RC 200
Pneumatic Actuator
Double Acting
&
Spring Return

REMOTE CONTROL®

Top Quality Valve Actuators
Made in Sweden

RC 200

High reliability pneumatic actuators

REMOTE CONTROL has been manufacturing pneumatic actuators in Sweden since 1961.

RC 200 series actuators are unique by design through the use of our Scotch Yoke technology on everything from the smallest RC 210 to the largest.

Our customers appreciate the technical benefits of the RC 200 actuators for a wide range of process environments. Scotch Yoke technology gives higher torque in the end positions, which is essential when valves are shut for long periods of time and require more torque during the initial operation. RC 200 actuators are smooth operating and have soft starting and finishing rotary motion to significantly protect and extend valve's working life.

The RC series is fitted exclusively with our RC-M1 manual override, a solution which is regarded as the best on the market (see p. 4).

The RC 200 series meets all international standards for fast, easy fitting of actuators to valves and accessories such as solenoid valves, end switches, position sensors, etc.

Valves and actuators are assembled quickly and easily at any of our workshops worldwide. They can also be installed out on site at our customers' premises.

Remote Control is a Swedish company with its own international subsidiaries and workshops in Germany, Great Britain, Singapore and the USA.

Technical Data

- 10 Nm – 8,000 Nm.
  90 lbf. in. – 71,000 lbf. in.
  On – Off and modulating
  Double-acting or Single-acting with spring return.
- Max pressure: 10 bar/ 145 psi
  Temp: -20 °C to +80 °C
  -5 °F to +175 °F
  Low temp: -40 °C to +60 °C
  -40 °F to +140 °F
  High temp: 0 °C to +150 °C
  +30 °F to +300 °F
- Mounting face according to international standard ISO5211, DIN3337, DIN79, NAMUR, VDI/VDE 3845.
- Mounting kits for all 90° valves and accessories.
- Spring cartridge with pre-tensioned springs. Blow-off-proof drive shaft.
- Scotch Yoke provides increased torque in the end positions, smooth action, precise control, low air consumption and compact dimensions.
- High-quality materials for long working life and optimum corrosion proofing. Extruded anodised aluminium housing, RC 210-260 have drive shafts and screws of stainless steel.
- Long life, maximum reliability and three-year warranty.

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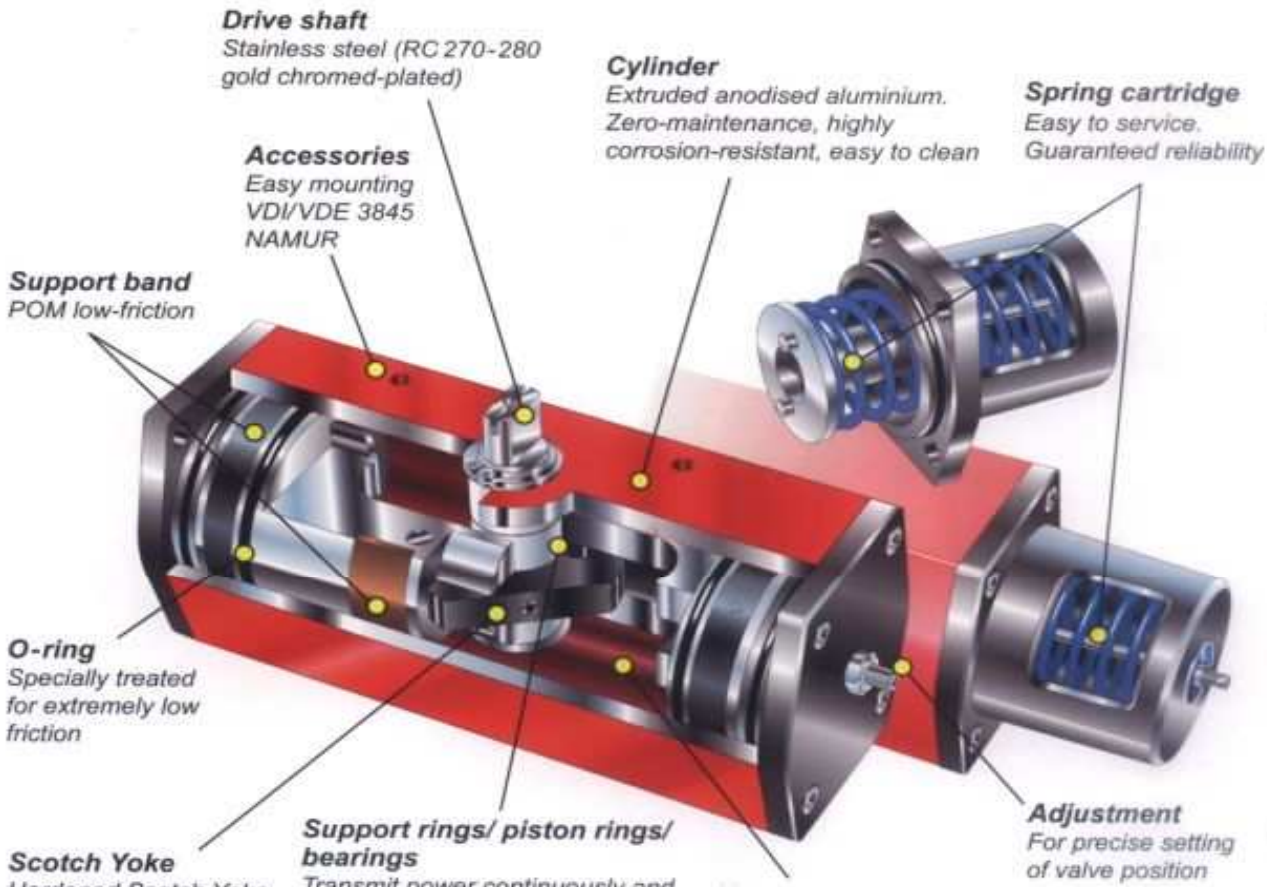
REMOTE CONTROL®

RC200 - The flexible power package

Quality - Strength - Reliability



Drive shaft
Stainless steel (RC 270-280 gold chromed-plated)

Cylinder
Extruded anodised aluminium. Zero-maintenance, highly corrosion-resistant, easy to clean

Spring cartridge
Easy to service. Guaranteed reliability

Accessories
Easy mounting VDI/VDE 3845 NAMUR

Support band
POM low-friction

O-ring
Specially treated for extremely low friction

Scotch Yoke
Hardened Scotch Yoke with canted grooves, optimum power, compact unit, minimum energy consumption

Support rings/ piston rings/ bearings
Transmit power continuously and precisely

Adjustment
For precise setting of valve position

Polished surface finish
Minimum friction, maximum working life, maximum precision

Hole pattern
International standard ISO 5211, DIN 3337, NAMUR

Centering ring
ISO 5211, DIN 3337, NAMUR

Stardrive shaft
Tailored to international standards for square-section shafts. ISO 5211, DIN 79 and NAMUR

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REMOTE CONTROL

Quality - Strength - Reliability

Quality

All RC actuators are made under strict quality control. We are certified to ISO 9001 and ISO 14001.

Our RC actuators comply with all standard international requirements, and all our products are CE-marked according to PED and ATEX. The recognised high quality of our RC actuators ensure our customers get top class actuating. We are proud to be able to give the unique RC warranty of three years!

Strength

RC actuators are strong. RC 200 with Scotch Yoke gives at least 50% more torque in the end positions, precisely where valves need it most. This ensures that valves work even after prolonged standstills.

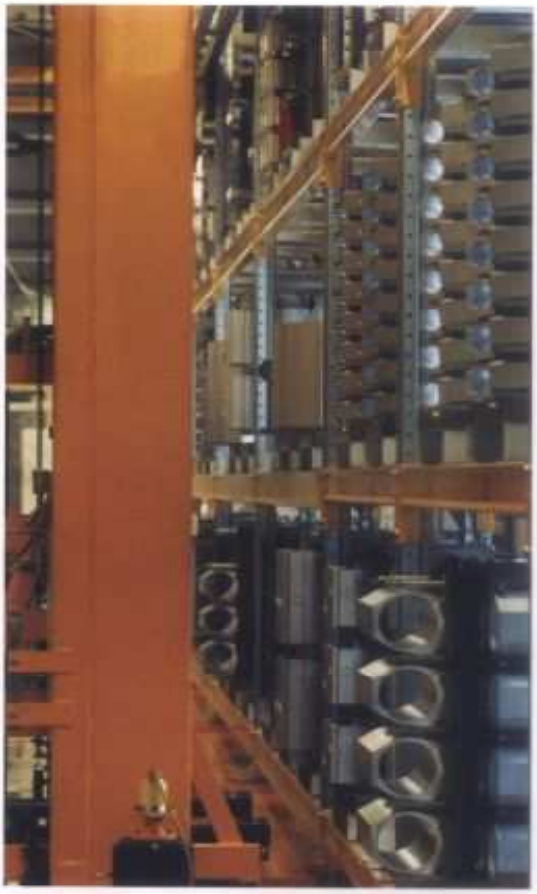
RC 200 actuators have the lowest weight and smallest external dimensions for their torque output. Giving compact, light valve and actuator units, especially when using RC-M1 manual override. This reduces stresses on pipe work, especially when there is vibration in the pipe system.

Another benefit to our customers is that RC 200 actuators use less stroke volume than equivalent rack and pinion actuators, a major saving when you consider what compressed air costs.

Reliability

Simple, robust design. We use only top-quality materials in production, so our actuators last.

Our RC-M1 manual override unit is the best solution on the market. It is integrated in the endcap of the RC 200 actuator. To find out more about the benefits of the RC-M1 unit, go to page 4.



RC 200 actuators are manufactured around the clock using State-Of-The-Art automated CNC machinery.

RC 200-SR spring return

Remote Control is always out in front when it comes to technology. Customers who switch to RC 200-SR have told us about the problems they had with other actuators and their small, weak springs. In contrast, all RC 200-SR actuators come with powerful pre-tensioned springs which are simple and easy to use.

RC 200-SR with its powerful return springs ensures that springs shut or open by air failure.

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REMOTE CONTROL®

RC 200-M1 Manual override unit

The best solution on the market

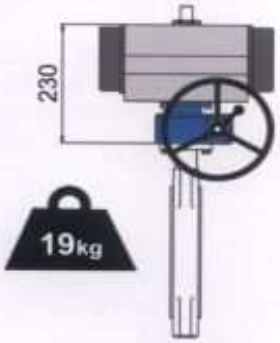
RC260-SR M1
RC1990

Remote Control has the smart, intelligent, cost-effective design for a manual override, the RC-M1. It is integrated in the endcap of the RC unit, and can be fitted to all RC 200-DA and -SR units, from large to small. The wheel does not rotate, but remains stationary during operation.

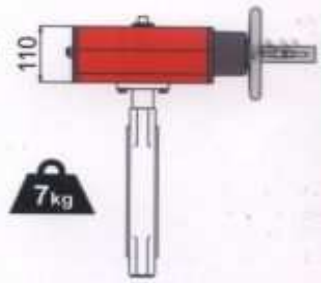
Our customers opt for the RC 200 units with RC-M1 manual override when they want a compact unit with minimum weight and installation size. The installation height is the same as a normal RC actuator, and the top is free for easy mounting of accessories. See the comparative weights and dimensions for the RC-M1 and rack and pinion actuators with intermediate gear box.

RC240-SR M1

With the RC-M1, actuator and valve can be locked in any end position. This is for example a good way of ensuring valves are closed when servicing pipes.



Rack and pinion actuator with intermediate gear box



RC240-DA M1

Compare for yourself and see the benefits of the RC-M1 manual override unit.

Butterfly valve DN 200 with double-acting actuator and manual override.

The RC 240-DA M1 measures just 110 mm and the actuator with the manual override weighs only 7 kg.

An equivalent rack and pinion actuator with intermediate gear box measures 230 mm and weights a massive 19 kg.

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REMOTE CONTROL®

Demanding installations

Strong and reliable

Our customers choose RC actuators, for even the most demanding applications. Remote Control meets all specifications and supplies top-quality actuators.

Here we show some examples of RC units suitable for both offshore and onshore use. Many examples and references are available such as RC 200 'fire safe' units with protective fire insulation and RC 200 quick actuators for turbin control.

Get in touch with us when you need actuators for more demanding applications.

RC 200
Available epoxy-painted to NORSOK Offshore standards or other customer specifications.

RCG
Epoxy-painted cast iron cylinder.
High torque output
up to 15,000 Nm / 32,750 lbf. in.

RCT
Cylinder and spring housing are hard anodised and PTFE sealed for optimum corrosion resistance. A good alternative to steel or stainless steel. Good for use in corrosive environments such as offshore and petrochemicals.

RC88
Aluminium cylinder. High torque output
up to 7,600 Nm / 67,260 lbf. in.

RCC
Epoxy-painted steel actuator. For conditions where a high level of corrosion proofing is required, where non-aluminium actuators are specified.
Up to 150,000 Nm / 1,327,500 lbf. in.

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REMOTE CONTROL

RC200 - Fitting accessories

ISO - DIN - NAMUR

RC1990
Switch box, intrinsically safe
IP66/67
Temp: -50 °C to +110 °C/-58 °F to +230 °F
Ex II 2 GD EEx dIIC T6/T5/T4
GOST R51330.0-99/R51330.1-99

RCE4L
Switch box
IP67
Option: Ex II 2 GD T80/100 °C
EEx ib IIC T6/T5

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REMOTE CONTROL®

RC fittings

Control equipment
Solenoid valves are available for all voltages, in standard or Ex-proof versions. RC actuators can be fitted with the RC speed control unit.RC 200 DA and SR can be controlled by pneumatic or electro-pneumatic valve position controls.

Installation
Remote Control's mounting kits are ideally suited to fitting actuators to valves, ensuring reliable operation and long life. We offer installation and testing at the client's premises or at any of our workshops.

Training
To ensure our products are used correctly and effectively, we offer product training on site at the customer's premises when commissioning or at Remote Control companies anywhere in the world.

Indicators
RC200 actuators have indicators showing the valve position. Remote Control makes and supplies a large number of switch boxes of different designs.
Of course we assemble equipment to suit Customers' wishes and specifications.

Field bus
RC actuators can be connected to all the field bus systems on the market; InterBus, DeviceNet, CAN, Modbus, Foundation Fieldbus, Profibus PA, Profibus DP, AS-Interface etc.

Service
Our factory trained engineers can assist you with installation and commissioning, service and maintenance.

All Remote Control actuators are
- **100% leak and functional tested**
- **Marked according to international standards**
- **Delivered with instructions in all EU languages**

RC 200 designs

Temperature range
Standard: -20°C to +80°C / -5°F to +175 °F
Low temp: -40°C to +60°C / -40°F to +140 °F
High temp: 0°C to +150°C /+30°F to +300°F

RC 200 meet standards
Solenoid valve connection: NAMUR
Fitting accessories: VDI/VDE 3845, NAMUR
Fitting to valve: Hole pattern,centering ring ISO 5211, DIN 3337, NAMUR
Stardrive shaft: ISO 5211 with 90° □ and DIN 79 with 45° ◇ and NAMUR

RC200 are CE-marked
According to PED and ATEX.

Quick acting RC 200 actuators
For extremely short operating times.

Pressure ranges
RC200-DA: 2-10 bar / 30-145 psi
RC200-SR: 2-10 bar / 30-145 psi

Extra corrosion protection
RCT hard anodised actuators
Epoxy finished
Offshore or other finish to meet customer specifications.
Stainless screws and drive shaft (standard for RC210-260)

Operating medium
Air, inert gases (non-dangerous fluids, group 2 according to directive PED 97/23/EC)
RC200 actuators also available for Water or oil hydraulics: 2-10 bar / 30-145 psi

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CE-marking according to the Pressure Equipment Directive PED 97/23/EC

Environment Control ISO 14001:2004

Quality Assurance ISO 9001:2000

CE-marking according to the ATEX Directive 94/9/EC

The national reference laboratory Force Technology in Vejen, Denmark. Calibration of gas flow meters.

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RC Twin Power
Multi-turn Pneumatic/Hydraulic Actuator
Up to 800 Nm
7,080 lbf. in.

RCC
Pneumatic Steel Actuator
Up to 150,000 Nm
1,327,500 lbf. in.

RCEL
Electric Actuator
Up to 2,450 Nm
21,680 lbf. in.

Ref No:801C / ArtNo:980801

RC200

Pneumatic Actuators
DA – Double acting

TORQUE Nm

4 bar

Type	0°	50°	90°
RC210-DA	25	12	18
RC220-DA	51	25	36
RC230-DA	96	47	69
RC240-DA	195	97	140
RC250-DA	300	150	215
RC260-DA	610	300	440
RC265-DA	864	406	614
RC270-DA	1260	630	910
RC280-DA	2540	1270	1830

5,5 bar

Type	0°	50°	90°
RC210-DA	34	17	25
RC220-DA	70	35	50
RC230-DA	130	66	95
RC240-DA	270	135	190
RC250-DA	410	210	300
RC260-DA	840	420	600
RC265-DA	1188	559	844
RC270-DA	1730	880	1250
RC280-DA	3500	1750	2500

TORQUE Nm

6 bar

Type	0°	50°	90°
RC210-DA	38	19	27
RC220-DA	76	38	54
RC230-DA	145	72	105
RC240-DA	290	145	210
RC250-DA	450	225	320
RC260-DA	910	460	650
RC265-DA	1296	609	921
RC270-DA	1890	940	1360
RC280-DA	3800	1900	2740

7 bar

Type	0°	50°	90°
RC210-DA	44	22	32
RC220-DA	88	44	63
RC230-DA	165	83	120
RC240-DA	340	170	240
RC250-DA	530	260	380
RC260-DA	1070	530	770
RC265-DA	1512	711	1075
RC270-DA	2200	1100	1590
RC280-DA	4450	2220	3190

AIR CONSUMPTION RC200-DA

Free air at 6 bar air pressure

Type	Anticlockwise rotation dm^3	Clockwise rotation dm^3
RC210-DA	0,6	1,1
RC220-DA	1,1	1,3
RC230-DA	2,2	4,0
RC240-DA	4,4	5
RC250-DA	6,9	13
RC260-DA	13,8	16
RC265-DA	32	36
RC270-DA	33	54
RC280-DA	66	67

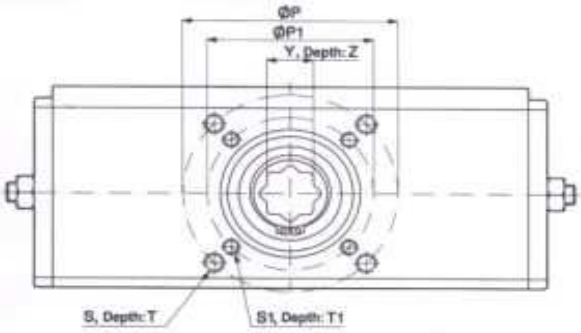
OPERATION TIME RC200-DA

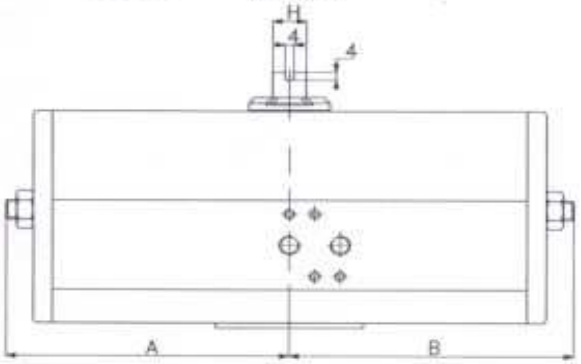
At 6 bar air pressure

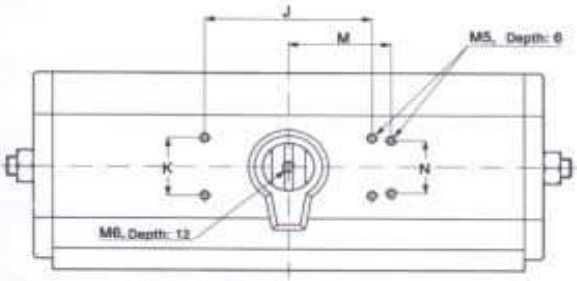
Type	Anticlockwise rotation sec.	Clockwise rotation sec.
RC210	<0,25	<0,5
RC220	<0,25	<0,3
RC230	<1	<0,25
RC240	<1	<1
RC250	<1,5	<2,5
RC260	<2	<2,5
RC265	<1,5	<1,5
RC270	<4	<6
RC280	<5	<5

The times relate to full air flow and may increase depending on solenoid valves and the dimensions of connecting pipes.

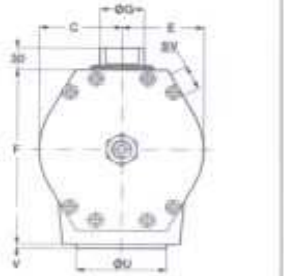
TECHNICAL DATA





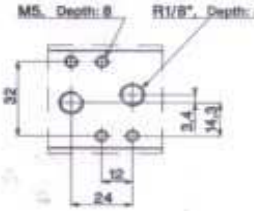


RC 270-280

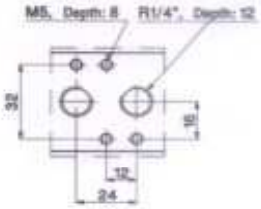


RC 210-260

RC 210-240



RC 250-280



Technical data:
Max. working pressure 10 bar. Operating medium: air or inert gases. On request also low pressure hydraulics.
Ambient temperature: –20 to +80 °C. Actuators for other temperature ranges can be delivered on request.

MEASUREMENTS RC200-DA Standard design

Type	N.FI	A	B	C	E	F	G	H	J	K	M	N	FI	P	S	T	FI	P1	S1	T1	U	V	Y**	Z	Weight kg
RC210-DA	F05	45	98	32	41	75	16	10	35,4	35,4	40	30	F05	50	M6	11	-	-	-	-	35	2	14	15	1,2
RC220-DA	F05	98	98						80	30	–	–	F05	50	M6	11					35		14	19	1,6
RC230-DA	F07	65	135	49	55	110	25	16					F10*	102*	M10*	17*	F07	70	M8	14	55	3	17	30	3,5
RC240-DA	F10	135	135										F10	102	M10	17	F07*	70*	M8*	14*	70		22	30	4,9
RC250-DA	F10	90	190	69	75	155	35	22					F12*	125*	M12*	21*	F10	102	M10	17	70			37	9,4
RC260-DA	F12	190	190										F12	125	M12	21	F10*	102*	M10*	17*	85		27	37	12,5
RC265-DA	F12	195	195	76	78	202	36	22					F12	125	M12	21	-	-	-	-	85	3	27	37	16,6
RC270-DA	F14	145	300	110	110	248	60	40	130				F14	140	M16	25	-	-	-	-	100	4	36	64	32,0
RC280-DA	F16	300	300										F16	165	M20	32	F12*	125*	M12*	25*	130	5	46	64	42,0

N.FI = Nominal ISO/DIN flange. I.e. mounting hole circle to valve, guide ring diameter U and measure Y follow the same standard flange.
SV = Connection to solenoid valve on RC270–280.
* = Extra mounting holes on all RC230–260 and 280 for alternative ISO/DIN hole pattern.
** = Tolerance H9. The hole is octagonal and adapts to valve stems with squares both in 90° and 45° direction.
RC265: Extra mounting holes on the bottom side, please see leaflet No. 886.
RC270 also has the following hole pattern on the bottom side: CC 170 x 110 mm placed alongside the actuator, 4 pcs M16, depth 25 mm.
RC280 also has the following hole pattern on the bottom side: CC 234,7 x 97,2 mm, 4 pcs M16, depth 25 mm, which corresponds to 4 pcs of 8 pcs F25-holes.
Regarding special designs: Please ask for a special brochure from Remote Control.

Ref No 856 E/Art No 980856

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RC200

Pneumatic Actuators SR – with spring return

TORQUE Nm

4,1 bar/60 psi*

Type	Air opens → 0°	60°	90°	Spring closes → 90°	30°	0°
RC210-SR	14	6	7,5	12	6	8,5
RC220-SR	29	12	15	25	12	17
RC230-SR	54	23	29	47	23	33
RC240-SR	110	47	58	96	47	66
RC250-SR	170	74	90	150	74	100
RC260-SR	345	150	180	305	150	210
RC265-SR	560	225	250	420	205	305
RC270-SR	710	310	380	630	310	430
RC280-SR	1430	620	760	1270	620	870

Air 5,5 bar/80 psi - Springs for 87 psi

Type	Air opens → 0°	60°	90°	Spring closes → 90°	30°	0°
RC210-SR	18	7	8,5	18	9	12
RC220-SR	36	15	18	37	18	25
RC230-SR	68	28	33	69	33	47
RC240-SR	138	56	67	140	68	96
RC250-SR	210	88	105	215	105	150
RC260-SR	440	180	210	440	215	305
RC265-SR	670	260	290	570	360	410
RC270-SR	910	370	440	910	440	620
RC280-SR	1820	740	880	1840	900	1260

* Springs adapted to air pressures above

TORQUE Nm

6 bar/87 psi*

Type	Air opens → 0°	60°	90°	Spring closes → 90°	30°	0°
RC210-SR	20	9	11	18	9	12
RC220-SR	41	18	22	37	18	25
RC230-SR	78	33	41	69	33	47
RC240-SR	158	68	84	140	68	96
RC250-SR	245	105	130	215	105	150
RC260-SR	500	215	265	440	215	305
RC265-SR	730	305	330	610	330	440
RC270-SR	1030	440	550	910	440	620
RC280-SR	2080	900	1110	1840	900	1260

7 bar/100 psi*

Type	Air opens → 0°	60°	90°	Spring closes → 90°	30°	0°
RC210-SR	24	10	13	21	10	14
RC220-SR	48	21	26	43	21	29
RC230-SR	92	39	48	81	39	55
RC240-SR	185	80	98	163	80	115
RC250-SR	290	125	155	255	125	175
RC260-SR	580	250	310	515	250	350
RC265-SR	935	360	425	695	355	525
RC270-SR	1210	520	640	1060	520	720
RC280-SR	2430	1050	1290	2150	1050	1470

AIR CONSUMPTION RC200-SR

Free air at 6 bar air pressure

Type	dm³
RC210-SR	1,1
RC220-SR	1,3
RC230-SR	4,0
RC240-SR	5
RC250-SR	13
RC260-SR	16
RC265-SR	36
RC270-SR	54
RC280-SR	67

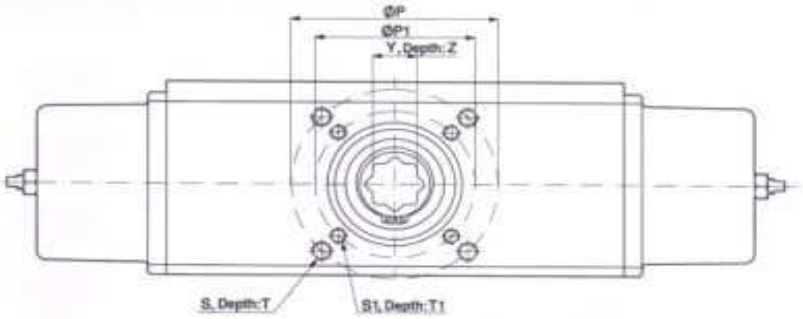
OPERATION TIME RC200-SR

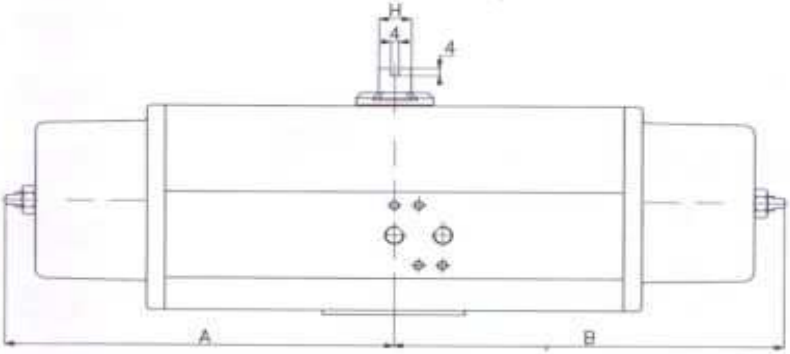
At 6 bar air pressure

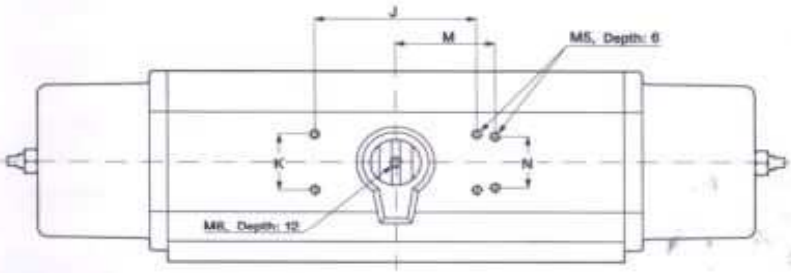
Type	Anticlockwise and clockwise rotation sec.
RC210	<0,5
RC220	<0,3
RC230	<0,25
RC240	<1
RC250	<2,5
RC260	<2,5
RC265	<1,5
RC270	<6
RC280	<5

The times relate to full air flow and may increase depending on solenoid valves and the dimensions of connecting pipes.

TECHNICAL DATA

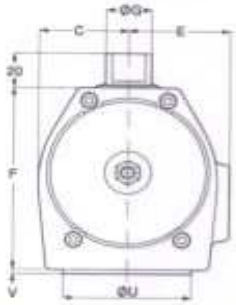




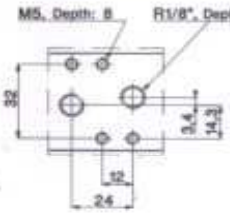


RC 270-280

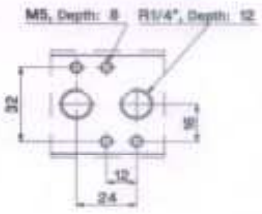
RC 210-260



RC 210-240



RC 250-280



Technical data:
Max. working pressure 10 bar. Operating medium: air or inert gases. On request also low pressure hydraulics.
Ambient temperature: –20 to +80 °C. Actuators for other temperature ranges can be delivered on request.

MEASUREMENTS RC200-SR Standard design

Type	N.FI	A	B	C	E	F	G	H	J	K	M	N	FI	P	S	T	FI	P1	S1	T1	U	V	Y**	Z	Weight kg
RC210-SR	F05	45	150	32	41	75	16	10	35.4	35.4	40	30	F05	50	M6	11	–	–	–	–	35	2	14	19	1,5
RC220-SR	F05	150	150						80	30	–	–	F05	50	M6	11					35		14	19	2,2
RC230-SR	F07	65	200	49	55	110	25	16					F10*	102*	M10*	17*	F07	70	M8	14	55	3	17	30	4,2
RC240-SR	F10	200	200										F10	102	M10	17	F07*	70*	M8*	14*	70		22	30	7,0
RC250-SR	F10	90	285	69	75	155	35	22					F12*	125*	M12*	21*	F10	102	M10	17	70			37	12,4
RC260-SR	F12	285	285										F12	125	M12	21	F10*	102*	M10*	17*	85		27	37	18,5
RC265-SR	F12	317	317	76	76	202	35	22					F12	125	M12	21	-	-	-	-	85	3	27	37	26,6
RC270-SR	F14	145	510	110	110	248	60	40	130				F14	140	M16	25	-	-	-	-	100	4	36	64	45,0
RC280-SR	F16	510	510										F16	165	M20	32	F12*	125*	M12*	25*	130	5	46	64	68,0

N.FI = Nominal ISO/DIN flange. I.e. mounting hole circle to valve, guide ring diameter U and measure Y follow the same standard flange.
SV = Connection to solenoid valve on RC270–280.
* = Extra mounting holes on all RC230–260 and 280 for alternative ISO/DIN hole pattern.
** = Tolerance H9. The hole is octagonal and adapts to valve stems with squares both in 90° and 45° direction.
RC265: Extra mounting holes on the bottom side, please see leaflet No. 887.
RC270 also has the following hole pattern on the bottom side: CC 170 x 110 mm placed alongside the actuator, 4 pcs M16, depth 25 mm.
RC280 also has the following hole pattern on the bottom side: CC 234,7 x 97,2 mm, 4 pcs M16, depth 25 mm, which corresponds to 4 pcs of 8 pcs F25-holes.
Regarding special designs: Please ask for a special brochure from Remote Control.

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REMOTE CONTROL®

RC200
Pneumatic Actuators

TYPE AND DESIGN

DA = Double Acting. Actuator with pneumatic operation in both directions.
SR = Spring Return. Actuator with spring return.
RC 210, 230, 250 and 270 have 1 piston.
RC 220, 240, 260, 265 and 280 have 2 pistons.

OPERATING MEDIUM

If the operating medium is instrument air, it shall be dust- and oil-free. Accepted operating medium: Non-dangerous fluids (group 2 according to directive 97/23/EC). The dew point shall be equal to –20 °C or, at least, 10 °C below the ambient temperature. The maximum particle size must not exceed 40 µm. The exhaust air must pass through a filter silencer before it is let out into the workshop.

THE APPLICATION OF THE SCOTCH YOKE CONSTRUCTION

The Scotch Yoke of the RC200 actuators has angled slots. Thus the output torque can be given different values depending on how the pistons are mounted in the actuator.

As standard, the DA actuators are mounted as shown on figure 1, page 2. This design allows for highest torque at "closed" valve position. The pistons are then in their outermost position and can be fine adjusted ±3°.

The SR actuators have the pistons turned (rotated) 180° in relation to the DA actuators according to figure 3 on page 3. This gives an increase of the torque towards the end of the rotary motion, although the spring force is diminished.

When the pistons in an SR actuator are mounted according to figure 1 on page 2, the function is changed from "springs closes" to "spring opens". The adjustment of the end position will then take place in "closed position".

If the pistons in a DA actuator are mounted according to figure 3 on page 3, the fine adjustment will take place in "open" valve position. The actuators can be supplied with adjustment in both end positions on request. The possibility to turn the pistons can be used in several ways in order to suit the actuators to the customer´s requirements. For further information on this, please consult factory

WARNING!

RC actuators must only be used as actuators on valves. Levers, racks and similar cannot be used to transmit movement without protective equipment. Pinch risk in the valve opening when test trimming non-installed valves.

HAND OPERATION

WARNING!

It is 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.

The actuator can be equipped with handwheel for manual operation, RC-M1. Other methods on request.

WARNING!

All manual operations must be carried out with a vented actuator.

INSTALLATION AND ADJUSTMENT

All types of actuators can be mounted in various positions, e.y. vertical or horizontal. Unless otherwise agreed, the valve stem shall comply to ISO 5211. When mounting on a valve, ensure that the actuator shaft and the valve stem are centered, and that a play of 0,5-1 mm exists between shaft and driving bush depending on actuator size. Ensure especially that actuator and driving bush are mounted correctly in relation to eachother, considering that the actuator shaft has an octagonal hole and that a faulty mounting of 45° is possible. This naturally also applies to direct mounting on a valve.The guide ring (37) can be dismantled when not in use. After mounting, it may be necessary to adjust the turning angle of the actuator.

Tightening torques for lock nuts on page 6.

As mentioned previously, the DA actuators can, as standard, be adjusted in "closed" valve position and the SR actuators in "open" position. The adjustment occurs by loosening the lock nut on the end plate, after which the set screw is turned clockwise for reduced and anti-clockwise for increased rotary motion. The adjustment degree is ±3°.

RC 220, 240, 260 and 280 have two adjustment screws. **It is important that both screws are in contact with the piston in question.**

The actuator is supplied with an indicator on the driving shaft. The indicator can be mounted in 2 optional positions for different valve functions, mounting directions, etc.

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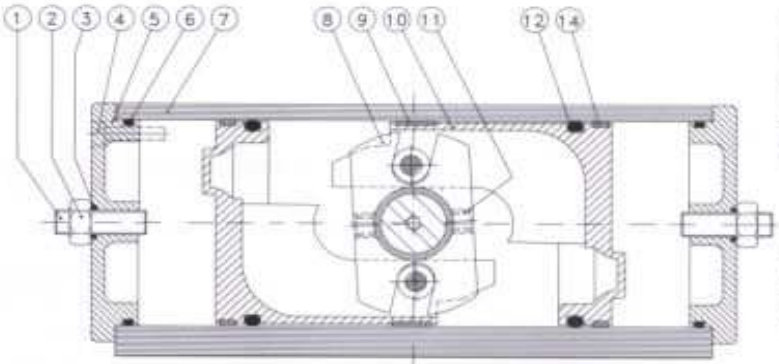


Fig. 1 RC 200-DA from above

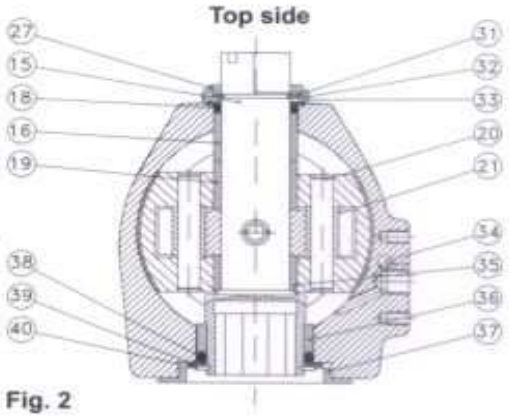


Fig. 2

LUBRICATION

RC 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 lubriction is recommended.

Oil mist lubrication requires a mineral oil type ISO VG32 according to DIN 51524HLP 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.

RECOMMENDED LUBRICATION GREASE

Cylinderbore and drive shaft with shaft sealings	Grease
RC200 standard	Cargo White Grease
RC200 high temp	Cargo Flour
RC200 low temp	Klüber Isoflex Topas NCA 52

Piston roller (21) + bearing	Grease
All RC200	Cargo Red Grease

SERVICE OF RC 210–280

WARNING!

Before dismantling, check that the compressed air and possible power supply are disconnected. Dismantling of SR unit, see instruction on page 5. Dismantling of SR unit with manual operation unit type M1, see instruction on page 4.

Exchange of piston sealings and support elements

1. *Please read the warning above!*
2. Dismantle the actuator from the console.
3. Dismantle the end plates (5) or the spring houses (25).
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 outside 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 band (14) if it is worn.
7. Replace the support element (9) if it is worn.
8. Grease the cylinder surface with a grease according to the lubrication list above.
9. Mount the end plates and adjust the shaft turning angle.

Exchange of shaft sealings and support washers

The O-rings (18) and (38) and the support washers (33) and (39) can easily be replaced as below.

1. *Please read the warning on the left!*
2. Dismantle the actuator from the console.
3. Dismantle the retaining rings (31) and (40) around the shaft.
4. Dismantle the worn details.
5. Fit the new O-rings (18) and (38).
6. Fit new washers under the retaining rings.
7. Use a grease according to the lubrication list when mounting.
8. Fit the new retaining rings.
9. **Check that the retaining rings are tightly fitted without play in their grooves.**

Exchange of shaft bearings

The bearings (16) and (36) and also the support ring (19) on the RC210-240 can easily be replaced when the pistons and shaft sealings are dismantled as above. For larger actuators, please contact the supplier.

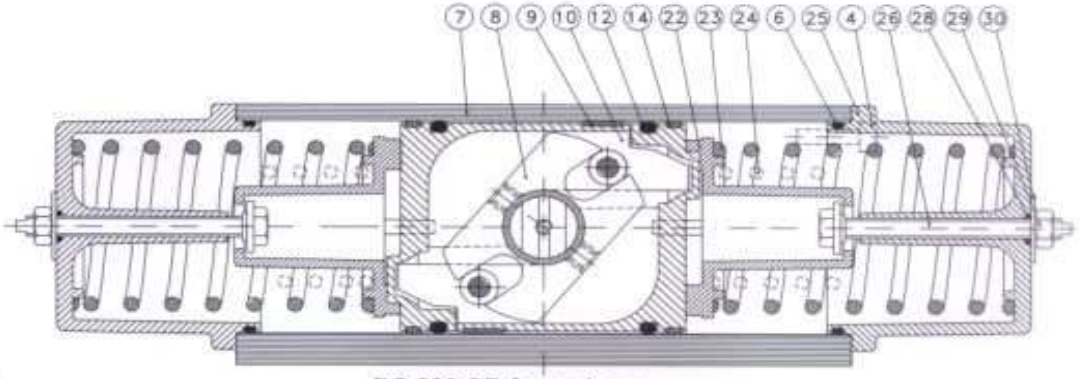


Fig. 3 RC 200-SR from above

Part No	Description	Number DA	Number SR	Material	Surface treatment
1	Adjusting screw[1]	1	—	210–260: Stainless steel Others: Steel	 Zinc plated
2	Lock nut[1]	1	—	210–260: Stainless steel Others: Steel	 Zinc plated
3	O-ring[1]	1	—	Nitrile	
4	Screw	8–16	8–16	210–260: Stainless steel Others: Steel	 Zinc plated
5	End plate with centre hole[1]	1	—	Aluminium	Anodized
6	O-ring	2	2	Nitrile	
7	Cylinder	1	1	Aluminium	Anodized
8	Scotch Yoke	1	1	Steel	
9	Support element[1]	1	1	POM/PTFE	
10	Piston[1]	1	1	Aluminium	
11	Roll pin, double [2, 3]	1	1	Spring steel	
12	O-ring[1]	1	1	Nitrile	
14	Support band[1]	1	1	PTFE, filled	
15	Driving shaft	1	1	210–260: Stainless steel Others: Steel	 Zinc plated, yellow chromated
16	Bearing, upper	1	1	Polymer material	
17	End plate without centre hole[4]	1	1	Aluminium	Anodized
18	O-ring, upper	1	1	Nitrile	
19	Support ring, upper	1	1	Polymer material	
20	Piston pin[1]	1	1	Steel	
21	Piston roller[1]	1	1	Steel	
22	Spring guide[1]	—	1	Aluminium	
23	Spring, external[5]	—	1	210–260: Alloyed spring steel Others: Spring steel	Corrosion protected Corrosion protected
24	Spring, internal[1, 5]	—	1	Alloyed spring steel	Corrosion protected
25	Spring housing[1]	—	1	Aluminium	Anodized
26	Pre-tensioning screw[1]	—	1	210–260: Stainless steel Others: Steel	 Zinc plated
27	Indicator	1	1	Polymer material	
28	O-ring[1]	—	1	Nitrile	
29	Lock nut[1]	—	1	210–260: Stainless steel Others: Steel	 Zinc plated
30	Marking washer[1]	—	1	Aluminium	Anodized
31	Retaining ring, upper	1	1	210–260: Stainless spring steel Others: Spring steel	 Corrosion protected
32	Middle washer	1	1	210–260: Stainless steel Others: Steel	 Corrosion protected
33	Support washer, upper	1	1	Polymer material, chemically resistant	
34	Sealing[1]	1	1	210–220: Stainless steel Others: Nitrile	
35	Support ring, lower	1	1	Polymer material	
36	Bearing, lower	1	1	Polymer material	
37	Guide ring	1	1	Polymer material	
38	O-ring, lower	1	1	Nitrile	
39	Support washer, lower	1	1	Polymer material, chemically resistant	
40	Retaining ring, lower	1	1	210–260: Stainless spring steel Others: Spring steel	 Corrosion protected

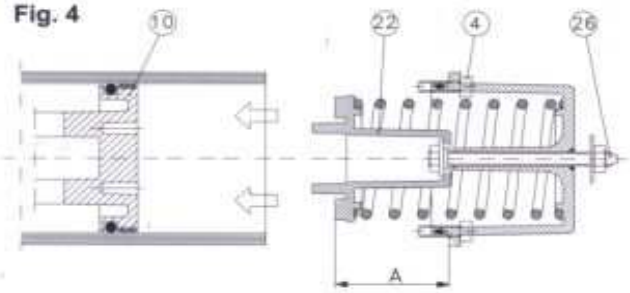
1) For actuator sizes 220, 240, 260 and 280: The double amount of details. 2) RC240 has treble roll pins.
3) RC270–280 have a slotted pin in steel. 4) Not in the picture! Do not exist for sizes 220, 240, 260 and 280.
5) Only for sizes 270 and 280.

Convertering to SR actuators

All DA actuators can be changed into SR actuators by adding spring conversion kits according to the following instruction:

1. *Please read the warning on page 2!*
2. Dismantle the end plates. (The description is for RC220, 240, 260 and 280 which have two pistons).
3. Dismantle the pistons. See text under "Exchange of piston sealings and support elements".
4. Mount the pistons according to figure 3 on page 3.
5. Check that the spring is correctly pre-tensioned according to table 1 and figure 4.
6. The spring guide (22) is centered towards the piston with the aid of 2 pins.
7. The SR units on sizes 230–280 must be turned so that one of the three support points lies between the bosses on the piston (10).
8. Mount the SR unit when the pistons are in their innermost position.
9. Put the screws (4) in place. When tightening the screws, the spring force is transmitted from the tensioning screw (26) to these screws.
   Tightening torques according to table on page 6.
10. The turning angle of the actuator is adjusted with the tensioning screw (26).

Fig. 4



Adjustment is made with screw (26).

Table 1

RC200-SR actuator	A
210-220	41
230-240	62
250-260	87
270-280	137

INSTRUCTIONS FOR DISMANTLING OF RC 200-SR ACTUATORS WITH MANUAL OPERATION UNIT TYPE M1

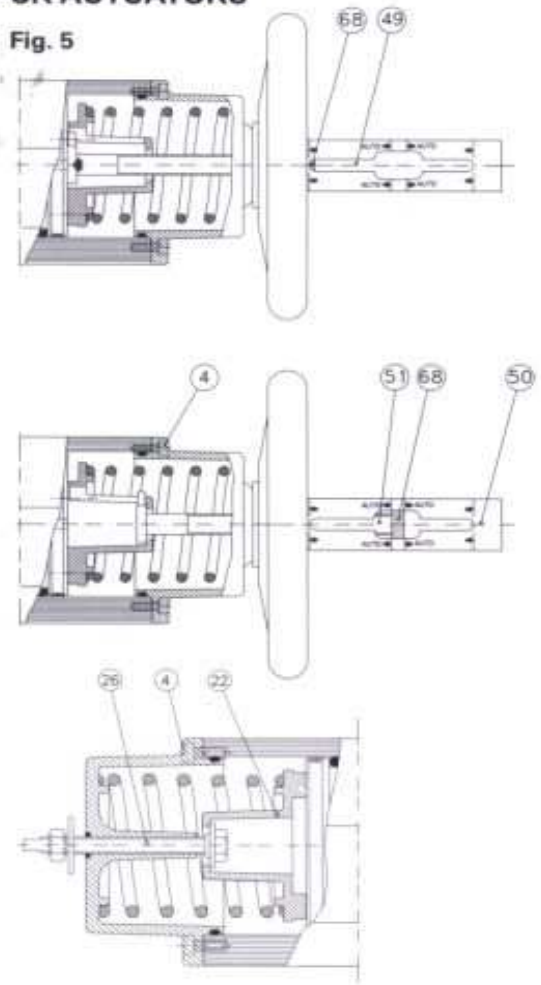
WARNING!

Do not remove the protective tube (50) and handwheel from the spring housing as long as the springs are tensioned. This procedure must be followed for safe dismantling of pre-tensioned spring housings.

1. The actuator must be pressureless.
2. Check that the springs can press the piston back into its starting position according to figure 5.
   The upper shaft journal must not be oblique.
3. Disconnect possible power supply.
4. Turn the handwheel so that the threaded stem (51) moves toward the actuator until it stops and the yellow marker can just barely be seen in the plastic tube (49).
5. For sizes RC220, 240, 260 and 280 (i.e. actuators with two pistons): adjust the tensioning screw (26) in the opposite spring housing anti-clockwise until it lies against the spring guide (22). Dismantle the spring housing by loosening the screws (4).
6. For all sizes: then turn the handwheel until there is resistance and the yellow marker (68) can be seen within the "AUTO" position.
7. Dismantle the spring housing of the manual override by loosening the retaining screws (4) and turning the handwheel several turns in the direction which gives the least resistance.

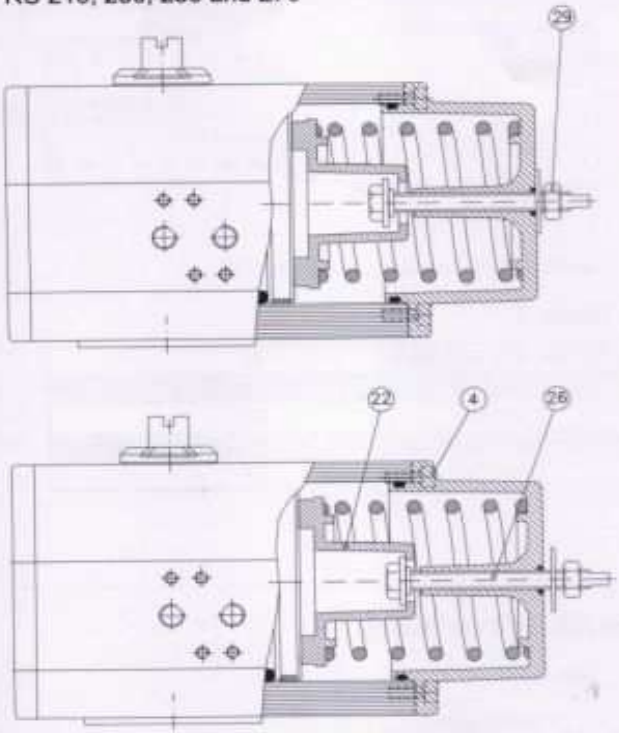
Dismantling must be carried out in the above order with the utmost care. In the case of the slightest uncertainty - contact the supplier.

Fig. 5



INSTRUCTIONS FOR DISMANTLING OF RC 200-SR ACTUATORS

RC 210, 230, 250 and 270

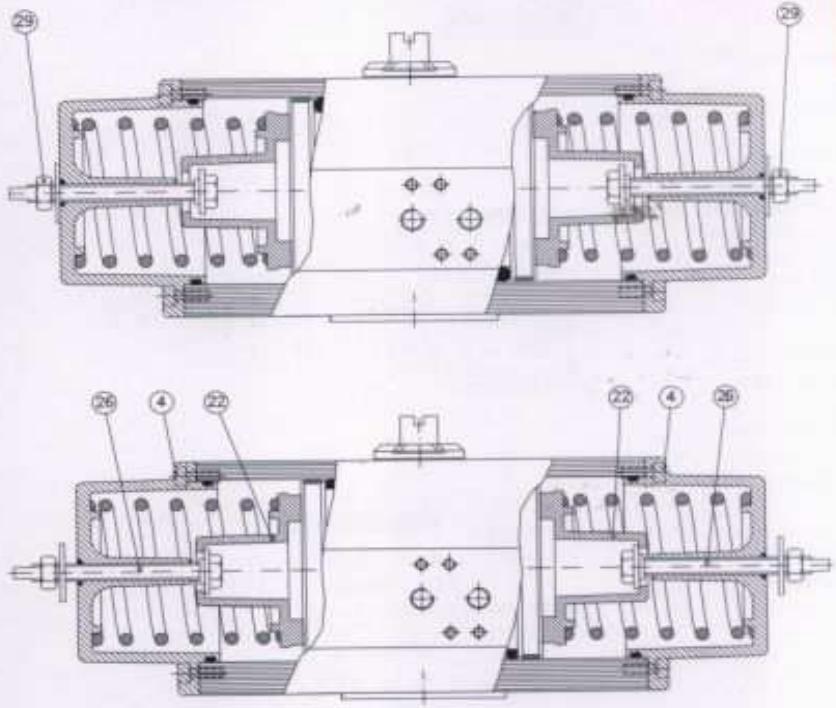


WARNING!

The procedure below must be followed for safe dismantling of pre-tensioned spring housings.

1. The actuator must be pressureless.
2. Check that the springs can press the piston into starting position according to picture on the left.
3. Disconnect all possible power supply.
4. Loosen the lock nut (29).
5. Turn the tensioning screw (26) anti-clockwise until it lies lightly against the spring guide (22).
6. Dismantle the spring housing by loosening the screws (4).
7. Dismantling must be carried out with the utmost care. In the case of the slightest uncertainty - contact the supplier.

RC 220, 240, 260 and 280



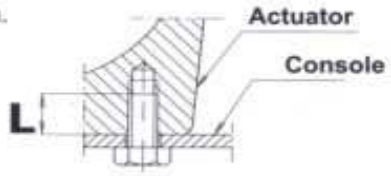
WARNING!

The procedure below must be followed for safe dismantling of pre-tensioned spring housings.

1. The actuator must be pressureless.
2. Check that the springs can press the piston into starting position according to picture on the left.
3. Disconnect all possible power supply.
4. Loosen the lock nuts (29).
5. Turn both spring tensioning screws (26) clockwise until they can be turned with minimum force.
6. Turn the left spring tensioning screw (26) anti-clockwise until it lies lightly against the spring guide (22) and dismantle the left spring housing by loosening the screws (4).
7. Dismantle the right spring housing in the same manner as the left one.
8. Dismantling must be carried out with the utmost care. In the case of the slightest uncertainty - contact the supplier.

TIGHTENING TORQUES FOR SCREWS AND LOCK NUTS

The actuators must be screwed onto the console with the correct tightening torque in order to remain stable during operation. Please use as long screws as possible without the threads grounding.
"L" is the screw length according to drawing.



Actuator	Tightening torques		
	End plate screw (4)	Lock nut DA (2)	Lock nut SR (29)
RC210-220	5,5	20	9
RC230-240	5,5	40	18
RC250-265	23	90	35 *
RC270-280	76	120	80

* RC265 = 90

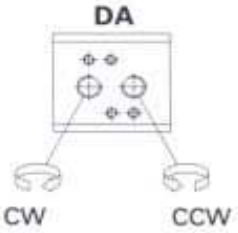
Tightening torques in Nm

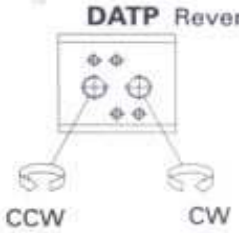
Resistance class min. 8.8. Lightly oiled screws.

Actuator	DIN flange	Thread	L max (mm)	Screw length (mm) 8	10	12	14	16	18	20	24	28	32
RC210-220	F05	M6	11	8,8	9,2								
RC210-220	F07	M8	14		21	23	23						
RC230-240	F07	M8	14		21	23	23						
RC230-240	F10	M10	17			40	45	45					
RC250-260	F10	M10	17			40	45	45					
RC250-260	F12	M12	21				60	70	75	75			
RC265	F12	M12	21				60	70	75	75			
RC270	F14	M16	25					125	140	155	185		
RC270	170 x 110	M16	25					125	140	155	185		
RC280	F12	M12	25					70	75	75	75		
RC280	F16	M20	32								280	330	360
RC280	F25	M16	25					125	140	155	185		

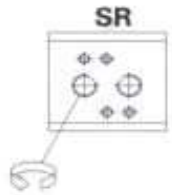
AIR CONNECTIONS

Double Acting

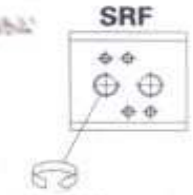




Single acting with Spring Return



Air CCW rotation
Spring CW rotation



Air CW rotation
Spring CCW rotation

We reserve the right to alterations without previous notice.

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