

MA-SERIES



Pneumatic stroke actuator

Diaphragm effective areas

– 70 to 1070 cm²

Shut off forces

– 0.5 to 122 kN

Strokes

– 10 to 140 mm

Allowable airpressure
up to 6 bar

Operating and maintenance instructions

Armaturen AG

von Rohr

Pneumatische und elektrische Stellgeräte und Apparate

Fichtenhagstrasse 4, CH-4132 Muttenz 2, Telefon +41 (0) 61 461 48 48, Fax +41 (0) 61 461 18 27
e-mail: info@von-rohr.ch, www.von-rohr.ch

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1. Warning symbols

Safety advices and warnings are made for preventing danger against life and health of users and maintenance personnel resp. preventing material damage. They are being stressed by the presently described signal terms and in addition marked with warning symbols (pictograms). The applied symbols have the following meanings:

Danger: Death, severe injury and/or significant material damage **will** be the consequence, if the appropriate precautions should not be taken.



Warning: Death, severe injury and/or significant material damage **may** be the consequence, if the appropriate precautions should not be taken.



Caution: Light injury and/or material damage **may** be the consequence, if the appropriate precautions should not be taken.



Note: Important information about the product itself, about how to handle the product, to which special attention is being called.



2. Safety advices

The actuator has been exclusively designed for the use according to the specification in our order confirmation. Any other use is not according to the directives. For resulting damages the user alone is liable. Unauthorized changes, as well as the use of non original **von Rohr** spare parts exclude any responsibility for damages caused. Any change brought to the installation is done at the users own risk.



Maintenance and repair operation may only be done by qualified personnel observing the respective directives.

Actuators bring up great actuating power. Assembly and initiation are to be done under strict observation of the safety instructions.

It is expressly pointed out to follow the instructions for explosive devices where appropriate.

The following instructions are to be observed before any maintenance operations:

- Depressurize the conduit.
- Exclude initiation by third party.

3. Qualified personnel

According to the spirit of this manual, such persons are familiar with assembly, initiation and operation of this product, and have the qualifications for executing their function, like:

- Training or instruction according to the actual standards in safety features maintaining and using appropriate safety equipments.
- Training in first aid.
- Training resp. permission to perform tasks with explosive devices.
- Training at von Rohr Armaturen AG, CH-4132 Muttenz.



I. Description

1.1 Introduction

The purpose of this manual is to make yourself familiar with design, function and maintenance. Please read this manual thoroughly in order to be able to operate the actuator effectively and obtain a long life time.

1.2 Specification (drawing and bill of materials)

See pages 10 to 12.

II. Mounting to valve

1. Preparation and measures of precaution



The concept development of the actuator and the choice of materials are done according to the specification of the order. Application conditions diverging from the ordering designations are to be allowed by the manufacturer.

2. Mounting

The actuator may be mounted on valves and other devices of various types of construction. Suitable mounting parts are usually provided with the actuator. Typically, the actuator is mounted upright onto the valve.



Caution: Do not turn the stem when in closed position!

3. Mounting Po actuators

- Apply pressure on the actuator until the stem is drawn in.
- Screw the actuator coupling onto the actuator stem.
- Put the actuator on the valve – the pillar threads go into the holes of the traverse.
- Screw on the pillar nuts – tighten with 80 Nm.
- Depressurize the actuator – make sure the valve stem is at the bottom.
- Set the actuator coupling in a way that it fits upon the valve coupling.
- Set the pressure in the actuator above the minimal positioning pressure, and verify the nominal stroke with a measuring stick or a calliper (space between actuator and valve coupling) – distort actuator coupling if required.
- Screw the couplings together loosely, go through the stroke, position the couplings appropriately.
- Screw the couplings together tightly in central position.
- Tighten the counternut above the actuator coupling.

4. Mounting Ps actuators

- Screw the actuator coupling onto the actuator stem.
- Put the actuator on the valve – the pillar threads go into the holes of the traverse – make sure the valve stem is at the bottom.
- Screw on the pillar nuts – tighten with 80 Nm.
- Position the actuator coupling in a way that the distance to the valve coupling corresponds to the nominal stroke – verify with a measuring stick or a calliper.
- Set the pressure in the actuator to the upper range.
- Stroke with loose connected couplings and adjust couplings.
- Screw the couplings together tightly in middle position.
- Tighten the counternut above the actuator coupling.

III. Assembly instructions

The actuators of type series MA are assembled and disassembled within special appliances in the factory. The following assembly instructions are based upon simpler utilities. They are meant for working on existing actuators installed at the user's location. Table 2 shows a list of utilities which can be purchased.

1. Disassemble Po actuators



Caution: Springs are preloaded!

- Loosen the coupling's counter nut and remove coupling and nut.
- Remove the number of actuator screws according to table 2.
The intervals of the removed screws should be the same.
- Put long screws (do not use stainless steel screws) in the places according to table 2 and tighten the nuts.
Remove all short screws.
- Loosen the nuts on the long screws regular.
- Remove the springs.
- Remove the spring plate with the diaphragm from the lower case.
- Screw 2 hexagon nuts onto the stem's thread and lock them.
- Clamp the hexagon nuts in a vice.
- Loosen the nut above the spring plate.
Remove spring plate, diaphragm, o-ring, pressure plate and stem ring halves from the stem.
- Remove the guiding from the lower case.

2. Assemble Po actuators

- Apply silicone grease in the middle hole of the lower case.
- Insert guiding and circlip.
- Screw pillar into lower case
(On type MA21, an o-ring must be slid over the thread beforehand).
- Put 2 stem ring halves into the clearance groove of the stem.
- Slide the pressure plate onto the stem (from the side with the short thread).
- Slide o-ring, diaphragm, diaphragm plate and washer onto the stem.
- Screw the nut with some liquid screw retention «slightly» hand-screwed.
- Screw two hexagon nuts onto the long stem thread, tighten and clamp them in a vice.
- Position the diaphragm according to figure 1 to the spring centering of the diaphragm.
- Tighten the nut and verify and correct if necessary the position of the diaphragm.
Impact screw driver is recommended.

- Clamp the pillars with the pre-mounted lower case in a vice.
- Apply silicone grease onto the bottom of the stem and slide it into the guiding.
- Position the diaphragm according to the air connections (see figure 1).
- Dispose the springs symmetrically (left-wound and right-wound alternately).
- Mount the spring centering plate into the upper case (mind its position) and position it on the springs.
- The air supplies of upper case and lower case must be on top of each other. Verify whether the springs are properly centered.
- Tighten upper case and lower case together with long screws (see table 2) mount screws, nuts and washers.
- Replace the long screws by short ones.
- Tighten all nuts evenly with torque according to table 1.

3. Disassemble Ps actuators

Caution: Springs are preloaded!



- Loosen the coupling's counter nut and remove coupling and nut.
- Remove the number of actuator screws according to table 2.
The intervals of the removed screws should be the same.
- Put long screws (do not use screws of stainless steel) in the places according to table 2 and tighten the nuts.
- Remove all short screws.
- Loosen the nuts on the long screws.
- Remove the springplate with the diaphragm from the lower case.
- Remove the springs.
- Screw 2 hexagon nuts onto the stem's thread and lock them.
- Clamp the hexagon nuts in a vice.
- Loosen the nut above the spring plate.
- Remove spring plate, diaphragm, o-ring pressure plate and stem ring halves from the stem.
- Remove the guiding from the body.

4. Assemble Ps actuators

- Apply silicone grease in the middle hole of the body.
- Insert guiding and circlip.
- Screw pillar into lower case
(On type MA21, an o-ring must be slid over the thread beforehand).
- Put 2 stem ring halves into the groove of the stem.
- Slide the pressure plate onto the stem (from the side with the short thread).
- Slide o-ring, diaphragm, diaphragm plate and washer onto the stem.
- Screw the nut with some liquid screw retention «slightly» hand-screwed.
- Screw two hexagon nuts onto the long stem thread, tighten and clamp them in a vice.
- Position the diaphragm according to figure 1 to the spring centering of the diaphragm.
- Tighten the nut and verify and correct if necessary the position of the diaphragm.
Do not bend the stem. Impact screw driver is recommended.
- Clamp the pillars with the pre-mounted lower case in a vice.
- Mount the spring centering plate into the upper case (mind its position) and position it on the springs.
Dispose the springs symmetrically (left-wound and right-wound alternately).
- Apply silicone grease onto the bottom of the stem and slide it into the guiding.
- Position the diaphragm according to the air connections (see figure 1).
- The air connections of upper case and lower case must be on top of each other.
Verify whether the springs are properly centered.
- Tighten upper case and lower case together with long screws (see table 2)
- Mount screws, nuts and washers. Replace the long screws by short ones.
- Tighten all nuts evenly with torque according to table 1.

IV. Maintenance

1. General indications

- Certain parts of the actuator (diaphragm, o-ring, connection, bellows) will wear out in the course of time. Therefore they regularly need to be verified and replaced where appropriate.
- The maintenance window depends on the operating conditions.

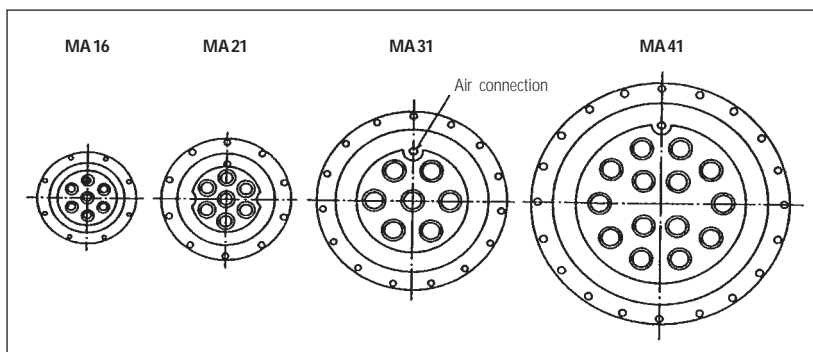
Table1: Torques for actuator screws

Actuator sizes	Thread	Torque
MA16, MA21	M6	11 Nm
MA31, MA41	M8	23 Nm

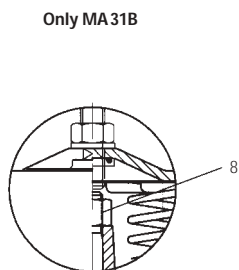
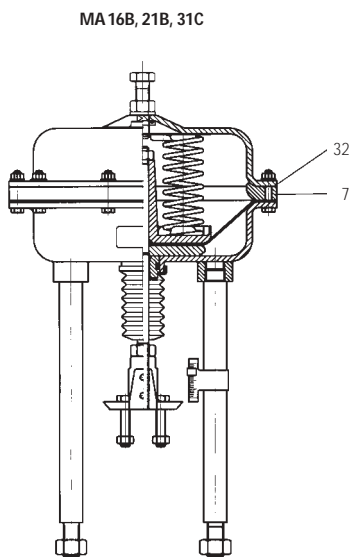
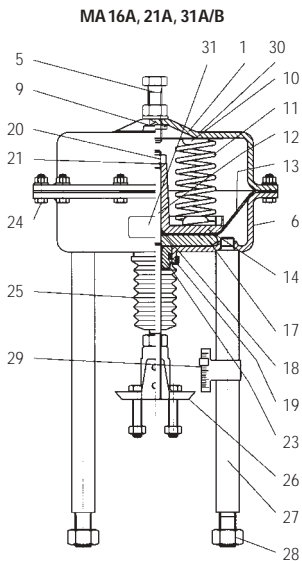
Table 2: Assembly utilities

Actuator sizes	Description
MA16 A and B	3 pcs screw M6 x 70
MA21 A and B	3 pcs screw M6 x 70
MA31 A, B and C	3 pcs screw M8 x 80
MA41 A and B	4 pcs screw M8 x 100
MA41 C	4 pcs screw M8 x 220
MA41 D	4 pcs screw M8 x 320

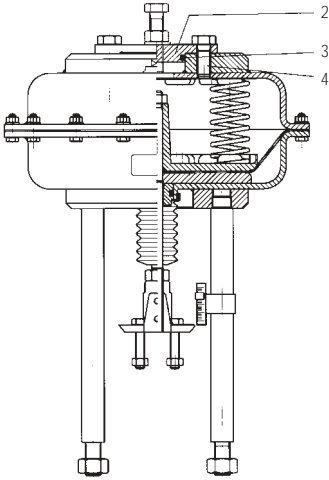
Figure 1: Spring centering of the diaphragm



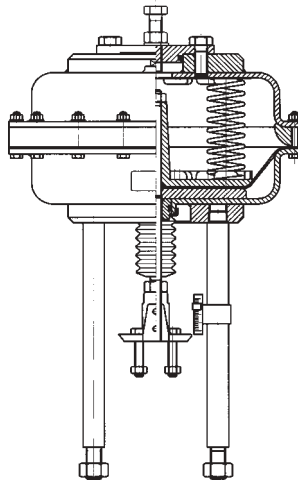
V. Specifications



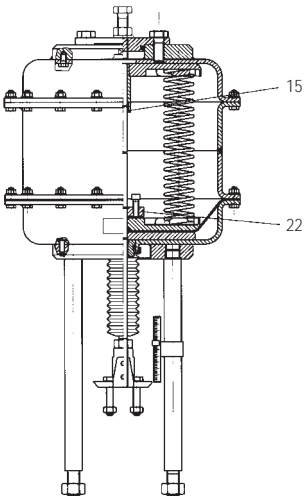
MA 41A



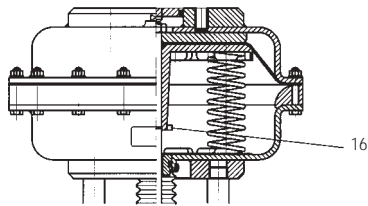
MA 41B



MA 41C/D



MA 41B as Ps



VI. Spare parts offer / orders

To: von Rohr Armaturen Ltd.
 Fichtenhagstrasse 4
 CH-4132 Muttenz 2
 Phone +41 (0) 61 461 48 48
 Fax +41 (0) 61 461 18 27
 e-mail: info@von-rohr.ch

Sender

In reference to the serial number(s):

- We would like to request a spare parts offer for the following items
- We would like to order the following spare parts

Bill of materials

Item	Description	Quant.
1	Upper case	
2	Cover	
3	O-ring	
4	Hexagon screw	
5	Stroke limitation	
6	Lower case	
7	Intermediate ring	
8	Hexagon nut	
9	Vent screw	
10	Spring centering plate	
11	Spring	
12	Stem	
13	Diaphragm	
14	Diaphragm plate	
15	Slide bearing	
16	Set collar complete	
17	Pressure plate	
18	O-ring	
19	Stem rings (kit of 2 half rings)	
20	Stem nut	
21	Washer	
22	Tension ring	
23	Guiding complete	
24	Rimscrews with nuts and washers	
25	Protection bellows	
26	Coupling	
27	Pillar	
28	Pillar nut	
29	Stroke scale	
30	Name plate	