EGMO
NEUMO Ehrenberg Group

TWISTMax

Pneumatic Rotary Actuators

Installation and Maintenance Instructions

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⚠ **Make sure you read this guide fully, before using the actuator**

⚠ **Store this guide safely so that you can use it in the future**

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1. General information

The following document contains information on how to install, operate and perform maintenance of TWISTMax pneumatic actuators. Product users and maintenance personnel should thoroughly review this document along with installation, operation and maintenance instructions of any valve that actuated by TWISTMax pneumatic actuator.

2. Safety and warnings

Serious injuries or death can be caused or property can be damaged due to improper usage of this product. Users and maintenance personnel must read this document before using this product and strictly adhere it at all times. For additional information contact EGMO.

2.1. The system designer and user have the sole responsibility for selecting products suited to their application requirements and ensuring the proper installation, operation and maintenance of the product. Please consider application details, material compatibility and product ratings when making your selection. Improper selection or use of products can cause serious injuries, death or property damage.

2.2. Product users and maintenance personnel must have deep understanding of any national and/or local safety laws and regulations.

2.3. The product must be used only at operating conditions EGMO and as it stated on product nameplate.

2.4. The product does not require maintenance of internal components. DO NOT DISASSEMBLE THE PRODUCT. THE PRODUCT HAS PRELOADED SPRING INSIDE.

2.5. Before performing any installation or maintenance works insure that all pressure or electrical sources are not connected to product.

2.6. Before performing any installation or maintenance works including valve actuation insure that you deeply understand in system.

2.7. Before servicing any installed valve you must depressurize and drain the system.

2.8. Before servicing any installed valve you must cycle it.

2.9. Note that residual material may be left in the valve and system.

2.10. Do not rotate manually an actuator's shaft.

2.11. Do not leave any grip key or shaft connection attached to the actuator during functional testing.

2.12. Keep hands, hair and clothing away from moving parts while actuating the actuator.

2.13. Only train and qualified users, who have read this document, are allowed to install, operate and perform maintenance of this product.

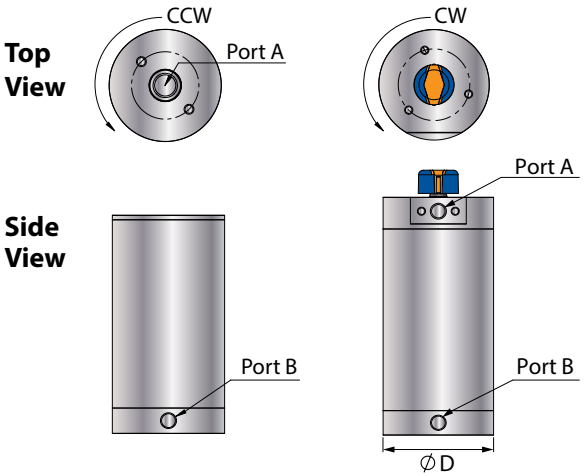
2.14. EGMO does not bear responsibility for accessories, attached to the actuator, which were not provided by EGMO.

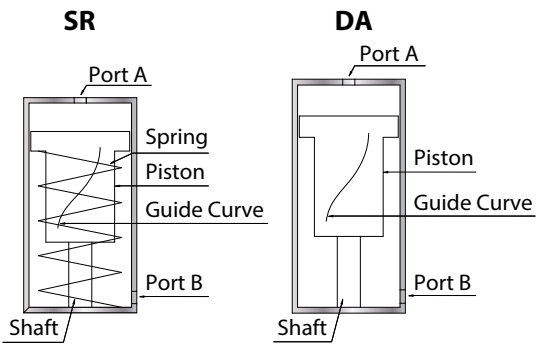
2.15. It is allowed to actuate the actuator only with medium which designated by EGMO. For additional information contact EGMO. **DO NOT ACTUATE THE ACTUATOR WITH OXYGEN AND HYDROGEN.**

3. Working principle

3.1. DA - Double Acting Actuator: Air supplied through Port A forces the piston and moves it downwards. Shaft forced by spiral guide rotates in CCW direction. Air supplied through Port B forces the piston and moves it upwards. Shaft forced by spiral guide rotates in CW direction.

3.2. SR - Spring Return Actuator: Air supplied through Port A forces the piston, moves it downwards, and compresses the spring. Shaft forced by spiral guide rotates in CCW direction. Upon release of air pressure, the spring forces the piston upwards. Shaft forced by spiral guide rotates in CW directions.





4. Operating and storage conditions

4.1. Technical data:

Housing material *	AISI 304
Internal components material *	AISI 304
Spring material	Chrome silicon alloy (coated)
Piston material	Engineering polymer
Seal material *	Engineering elastomers
Operating temperature *	-10°c to +60°c
SR Operating pressure	5 - 8 bar
DA Operating pressure	4 - 8 bar
Rotation	90°±5°
Torques	See catalogue
Pneumatic interface *	Metric
Control devices interface	VDI/VDE 3845 (optional)
Control media*	Filtered air according to DIN ISO 8573-1/class 4
Air filtration rate	30 micron (or less)
Usage	Indoor / Outdoor / Corrosive environment

* For other options contact EGMO

4.2. Storage:

4.2.1. Store the actuators inside their original package.

4.2.2. Store the actuators indoors, in dry and clean place.

4.2.3. It is recommended to cycle the actuators during long period storage.

4.3. Unpacking:

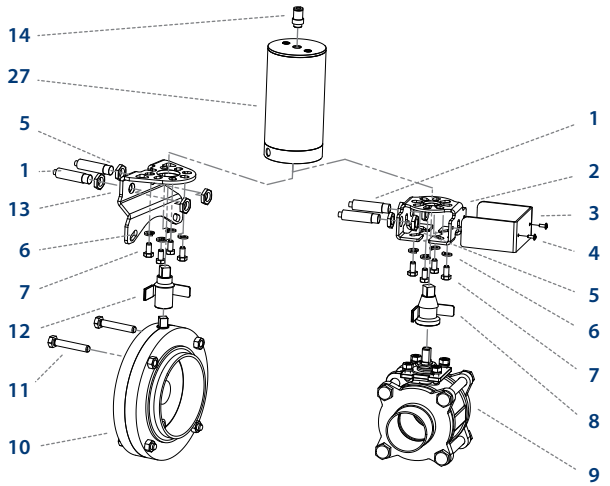
4.3.1. Before unpacking the actuator, insure that product received comply with packing list.

4.3.2. Inspect the actuator to any damages (contact your shipper if damages found).

4.3.3. Remove protection plugs close as possible to installation. Installation

5. Installation

Basic



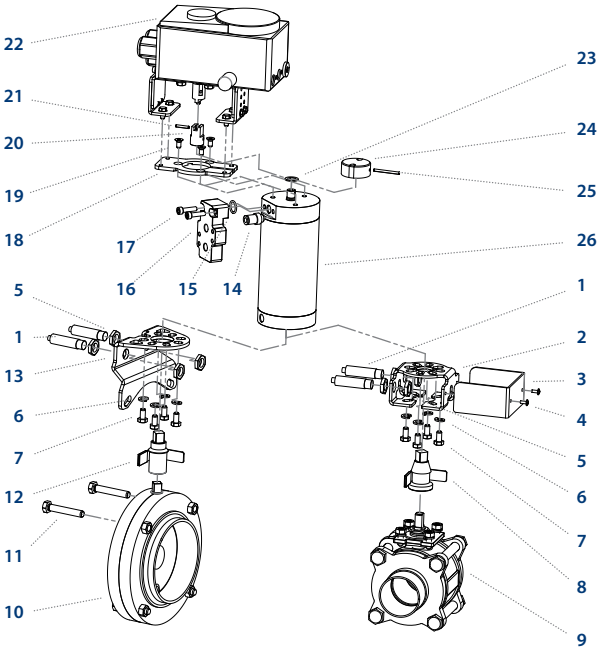
No.	Description	Qt'y	Material
1	Proximity Switch sensor	2	N/A
2	Universal bracket for ball valve	1	SS304
3	Bracket safety cover	1	PC
4	Button Head Cap Screw	2	SS304
5	Nut M12	4	SS304
6	Spring washer*	4	SS304
7	HEX Head bolt*	4	SS304
8	Coupling for ball valve (for inductive sensors)	1	SS304
9	Ball valve	1	STD
10	Butterfly valve	1	STD
11	Valve tightening bolt **	2	SS304
12	Coupling for butterfly valve (for inductive sensors)	1	SS304
13	Bracket for butterfly valve	1	SS304
14	Air connection	1	STD
15	O-Ring # 2-009/ 2-014***	1	STD

* See size in catalogue.

** According to valve size (defined by valve manufacturer)

*** See 5.2.1.5

Advanced



No.	Description	Qt'y	Material
16	NAMUR pad adapter	1	Aluminum, hard anodized
17	Socket head screw M5x20	2	SS304
18	VDI/VDE 3845 Plate	1	SS304
19	Flat head socket M5x10	2	SS304
20	VDI/VDE 3845 Adapter	1	SS304
21	Spiral pin 3mm x 16mm	1	SS304
22	Control unit	1	N/A
23	Sliding washer	1	PTFE
24	Upper visual position indicator	1	Plastic
25	Spiral pin 3mm x 32mm	1	SS304
26	TWISTMax Advanced quarter turn pneumatic actuator	1	N/A
27	TWISTMax Basic quarter turn pneumatic actuator	1	N/A

* See size in catalogue.
** According to valve size (defined by valve manufacturer)

5.1. Actuator installation:

5.1.1. Prior to installation make sure that there is enough space for installation / removal and connection of actuator (26, 27).

5.1.2. When SR actuator (26, 27) used it is recommended to mount filter on port B in order to avoid particles entrance into the actuator.

5.1.3. When SR actuator (26, 27) used in system that being washed periodically by water (or any other fluid) it is recommend to mount elbow faced downwards on Port B in order to prevent water (or any other fluid) entrance into the actuator.

5.1.4. Actuator (26, 27) and valve (9, 10) must be properly aligned. Failure to do so may lead to valve malfunction or medium leak.

5.1.5. After the installation check visually alignment of coupling (8, 12) and actuator (26, 27).

5.1.6. DO NOT BLOCK Port B at all times. The actuator (26, 27) will stop if port B is blocked.

5.1.7. It is recommended to connect the actuator (26, 27) to the bracket (2, 13) first and only to connect the bracket (2, 13) to the valve (9, 10).

5.1.8. After final tightening of installation bolts (7, 11) on valve (9,10) and actuator (26,27) check that the coupling (8, 12) has small axial movement.
WHEN PERFORMING THIS OPERATION INSURE THAT THE ACTUATOR (26,27) IS NOT CONNECTED TO PRESSURE SUPPLY.

5.1.9. After the installation insure proper tightening of all bolts.

5.1.10. Prior to installation verify correct valve's (9, 10) position (NO - Normally Opened or NC - Normally Closed) according to system design and rotate valve's (9, 10) stem accordingly.

5.1.11. Insure valve's (26,27) body tightening torque according to valve's manufacturer instructions.

5.1.12. TWISTMax actuator (26,27) can be mounted at any orientation.

5.1.13. For actuator (26,27) installation use suitable, fault free accessories and tools.

5.1.14. Apply lubricant on threads in order to prevent galling.

5.1.15. After the installation use soap solution to make sure all air connections (14, 16) are leak free.

5.1.16. It is recommended to mount on TMX4 Advanced actuator (26,27) air connection (14) with ø10mm (ø⅜") outside diameter.

5.1.17. Note that TMX4 actuator's (26,27) connection interface is not according to ISO5211. For more details see catalogue.

5.2. Accessories installation (applicable only for advanced type):

5.2.1. NAMUR Pad (15).

5.2.1.1. Apply grease on o-ring (15).

5.2.1.2. Install supplied o-ring (15).

5.2.1.3. Tighten installation bolts (17).

5.2.1.4. 5.2.1.4 Use soap solution to insure that the installation is leak free.

5.2.1.5. O-Rings sizes:

NAMUR Pad for	O-Ring #	Mat'l
TMX-4	2-009	NBR
TMX-5 to 11	2-014	NBR

5.2.2. VDI/VDE 3845 AA1 Plate (18) and VDI/VDE 3845 Adapter (20):

5.2.2.1. Remove spiral pin 3mm x 32mm (25) (hole diameter ø3mm / 0.12").

5.2.2.2. Remove upper visual position indicator (24).

5.2.2.3. Install sliding washer (23).

5.2.2.4. Install VDI/VDE 3845 Adapter (20) and insure that alignment of holes in actuator's (26) shaft and VDI/VDE 3845 Adapter (20).

5.2.2.5. Insert spiral pin 3mm x 16mm (21).

5.2.2.6. Install VDI/VDE 3845 Plate (18) and tighten flat head socket screws (19).

5.2.3. Mounting bracket (2, 13) and travel adjustment (hard stop) of actuator (26, 27) and valve (9, 10):

Mounting bracket , has slots on its connection surfaces in order to allow performance of actuator's , travel adjustment.

6. Operating and storage conditions

TWISTMax actuator does not require maintenance of internal components. It is recommended to perform steps as follows every six months in order to insure actuator's proper operation.

WARNING: To avoid serious injuries, death or property damage the following steps should be performed when pressure supply is disconnected.

6.1. Observe the actuator for correct fail-safe action.

6.2. Examine the actuator for damage caused by corrosive fumes and process drippings.

6.3. If possible, stroke the actuator and check for a smooth, full-stroke operation.

WARNING: To avoid serious injuries, death or property damage, keep hands, hair and clothing away from all moving parts while operating the actuator. If the actuator failed during testing, do not disassemble it. Contact EGMO customer service. Disassembling the actuator is a dangerous operation.

DO NOT DISASSEMBLE THE ACTUATOR IN ANY CASE!

6.4. Make sure the positioner mounting bolts, linkage and stem clamp are fastened securely.
6.5. Ensure all accessories, brackets and associated bolting is fastened securely.
6.6. Clean any dirt or foreign material from actuator's surfaces.
6.7. If an air filter is mounted, isolate the air filter, then check and clean or replace the element if necessary.

7. Troubleshooting

7.1. **Problem:** Pressure supplied to actuator but it does not move.

	Probable cause	Corrective action
1.	Leaks in pressure supply system.	Check pressure supply system for leaks.
2.	Incorrect pressure supply system design.	Check pressure supply system design.
3.	Supply pressure (to actuator) too low.	Check supplied pressure (to actuator).
4.	Malfunctioning control device.	Check control device.
5.	Actuator internal components failure.	Replace actuator.
6.	Valve's body bolts are over tightened.	Tight valve's body bolts according to manufacturer instructions.
7.	Incorrect installation.	Refer to installation procedure as described in this document.
8.	Port B blocked.	Unblock port B.

7.2. **Problem:** Pressure supplied, actuator and valve are operating but process is incorrect (when connected to 3 way ball valve).

	Probable cause	Corrective action
1.	Valve malfunctioning.	Replace or fix valve.

7.3. **Problem:** Excessive leakage through valve's seat.

	Probable cause	Corrective action
1.	Improper travel adjustment.	Perform travel adjustment.
2.	Valve malfunctioning.	Replace or fix valve.

7.4. **Problem:** Valve does not operate when actuator operate.

	Probable cause	Corrective action
1.	Valve malfunctioning.	Replace or fix valve

7.5. **Problem:** Valve does not operate when actuator operate.

	Probable cause	Corrective action
1.	Pressure supply system malfunction.	Check pressure supply system.
2.	Incorrect installation.	Refer to installation procedure as described in this document.
3.	Valve malfunctioning.	Replace or fix valve.
4.	Actuator malfunctioning.	Replace actuator.

8. Guarantee

Our liability, with respect of any defect or failure of the goods supplied or for any loss, injury or damage attributable onward is limited to the replacement or repair of the defects which under proper use appear therein and arise solely from faulty materials and workmanship. This guarantee is for a period of 12 calendar months after the original goods were first shipped. No other warranty is either expressed or implied.

Eu Machinery Directive Declaration Of Conformity Actuators:
The rotary pneumatic actuator range manufactured by EGMO, together with add-on units (Limit switches, positioners, solenoid valves, etc), all described in sales catalogue, conform to the requirements of the Machinery Directive 2006/42/EC, and to the essential health and safety requirements imposed by this directive.

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Position: Q.A. Manager
Signature: 

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