

## Pneumatic actuators Firesafe

### TYPE AND DESIGN

SR = Spring return. Actuator with spring return.  
RCC30 and 50 have 1 piston.  
RCC20 has 2 pistons.

### LUBRICATION

RCC actuators are permanently lubricated and additional lubrication is normally not required. However, for actuators performing 100.000 operation cycles or more under very heavy load, an oil mist lubrication is recommended.

Oil mist lubrication requires a mineral oil type ISO VG32 class 1 for usage in temperature range -10 to +70°C. Oil mist lubricator must be set at lowest possible value. Commenced oil mist lubrication must continue. If the actuator is equipped with pneumatic or electro-pneumatic positioner, oil mist must not be used.

### OPERATING MEDIUM

The air or inert gas to be used must be filtered to 50 µm particle size or less. If the operating temperature is below +5° C, the air dew point must be below the application temperature. The exhaust air must pass through a filter silencer before it is let out into a workshop.

The spring houses on SR actuators which normally "breathe" through the ports in the end plates, **must not be in connection with corrosive atmosphere**. Our technicians will show a suitable method to avoid this.

### HAND OPERATION

#### WARNING!

*It is practically impossible and very risky to try to operate the actuator manually by using the key grip on the driving shaft. The accumulated energy inside the actuator may instantaneously be set free.*

#### WARNING!

*All manual operations in emergency situations must be carried out using a vented actuator.*

### THE PRINCIPLE AND APPLICATION OF THE SCOTCH YOKE CONSTRUCTION

The Scotch Yoke (8) and the pistons (10) are mounted according to Dwg 1 and Dwg 3 on page 2 and 3. The Scotch Yoke is supplied with an oblique groove which increases the torque at the moment when the spring closes the valve.

This torque increase counteracts well the reduction of the spring force at the end of the spring closing movement.

### INSTALLATION AND ADJUSTMENT

#### WARNING!

*RCC actuators must only be used as rotating actuators on valves. Levers, racks and similar cannot be used to transmit movement without protective equipment.*

All types of actuators can be mounted in various positions, e.y. vertical or horizontal. When mounting on a valve, ensure that the actuator shaft and the valve stem are centered, and that a play of ca. 0,5–1 mm exists between shaft and driving bush or valve stem. After mounting it may be necessary to adjust the turning angle of the actuator.

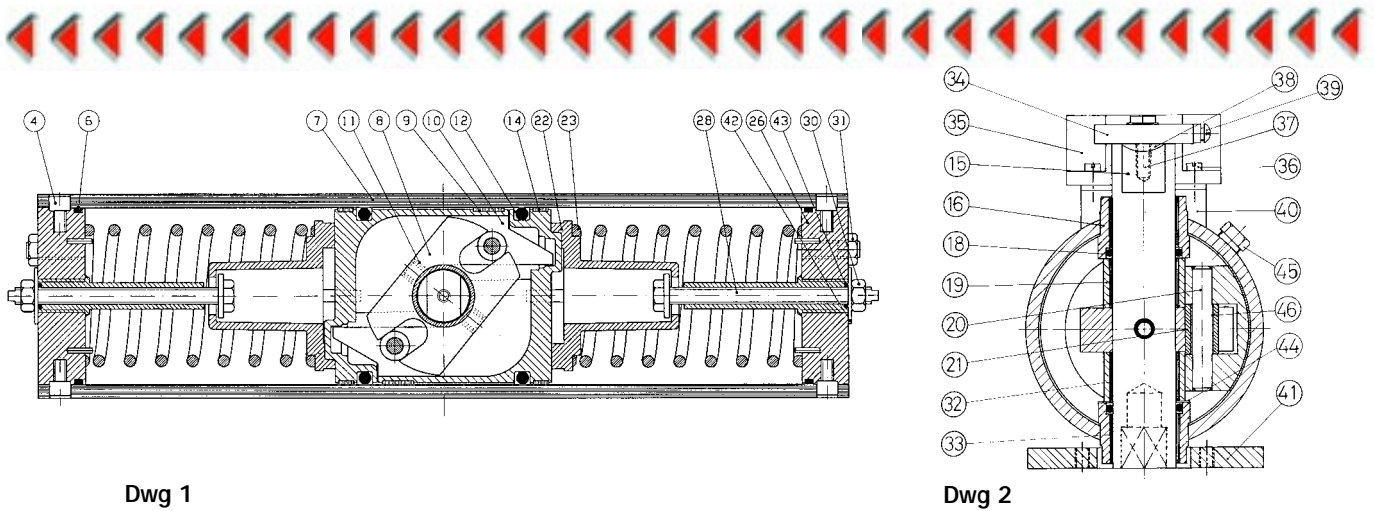
*Tightening torques for lock nuts on page 2.*

The SR actuators can be adjusted in "open" position. The adjustment occurs by loosening the lock nut on the end plate and turning the set screw clockwise for reduced and anticlockwise for increased rotary motion. The adjustment degree is  $\pm 3^\circ$  C.

RCC20 has two adjustment screws. **It is important that both screws are in contact with the piston in question.**

#### WARNING!

*Pinch risk in the valve opening when test running non-installed valves.*



Dwg 1

Dwg 2

## SERVICE OF RCC-SR

### WARNING!

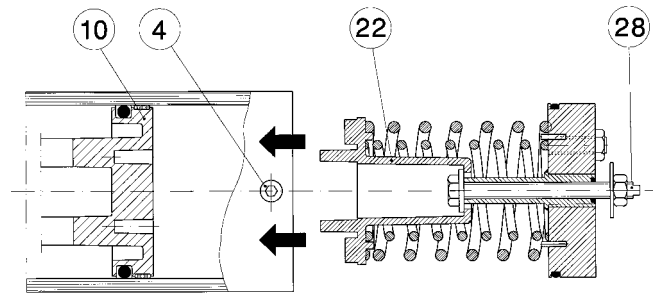
*Before dismantling, check that the compressed air and possible power supply are disconnected. Dismantling of SR unit: see instruction on page 4.*

### Exchange of O-rings to pistons and support elements

1. Please read the warning above!
2. Dismantle the actuator from the console.
3. Dismantle the end plate for spring (26).
4. Fasten the actuator shaft between soft jaws in a vice and turn the actuator until the pistons reach the cylinder end. Then place a few rods in the holes on the back side of one piston. By pressing together and pulling these rods simultaneously, the piston is dismantled from the cylinder.
5. If the piston O-ring (12) is worn, it must be replaced.
6. Replace the support ring (14) if it is worn.
7. Replace the support element (9) if it is worn.
8. Grease the cylinder surfaces with a high quality grease, for instance a ball bearing grease.
9. Mount the end plates and adjust the shaft turning angle according to the instruction on the right.

### Mounting of spring package

1. Turn the screw (28) anti-clockwise until it stops and the springs are tensioned to the full.



2. The spring guide (22) is centered towards the piston with the aid of 2 pins.
3. On sizes 30 and 50, the SR units must be turned so that one of the three support points lies between the bosses on the piston (10).
4. Mount the SR unit when the piston is in its innermost position.
5. Put the screws (4) in place. RCC50 has its screws placed horizontally according to example on page 3.

*Tightening torques according to table below.*

6. The turning angle of the actuator is adjusted with the tensioning screw (28).

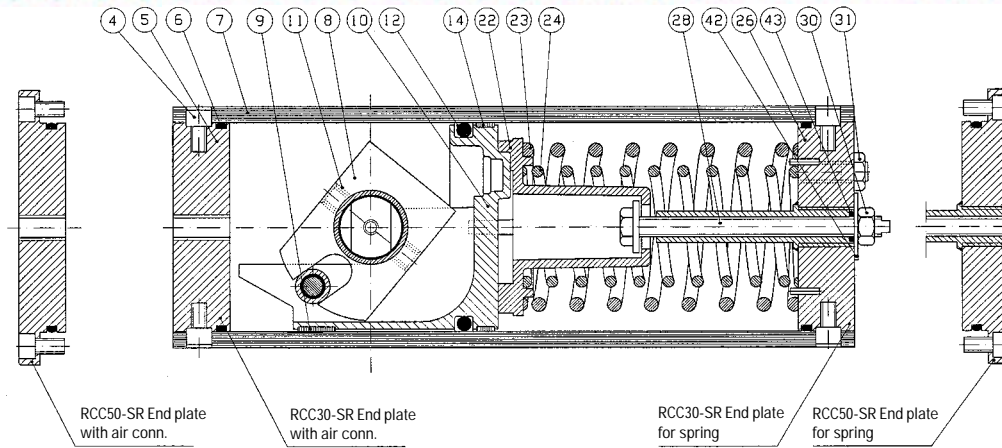
### Tightening torques for screws and lock nuts

The actuators must be screwed onto the console with the correct torque in order to remain stable during operation. Please use as long screws as possible without the threads grounding.

#### Tightening torque in Nm

Actuator	Fixing screw against console	End plate screw	Lock nut (30)
RCC20	8,5	8,5	9
RCC30	20,5	8,5	18
RCC50	40	8,5	35

Resistance class min. 8.8. Lightly oiled screws.



### Material table for RCC Firesafe

Part No	Description	Number	Material	Surface treatment
4	Fastening screw <sup>3</sup>	4	Stainless steel ISO 638/XIII-11	—
5	End plate <sup>4</sup>	1	Carbon steel	Zinc plated, epoxy coated
6	O-ring	2	Nitrile	—
7	Cylinder	1	Carbon steel	Epoxy coated
8	Scotch Yoke	1	Carbon steel, hardened	Zinc plated
9	Support element <sup>1</sup>	1	PES JCL-4036	—
10	Piston <sup>1</sup>	1	Ductile iron	Zinc plated
11	Roll pin double <sup>5</sup>	1	Spring steel ISO 638	Hardened
12	O-ring <sup>1</sup>	1	Nitrile	—
14	Support ring <sup>1</sup>	1	PTFE carbon filled	—
15	Drive shaft	1	Stainless steel ISO 638/XIII-17	—
16	Bearing shell	2	Carbon steel	Zinc plated
18	O-ring	2	Nitrile	—
19	Support ring	2	Carbon steel	Zinc plated
20	Shaft <sup>1</sup>	1	Steel ISO 683/11C16M2	Hardened
21	Bearing roller <sup>1</sup>	1	Ball bearing steel on RCC 30, RCC 50 steel	Hardened
			ISO Dp 683/9-35 SMn 20	
22	Spring guide <sup>1</sup>	1	Carbon steel	Zinc plated
23	Spring external <sup>1</sup>	1	Spring steel ISO 638/XIV-1	Ball blasted, anti-corrosion protected
24	Spring internal <sup>4</sup>	1	Spring steel ISO 683/XIV-1	Ball blasted, anti-corrosion protected
26	End plate for spring <sup>1</sup>	1	Carbon steel	Zinc plated and epoxy coated
28	Pre-tensioning screw <sup>1</sup>	1	Stainless steel ISO 683/XIII-11	—
30	Lock nut <sup>1</sup>	1	Stainless steel ISO 638/XIII-11	—
31	Silencer <sup>1</sup>	1	Brass	—
32	Bearing <sup>2</sup>	2	Type Glycodur	—
33	Bearing	2	Type Glycodur	—
34	Cam disc	1	Carbon steel	Zinc plated
35	Indicator open/close	1		
36	Screw	2	Stainless steel ISO 638/XIII-11	—
37	Screw	1	Stainless steel ISO 638/XIII-11	—
38	Locking washer	1	Stainless steel	—
39	Adjustment screw	1	Stainless steel ISO 638/XIII-11	—
40	Bracket	1	Carbon steel	Epoxy coated
41	Flange	1	Carbon steel	Epoxy coated
42	Marking plate <sup>1</sup>	1	Aluminium	Anodized
43	O-ring <sup>1</sup>	1	Nitrile	—
44	Shim washer	0-2	Steel	—
45	Air connection	1	Stainless steel (only RCC 20-SR)	—
46	Bearing	2	Brass (only RCC 50-SR)	—

1) For actuator RCC20-SR: the double amount of details.

2) For actuator RCC20-SR: bearings in solid carbon steel.

3) For RCC50-SR: 16 screws.

4) Do not exist for RCC20-SR.

5) For RCC20 3 pcs.



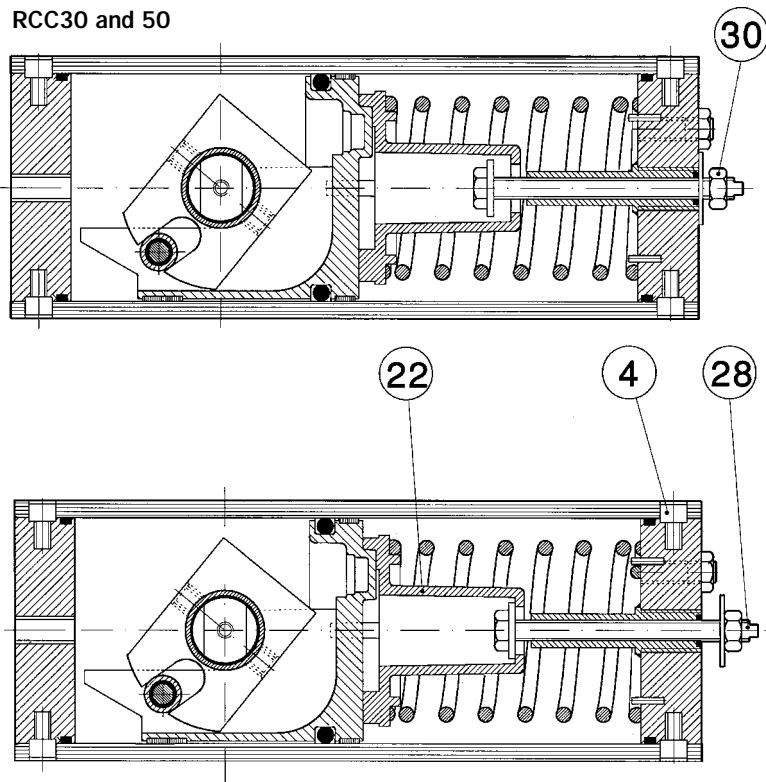
## Instructions for dismantling of RCC-SR actuators

RCC30 and 50

### WARNING!

*This procedure must be followed for safe dismantling of pretensioned spring housings.*

1. Check that the springs can press the piston into starting position according to picture on the left.
2. The actuator must be pressureless.
3. Disconnect possible power supply.
4. Loosen the lock nut (30).
5. Turn the spring tensioning bolt (28) anti-clockwise until it lies lightly against the spring steering (22) and the full spring force is resting on the bolt (28).
6. Dismantle the spring housing by loosening the screws (4). RCC50 has its screws placed horizontally according to example on page 3.
7. Dismantling must be carried out with the utmost care. In the case of the slightest uncertainty – contact the supplier!



RCC20

### WARNING!

*This procedure must be followed for safe dismantling of pretensioned spring housings.*

1. Check that the spring can press the pistons into starting position according to the picture on the left.
2. The actuator must be pressureless.
3. Disconnect possible power supply.
4. Loosen the lock nuts (30).
5. Turn both spring tensioning bolts (28) clockwise until they can be turned without force.
6. Turn the left pre-tensioning bolt (28) anti-clockwise until it lies lightly against the spring steering (22) and the full spring force is resting on the bolt (28).
7. Dismantle the left spring housing by loosening the screws (4). RCC 50 has its screws placed horizontally according to example on page 3.
8. Dismantle the right spring housing in the same manner as the left one.
9. Dismantling must be carried out with the utmost care. In case of uncertainty – contact the supplier!

