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1.0 Introduction

This installation and maintenance instruction contains very important indications, to assemble, to maintain and operate correctly and securely the actuator.

Respecting those guidelines will help you to avoid danger, to reduce repair charges and downtime and will also enhance the reliability and durability of the actuators.

The installation and maintenance instruction has to be read and applied by every person, who is in charge to work with the actuators.

The installation and maintenance instruction has to be disposal in every time for the working personal and for the employees, who are in charge to maintain and repair the actuators.

Keep one copy of the installation and maintenance instruction always in the operating area of the actuators.

Before starting any assembly- or maintenance working actions, you have to read the installation and maintenance instruction completely.

In case of doubt please contact AMG-Pesch.

Any technical changes and additions of description / instruction are reserved.



Before any installation, commissioning and maintenance of the actuators, this installation and maintenance instruction has to be read and the including safety instructions have to be respected.

1.1 Application area

This installation and maintenance instruction is valid for AMG double piston rotary actuators in the sizes of 10,15,20,25,30,33,35,40,42,43,45 and 50, in the series SAD (double acting) and SAF(single acting, with spring return), without stroke limitation.

1.2 Requirements for the usage acc. to regulations

The AMG pneumatic double piston rotary actuators serve the automation of ball valves, plug valves, butterfly valves and control valves

They are designed to operate the rotary movements of the armature with 90°,

The AMG pneumatic double piston rotary actuators are available in types:

- **Type SAD** - double – acting.
- **Type SAF** – single acting, with spring return

For the safe operation and the proper use, the following measures have to be fulfilled:

- Connecting of an control valve on the installation side by a provided control
- Only the dry air as a control medium has to be used. The dew point must be at least 10°C lower than the lowest operating temperature



By operating with a deviating control medium as the dry air, the manufacturer has to be absolutely contacted.

- The maximal temperature of the supply air takes 45°C
- The maximal admissible pressure can be accessed from the type plats, however not more than 10 bar
- The mesh size of the control medium is to filter at least with 40 µm (ISO 8573-1, grade 5)
- The actuators are suitable for ambient temperatures from -25° C up to +80°C (special constructions can deviate from it)
- The shafts of the actuators are not appropriate to support external transversal forces
- Make sure, that no humidity or water could enter into the pneumatic connection of your single acting drive Type SAF with spring return
- The actuators are unsuitable for taking permanently torsion vibration in the end position
- Do not fall below the minimum switch time of the Actuators, mentioned in table 1.1

Size	Min. switching times
10;15;20	0,1 sec
25;30	0,2 sec
33;35	0,4 sec
40;42;43	0,7 sec
45;50	1,0 sec

Table 1.1

1.3 Safety instructions for user

Prerequisite for a safety-oriented workflow and a failure-free operation of the actuators is the knowledge of the basic safety instructions in this installation and maintenance instruction. Furthermore, the valid instructions and rules concerning accident prevention and the accepted standards for a safety-conscious and competent workflow have to be respected. It is not allowed to use the actuators for another aim than defined by the manufacturer. Obvious risks could be the consequence. Local standards of working and safety rules always have to be respected. Ensure also compliance with environmental laws and regulations. Working with oils, grease and other chemical substances needs to respect the safety instructions of the concerned products. Lubricants have to be disposed competently and in respecting the environment laws. The national standards have to be respected. While using the Actuators, the user should obligatory consider the following information concerning the prevention of occupational risks and should always guarantee their application.



Without respecting the advice contained in these instructions dangers can appear and lead to the ineffectiveness of the guarantee and liability of AMG - PESCH.

- The actuators are to be pursued only in flawless, functional state
- The security equipment in the enclosure to the limitation of the pressure is to be checked regularly for her functional ability
- The actuators may be linked up to the control, served and maintained only by skilled and trained
- Repair and servicing work may be exported only by skilled and trained staff considering the assembly instructions and servicing instructions
- Repair and maintenance should not to be executed in assembled state.
- Prior to disassembly the actuators, the energy supply has to be disconnected and the actuators should be turned into the safety position
- It is not allowed during the pressure to mount a manual emergency override on the extension of the shaft
- It is not allowed to use the spanner or similar tools to carry out a manual emergency override by the single acting actuators (with spring return).



Caution:
Disregard cause risk of injury.

1.4 Labelling of the actuators

Every actuator is identified with a label type as described below



Example of a label type

Elucidation on the type plate

Original / German version	Translation meaning	Exemplary description	Comment	
Typ	Type:	SAF 20 NC	Design: 20	SAF single-acting
		n:09	NC:	spring closes
Artikel	Article:	165811		Number of springs
Umgeb. Temp.	Ambiance temp.	-25 to +80°C		Clear component marking
Auftrag	Order:	521855		Admissible ambience temperature
Dichtwerkstoff	seal material	NBR		Clear order marking
Max. zul. Steuerdruck	max. admis. Pressure	10 bar		Designation of the used elastomere
Bj.	year of manufacture	2010		Maximal admissible pneumatic pressure
Anschluss / SW	Connection/ SW DIN EN ISO 5211	F07-Y-D/L-17	F07:	year of manufacture of the actuator
			Y:	flange size
			D/L:	with lead actuator
			17:	with an octagonal SW of the octagonal
Min./max. Federmoment	min./max. spring torque	28,6 / 47,6 Nm		Minimum and maximum back set moment of the springs in the final situations

1.5 Certification acc. to ATEX (2014/34/EU)

The actuators are applicable in plants, witch they succumb to device group II category 2 acc. to Directive 2014/34/EU.

The maximal surface temperature depends essentially on the environmental conditions (Marking Tx).

The maximal permitted ambient temperature is indicated on the type plate **CE II 2 GD c IIC Tx**

The temperature increase about 10°C due to the self-heating is to be considered.

The temperature of the compressed supply air should not exceed 45°C.

The added electrical / pneumatic equipment must also comply with the explosion protection requirements of the plant.

Explosive mixtures must not reach to the actuator. For this, the solenoids with exhaust air recirculation have to be used.

Conversion and repair work should not be executed in an explosive atmosphere.

Corrosive media should not get into the actuator



Differing operating conditions annul the certification of the actuators acc. to directive 2014/34/EU. Disregard of this rule constitutes a serious risk for the user and for the plant.

1.6 Transport

The transport may be carried out only by competent staff, which is qualified by knowledge and experience in the field of transport and able to carry out such a work.

Only use transport and tools, which are undamaged and suitable for the load.

The eye bolts for transport of the actuators (only Size 45, 50) may include in accordance with DIN 580 following maximum last record at an angle of 45 °:

Size 45: 170 kg

Size 50: 240 kg.

The unit weights of the individual actuators without attachments parts are listed in Table 1.2

Size	Weight [kg]		Size	Weight [kg]	
	SAD	SAF		SAD	SAF
10	1,8	1,9	35	18,5	26,0
15	2,8	3,5	40	24,0	37,5
20	4,0	5,0	42	33,5	48,5
25	6,0	8,5	43	58,0	86,0
30	12,0	13,5	45	75,0	102,0
33	13,5	18,5	50	126,0	190,0

Table 1.2



If slinging equipment is attached to the actuator, they will be used only to transport the actuator and not to fix the complete device (armature and actuator).

1.7 Storage

The actuators are to be stored in closed rooms and protected from harmful influences such as dirt or humidity.

If the package does not show any damage in transit, actuators or devices should only be unpacked directly before installation.

Unwrapped parts have to be protected from any soiling, humidity and corrosion.



Note that the air connections have to be protected with plugs against entering of foreign bodies as dirt and dust.

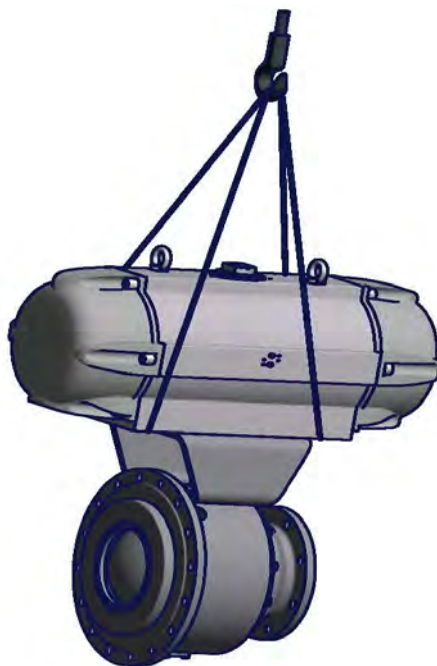
Do not stack unpacked actuators!

By transport or storage damaged actuators can not be used at all.



Installation and Maintenance Instructions

Type SAD/SAF 10, 15, 20, 25, 30, 33, 35, 40,
42, 43, 45, 50



Transportschrauben
Diese dürfen nur zum Transport des Antriebes verwendet werden
NICHT zum Transport des kompletten Stellgerätes

Shipping screws

This may only be used for transport of the actuator
NOT for transporting of the complete motorized unit.

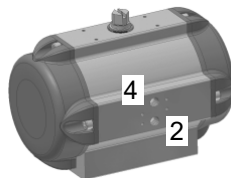
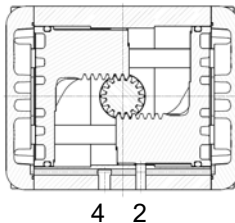
2.0 Installation and commissioning

AMG-actuators are usually delivered with the necessary accessories, such as control valve and feedback system. If this is not the case, the following instructions must be observed by fitting and building the accessories or the armature.

2.1 Air connections type SAD / SAF (standard version)

(Standard version)

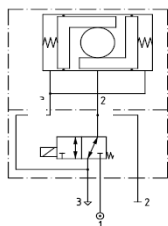
AMG double-piston rotary actuators have as standard NAMUR interface for direct mounting of control valves acc. to VDI / VDE 3845. The air connections are identified with "2" (inner chamber) and with "4" (external chamber).



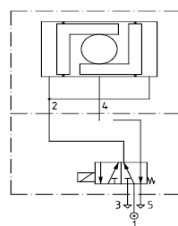
2.2 Assembly actuator- control valve

For the standard control it is required to combine:

- Type SAD (double acting) and 5/2-way solenoid
- Type SAF (single acting) and 3/2-way- solenoid



Type SAF 3/2-way-solenoid



Type SAD 5/2-way-solenoid

We recommend the use of control valves with NAMUR connection. Using the NAMUR Encoding Threaded pin, will ensure that the control valve can be only attached in the prescribed position (insuring the specified direction of action of the actuator). If the single acting actuators (TYPE SAF) are not controlled with a Namur-valve, it is essential to ensure that the ventilation of the outer spring chambers is only done with clean, dry air. It is to ensure that there is no contamination of the actuator with dust, liquids, vapours or corrosive Gases.



CAUTION: Ensure, while working of single acting actuator TYPE SAF, no corrosive media can penetrate through the exhaust port - otherwise you risk a spring break.

2.3 Mounting actuator - positioner or sensor slot

AMG double-piston rotary actuators have a standard interface according to VDI / VDE 3845 - fixing level 1, for fastening feedback units and positioners.

Close the feedback system or the positioner in compliance with the rules and instructions of the manufacturer, if not happened yet.



CAUTION: Working on electrical installations or equipment must be done only by a skilled electrician or by instructed persons under the direction and supervision of a skilled electrician according to the electrical engineering and rules

2.4 Assembly actuator- valve

AMG double-piston rotary actuators have as standard connection for valves according to DIN EN ISO 5211. The connection fittings is usually using console and adapter (coupling) according to DIN EN 15081. The right direction of rotation of the actuator has to be respected. Non-standard structures have a negative influence on the functioning and life of the valve unit. The actuator has to be positioned in a way, that in the end positions a full bore of the armature, respectively the reliable closing of the valve is guaranteed.



CAUTION: In a trial run of the valve unit, the safety regulations as well as the accident prevention regulations have to be observed.

2.5. Commissioning

Please make sure before the operation that all screws are tightened as prescribed, that the control pressure, as well as the feedback unit or positioner are connected properly. Check that the pipe system is properly grounded, so that the electrostatic charging and potential differences could be avoided.



Make sure that by operating the actuators no dangerous movements are initiated. Back up any possible clamping and pinching off by respecting the protective devices.

Make sure either that the connected armature properly fitted in the piping or it is in dismantled state. Additionally you have to make sure that the through bore of the valve is protected with protective caps before you start a movement.



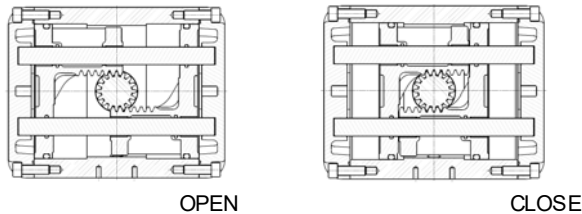
CAUTION: Take the actuator into operation, only when all the required safety devices are installed and shall pose no danger from the mounted components.

3.0 Design and function

The transfer of shear motion into a rotary motion is done via two opposing pistons with cast racks. The compressed air flows into one of the two chambers and the piston is in motion. These contribute to the pinion and thus initiate a rotation

3.1 Type SAD (double-acting)

For ventilation of the inner chamber (port 2) rotates the operating shaft in the counter clockwise direction (open), for ventilation of the outer chamber (port 4) clockwise (close).

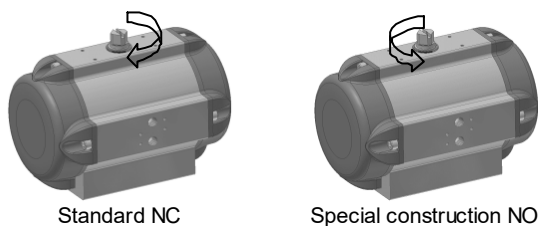


3.2 Type SAF (single acting, spring return)

For ventilation of the inner chamber (port 2) rotates the operating shaft in the counter clockwise direction (open) and stretches the springs. The stretched springs causes - when venting the interior chamber or failure of control pressure – the rotation of the stem clockwise (close). Standard construction is NC (normally closed).

3.3 Direction of rotation

Looking down at the actuator the direction of rotation is in the standard construction clockwise closing (NC normally closed). Alternatively, the actuators are supplied with the reverse rotation (NO normally open).

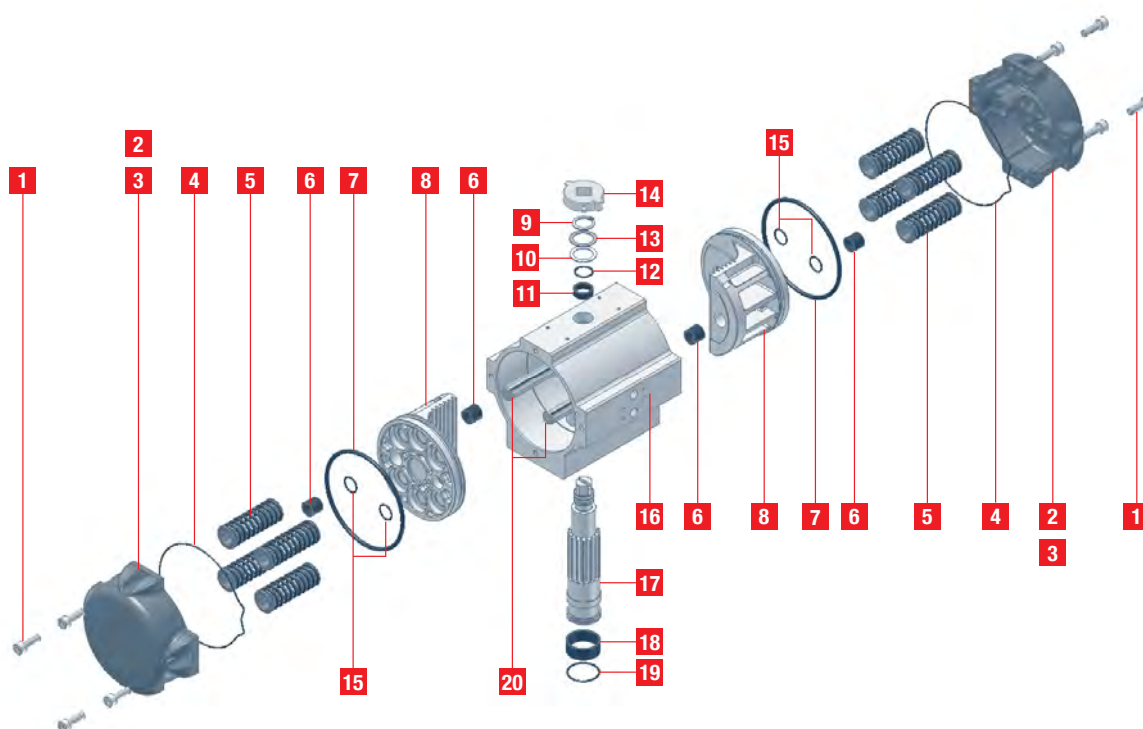


3.4 Parts list

Position	Piece		Component	Designation	Material
	SAD	SAF	sealing set		
1	8-12	8-12		Screw	Stainless steel
2	2			End cap (double acting)	Aluminum alloy, coated
3		2		End cap (single acting)	Aluminum alloy, coated
4	2	2	X	O-ring	NBR *
5		4-14		Safety spring package	Spring steel, coated
6	4	4		Guide bush	Bearing material
7	2	2	X	Piston sealing ring	NBR *
8	2	2		Piston	Aluminum alloy
9	1	1	X	Circlip	Stainless steel
10	1	1	X	Axial thrust bearing	Bearing material
11	1	1		Guide ring, top	Bearing material
12	1	1	X	Shaft sealing ring, top	NBR *
13	1	1	X	Spacer ring	Stainless steel
14	1	1		Position indicator	Plastic
15	4	4	X	Rod sealing ring	NBR *
16	1	1		Housing	Aluminum alloy, anodised
17	1	1		Pinion shaft	Stainless steel
18	1	1		Guide ring, bottom	Bearing material
19	1	1	X	Shaft sealing ring, bottom	NBR *
20	2	2		Guide rod	Stainless steel

* Another special material corresponding to the order is possible.

* Parts of sealing set



4.0 Disassembly and assembly of the actuators



CAUTION!

In principle, work and manipulations are banned when rotary actuators are in the alternative energy related!

In principle, only work on pressure less actuators!



CAUTION!

Work on actuators may only be performed by trained and qualified staff. The accident prevention regulations must be observed.

Before disassembly, all attachments on the actuators are to be removed (eg. valves, control valves, etc.). Before assembly of the actuator, all parts must be cleaned, checked on damage, if necessary, replaced and all seals have to be renewed.

The bearings, the contact surface in the housing (body), all fittings, seals, spring assemblies and the tooth system must be lubricated before installation.

A new Circlip (9) should be always used during assembly of the shaft.



CAUTION!

After installation make sure that all cover screws (1) are tightened according to the instructions and the circlip (9) is properly mounted.

4.1 Lubrication grease and quantities

For the protection of the actuators and to ensure their function, we only recommend the use of original AMG - grease. The following greases are for use for different applications when operating in dry air:

Temperature range	Grease grade
Normal temperature -25°C to +80°C	AMG-Standard grease/Renolit H442
High temperature -25°C to +100°C	AMG-High temperature grease/Syntheso glep1
Low temperature -40°C to +60°C	AMG- Low temperature grease/Isoflex Topas NB52

For deviating operating conditions please take contact with AMG-Pesch.

defined grease quantities			
Size	Grease qty. [g]	Size	Grease qty. [g]
10	25	35	70
15	25	40	80
20	30	42	100
25	35	43	180
30	50	45	240
33	60	50	280

4.2 Type SAD

4.2.1 Disassembly of the actuators type SAD

1. Remove cover screws (1) and detach the two flat cover (2) with seals.
2. Push out by turning the shaft (17) on the external square counter-clockwise two pistons (8) with guide rods (20) from the housing (16).
3. Mark the position of the pistons for the reassembly.
4. Remove the circlip (9), the washer (13) and the bearing washer (10) and push out the shaft (17) downward from the housing (16).

4.2.2 Assembly of the actuators type SAD

1. Set up the shaft (17) with the O-rings (12 +19) and the bearings (11 +18) from the bottom in the housing (16).
2. Equip both pistons (8) with the piston sealing ring (7) and O-rings (15).
3. Slide the guide rods (20) from the top up to the O-ring (15) into the piston (8).
4. Insert the pistons (8) from the left and right side in the housing (16). The guide rods (20) are pushed through free piston bore on the opposite. **Observe the installation position!**
5. The pistons (8) should be pushed together until the piston crowns terminate flush with the housing (16).
6. When the two pistons (1) terminates flush to the housing (16), both pistons (8) will be pressed in mutual termination inside by further rotation of the shaft (17) clockwise. "CLOSED" position.
7. Adjust the guide rods (20), until they have roughly the same body position on each side.
8. Grease lightly the cover seal (O-ring) (4) and insert it into the groove of the flat cover (2).
9. Doing the cover or cover assembly, note that the longitudinal bore is located within in the housing of the cover seal (O-ring) (4).
10. Fix both flat covers (2) with the cover screws (1). Tighten the cap screws (1) cross over with the appropriate torque (see Table 4.2).
11. Check the shaft positioning in position "close". The corners of the inner octagon of the shaft are at the cross axis of the actuator and the groove in the male square across the actuator. If this is not the case, press shaft (17) down from the housing (16) and reinstall in the correct position (16).
12. Bring the bearing washer (10) and the washer (13) on the free shaft end and secure with the circlip(9).

4.3 Type SAF



CAUTION!

Disassembly of the spring cover may only be performed when the actuator stands in the safety position. Risk of Injury!



CAUTION!

The spring cover is under pressure! The springs have to be seen as energy storage and they can cause injury in case of abuse!

4.3.1 Disassembly of the actuator type SAF

Size 10

These actuators are standard with unfettered (free) springs (5).

1. Loosen all the cover screws (1) evenly until the springs are no longer under tension.
2. Both spring covers (cover) with seals will be removed (3).
3. By turning the shaft (17) on the external square counter-clockwise, the pistons can be pushed out (8) from the housing (16) with guide rods (20).
4. Mark the position of pistons for the reassembly.
5. Remove the circlip (9), the washer (13) and the bearing washer (10) and press shaft (17) downward from the housing (16).

Sizes 15-50

These actuators are equipped with bound spring units (5).

1. Loosen uniformly all the cover screws (6). After a few turns the preload of the springs will be taken in the spring unit.
2. If the spring tension does not subside after the releasing of the cover screws of a way of 4-5 mm, stop the operation. Maybe the sleeve of the spring unit is damaged. In this case, you solve two opposing screws completely and replace them with two longer screws that you screw deeply. Now you can loosen the cover screws evenly until the remaining shorter screws are screwed out completely. Replace them again by corresponding longer screws and repeat the process until the springs are completely relaxed and you can safely remove the spring cap.
3. Remove both spring cover (3) with seals.
4. By turning the shaft (17) on the external square counter-clockwise, the pistons could be pushed out (1) with guide rods (20) from the housing (16).
5. Mark the positions of pistons for the reassembly.
6. Remove the circlip (9), the washer (13) and the bearing washer (10) and press the shaft (17) down from the housing (16)

4.3.2 Assembly of the actuator type SAF

1. Go with the assembly of the type SAF as you did it first with the double-acting actuator SAD before. The assembly of the spring cover (3) proceeds in the reverse order as in the disassembly.

- Put the spring unit (5) into the pockets provided in the piston (8). In the spring configuration it is to ensure that the arrangement of the spring units has to be in relation to the spring number n according to the following table 4.1.

Number of springs n								
n=4	n=5	n=6	n=7	n=8	n=9	n=10	n=11	n=12
								
								

Table 4.1

- Note that the total number n of the spring unit is the same with the n indicated on the label.
- Fasten the spring cover (3) by tightening all cover screws (6) evenly crosswise.
- Complete this work in each case only on the cover side. The screws have to be tightened according to the torque table (Table 4.2).

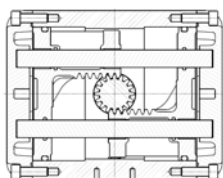
Size	Thread	Torque [Nm]
10	M5	4
15; 20	M6	7
25	M8	17
30; 33; 35	M10	35
40; 42; 43	M12	60
45	M16	145
50	M20	290

Table 4.2

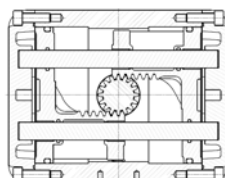
4.4 Reversal of the direction of rotation

If necessary, the rotation direction of the actuator can be changed. Therefore are the following processing steps essential.

- Disassembly the Cover and the piston as described in 4.2.1 and 4.3.1
- To change the direction of rotation, the pistons are to be rotated by 180 ° and, as mentioned in 4.2.2 and 4.3.2, re-assembled.
- Label the actuator with the correct direction of rotation.



Rotation direction NC



Rotation direction NO

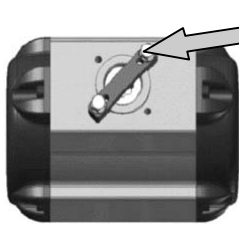
4.5 Functional testing of the actuator



Caution! When the actuator is pressurized without an assembled valve there is a risk that the pinion will be pushed out on the underside of the drive in case of damaged or the absence of the circlip.

To eliminate this risk to persons and to objects in close proximity, the functional test must be performed as follows:

1. Separate the steering air line from the actuator
2. If necessary remove the actuator from the valve
3. Secure according to the sketch the Pinion with special tool



The special tool will be screwed on the underside of the actuator, placed in the pattern of the interface like DIN EN ISO 5211.

4. Pose the actuator with the underside on solid ground
5. Connect the steering air line with the actuator
6. Check the actuator by supplying air

4.6 Assembly instructions Function group SAFs and gearbox ILG / S ...- LL -...

Follow sequence of operations!

- 1.) Unscrew both screws for the end position limitation approx. 3-4 mm.
- 2.) Turn the handwheel clockwise to the end position. (Clutch rotates clockwise)
- 3.) Turn the coupling by hand clockwise to the end stop. (Overflow of the coupling at least 3 degrees)
- 4.) Place actuator SAFs in unpressurized condition and secure.
- 5.) Turn the handwheel carefully counterclockwise until the resistance of the drive is reached becomes noticeable. (The drive pinion must never be rotated)
- 6.) Screw in the screw for the limit stop "to" until stop. (Not counter!)
- 7.) Open the drive with compressed air (pinion turns counterclockwise) and in the Leave open position.
- 8.) Turn the handwheel counterclockwise until it reaches the end position (open position) and resistance of the drive is noticeable. (Do not forcibly continue to turn!)
- 9.) Screw in screw for limit stop "up" until stop and lock.
- 10.) Vent the drive and move it over the gearbox to the closed position.
- 11.) Unscrew and tighten the screw for the end position limitation "to" approx. 1 mm.
- 12.) Track gearbox to end position. (Turn the handwheel clockwise)
- 13.) Function check pneumatic: Ventilates and vent the drive
Manual: Open and close the drive

Delivered condition: Valve closed

4.7 Assembly instructions Function group SAFö and gearbox ILG / S ...- LL -...

Follow sequence of operations!

- 1.) Unscrew both screws for the end position limitation approx. 3-4 mm.
- 2.) Turn the handwheel counterclockwise to the end position. (Clutch turns here counterclockwise)
- 3.) Turn the coupling by hand counterclockwise until the end stop. (Overflow of the Coupling at least 3 degrees)
- 4.) Place actuator SAFö in depressurized condition and secure.
- 5.) Turn the handwheel carefully clockwise until the resistance of the drive becomes noticeable.
(The drive pinion must never be rotated)
- 6.) Screw in the screw for the limit stop "up" until stop. (Not counter!)
- 7.) Close the drive with compressed air (pinion turns clockwise) and in the Leave closed position.
- 8.) Turn the handwheel clockwise until the end position (closed position) is reached and Resistance of the drive is noticeable. (Do not forcibly continue to turn!)
- 9.) Screw in screw for limit stop "to" until stop and lock.
- 10.) Vent the drive and move it over the gearbox in the open position.
- 11.) Unscrew and tighten the screw for the end position limitation "to" approx. 1 mm.
- 12.) Track gearbox to end position. (Turn the handwheel counterclockwise)
- 13.) Function check pneumatic: Ventilate and vent the drive

Manual: Close and open the drive

Delivered condition: Valve opened

4.8 Assembly instructions Function group SAFsli and gearbox ILG / S ...- LR -...

Follow sequence of operations!

- 1.) Unscrew both screws for the end position limitation approx. 3-4 mm.
- 2.) Turn the handwheel clockwise to the end position.
(Clutch turns counterclockwise)
- 3.) Turn the coupling by hand counterclockwise until the end stop. (Overflow the coupling at least 3 degrees)
- 4.) Place actuator SAFsli in depressurized condition and fasten.
- 5.) Turn the handwheel carefully counterclockwise until the resistance of the drive is reached becomes noticeable. (The drive pinion must never be rotated)
- 6.) Screw in the screw for the limit stop "to" until stop. (Not counter!)
- 7.) Open the drive with compressed air (pinion turns clockwise) and in the open position leave.
- 8.) Turn the handwheel anticlockwise until the end position (open position) is reached and Resistance of the drive is noticeable. (Do not forcibly continue to turn!)
- 9.) Screw in screw for limit stop "up" until stop and lock.
- 10.) Vent the drive and move it over the gearbox to the closed position.
- 11.) Unscrew and tighten the screw for the end position limitation "to" approx. 1 mm.
Track gearbox to end position. (Turn the handwheel clockwise)
- 12.) Function check pneumatic: Ventilate and vent the drive

Manual: Open and close the drive

Delivered condition: Valve closed

4.9 Spring arrangement SAF 10 to SAF 50

spring number n	Spring positioning right	Spring positioning left
4 interface solenoid valve		 interface solenoid valve
5		
6		
7		
8		
9		
10		
11		
12		

4.10 Vent plug

With immediate effect, bleed plugs (black) can no longer be installed in SAF / PGF drives! The pneumatic connection of the spring chambers is to be closed with the usual blind plugs (transparent).

Reason

Complaints experiences:



CAUTION!

The customer runs the risk, if no Namur valve is attached to leave the black vent plug in it. As a result, when driving the engine out of the atmosphere, atmospheric moisture or corrosive gases enter the spring chambers. This in turn leads to the destruction / corrosion of the spring packs.



CAUTION!

In the worst case, the spring cover is full of water - due to heavy frost, the spring cover can break off!

5.0 Period of maintenance and inspection

Basically, are AMG double-piston rotary actuators in the standard lubricated for lifetime and therefore maintenance-free.

The lifetime is calculated at 500,000 switching cycles. Those are the necessary conditions:

- Professional build-up of the actuator,
- Properly processed control medium
- Normal environmental conditions
- Compliance with the intended use.

The warranty expires when modifications and adjustments work is done on the actuator.

6.0 Liability and warranty

The liability and warranty expires if the use of the actuators is not being done according to the envisaged basis.

All information and instructions for operating and maintenance are carried out in light of our experience and know-how in good faith.

The original version of this Installation and maintenance manual has been prepared in German language and has been examined by us objectively. The translation in the respective country /



AMG - PESCH GmbH

Installation and Maintenance Instructions

Type SAD/SAF 10, 15, 20, 25, 30, 33, 35, 40,
42, 43, 45, 50

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language of the contract was performed by a certified translation office.

This manual has been compiled with great care. However if you notice some omissions and / or error, please contact us.

7.0 Technical data

Pivoting range: 0 ° to 90 °

Pressure range: up to 10

Control medium: air (dry or oily)

Temperature range:

NBR O-rings: -25 ° C to + 80 ° C

Cryogenic NBR O-rings: -40 ° C to + 60 ° C

FKM O-rings: -25 ° C to +100 ° C

Lubrication: Permanent lubrication

When ordering spare parts please indicate the type and size of the rotary actuator plus the item and the order number (see type label).



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