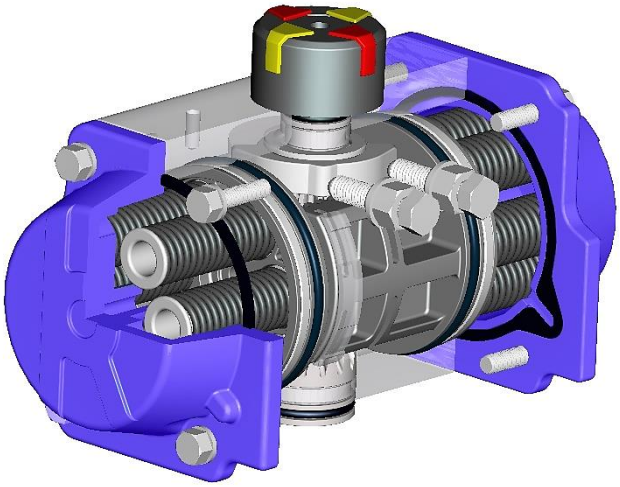
PNEUMATIC ACTUATORS

DOUBLE ACTING [DW] SINGLE ACTING [FR]



These operating instructions contain important information concerning the installation, function, maintenance and storage of the WESA rotary actuators. Please read them thoroughly and keep them for any queries. Only instructed and qualified personnel should service these rotary actuators.

CAUTION!

If the following and warning notes are not followed, hazards could result and the distributor's warranty could become invalid. The distributor is available for any queries.

Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

CONTENTS

IMPORTANT NOTICE

- Make sure that the drive is only used within the permissible limits (see technical specification).
- Operating the drive outside the permissible temperature range can overload and damage seals and bearings.
- Operating the drive above the maximum permissible working pressure can damage internal components and housing.
- Operating the actuator in extremely corrosive environments with inappropriate protection may damage internal and external components.
- Never disassemble the spring assemblies into their individual parts, this can lead to serious injuries. The spring assemblies should only be replaced completely.
- Disconnect all supply lines and make sure the actuator is depressurized before performing installation or maintenance.
- Never loosen or remove covers or existing accessories when the actuator is under pressure.
- Check the direction of rotation and position of the actuator in a test run before mounting the actuator on a valve.
- If the actuator is to be used as part of a system, as a safety element or as part of a circuit, compliance with the specified laws and safety regulations must be ensured.

OPERATING CONDITIONS and TECHNICAL DATA

Use dry, oiled or non-oiled compressed air that is compatible with the internal components and lubricants. The operating medium must have a dew point at -20° C or at least 10° C below the ambient temperature. The particle size must not exceed 30 µm.

Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

Operating pressure: The maximum operating pressure is 8 bar. The double-acting as well as the single-acting actuators can normally be operated in the pressure range from 2.5 bar to 8 bar.

Operating temperature: Standard drive from -20° C to + 80° C.

Switching: time See attached technical data sheet.
Important: the switching time depends on many factors, e.g.: Operating pressure, supply capacity (pipe Ø, flow capacity of the pneumatic accessories), valve type, torque and course of the valve, calculated safety factor, switching frequency, temperature, etc.

Design: rack and pinion principle

Coating and corrosion protection: All actuators are protected against corrosion for normal environmental influences.

Actuator designation: The actuator type, size, torque, spring action direction are specified by the actuator designation.

FUNCTION AND DIRECTION OF ROTATION

- The actuator is a pneumatic component for remote control of valves.
- There are different possibilities for the control 90°:
- Direct mounting of a solenoid valve (5|2 for double-acting, 3|2 for single-acting) to pressure ports 2 and 4.
- Piping (to pressure ports 2 and 4) with separate control unit.
- The standard direction of rotation is clockwise closing, a counterclockwise direction of rotation is achieved for double-acting actuators by pressurizing port 2.

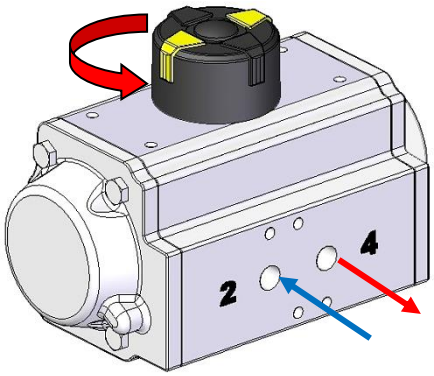
SETTING THE END POSITION [Positions 25 + 26]

Left adjusting screw: position -OPEN-.
Loosen the lock nut, by unscrewing the adjusting screw the opening angle is increased by max. 5°. After the adjustment, tighten the lock nut again.
Right adjusting screw: position -CLOSED-.
Loosen the lock nut and tighten the adjusting screw to reduce the opening angle by max. 5°. After the adjustment, tighten the lock nut again.
After the adjustment process, check the actuator for tightness!

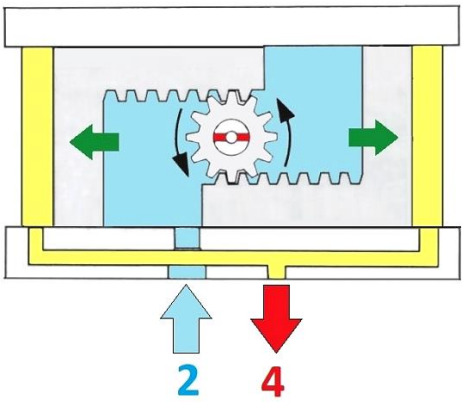
Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

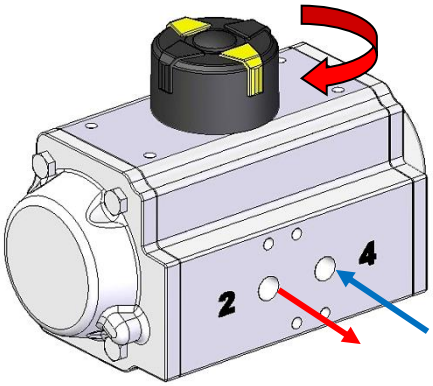
DOUBLE ACTING PNEUMATIC ACTUATOR DW



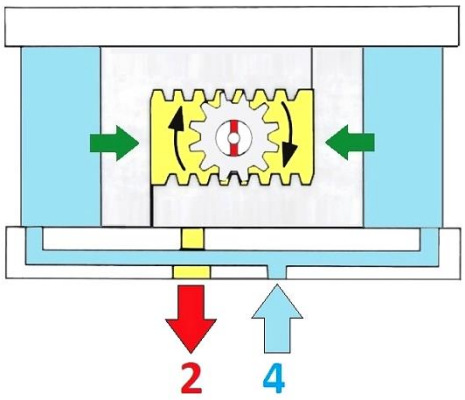
-OPEN COUNTERCLOCKWISE-
Supply air via port -2-



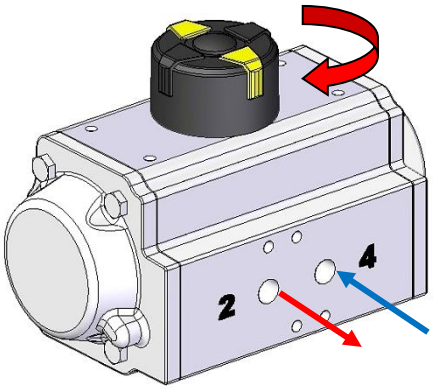
DOUBLE ACTING PNEUMATIC ACTUATOR DW



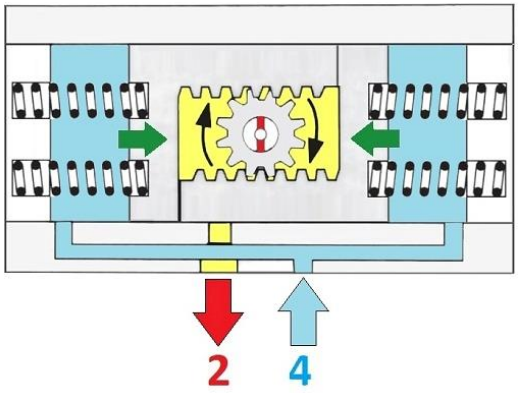
-CLOSE CLOCKWISE-
Supply air via port -4-



SINGLE ACTING PNEUMATIC ACTUATOR FR
SPRING FORCE CLOSING



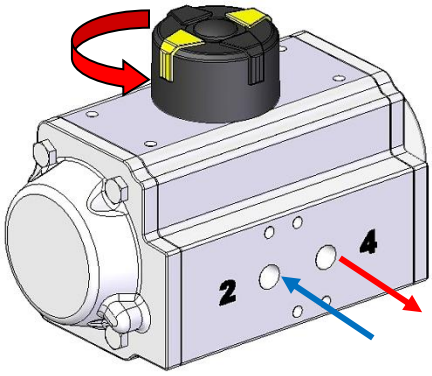
-CLOSE CLOCKWISE-
Supply air via port -4-



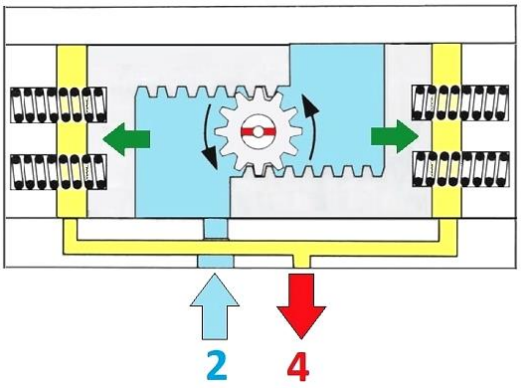
Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

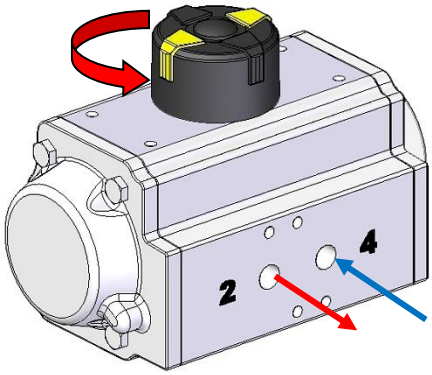
SINGLE ACTING PNEUMATIC ACTUATOR FR
SPRING FORCE CLOSING



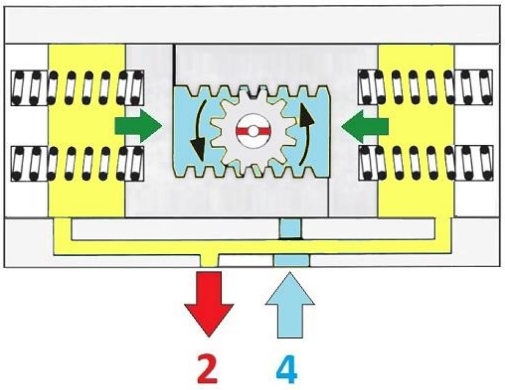
-OPEN COUNTERCLOCKWISE-
Supply air via port -2-



SINGLE ACTING PNEUMATIC ACTUATOR FR
SPRING FORCE OPENING

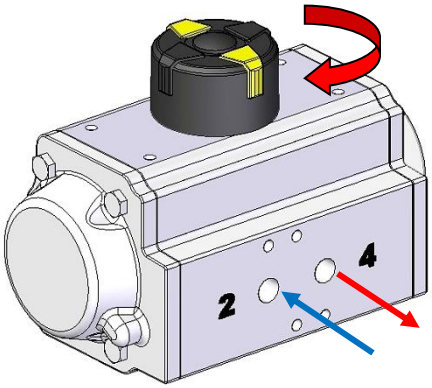


-OPEN COUNTERCLOCKWISE-
Supply air via port -4-

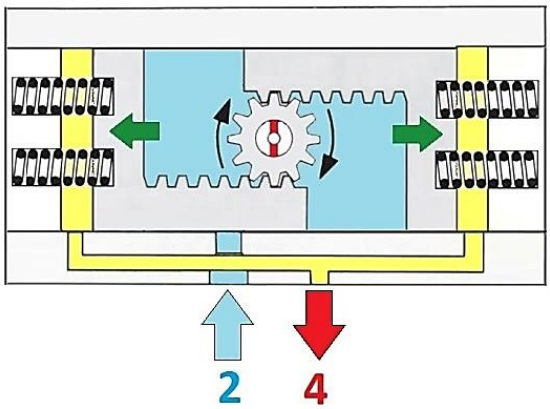


DRIVE PISTON INSTALLED UPSIDE DOWN

SINGLE ACTING PNEUMATIC ACTUATOR FR
SPRING FORCE CLOSING



-CLOSE CLOCKWISE-
Supply air via port -2-



DRIVE PISTON INSTALLED UPSIDE DOWN

Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

OPERATING INSTRUCTIONS

The WESA actuator is a pneumatic actuator for remote operation of industrial valves. The actuator operates various types of valves by a 90° rotation by opening and closing. All necessary information to mount the actuator correctly and safely on a valve, e.g.: Dimension, torque, air volume, end position setting, switching time, working temperature, direction of rotation can be found in the technical data sheets. Please read the technical information carefully before starting the installation of the valve.

Important safety instructions

During installation, the actuator must be depressurized for safety reasons. When connecting the actuator to the air supply, extreme cleanliness should be observed. In particular, the threaded connections, screw connections and seals must be clean and free of dirt. If you mount accessories on the actuator, make sure that the upper shaft end remains free so that manual operation may still be possible later. Before mounting the actuator on a valve, please ensure that the valve is in the correct initial position depending on the required direction of rotation.

Solenoid valve mounting

Before mounting a solenoid valve, please check if the actuator is in the initial position (closed position,). For standard mounting and clockwise closing rotation: the shaft at the top must be perpendicular to the longitudinal axis of the actuator in the closed position. Mount the solenoid valve on the actuator using screws provided for this purpose.

Limit switch box mounting

The box and limit switch bracket on the actuator, using screws provided for this purpose.

Actuator mounting on a valve

Before you start, please make sure that the actuator rotates in the required direction and that both parts, actuator and valve, are correctly positioned in relation to each other. **IMPORTANT:** if you are building a single-acting actuator (with spring) with a defined fail-safe position, please check that in case of failure of pneumatic or electric power the direction of rotation corresponds to your application (clockwise closing). Now attach the actuator to the valve. The actuator should be in the initial position (CLOSED position).

Direct mounting

Insert the square, dihedron or key of the valve shaft directly into the shaft of the actuator and screw the two parts tightly to the actuator through the ISO flange.

Bracket mounting

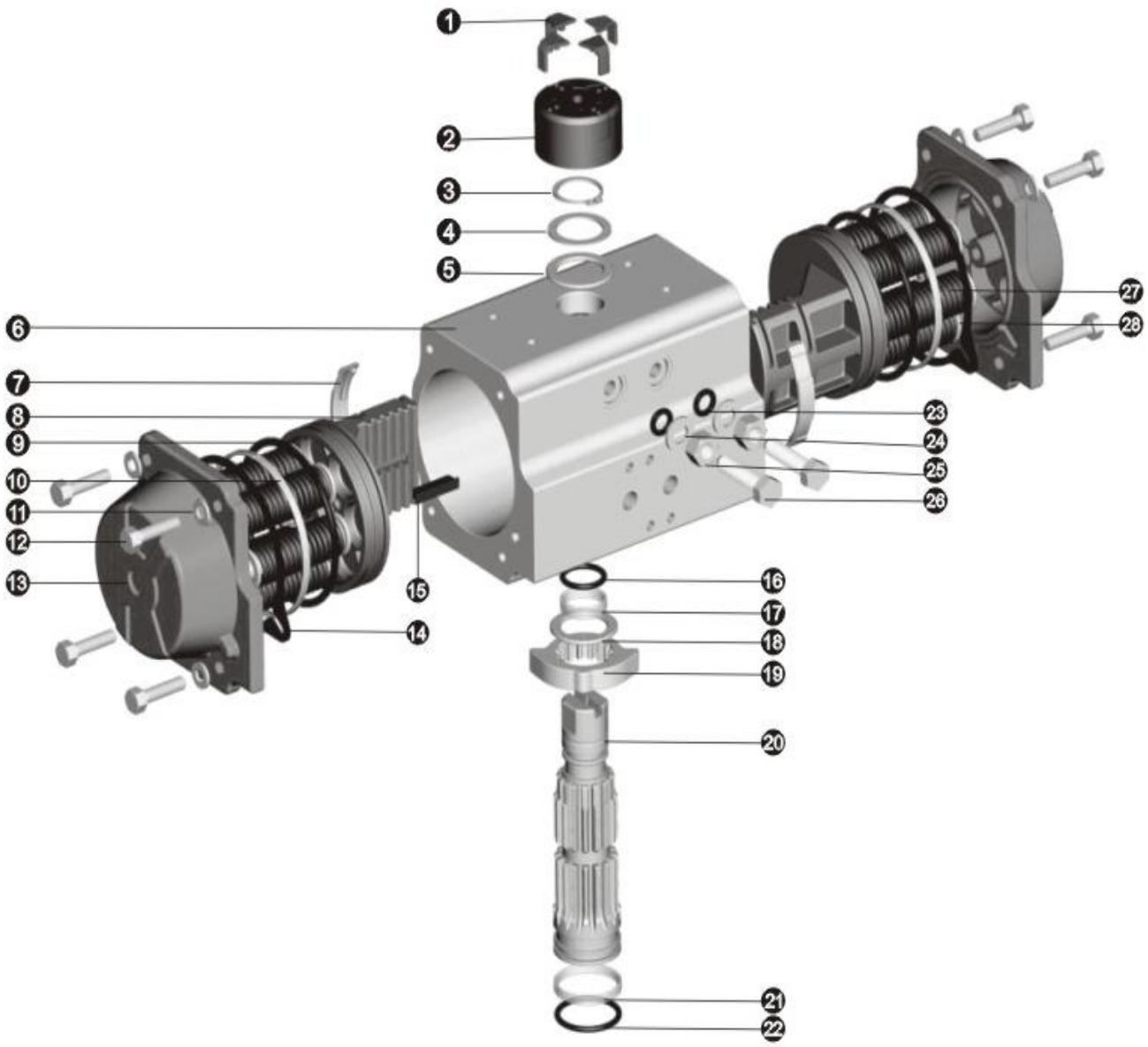
Mount the bracket on the valve and then plug the coupling onto the valve shaft. Make sure that the position indicator of the coupling corresponds to the switching position of the valve. Then fit the actuator and screw the unit tight.

Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

MAINTENANCE INSTRUCTIONS

With the instructions listed below, WESA aims to provide its customers with all the information they need for maintenance. Under normal operating conditions, only a periodic check is necessary to ensure proper functioning.



Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

PART-No.	QTY	DESRIPTION	MATERIAL
1	4	Position indicator	Polypropylene + GF
2	1	Position indicator holder	Polypropylene + GF
3	1	Spring clamp (drive pinion)	Stainless steel nickel plated
4	1	Lock washer (drive pinion)	Stainless steel
5	1	Guide bearing (drive pinion)	Polyphytalamide
6	1	Housing	Aluminum alloy anodized
7	2	Guide rail	Polyphytalamide
8	2	Piston	Cast aluminum hard anodized
9	2	O-ring (drive pinion)	Nitrile (NBR 70)
10	2	Guide rail	Polyphytalamide
11	8	Bearing bolt washer	Stainless steel
12	2	Bearing bolt (end cap)	Stainless steel
13	2	right and left end cap	Aluminum alloy anodized
14	2	O-ring (end cap)	Nitrile (NBR 70)
15	2	Piston guide bearing	Polypropylene + GF
16	1	O-ring (piston top)	Nitrile (NBR 70)
17	1	Guide rail (piston top)	Nylon 46
18	1	Guide bearing (piston)	Polyphytalamide
19	1	Open/close cam	Stainless steel
20	1	Drive shaft	Steel, nickel-plated
21	1	Guide rail (piston bottom)	Nylon 46
22	1	O-ring (piston bottom)	Nitrile (NBR 70)
23	1	O-ring (stop screw)	Nitrile (NBR 70)
24	2	Stop washer	Stainless steel
25	2	Stop nut	Stainless steel
26	2	Stop bolt	Stainless steel
27	Satz	min. 5 | max. 12 Spring	High alloy spring steel Epoxy coated
28	1	Spring holder	Polypropylene + GF

Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

DISASSEMBLY

If it is necessary to disassemble the actuator for maintenance, disassemble the actuator from the valve. It is important to ensure that the actuator is not pressurized before disassembling any components. Work carefully and check that port 2 and 4 are open. Disassemble any accessories or connections. When disassembling the single-acting actuators, make sure that the actuator is in the fail-safe position (springs released). All disassembled and unreplaced components should be thoroughly cleaned and checked for wear before reassembly.

1. **Disassembly of the cover**
   Disassemble the screws. **Caution**: When disassembling a single-acting drive, loosen the cover screws alternately. If after 4-5 screw turns there is no noticeable relief on all screws, this may be an indication of damaged spring assemblies. In this case, the disassembly should be aborted. Further cover disassembly may result in serious injury to maintenance personnel. Return actuator to supplier immediately. For single-acting actuators, remove spring assemblies, remove cover gasket and replace if necessary.

2. **Disassembly of the pistons**
   Clamp the housing in a vice or similar tool. Turn the shaft until the pistons are released. **Caution**: Compressed air must not be used to remove the pistons from the housing (projectile effect). Carefully remove piston seals using a screwdriver, remove piston guide jaws and piston guides. Replace O-ring in case of replacement.

3. **Disassembly of the shaft**
   Carefully remove snap ring with snap ring pliers, remove washer and thrust washer. Press the shaft downwards with light pressure on the upper side until it is possible to remove the cam and the internal thrust washer. Then pull the shaft completely out of the housing. If the shaft cannot be removed by hand, it can be driven out by lightly tapping the top of the shaft with a plastic hammer. Remove the upper and lower piston bearings, and upper and lower seal rings. Replace the bearings, internal and external thrust washers, and O-rings and, if necessary, replace all spare parts.

ASSEMBLY

Before assembly, all components must be clean and in perfect condition.

4. **Mounting of the shaft**
   Install upper and lower shaft bearings, then install upper and lower shaft seals on the shaft. Grease the outside of the shaft surface at the top and bottom. Partially insert the shaft into the housing, then mount the cam in the desired position in relation to the position of the shaft head and shaft flow and the direction of rotation of the drive. Then mount thrust washer, insert shaft completely. Mount external thrust washer, mount washer and snap ring with snap ring pliers.

Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland

ASSEMBLY

5. Mounting of the pistons

Install piston sealing rings, install piston guide and piston bearings. Grease the running surface of the pistons in the housing and the teeth of the pistons. Hold housing in horizontal position by clamping upper shaft end in a vice or by countering shaft end with an appropriate counterpart. Make sure that the cam is in the correct position. For standard direction of rotation (clockwise closing), rotate the housing 40-45° counterclockwise, as seen from the bottom view. Or turn clockwise, as seen from the top view, depending on how the shaft is held. Press both pistons into the housing at the same time until the pistons grip and turn the housing clockwise or counterclockwise to the end of stroke. Check that the pistons rotate the shaft 4° above the centerline in the end position.

6. Mounting of the cover

Tread housing. For single-acting actuators, insert the correct number of spring assemblies in the cover. Mounting of the cover sealing rings in the groove of both covers. Mounting the covers to the housing. Make sure that the O-rings are in the grooves. Screw in the cover screws by hand.

7. Mounting of the adjusting screws

Insert both adjusting screws, lock nuts, washers and O-rings. Screw the adjusting screws into the housing.

SWITCHING TIMES

Double-acting rotary actuator DW

Article DW		01	02	03	04	05	06	07	08	09
OPEN	[sec.]	0,15	0,20	0,25	0,30	0,40	0,50	0,90	1,50	2,70
CLOSE	[sec.]	0,15	0,25	0,30	0,40	0,50	0,70	1,20	1,80	3,50

Single-acting rotary actuator FR

Article FR		01	02	03	04	05	06	07	08
OPEN	[sec.]	0,25	0,30	0,35	0,50	0,60	1,10	1,70	3,20
CLOSE	[sec.]	0,30	0,35	0,50	0,60	0,90	1,40	2,10	4,00

STORAGE

If the actuators are to be stored, the following points must be observed:

- Store in a dry place at normal ambient temperature.
- Storage in the original packaging is recommended.
- Do not remove the plastic protective caps from the compressed air connections A and B.

Phone +49 (0)7181-404 0
Telefax +49 (0)7181-404-33
mailto info@wesa-armaturen.de
Http www.wesa-armaturen.de

WESA-Armaturen GmbH
Spanninger Straße 5
73650 Winterbach
Deutschland