3. If the degree of opening is correct, release the air to the actuator.
Double-acting actuators: apply compressed air to port 4 (B), until the closed end position is reached, then release air. Let the spring force closing actuator swing into the closed position without compressed air. End of sequence.
4. If you would like to change the setting, let the actuator swing into the closed position (double-acting actuator: apply compressed air to port 4 (B), then release the air. For single-acting actuators: release air to port 2 (A)).
5. Loosen the locking nuts of the diagonally opposing setting screws (Fig. 7-4.1) and (Fig. 7-4.3).
6. Make the adjustment of the end position at both setting screws with a closed valve (Fig. 7-4.1) and (Fig. 7-

4.3) and lock the setting screws in position with the locking nuts.

7. Make sure that both setting screws lie on the limiting cam of the actuator shaft.
8. Open the valve again and check the setting.
9. If the setting has to be corrected again, then repeat the sequence as from point 4.

7.4.2.2 Setting the pivoting angle of a right-handed rotating actuator AD/AS (spring force opening variation for mounting H)

Setting the opened valve position

1. Let the actuator swing into the open position (port 2 (A) release the air).
2. Loosen the locking nuts of the diagonally opposing setting screws (Fig. 7-4.1) and (Fig. 7-4.3).
3. Make the adjustment of the end position at both setting screws with open valve (Fig. 7-4.1) and (Fig. 7-4.3) and lock in position the setting screws with the locking nuts.
4. Make sure that both setting screws lie on the limiting cam of the actuator shaft.
5. Tighten the locking nuts.
6. Close and then open the valve again, check setting.

7 Mounting

Setting the closed valve position

1. Let the actuator swing into the closed position (port 2 (A) with the application of compressed air).
2. Check the degree of opening (for ball valves guide value ca. 90°/ butterfly valves guide value ca. 86°).
3. If the closing degree is correct, release air from actuator (port 2 (A)), until the opened end position is reached. End of sequence.
4. If you would like to change the setting, let the actuator swing into the opened position (for single-acting actuators: release air at port 2 (A)).
5. Loosen the locking nuts of the diagonally opposing setting screws (Fig. 7-4.2) and (Fig.7-4.4).
6. Make the adjustment of the end position at both setting screws with an opened valve (Fig. 7-4.2) and (Fig.7-4.4) and lock in position the setting screws with the locking nuts.
7. Make sure that both setting screws lie on the limiting cam of the actuator shaft.
8. Close valve 2-3 times and check setting.
9. If the setting has to be corrected again, then repeat the sequence as from point 4.

8 Care and Maintenance

The pneumatic actuator actubar® operates maintenance-free.

Do not use any strong, i.e. aggressive cleaning medium for cleaning the housing.

Generally speaking it is possible to maintain the pneumatic actuator by replacing seals and consumables sets.



Please note here that the guarantee is invalidated when you carry out maintenance work on the actuator actubar® inside

the guarantee period. We recommend letting the maintenance work be carried out by bar GmbH! We will be pleased to offer you corresponding care/maintenance/repairs!

This can all be arranged by contacting bar GmbH.

9 Troubleshooting

WARNING!



Troubleshooting also means you have to work within the safety instructions contained in [chapter 2](#) !

ATTENTION!



Spare parts are to be ordered, giving details of the serial number and all information on the identification nameplate. Use only original spare parts which come from bar GmbH.

10 Repair/Maintenance

10.1 Actuator actubar®

Type AD/AS-004 to AD/AS-230 (exploded view)

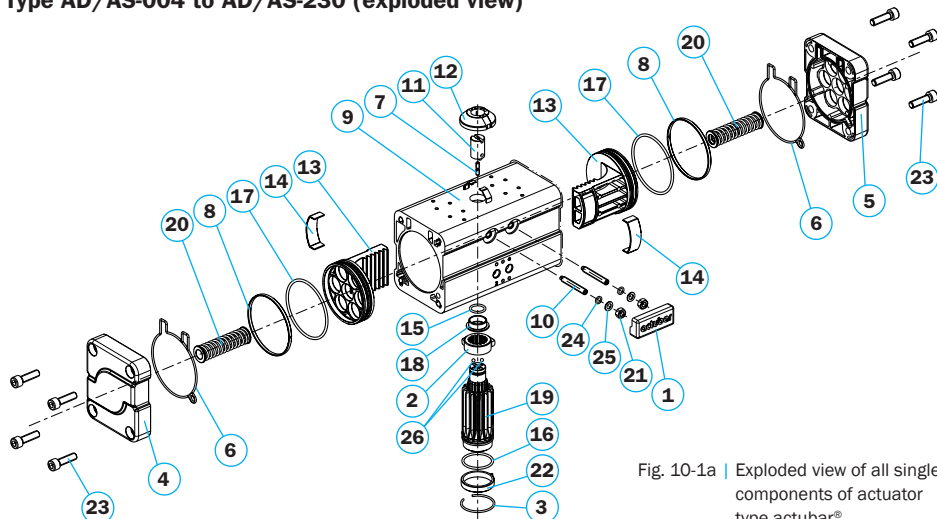


Fig. 10-1a | Exploded view of all single components of actuator type actubar®

- | | | |
|-----------------|-------------------------|------------------------------|
| 1 Cover cap | 11 Namur shaft | 21 Lock-nut |
| 2 End-stop cam | 12 Visual display | 22 Lower sliding ring |
| 3 Ring clip | 13 Piston | 23 Cap screw |
| 4 End cap left | 14 Guidance segment | 24 O-Ring |
| 5 End cap right | 15 O-Ring | 25 Washer |
| 6 End cap seal | 16 O-Ring | 26 Position indication balls |
| 7 Threaded pin | 17 Piston guidance ring | |
| 8 O-Ring | 18 Upper sliding ring | |
| 9 Housing | 19 Pinion | |
| 10 Threaded pin | 20 Spring | |

Spare parts sets:

- Set of seals, consists of 6, 8, 15, 16, 24
- Set of consumables, consists of 14, 17, 18, 22
- Caps complete, consists of 4, 5, 6, 23

10 Repair/Maintenance

Type AD/AS-350 to AD/AS-750 (exploded view)

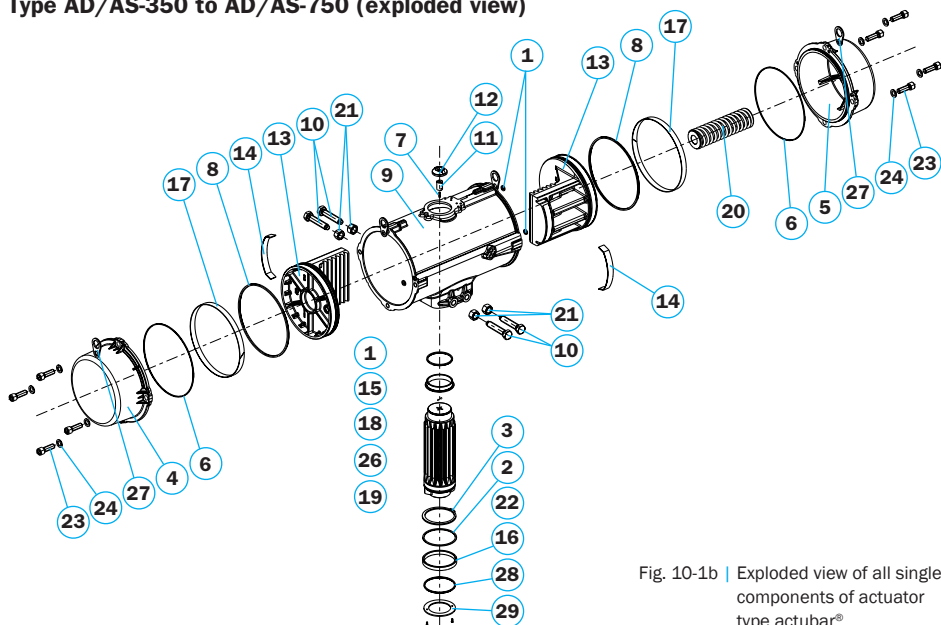


Fig. 10-1b | Exploded view of all single components of actuator type actubar®

- | | | |
|-----------------|-------------------------|------------------------------|
| 1 Cover cap | 11 Namur shaft | 21 Lock-nut |
| 2 End-stop cam | 12 Visual display | 22 Lower sliding ring |
| 3 Ring clip | 13 Piston | 23 Cap screw |
| 4 End cap left | 14 Guidance segment | 24 O-Ring |
| 5 End cap right | 15 O-Ring | 25 Washer |
| 6 End cap seal | 16 O-Ring | 26 Position indication balls |
| 7 Threaded pin | 17 Piston guidance ring | 27 Suspension eye |
| 8 O-Ring | 18 Upper sliding ring | 28 Cover ring |
| 9 Housing | 19 Pinion | 29 Screws |
| 10 Threaded pin | 20 Spring | |

Spare parts sets:

- Set of seals, consists of 6, 8, 15, 16, 24
- Set of consumables, consists of 14, 17, 18, 22

10 Repair/Maintenance

10.1.1 Assembly / Disassembly of the actuator with / without valve

DANGER!



Work on electrical connections may only be carried out by skilled qualified electricians whereby the device is switched off and prevented from being switched on again to the mains voltage supply.

WARNING!



Before disassembling or assembling the actuator on an installed valve in the pipework, always make the respective valve free of pressure, isolate the valve in the piping system and remove the medium before you start work on the valve or actuator. The medium under pressure can cause injury to persons.

WARNING!



Before performing care, maintenance and repair work on the valve, even installing/removing the valve from the pipework, always remove the compressed air supply to the actuator.

Single-acting actuators can move the ball-valve into the „open“ or „closed“ position when separating or closing the compressed air supply.

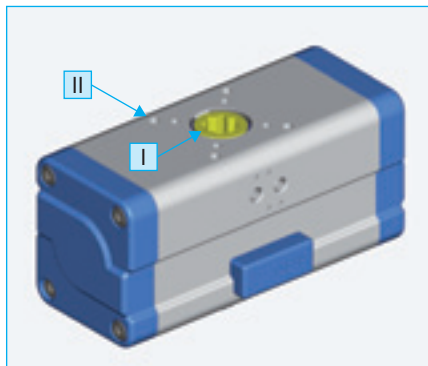


Fig. 10-2 | Removal/Mounting of valves (view of actuator from below (valve interface))

- I = Mounting spindle
- 2 = Mounting connecting screws

10 Repair/Maintenance

10.1.1.1 Disassembly

- Remove connecting screws (2) between valve and actuator.
- Remove actuator from the spindle (1) of the valve.
- Remove possible additional parts, such as shaft adapter, reducer, mounting bridge and/or centering and keep in a safe place.

10.1.1.2 Assembly

Take special care to see that the optical position indicator connected with a ball-valve/butterfly valve always corresponds with the bore of the ball or the disc position.

For assembly and operation, special care is to be taken to see that the maximum torque for the particular flange layout is not exceeded!

Connecting surfaces must be free from oil and grease, clean and dry.

1. Set the actuator onto the valve spindle (1).
2. Assemble and mount additional parts, e.g. shaft adapter, reducer, mounting bridge and/or center.
3. Tighten connection screws (only slightly greased) at the flange layout (2) .

Tightening torques for connecting screws actuator – valve

Flange layout	Screw Size	Tightening Torque [Nm]
F03	M5	6
F04	M5	10
F05	M6	10
F07	M8	25
F10	M10	49
F12	M12	85
F14	M16	145
F16	M20	310
F25	M16	145

Tab. 3 | Tightening torques for connecting screws actuator – valve

10.1.2 Disassembly/Assembly of the caps/safety springs

10.1.2.1 Disassembly caps/safety springs

WARNING!



When performing maintenance work on the pneumatic actuator, loosen the end-caps of the actuator only in a pressure-free situation. Otherwise components can be literally thrown out and the result is serious injury to persons. Separate the pneumatic actuator from the compressed air supply before starting work.

Operating instruction

Pneumatic actuator actubar®

10 Repair/Maintenance

Read the nameplate for the actuator to find out the number of safety springs required, which are to be placed into the chambers for the springs.

Then place the springs in the prescribed positions according to [Table 2](#).

WARNING!



When performing maintenance work on the pneumatic actuator, never use compressed air to push parts out of the housing. There is a real possibility of parts shooting out and the result will be serious injury to persons. Think of yourself and others – always separate the actuator from the compressed air supply before starting work.

ATTENTION!



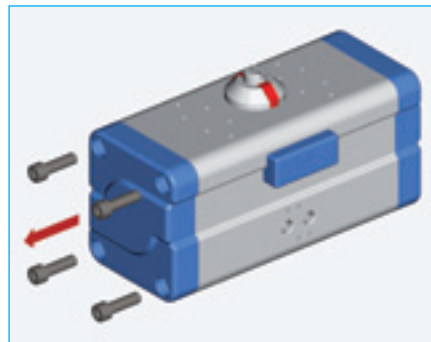
In the case of single-acting actuators, the end covers can be under pressure from the springs inside!

WARNING!



Actuator weight: above the sizes AD/AS-160 to AD/AS-750 there should be a minimum of 2 persons to move the actuator i.e. lifting facilities such as a crane etc. to move the heavy actuator!

actubar® Type AD/AS-004 to AD/AS-230



actubar® Type AD/AS-350 to AD/AS-750

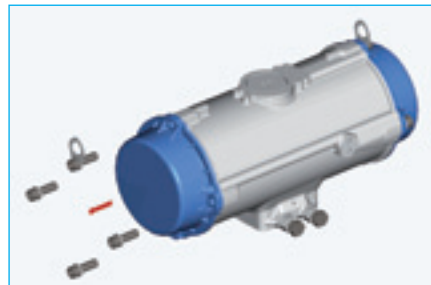
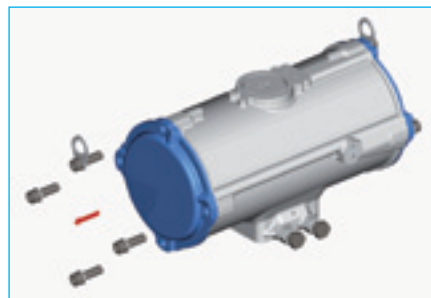


Fig. 10-3 | Disassembly / Assembly of the caps
actubar® Type AD/AS-004 to AD/AS-750

10 Repair/Maintenance

Remove the covers right/left on the actuator, whereby you carefully loosen the hexagonal-socket caps cover screws cross-wise.

For single-acting actuators:

ATTENTION!



The cap is under pressure from the safety springs!

Remove the safety springs (number of springs depends on the model type).

10.1.2.2 Assembly caps/safety springs

actubar® Type AD/AS-004 to AD/AS-230



actubar® Type AD/AS-350 to AD/AS-750



Fig. 10-4 | Assembly of caps/safety springs actubar® Type AD/AS-004 to AD/AS 750

Mount the caps right/left for the actuator, whereby you carefully tighten the hexagonal-socket cover screws cross-wise.

Take special care here to see that the cover seal does not become damaged. For single-acting actuators:

WARNING!



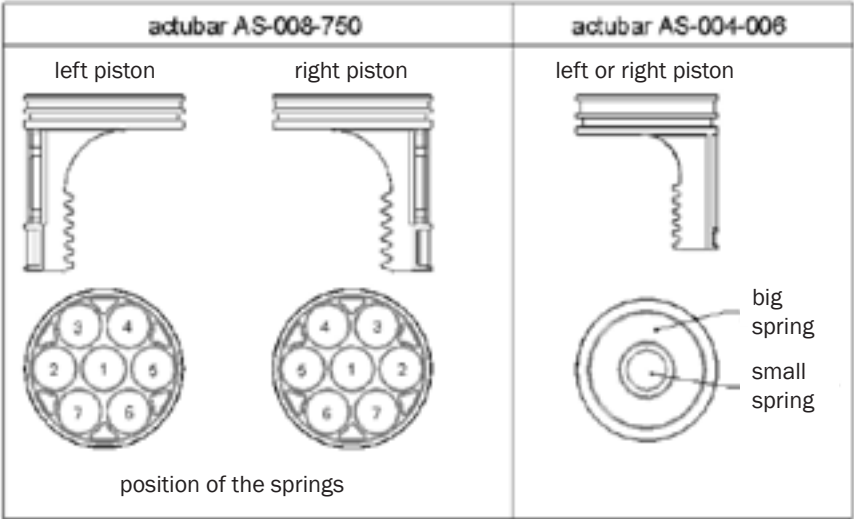
Covers are mounted under pressure. Here also, take special care to see that the safety springs are inserted according to table 3.

Operating instruction

Pneumatic actuator actubar®

10 Repair/Maintenance

Mounting instruction springs for actubar® size AS-004 to 750



number of springs	position at left piston	position at right piston
2	1	1
3	1	2+5
4	2+5	2+5
5	2+5	1+2+5
6	1+2+5	1+2+5
7	1+2+5	3+4+6+7
8	3+4+6+7	3+4+6+7
9	3+4+6+7	1+3+4+6+7
10	1+3+4+6+7	1+3+4+6+7
11	1+3+4+6+7	2+3+4+5+6+7
12	2+3+4+5+6+7	2+3+4+5+6+7
13	2+3+4+5+6+7	all
14	all	all

Table 4a | Number and position of return springs AS-004 to AS-750

10 Repair/Maintenance

Mounting instruction springs for actubar® type AS-004 to 750

Working pressure/bar	actubar 008–750	actubar 004–006	
	number of springs/Code	small spring	big spring
1	2	1	0
2	4	2	0
3	6	1	1
4	8	0	2
5	10	1	2
6	12	2	2

Table 4b | Number and position of return springs AS-004 to AS-750

Type AS	Screw size	Tightening torque [Nm]
004/90	M5	6
006/90	M6	10
008/90	M8	25
011/90	M8	25
018/90	M10	49
026/90	M10	49
037/90	M10	49
050/90	M10	49
076/90	M12	85
110/90	M12	85
160/90	M12	85
230/90	M12	85
350/90	M16	200
510/90	M16	200
750/90	M16	200

Table 5 | Tightening torques fixing screws

10 Repair/Maintenance

10.1.2.3 Removing the pistons AD/AS-004 to AD/AS-230

WARNING!



When performing maintenance work on the pneumatic actuator, never use compressed air to push pistons out of the housing.

There is a real possibility of parts shooting out and the result will be serious injury to persons. Think of yourself and others – always separate the actuator from the compressed air supply before starting work.

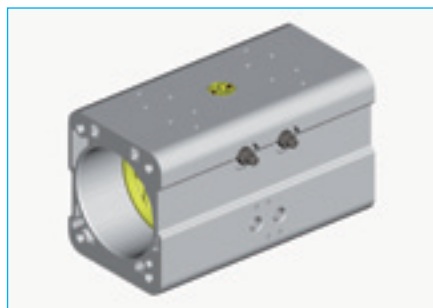


Fig. 10-5 | Removing/Inserting the pistons, actuator excl. end caps left and right

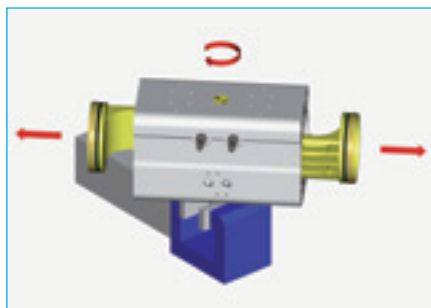
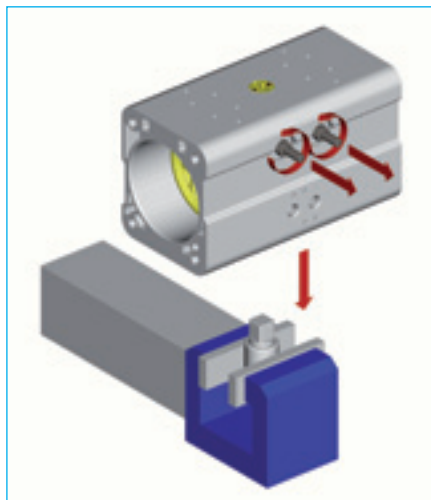


Fig. 10-6 | Special tool for removing/inserting the pistons

Rotate the drive pinion with a special tool (square, i.e. respective shaft adapter) (see [Fig. 10-4](#)) so that the piston appears out of the housing. Note: setting screws have to be removed first (approx. 5–6 turns).

10 Repair/Maintenance

10.1.2.4 Inserting the pistons AD/AS-004 to AD/AS-230

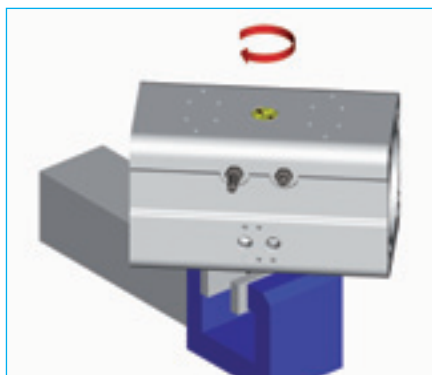
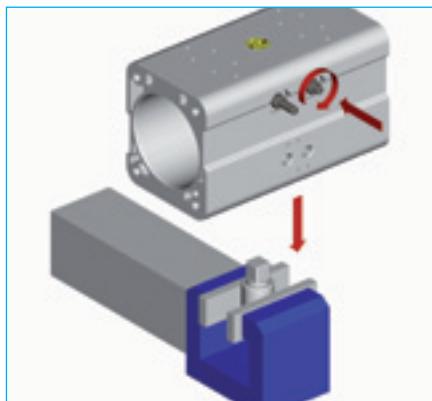


Fig. 10-7a | Inserting the pistons

1. Housing and pinion must be in a special position to each other to be able to insert the pistons. Rotate the pinion from the basic position 0° and 90° pivoting angle, plus 2 pinion teeth

(45°) round to to 135° . Here you have to screw out the left setting screw for a left-handed rotating actuator. Then lightly grease all round both piston contact surfaces with a brush.

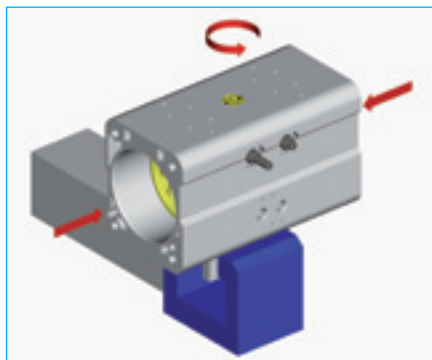
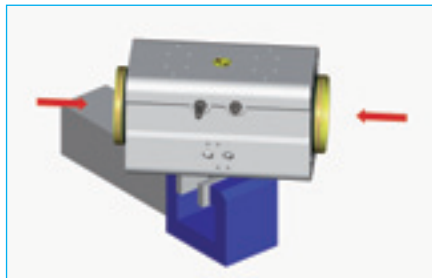
2. Grease round lightly and evenly the piston teeth and O-ring channel with a brush. Then lightly grease the O-rings just before insertion. The next step is drawing them onto the pistons. This done with no twisting and bending movements.
3. Slowly insert the pistons into the housing, until the first tooth on each side is taken-in. While the left rear side of the piston shows backwards for the right positioning of the piston for model F, this feature changes over to the right rear side of the piston for model H. The result is a left, i.e. right-handed rotating actuator. Rotate the pinion with a special tool (see illustration), to draw the pistons into the housing.

Take special care to see that the pistons are pulled-in symmetrically and that seals and consumables assemble correctly and do not become damaged.

Operating instruction

Pneumatic actuator actubar®

10 Repair/Maintenance



4. Left setting screw is replaced and then set (see 7.4 Setting).

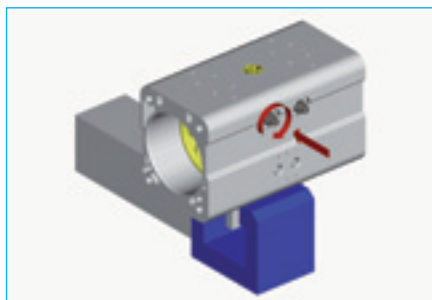


Fig. 10-7b | Insert of the pistons actubar®
Type AD/AS-004 to AD/AS-230

10.1.2.5 Removing the pistons AD/AS-350 to AD/AS-750

WARNING!



When performing maintenance work on the pneumatic actuator, never use compressed air to push pistons out of the housing. There is a real possibility of parts shooting out and the result will be serious injury to persons. Think of yourself and others – always separate the actuator from the compressed air supply before starting work.



Fig. 10-8a | Disassembly of the pistons actubar®
Type AD/AS-350 to AD/AS-750

10 Repair/Maintenance

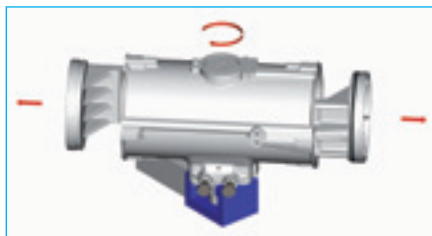


Fig. 10-8b | Disassembly of the pistons actubar®
Type AD/AS-350 to AD/AS-750

Before removing the pistons out of the housing, you have to screw-out the 4 setting screws. Then you can press-out the pistons with the special tool (square, e.g. respective shaft adapteradapter) in a clockwise manner (assembly models F and E) or anti-clockwise (assembly models G and H).

10.1.2.6 Inserting the pistons AD/AS-350 to AD/AS-750

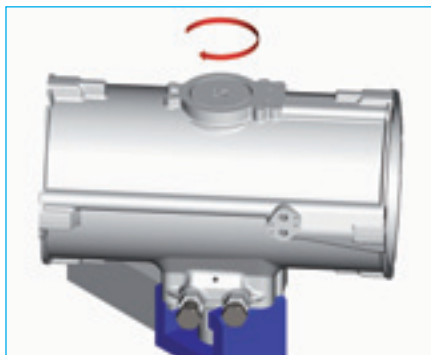
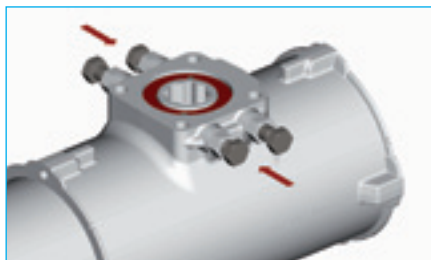


Fig. 10-9a | Assembly of the pistons actubar®
Type AD/AS-350 to AD/AS-750

1. Setting the drive pinion

Arrange the setting screws in accordance with point 7.4 Settings. Then the pinion is set from 0° pivoting angle to 90° pivoting angle plus 2 pinion teeth (135° pivoting angle) eingestellt. Then thinly grease both piston contact surfaces all round with a brush.

2. Inserting pistons

Lightly grease entrance bed, entrance channels as well as piston teeth with

10 Repair/Maintenance

a brush. Next for light greasing are the O-rings. The next step is drawing them onto the pistons. This is done with no twisting and bending movements.

ATTENTION!



Piston shoes are only held in position by surface grease (adhesive bed), it is imperative to avoid slipping and sliding.

While the left rear side of the piston shows backwards for the right positioning of the piston for model F, this feature changes over to the right rear side of the piston for model H. The result is a left, i.e. right-handed rotating actuator.



Fig. 10-9b | Assembly of the pistons actubar®
Type AD/AS-350 to AD/AS-750

There is no preference for inserting the first piston (do not let the piston shoes fall out!). In the course of insertion, there must be the same depth of penetration to be seen (forced symmetry), after contact with the pinion teeth. If

there is a tendency for canting/tilting, then this can be corrected with the use of a soft hammer!



Fig. 10-9c | Assembly of the pistons actubar®
Type AD/AS-350 to AD/AS-750

Draw-in the pistons using the special tool. As soon as the pinion has drawn-in the pistons by 45°, the piston sequence has been completed. There now follows a visual inspection of the sealing and consumable elements. Then the pistons can be pulled into the desired position manually and the setting screws can be returned to position (Tip here: lightly grease the setting screws – they will screw-in better). For adjusting the setting screws see point 7.4 Setting!

10 Repair/Maintenance

10.1.3 Removal/insertion of the drive pinion

10.1.3.1 Removing the drive pinion AD/AS-004 to AD/AS-230

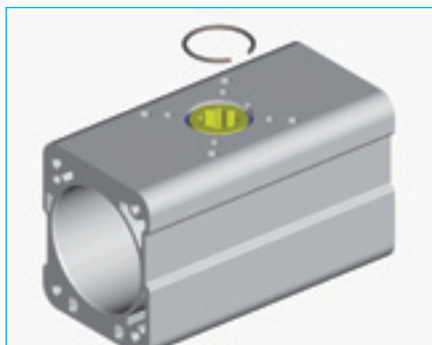
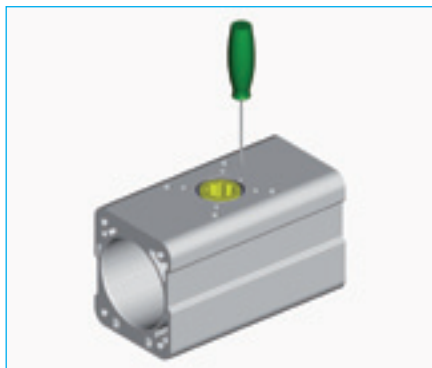


Fig. 10-10a | Disassembly of the drive pinion actubar® Type AD/AS-004 to AD/AS-230

Before you can remove the drive pinion, you must remove the end covers and the pistons and the corresponding end position setting screws must be screwed-out! Next, remove the circlip, which keeps the

underside of the pinion in position. Use here a suitable screwdriver. Now finally, the pinion can be drawn downwards and out of the housing and the end-stop cam, which is held around the pinion inside the housing, can also be removed.

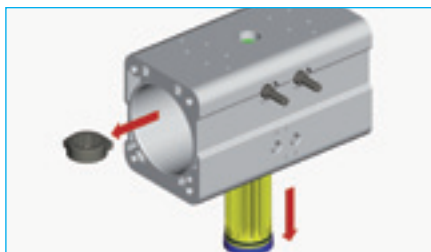


Fig. 10-10b | Disassembly of the drive pinion actubar® Type AD/AS-004 to AD/AS-230

10.1.3.2 Removing the drive pinion AD/AS-350 to AD/AS-750

Firstly, remove the securing plates (AD/AS-750) i.e. the circlip (AD/AS-350-510) on the side of the valve as well as all 4 setting screws. Next, the retaining ring (see red arrow) is grasped and taken away upwards.

ATTENTION!



Take special care here to ensure that the pinion (watch out for the weight of the pinion!) does not fall out of the housing and onto the floor!

10 Repair/Maintenance

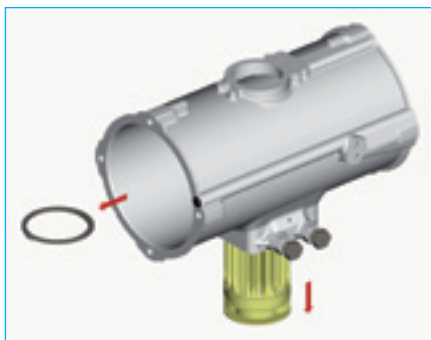


Fig. 10-11 | Disassembly the drive pinion
AD/AS-350 to 750

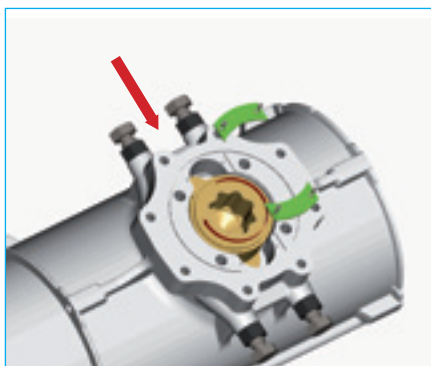


Fig. 10-12 | Disassembly the drive pinion
AD/AS-750

10.1.3.3 Inserting the drive pinion AD/AS-004 to AD/AS-230

Lightly grease both the load-bearing locations (above and below) inside the housing where they have contact with the pinion. Then where necessary, insert new bearing lining to the upper side of the housing.

Also, lightly and evenly grease all running, sealing, toothed areas of the pinions as well as the upper and lower O-ring channel with a brush. Next, take the greased O-ring over and past the teeth and allow to click into both channels and grease once more (grease reserve).

Position the housing with the bottom side upwards and insert the pinion downwards into the housing. Before you have inserted the pinion completely into the housing, you must slide over the end stop cam over the pinion inside the housing and click into the respective toothings.

ATTENTION!



Take care to ensure that the cam end stop surface is at right-angles to the pinion cross! Then rotate the pinion in the upper bearing lining, sliding it to the end. Then the lower lining bearing can be carefully inserted from the outside. Inserting the circlip to secure the pinion.

10 Repair/Maintenance

WARNING!



It is absolutely necessary to make sure the circlip sits perfectly in position! Make the following control with a screwdriver!

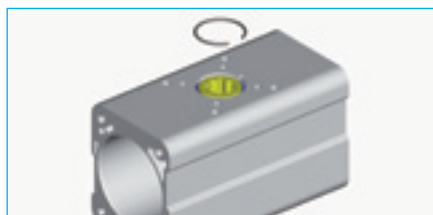
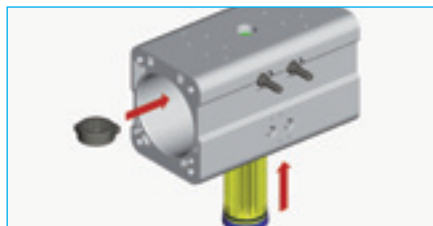


Fig. 10-13 | Assembly of the seeger ring actubar®
Typ AD/AS-004 bis AD/AS-230

10.1.3.4 Inserting the drive pinion AD/AS-350 to AD/AS-750

Lightly and evenly grease all running, sealing, toothed areas of the pinions as well as the upper and lower O-ring channel with a brush. Next, take the greased O-ring over and past the teeth and allow to click into the channel.

Great assistance for inserting the pinion could be offered by a workshop crane, the

use of which runs parallel with adherence to the regulations for prevention of accidents at work! To ensure that the housing travels centrally over the free-standing pinion, 2 hanging plates are to be attached temporarily, one each at the upper cover thread.

ATTENTION!



Special care has to be taken when attaching lifting hooks and chains, as well as positioning of the trolley, so that the load lifted does not swing out of the vertical!

The housing can be lowered down to half of the pinion height in an intermediate step. Next, attach the seeger ring onto the pinion bearing surface, and then the pinion be fully inserted. If the pinion sits in the right position, then finally the Seeger ring can be carefully positioned over the pinion bearing surface downwards into the seating with the use of Seeger ring pliers.

ATTENTION!



Make absolutely sure that the Seeger ring clicks properly into the seating and the function/ease of movement of the fully mounted pinion shaft. Mount the securing plates on the valve side.

10 Repair/Maintenance

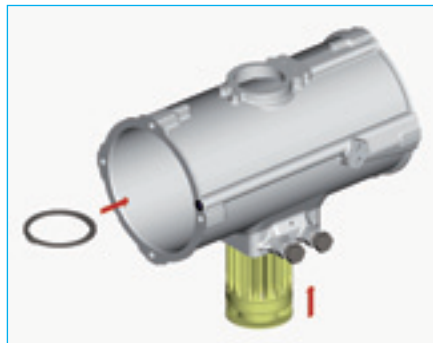


Fig. 10-14 | Inserting the drive pinion AD/AS-350 to 750

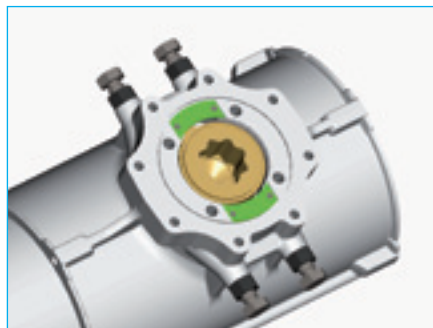


Fig. 10-15 | Mounting the securing plates AD/AS-750

10.1.3.5 Mounting/Removing the position indicator



Fig. 10-16 | Mounting/Removing of the position actubar® Typ AD/AS-350 bis AD/AS-750

Remove/mount the position indicator, whereby you use a hexagonal Allen key to either screw-in or screw-out the grub screw in the center of the position indicator.

10.1.3.6 Changing mounting variations

The following mounting variations can be made by changing the position indication ball:

- Change mounting variation F into E or reverse
- Change mounting variation G into H or reverse

Should the actuator be in the basic position (pistons are together), then the position indication ball can be removed and reset by 90° in the upper pinion cross.

10 Repair/Maintenance

Encoding mounting variations

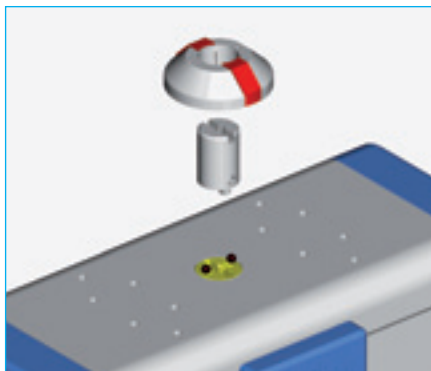


Fig. 10-17a | Encoding mounting variations
The figure shows the mounting variations F + G in ground position (pistons closed).

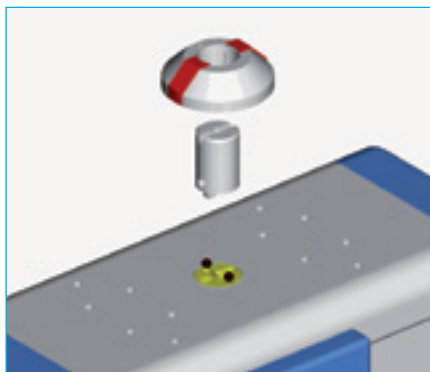


Fig. 10-17b | Encoding mounting variations
The figure shows the mounting variations E + H in ground position (pistons closed).

Operating instruction

Pneumatic actuator actubar®

11 Disposal

- Correct disposal of the device is the duty of the customer. When the device can no longer be used, dispose of it according to the legally-binding, safety and environmentally-related regulations for correct disposal.
- Materials used in this device are steel, aluminium, brass and various plastics. Electrical equipment consists of plastic and copper.

Take note here that parts with lubricants are to be disposed of in accordance with the locally valid environmental regulations!

Should you have any questions, please contact bar GmbH.

12 CE Conformity

The pneumatic actuator actubar® is recognisable with the CE identification and thereby fulfills the appropriate European guidelines.



bar GmbH hereby confirms that for this product concurrence with the following guidelines:

- Machine Guidelines 2006/42/EC
- Pressure Devices Guidelines 97/23/EC

The Declaration of Conformity is deposited with the manufacturer.

13 Guarantee

Devices produced by bar GmbH are designed to give the customer a long service life. They are products of the state-of-the-art in science and technology and have been individually tested in all functions. The electrical and mechanical construction fulfills valid standards and guidelines.

bar GmbH performs on-going examinations of products and markets for the purpose of constant further development and improvement of its products.

In case of a fault and/or technical problem, please do not hesitate to contact our customer service. We can assure you that suitable measures will be implemented as soon as is humanly possible.

Valid are the warranty stipulations laid down by bar GmbH, which if so requested, can be obtained for viewing from our General Terms & Conditions of Business.

We guarantee fault-free function of our products according to and as appears in our advertising, our issued product information and the instructions here in. Further product features are neither promised nor implied. We accept no liability whatsoever for economic performance and fault-free function if the product is used for any other function as that described in [chapter 2.5 Designated Use](#).

Claims for damages are generally deemed to be invalid, except when wilful intent or gross negligence on the side of bar GmbH can be

13 Guarantee

proved without doubt, or in the case where promised product features are not present. If this product is deployed in an environment for which it is not suitable, or which it does not comply with technical standards, then we are in no way liable what so ever for the consequences.

bar GmbH accepts no liability for damage to facilities in their widest form, and systems in the area in the vicinity of the product, which are caused by a fault in the product or in these instructions. We are not responsible for the non-adherence to patents and/or other rights of third parties outside The Federal Republic of Germany.

13 Guarantee

Konformitätserklärung / Declaration of Conformity

Im Sinne der ATEX-Richtlinie 94/9/EG (Anhang X B)

According to ATEX directive 94/9/EC (Annex X B)

Name und Anschrift des Herstellers:
Name and address of the manufacturer:

bar pneumatische Steuerungssysteme GmbH
Auf der Hohl 1, 53547 Dattenberg / Germany

Diese Erklärung bezieht sich nur auf die Maschine in dem Zustand, in dem sie in den Verkehr gebracht wurde.
Die Erklärung verliert ihre Gültigkeit, wenn das Produkt ohne Rücksprache mit uns umgebaut oder verändert wird.
This declaration relates exclusively to the machinery in the state in which it was placed on the market.
This declaration is no more valid, if the product is modified without agreement of company bar.

Hermit erklären wir, dass die nachstehend beschriebene unvollständige Maschine
Herewith we declare, that the uncompleted machinery described below

Produktbezeichnung / product denomination:

Pneumatischer Doppelkolbenschenkantrieb
Pneumatic double piston actuator
actubar Typ AD/AS / actubar type AD/AS

Serien-/Typenbezeichnung / model type:

auch den folgenden Richtlinien entspricht / is also complying with the following directives:

Maschinenrichtlinie 2006/42/EG / Machinery Directive 2006/42/EC

Angewandte harmonisierte Normen:

Where appropriate harmonised Standards used:

EN ISO 12100-1	Sicherheit von Maschinen – Grundbegriffe / Safety of Machinery – Basic concepts
EN ISO 12100-2	Sicherheit von Maschinen – Technische Leitsätze / Safety of Machinery – Technical principles
EN ISO 13463-1	Nichtelektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen Teil 1: Grundlagen und Anforderungen Non-electrical equipment for use in potentially explosive atmospheres Part 1: Basic method and requirements
EN ISO 13463-5	Nichtelektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen Teil 5: Schutz durch sichere Bauweise 'c' Non-electrical equipment for use in potentially explosive atmospheres Part 5: Protection by constructional safety 'c'

Angewandte sonstige technische Normen und Spezifikationen: / Other technical standards and specifications used:

VDI/VDE 3845	Verbindungsstellen zwischen Stellglied, Stellantrieb, Stellgeräteeinbauelement Interfaces between valves, actuators and auxiliary equipment
EN ISO 5211	Industriearmaturen - Anschlüsse von Schwenkantrieben Industrial valves - Part-turn actuator attachments

Dieses Produkt ist gekennzeichnet mit: / The marking of the product shall include the following:  II 2GDc T110°C

Die Einhaltung der in den technischen Daten und Sicherheitshinweisen beschriebenen Betriebsbedingungen ist sicherzustellen.
Please take care about the technical data and the relevant warning and safety notices.

Die Inbetriebnahme ist solange untersagt, bis die Armatur, auf die der Schwenkantrieb montiert ist, in ein Rohrleitungssystem installiert wurde. Bringing into service is prohibited until the valve on which the actuator is mounted will be ready installed into a pipework.

Bevollmächtigter für die Zusammenstellung der technischen Dokumentationen (EU-Adresse): The person authorised to compile the technical documentation (must be established within EU):

Dattenberg, 09.03.2011
Ort, Datum
Place, Date

Scholl, Klaus, Konstruktionsleitung
Name, Vorname und Funktion des Unterzeichners
Surname, first name and function of signatory


Unterschrift
Signature

14 Index and schemata

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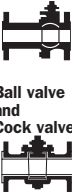
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Technical Data

	Standard model	Options available
Description	pneumatic double piston actuator type AD = double-acting type AS = single-acting (with spring return)	
Constructional features	rack and pinion principle with self-centering piston guides in the housing; single-acting: with bar safety springs	
Mounting position	as desired	
Standards	Interface actuator signal unit: acc. to VDI/VDE 3845 (NAMUR) and VDI/VDE 3847 Interface actuator/control valve: acc. to NAMUR i.e. VDI/VDE 3845 Interface actuator/valve: 4, i.e. 8 internal threaded in actuator housing acc. to EN ISO 5211	differing mounting and connecting dimensions possible pinion optional with internal double-D or acc. to DIN ISO 5211
Directives	ATEX, Machine Guidelines	
Materials	Housing: Aluminium alloy, anodised Caps: Aluminium alloy Pistons/Racks: Aluminium alloy Pinion: Corrosion-protected steel Seals: NBR Bearings: self-lubricating plastic Screws: stainless steel A2	Housing: anodised, powder-coated, PTFE Caps: PTFE Pinion: stainless steel AISI 303; AISI 316 Seals: FKM
Ambient temperature	-20° C to +80° C	low-temperature model: -40° C to +80° C high-temperature model: 0° C to +160° C
Rated pivoting angle	double and single-acting: 90° rated pivoting angle as standard from +5° to -10° adjustable in both end positions	
Torque	2.5 Nm to 6,000 Nm	
Control pressure	2 to 8 bar	
Control medium / Quality	filtered air in respect of remaining oil content, dust and water minimum according to DIN ISO 8573-1 / class 4	also upon request: other non-aggressive gaseous or liquid mediums

Mounting Variations

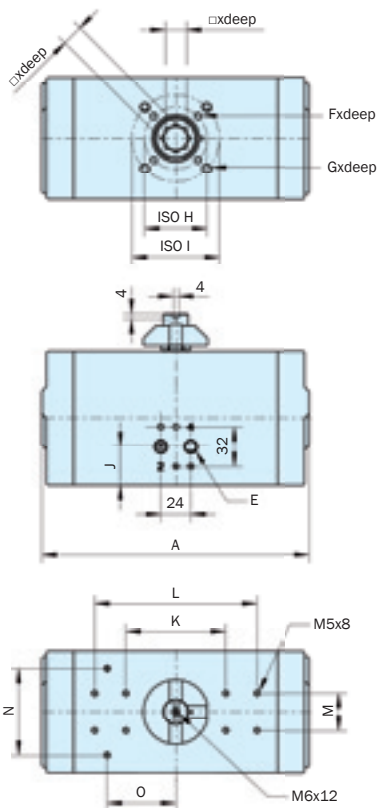
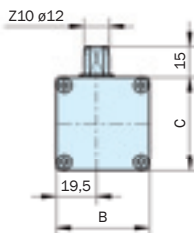
2/2-way-valve	Drive Pinion	Function	Mounting Type
	Double D = Z (upon request)	single-acting spring force closed	A
		single-acting spring force open	D
	Octagonal = V	single-acting spring force closed	F
		single-acting spring force open	H

2/2-way-valve	Drive Pinion	Function	Mounting Type
	Double D = Z (upon request)	single-acting spring force closed	A
		single-acting spring force open	D
	Octagonal = V	single-acting spring force closed	F
		single-acting spring force open	H

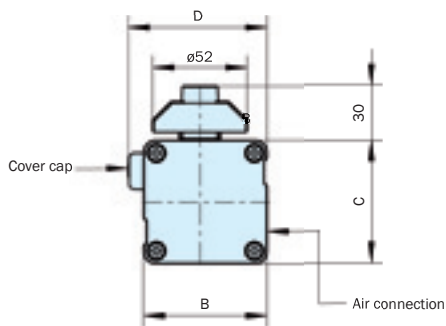
15 Annex / Technical datasheet

Dimensioned drawings for actubar types AD-001 to AD/AS-006

Type AD-001



Type AD/AS-004 and AD/AS-006



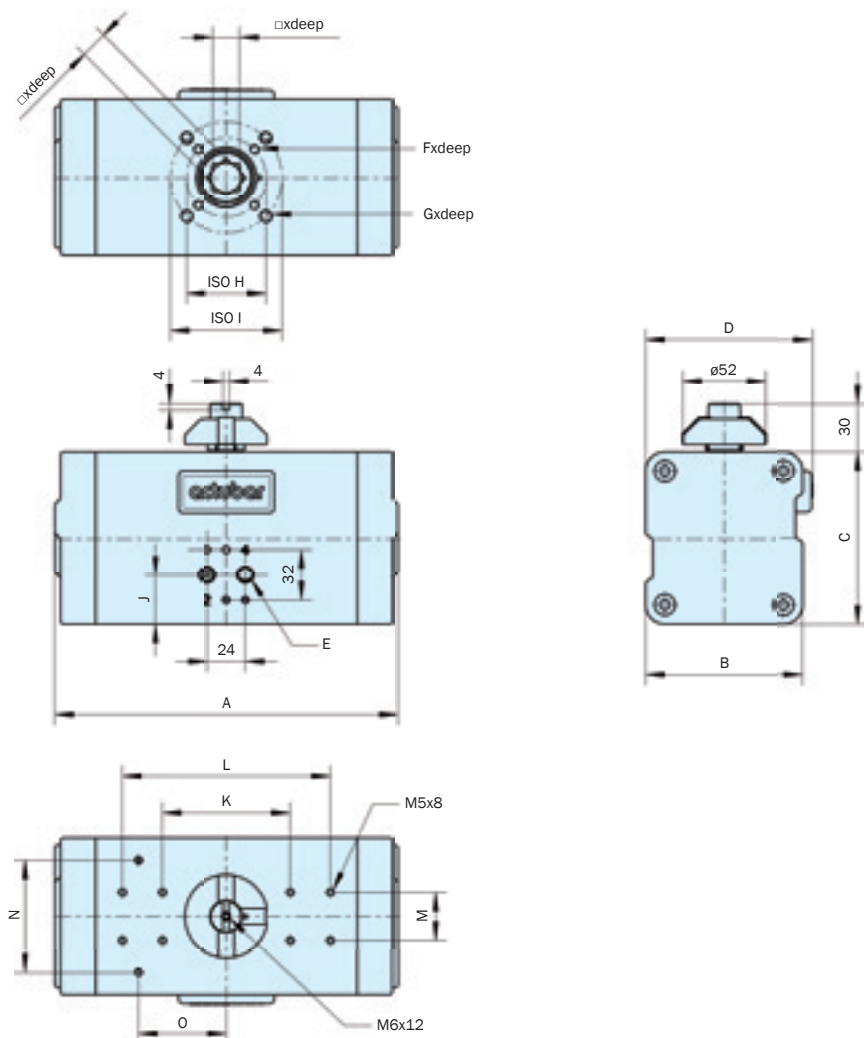
Operating instruction

Pneumatic actuator actubar®

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Dimensioned drawing for actubar type AD/AS-008 to AD/AS-230

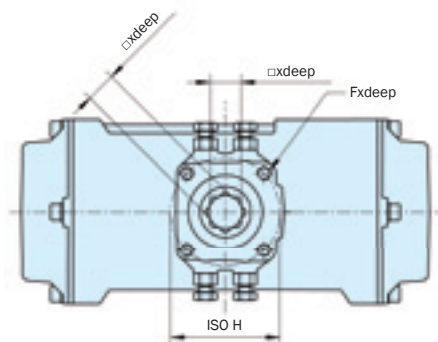
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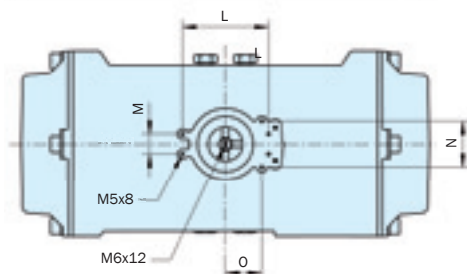
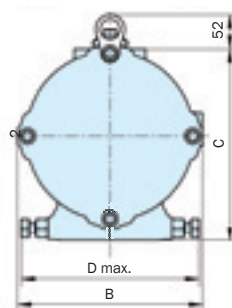
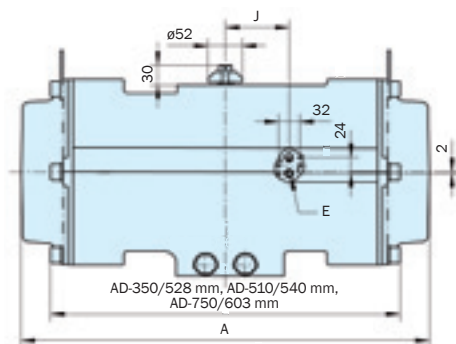
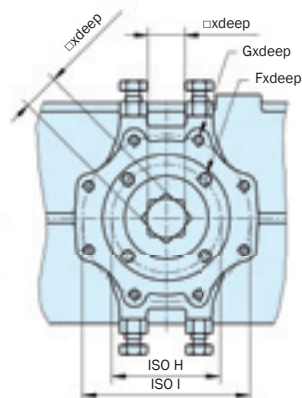
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Dimensioned drawing for actubar type AD/AS-350 to AD/AS-750

Type AD/AS-350 to AD/AS-510



Type AD/AS-750



Operating instruction

Pneumatic actuator actubar®

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Type AD/AS	A	B	C	D	E	Fxdeep	Gxdeep	ISO H	ISO I	J	K	L	M	N	O	□xdeep
001	80	45	45		G 1/8"	M5x8		ø36/F03		22,5	50		25			9x12
004	144	68	68	82	G 1/8"	M5x8	M6x9	ø36/F03	ø50/F05	24	80		30			14x17
006	159	76	84	90	G 1/8"	M6x9	M8x12	ø50/F05	ø70/F07	32	80		30			14x17
008	173	98	108	109	G 1/8"	M6x9	M8x12	ø50/F05	ø70/F07	31	80		30			14x17
011	215	98	108	109	G 1/8"	M6x9	M8x12	ø50/F05	ø70/F07	31	80	130	30	70	55	17x20
018	213	114	132	127	G 1/4"	M6x9	M8x12	ø50/F05	ø70/F07	35	80	130	30	70	55	17x20
026	281	114	132	127	G 1/4"	M8x12	M10x15	ø70/F07	ø102/F10	35	80	130	30	70	55	22x25
037	266	138	161	155	G 1/4"	M8x12	M10x15	ø70/F07	ø102/F10	40,5	80	130	30	70	55	22x25
050	347	138	161	155	G 1/4"	M8x12	M10x15	ø70/F07	ø102/F10	40,5	80	130	30	70	55	22x25
076	329	176	200	196	G 1/4"	M10x15	M12x18	ø102/F10	ø125/F12	50	80	130	30	70	55	27x30
110	475	176	200	196	G 1/4"	M10x15	M12x18	ø102/F10	ø125/F12	50	80	130	30	70	55	27x30
160	516	199	220	225	G 1/4"	M10x15	M12x18	ø102/F10	ø125/F12	60	80	130	30	70	55	27x30
230	560	223	244	249	G 1/4"	M16x24		ø140/F14		72	80	130	30	70	55	36x40
350	617	280	290	275	G 1/4"	M20x40		ø165/F16		96		130	30	70	55	46x50
510	732	330	341	310	G 1/4"	M20x40		ø165/F16		96		130	30	70	55	46x50
750	826	368	430	425	G 1/4"	M20x45	M16x35	ø254/F16	ø254/F25	109		130	30	70	55	55x60

Table of Dimensions

Type AD	Weight* [kg]	Volume/Double-stroke [L]
001	0,34	0,05
004	1,21	0,25
006	1,81	0,41
008	2,97	0,60
011	3,59	0,85
018	4,80	1,35
026	6,27	1,78
037	8,23	2,75
050	11,25	3,73
076	15,90	5,50
110	22,94	8,50
160	27,46	11,90
230	38,10	16,90
350	40,60	19,00
510	59,20	30,00
750	90,00	42,50

Weights double-acting actuators

Type AD	Weight* [kg]	Volume/Double-stroke [L]
004	1,38	0,09
006	2,04	0,19
008	3,13	0,20
011	3,89	0,33
018	5,28	0,50
026	6,93	0,73
037	9,43	1,15
050	12,81	1,63
076	18,66	2,30
110	27,02	3,50
160	33,30	4,80
230	45,20	7,00
350	50,00	9,60
510	85,00	15,00
750	125,00	20,50

Weights single-acting actuators

* weight at 12 springs

A S	-	0 5 0	/	0 9 0	-	0 8	-	V22	-	F
A D	-	0 5 0	/	0 9 0	-		-	Z...	-	A
Function S = single D = double		Type		Pivoting angle 90°		No. springs		Pinion model *		Mounting type Page 3

Ordering Code (example)

* V = octagonal with measurements
Z = double-D with dimensions given

