RCI-200 SERIES ACTUATORS
TECHNICAL DATA SHEETS

The Remote Control RCI 200 Series Pneumatic Actuator features a modern scotch yoke mechanism, which allows us to produce an actuator with high starting and ending torques in a very compact package. Available in both double acting and spring return in 8 sizes with torques to 38,720 in-lbs., the RCI 200 Series offers great flexibility. Our spring return actuator features a spring module with the spring(s) safely contained and are epoxy powder coated for maximum corrossion resistance. Our pistons are guided in two places with reinforced Teflon bearings which insure positive alignment and long seal life. All of our RCI 200 Series Actuators carry a 3 year warranty.

TECHNICAL INFORMATION

Body ..... Extruded Aluminum, Anodized finish
Spring Housings, End Caps ..... Cast Aluminum, Anodized Finish
Pistons ..... Anodized Aluminum
Drive Shaft ..... Stainless Steel thru RCI 260 size, Plated Steel in sizes RCI 270, RCI 280
Seals ..... Buna N
Fasteners ..... Stainless Steel Thru size RCI 260 Plated Steel sizes 270 + 280
Pressure Rating ..... 150 PSI Continous
Temperature Range ..... -20^0F to $+175^0$F
Optional Exterior Finishes ..... Epoxy or Tufram
Optional Constructions ..... Low Temperature or High Temperature Seals, Low Pressure Hydraulic Service, Water Hydraulic Service, Fast Opening/Closing Speed.
Operating Medium ..... Compressed Air or Inert Gas
Mounting Dimensions ..... ISO 5211 Standard

REMOTE CONTROL

AIR CONSUMPTION

DISPLACEMENT PER STROKE

SPRING RETURN	
SIZE	CUBIC INCHES
RCI 210 - SR	10
RCI 220 - SR	11.5
RCI 230 - SR	36
RCI 240 - SR	45
RCI 250 - SR	115
RCI 260 - SR	142
RCI 270 - SR	478
RCI 280 - SR	593

DOUBLE ACTING		
SIZE	COUNTER-CLOCKWISE CUBIC INCHES	CLOCKWISE CUBIC INCHES
RCI 210 - DA	5.5	10
RCI 220 - DA	10	11.5
RCI 230 - DA	20	36
RCI 240 - DA	39	45
RCI 250 - DA	62	115
RCI 260 - DA	122	142
RCI 270 - DA	292	478
RCI 280 - DA	584	593

OPERATION TIME

At 80 PSI operating pressure

SPRING RETURN	
SIZE	SECONDS
RCI 210 - SR	0.5
RCI 220 - SR	0.3
RCI 230 - SR	0.25
RCI 240 - SR	1.0
RCI 250 - SR	2.5
RCI 260 - SR	2.5
RCI 270 - SR	6
RCI 280 - SR	5

DOUBLE ACTING		
SIZE	COUNTER-CLOCKWISE SECONDS	CLOCKWISE SECONDS
RCI 210 - DA	0.25	0.5
RCI 220 - DA	0.25	0.3
RCI 230 - DA	1.0	0.25
RCI 240 - DA	1.0	1.0
RCI 250 - DA	1.5	2.5
RCI 260 - DA	2	2.5
RCI 270 - DA	4	6
RCI 280 - DA	5	5

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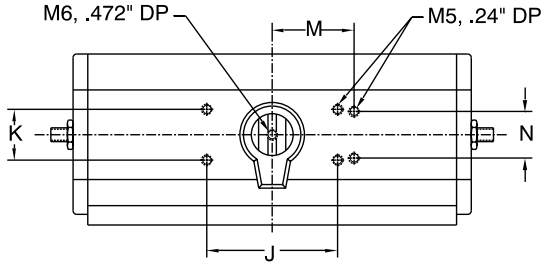
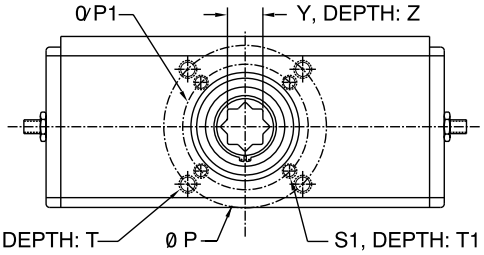
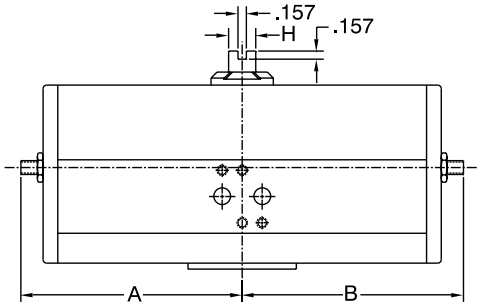
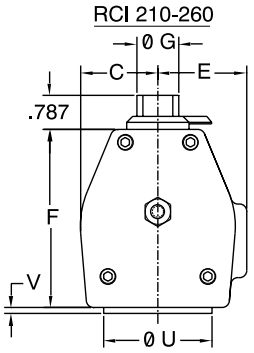
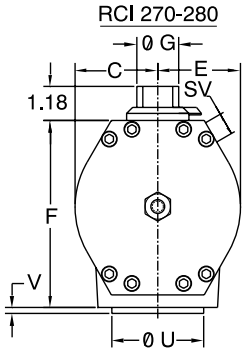
RCI 200DA DIMENSIONAL DATA

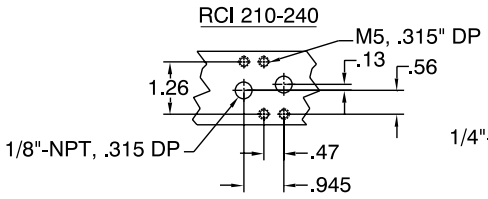


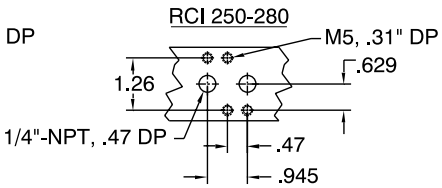


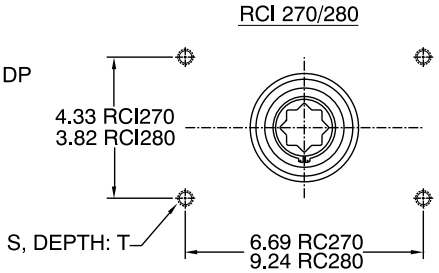










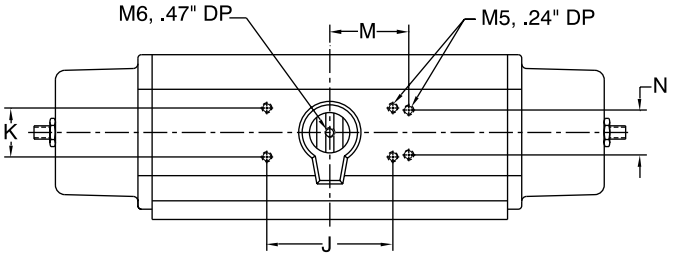


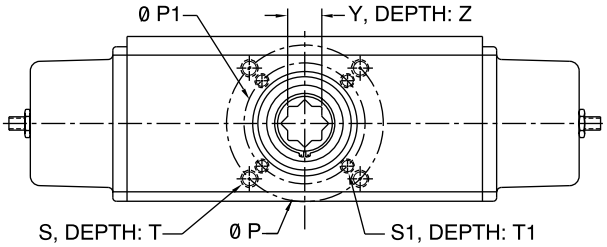
DIMENSIONS (Inches)

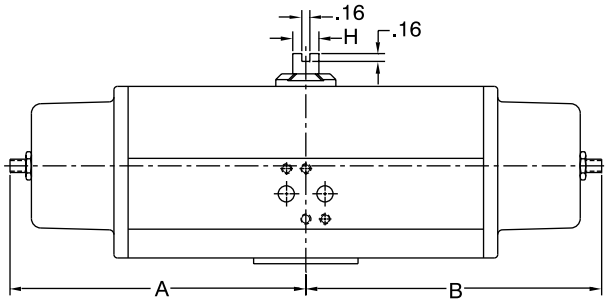
MODEL	A	B	C	E	F	G	H	J	K	M	N	P	P1
RCI210-DA	1.77	3.85	1.26	1.61	2.95	.63	.393	1.39	1.39	1.574	1.18	1.97	—
RCI220-DA	3.85	3.85						3.15	1.18	—	—	1.97	
RCI230-DA	2.56	5.30	1.93	2.17	4.25	.98	.629					4.02	2.76
RCI240-DA	5.30	5.30										4.02	2.76
RCI250-DA	3.54	7.48	2.71	2.95	6.10	1.38	.944					4.92	4.02
RCI260-DA	7.48	7.48										4.92	4.02
RCI270-DA	5.70	11.60	4.33	4.33	9.76	2.36	1.574	5.12				5.51	—
RCI280-DA	11.80	11.60										6.50	4.92

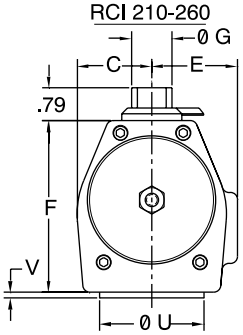
MODEL	S	S1	T	T1	U	V	Y	Z	WT (Lbs)	ISO5211
RCI210-DA	1/4-20UNC	—	.43	—	1.38	.08	.553 .551	.74	3.1	F05
RCI220-DA	1/4-20UNC		.43		1.38		.553 .551	.74	4.00	F05
RCI230-DA	3/8-16UNC	5/16-18UNC	.67	.55	2.17	.12	.672 .669	1.18	8.00	F07/F10
RCI240-DA	3/8-16UNC	5/16-18UNC	.67	.55	2.76		.869 .866	1.18	10.60	F10/F07
RCI250-DA	1/2-13UNC	3/8-16UNC	.83	.67	2.76			1.45	20.40	F10/F12
RCI260-DA	1/2-13UNC	3/8-16UNC	.83	.67	3.35		1.066 1.063	1.45	27.00	F/10F12
RCI270-DA	5/8-11UNC	—	.98	—	3.94	.16	1.420 1.417	2.52	69.00	F14
RCI280-DA	3/4-10UNC	1/2-13UNC	1.26	.98	5.11	.20	1.815 1.812	2.52	89.00	F16/F12

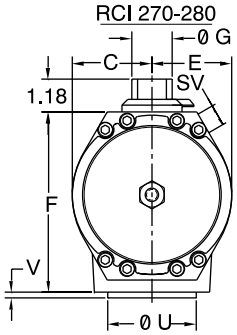
RCI 200SR DIMENSIONAL DATA

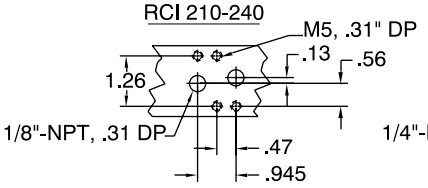


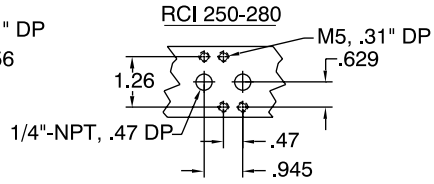


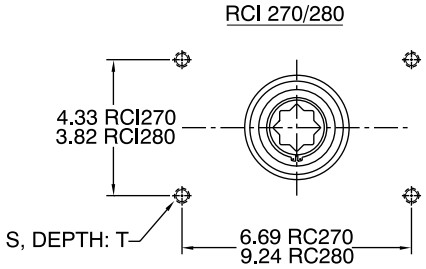










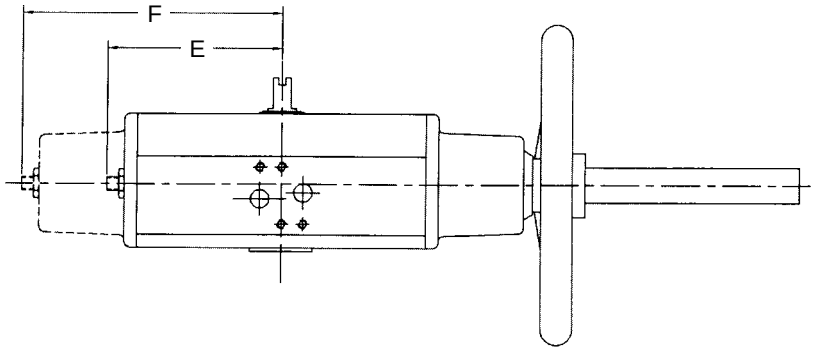


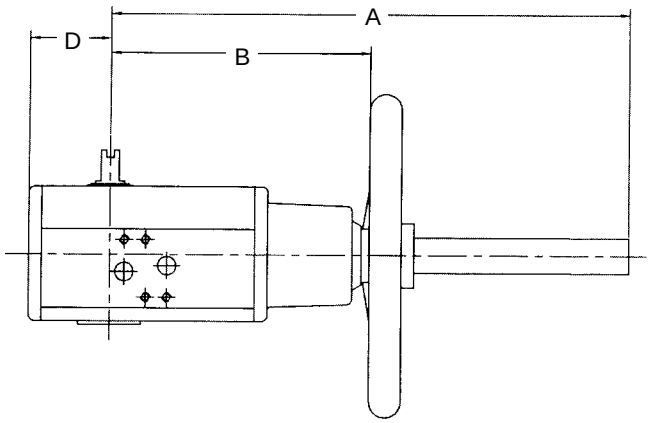
DIMENSIONS (Inches)

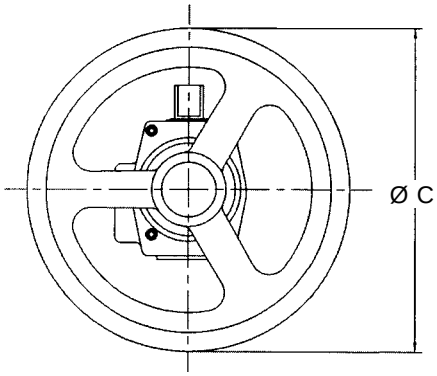
MODEL	A	B	C	E	F	G	H	J	K	M	N	P	P1
RCI210-SR	1.77	5.7	1.26	1.61	2.95	.63	.393	1.39	1.39	1.574	1.18	1.97	—
RCI220-SR	5.91	5.91						3.15	1.18	—	—	1.97	
RCI230-SR	2.56	7.87	1.93	2.17	4.25	.98	.629					4.02	2.76
RCI240-SR	7.70	7.70										4.02	2.76
RCI250-SR	3.54	11.2	2.71	2.95	6.10	1.38	.944					4.92	4.02
RCI260-SR	11.20	11.20										4.92	4.02
RCI270-SR	5.70	20.01	4.33	4.33	9.76	2.36	1.574	5.12				5.51	—
RCI280-SR	20.00	20.00										6.50	4.92

MODEL	S	S1	T	T1	U	V	Y	Z	WT (Lbs)	ISO 5211
RCI210-SR	1/4-20 UNC	—	.43	—	1.38	.08	.553 .551	.74	4.0	F05
RCI220-SR	1/4-20 UNC		.43		1.38		.553 .551	.74	5.85	F05
RCI230-SR	3/8-16 UNC	5/16-18 UNC	.67	.55	2.17	.12	.672 .669	1.18	10.40	F07/F10
RCI240-SR	3/8-16 UNC	5/16-18 UNC	.67	.55	2.76		.869 .866	1.18	15.50	F10/F07
RCI250-SR	1/2-13 UNC	3/8-16 UNC	.83	.67	2.76			1.45	26.80	F10/F12
RCI260-SR	1/2-13 UNC	3/8-16 UNC	.83	.67	3.35		1.066 1.063	1.45	40.00	F10/F12
RCI270-SR	5/8-11 UNC	—	.98	—	3.93	.16	1.420 1.417	2.52	100.00	F14
RCI280-SR	3/4-10 UNC	1/2-13 UNC	1.26	1.00	5.12	.20	1.815 1.812	2.52	142.00	F16/F12

OPTIONAL MI MANUAL OVERRIDE DIMENSIONAL DATA







DIMENSIONS (Inches)

MODEL	A	B	C	D	E	F	WT LBS
* RCI 210 DA/MI	11.4	5.7	7.1	1.77			1.5
RCI 220 DA/MI	11.4	5.7	7.1		3.85		
RCI 220 SR/MI	11.4	5.7	7.1			5.70	
* RCI 230 DA/MI	13.4	7.5	7.1	2.56			2.5
RCI 240 DA/MI	13.4	7.5	7.1		5.30		
RCI 240 SR/MI	13.4	7.5	7.1			7.70	
* RCI 250 DA/MI	19.7	11.6	12.6	3.54			6.5
RCI 260 DA/MI	19.7	11.6	12.6		7.48		
RCI 260 SR/MI	19.7	11.6	12.6			11.20	
* RCI 270 DA/MI	31.5	20.3	15.7	5.70			26
RCI 280 DA/MI	31.5	20.3	23.6		11.80		
RCI 280 SR/MI	31.5	20.3	23.6			20.0	

*NOTE: For models 210, 230, 250 & 270, M-1 dimensions for SR Actuators are the same as DA Actuators.

RIM PULL FORCES (Lb.)

To obtain an output torque equal to an air pressure of 80 PSI on the actuator

DOUBLE ACTING	
RCI 210 - DA	14.3
RCI 220 - DA	28.6
RCI 230 - DA	26.5
RCI 240 - DA	53.0
RCI 250 - DA	14.9
RCI 260 - DA	30.0
RCI 270 - DA	47.5
RCI 280 - DA	55.4

SPRING RETURN	
RCI 210 - SR	14.3
RCI 220 - SR	32.3
RCI 230 - SR	26.5
RCI 240 - SR	60.0
RCI 250 - SR	14.9
RCI 260 - SR	33.6
RCI 270 - SR	47.5
RCI 280 - SR	62.5

REMOTE CONTROL

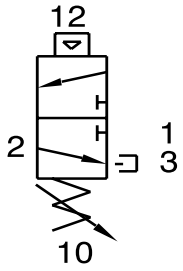
Product specifications and data are subject to change.

Remote Control Inc. • P.O. Box 275 • North Kingstown, RI 02852 • 401-294-1400 • FAX 401-294-3388

3 WAY AIR PILOTED SWITCHING/LOCKUP VALVE

PNEUMATIC FLOW SCHEMATIC

PRESSURE TO PILOT 12 ALLOWS FLOW FROM PORT 1 TO PORT 2. LOSS OF PILOT PRESSURE (12) TO OR BELOW SET POINT (10) WILL SHIFT SPOOL ALLOWING FLOW FROM PORT (2) TO PORT (3). THIS WILL EXHAUST IF OPEN OR BE LOCKED IF BLOCKED.



FEATURES

- Suitable for Switching or Lockup Functions
- 3 Way Adjustable (30 - 60 PSI)
- External Pilot
- Compact Size
- Anodized Aluminum Bar Stock Body
- CV = 1.0
- Maximum Operating Pressure 150 PSI
- Maximum Operating Temperature 180^{0}F

REMOTE CONTROL

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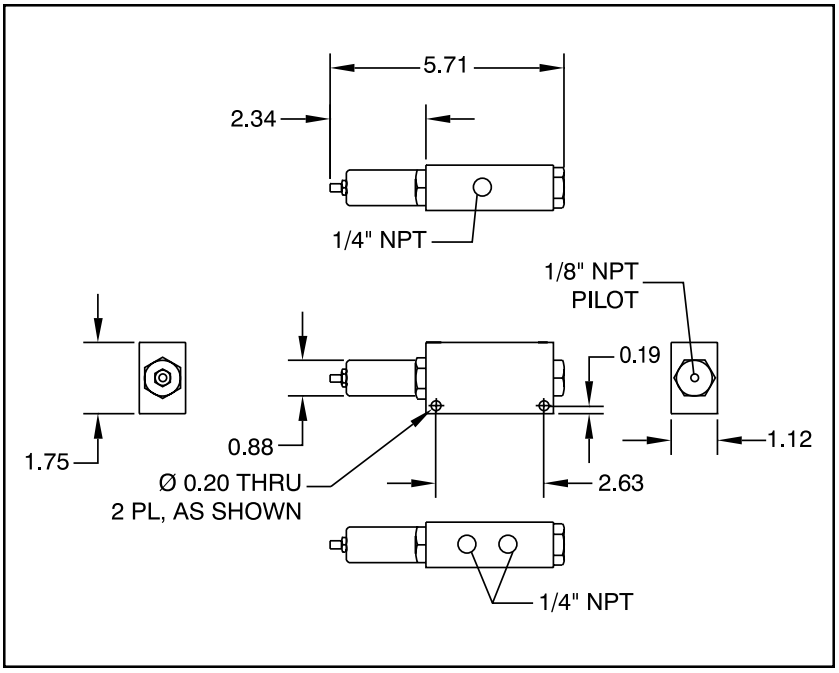
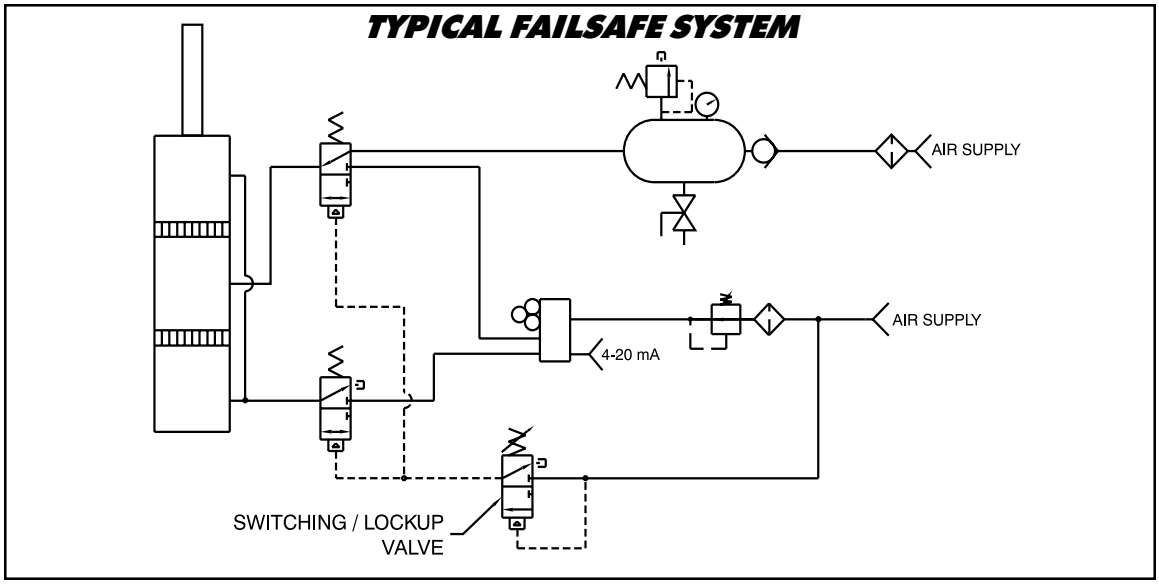
SPECIFICATIONS

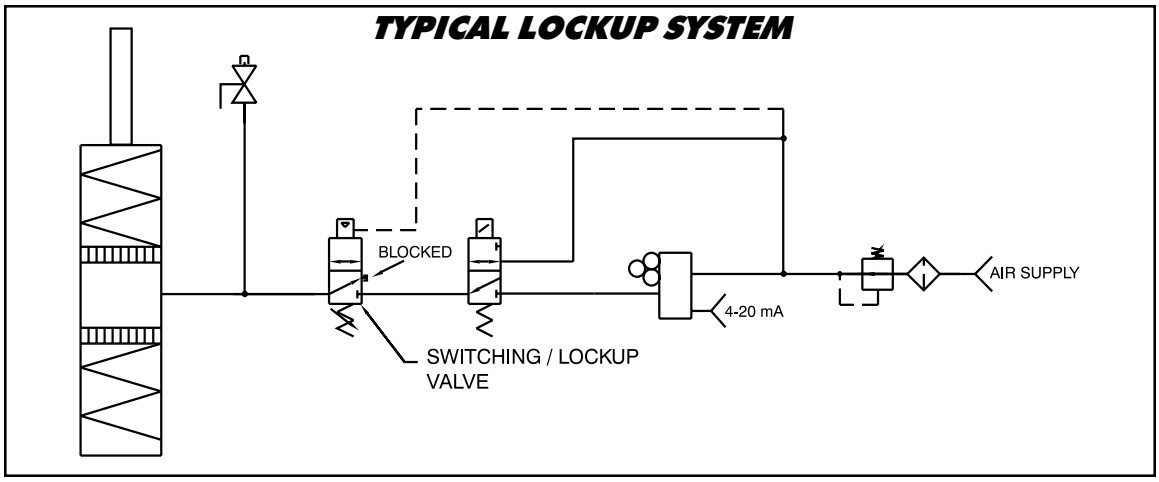
- Aluminum Anodized Barstock Body
- Honed & Burnished Bore
- Pressure Balanced Spool
- Buna N Seals
- 1/4” NPT Connection
- 30 - 60 PSI Adjustable Range
- CV = 1.0
- Single Pilot Spring Return
- Maximum Operating Pressure 150 PSI
- Maximum Operating Temperature 180^{0}F



TYPICAL FAILSAFE SYSTEM



TYPICAL LOCKUP SYSTEM



REMOTE CONTROL

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Torque Charts for Remote Control "RCI" Actuators

REMOTE CONTROL

These easy to use torque charts are applicable to all Remote Control quarter turn pneumatic actuators. They are arranged to assist you in correctly selecting Remote Control Actuators. We believe all of the information contained within to be correct at the time of publication. We do reserve the right to make changes at any time caused by product development.

To enable you to apply these values as accurately as possible it is important you know the correct valve torque and any service conditions which could affect that torque. This information should be obtained from the valve manufacturer.

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Table No. #002 Effective 7-15-99

Remote Control Inc. • P.O. Box 275 • North Kingstown, RI 02852 • 401-294-1400 • FAX 401-294-3388

Double Acting RCI-DA Series CLOCKWISE TO CLOSE

40 PSIG Air Supply

Model #	0^0	50^0	90^0
RCI 05-DA	97	53	97
RCI 210-DA	150	70	105
RCI 220-DA	310	140	220
RCI 230-DA	575	275	425
RCI 240-DA	1170	560	865
RCI 250-DA	1815	860	1325
RCI 260-DA	3715	1770	2745
RCI 270-DA	7520	3630	5575
RCI 280-DA	15490	7300	11500
RCI 88-DA	30975	14600	23010
RCI 100-DA	59826	28320	44427

60 PSIG Air Supply

Model #	0^0	50^0	90^0
RCI 05-DA	145	80	145
RCI 210-DA	220	105	170
RCI 220-DA	470	220	335
RCI 230-DA	865	405	635
RCI 240-DA	1750	840	1310
RCI 250-DA	2725	1285	1990
RCI 260-DA	5575	2655	4115
RCI 270-DA	11280	5440	8360
RCI 280-DA	23230	10975	17260
RC 88-DA	46460	21900	34515
RCI 100-DA	92040	43365	68145

80 PSIG Air Supply

Model #	0^0	50^0	90^0
RCI 05-DA	195	106	195
RCI 210-DA	300	140	220
RCI 220-DA	620	290	450
RCI 230-DA	1150	550	850
RCI 240-DA	2340	1120	1740
RCI 250-DA	3630	1720	2650
RCI 260-DA	7430	3540	5490
RCI 270-DA	15040	7260	11150
RCI 280-DA	30970	14600	23010
RCI 88-DA	61950	29200	46020
RCI 100-DA	123900	58410	92040

100 PSIG Air Supply

Model #	0^0	50^0	90^0
RCI 05-DA	240	130	240
RCI 210-DA	370	175	265
RCI 220-DA	780	354	565
RCI 230-DA	1430	690	1060
RCI 240-DA	2920	1415	2170
RCI 250-DA	4510	2170	3320
RCI 260-DA	9290	4425	6860
RCI 270-DA	18805	9070	13940
RCI 280-DA	38720	18230	28760
RCI 88-DA	77435	36505	57525
RCI 100-DA	150450	71685	112837

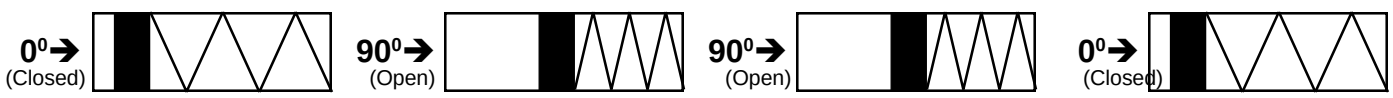
Spring Return RCI-SR Series
Air Stroke Counterclockwise to Open - Spring Stroke Clockwise to Close

40 PSIG Air Supply

	AIR STROKE			SPRING STROKE		
Model #	**0^0**	**60^0**	**90^0**	**90^0**	**30^0**	**0^0**
RCI 05-SR	40 PSI N/A			40 PSI N/A		
RCI 210-SR	40 PSI N/A			40 PSI N/A		
RCI 220-SR	168	71	88	124	62	97
RCI 230-SR	318	124	150	248	115	177
RCI 240-SR	637	257	319	513	239	363
RCI 250-SR	1062	380	487	761	363	549
RCI 260-SR	2124	805	1018	1549	761	1150
RCI 270-SR	4248	1681	2035	3186	1549	2301
RCI 280-SR	8496	3363	4248	6549	3186	4779
RCI 88-SR	16922	6815	8496	13186	6372	9558
RCI 100-SR	33984	13629	16992	26373	12744	19116

60 PSIG Air Supply

	AIR STROKE			SPRING STROKE		
Model #	**0^0**	**60^0**	**90^0**	**90^0**	**30^0**	**0^0**
RCI 05-SR	84	31	48	88	35	53
RCI 210-SR	133	44	62	97	44	71
RCI 220-SR	265	106	133	195	97	150
RCI 230-SR	495	186	239	380	186	274
RCI 240-SR	982	389	495	788	363	558
RCI 250-SR	1637	593	752	1195	558	850
RCI 260-SR	3274	1239	1593	2389	1195	1770
RCI 270-SR	6649	2566	3097	4956	2354	3628
RCI 280-SR	13098	5221	6549	10178	4956	7434
RCI 88-SR	26196	10443	13049	20355	9823	14780
RCI 100-SR	52392	20866	26196	40710	19647	29559



AIR START | AIR END | SPRING START | SPRING END

Spring Return RCI-SR Series

Air Stroke Counterclockwise to Open - Spring Stroke Clockwise to Close

80 PSIG Air Supply

	AIR STROKE			SPRING STROKE		
Model #	**0^0**	**60^0**	**90^0**	**90^0**	**30^0**	**0^0**
RCI 05-SR	115	44	66	124	49	75
RCI 210-SR	175	62	88	135	62	95
RCI 220-SR	350	140	175	265	130	200
RCI 230-SR	665	255	320	515	250	370
RCI 240-SR	1330	530	665	1060	495	750
RCI 250-SR	2210	795	1020	1590	750	1150
RCI 260-SR	4420	1680	2120	3270	1590	2390
RCI 270-SR	8850	3450	4250	6720	3190	4870
RCI 280-SR	17700	7030	8850	13720	6640	10000
RCI 88-SR	35400	14160	17700	27430	13270	19910
RCI 100-SR	70800	28320	35400	54870	26550	39825

100 PSIG Air Supply

	AIR STROKE			SPRING STROKE		
Model #	**0^0**	**60^0**	**90^0**	**90^0**	**30^0**	**0^0**
RCI 05-SR	140	53	80	150	62	90
RCI 210-SR	220	80	110	170	80	125
RCI 220-SR	440	175	220	335	170	265
RCI 230-SR	830	310	400	635	309	460
RCI 240-SR	1665	665	840	1330	620	930
RCI 250-SR	2745	975	1240	1990	930	1415
RCI 260-SR	5530	2125	2655	4070	1990	3010
RCI 270-SR	11154	4290	5310	8410	3980	6105
RCI 280-SR	22125	8850	11060	17170	8320	12480
RCI 88-SR	44250	17700	22125	34295	16595	24870
RCI 100-SR	88500	35400	44250	68587	33187	49737

AIR START | AIR END | SPRING START | SPRING END

Remote Control Inc. • P.O. Box 275 • North Kingstown, RI 02852 • 401-294-1400 • FAX 401-294-3388

REMOTE CONTROL

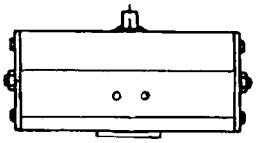
PNEUMATIC ACTUATORS
Installation & Maintenance Instructions
(Including Parts List) MI 0998

P.O. Box 275 • North Kingstown, RI 02852 • Phone: 401-294-1400 • Fax: 401-294-3388
www.remotecontrol.thomasregister.com

INTRODUCTION
RC Compact Pneumatic Actuators are intended for on-off and proportional control on quarter-turn valves. The design features a modern Scotch Yoke. This instruction covers the following actuators:

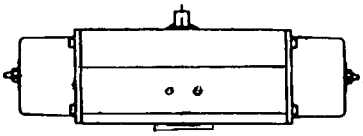
RC 210, 230, 250, and 270 (one piston)
RC 220, 240, 260, and 280 (two pistons)
Type DA (Double Acting)
Type SR Single Acting-Spring Return
Type SR actuators can be arranged for valves to "Fail Close" (CW rotation) or "Fail Open" (CCW rotation)

DOUBLE ACTING (DA) ACTUATOR



For clockwise to close valves, pressure to the left port closes the valve, pressure to the right port opens the valve.

SPRING RETURN (SR) ACTUATOR



For clockwise to close valves, pressure to the left port opens the valve. The right port is an exhaust port from the spring chamber(s).

STANDARD SPECIFICATIONS
Ambient Temperature Limits: -4 to+175^{0}F
Operating Medium: Filtered dry air or inert gas
Maximum Working Pressure: 150 PSI

Pneumatic piping to the actuator and associated accessories should follow the best practices for instrument pneumatic piping systems, ie: lines free of all water, oil or other contaminents, etc.

The operating medium is to be filtered dry air or inert gas which is filtered to 30 micron particle size or less. It is extremely important that the actuator be powered with an adequate air supply. Inadequate air could cause the valve to fail to operate.

The Spring housings on SR actuators, if not piped, will breath through the right hand port, see sketch (above). It's important that it not be exposed to a corrosive atmosphere. Please contact Remote Control for possible solutions if this condition exists.

INSTALLATION OF ACTUATOR
RC actuators are adapted to the valve by means of an intermediate bracket and coupler. The coupler adapts the ISO or DIN/ISO female output of the actuator to the valve shaft.

Standard mounting kits provide for mounting the actuator body in the direction of the pipe. Pipelines can be horizontal, vertical, or other postitions. When mounting on a valve, the axis of the actuator drive shaft and valve shaft must be in line. Intermediate couplings must allow for axial clearance of .020" to .040", depending on actuater size, between valve shaft and bottom of drive socket. This axial clearance must be added to any valve stem rise which may be applicable. After mounting, it may be necessary to adjust the end of travel limit stop (yoke turning angle).

LUBRICATION
RC actuators are permanently lubricated and additional lubrication is not normally required. However, for actuators performing 100,000 cycles or more under a very heavy load, an oil mist lubrication is recommended. Oil mist lubrication requires a mineral oil type ISO VG32 class 1 for useage in temperature range 15 to 158^{0}F. Oil mist lubricator must be set at the lowest possible value. Once begun, the oil mist lubrication cannot be discontinued.
CAUTION: If the actuator is equipped with a pneumatic or electro pneumatic positioner or pneumatic controller, oil mist lubricated air cannot be used unless the instrument manufacturer indicates that the instrument is compatible with lubricated air.

RECOMMENDED LUBRICATION GREASE

Cylinder bore and drive shaft with shaft seals and bearings	Grease
RC 200 standard and high temp	Cargo White Grease Klüber Isoflex Topas NCA 52
RC 200 low temp	Klüber Isoflex Topas NCA 52
Piston Roller (21)	**Grease**
All RC 200	Cargo Red Grease Klüber Unimoly GL 82

ORIENTATION OF PISTONS
Type DA
The pistons of standard Type DA Actuators are mounted as shown in figure 1. This provides for the highest torque at the "closed" (CW) valve position for valves that rotate clockwise to close. The pistons are then in their outermost position and the end of travel stop (yoke turning angle) can be fine adjusted $\pm 3^0$. To enable this adjustment to be done in the "open" (CCW) valve position, turn the pistons 180^0 about their axis as shown in Figure 3.
Type SR
The pistons of standard Type SR Actuators are mounted as shown in Figure 3. Although spring force is diminished, the geometry of the mechanism provides a greater torque at the end of the spring stroke than at mid stroke. When the actuator is in the "Open" valve position (Springs fully compressed), the end of travel stop, (turning angle), can be fine adjusted $\pm 3^0$.

Changing from "SPRING CLOSES" to "SPRING OPENS" (or Vice Versa)
CAUTION!! - STORED ENERGY - This procedure MUST be followed for safe removal of pretensioned spring housings. Serious injury or damage could result from failure to follow these instructions.
Refer to Figures 2 & 3
1. Shut off pneumatic (or hydraulic) supply and vent actuator.
2. Remove actuator from valve.
3. Disconnect any electrical power.

4. Confirm that the springs are fully extended as shown in figure 3. This can be confirmed by observing that the flats on the top drive shaft are 90^0 to the actuator axis on a "Fail Close" (fails CW) when viewed from the top of the actuator and parallel to the axis on a "Fail Open" (fails CCW) when viewed from the top of the actuator.
5. Loosen Locknut (29).
6. Rotate tensioning screw (26) counterclockwise until resistance is felt, then turn one more full turn.
7. Remove screws (4).
8. Remove spring pack(s) from actuator.
9. Rotate drive shaft (15) until the pistons are at the end of the cylinder. This can be done by turning the drive shaft with a wrench on the flats or by clamping the shaft between soft jaws in a vise and turning the actuator. Insert two close fitting rods in the holes on the end of the piston and, squeezing them, pull the piston(s) from the cylinder.
10. Rotate drive shaft 90^0.
11. Grease cylinder surface (see table above)
12. Rotate piston(s) 180^0 about their axis and reinstall them as shown in figure 1.
13. Ensure that pistons are lined up so that roller bearing (21) engages scotch yoke correctly. Once pistons are in, rotate shaft 90^0 to draw pistons in and confirm proper engagement. Pistons should now be in their innermost position. On sizes RC 230 through RC 280, align spring assembly so that one of three support points falls between the bosses on the piston and pins engage holes in the piston.
14. Install screws (4).
15. Rotate tensioning screw clockwise until resistance abates and turn one more full turn.
16. Tighten locknut (29).

The adjustment will then take place at the air end position.

ADJUSTMENT OF THE TURNING ANGLE

The $\pm 3^0$ adjustment of the end of travel stop described in the section on Orientation of Pistons is accomplished by loosening the lock nut on the end plate and turning the adjusting screw clockwise for reduced and counterclockwise for increased rotary motion. RC 220, 240, 260, and 280 actuators have two adjustment screws. It is important that both screws are in contact with their respective pistons.

MANUAL OPERATION

All actuators have a drive shaft with two flats for manual operation. However, because of the potential for stored energy in the actuator and the possibility of injury, it is strongly recommended that actuators size RC 230 and larger be equipped with M1 Manual Handwheel Override for manual operation.

CAUTION: Actuators must be vented before attempting manual operation.

MAINTENANCE

CAUTION: Before removing any components of the actuator, ensure that all pneumatic (or hydraulic) and electrical power supplies are disconnected.

Replacement of Shaft O-Rings

The shaft O-rings (18) & (38) and the support washers (33) & (39) can easily be replaced. Refer to figure 2.

1. Vent actuator.
2. Remove circlip locking rings (31) & (40).
3. Replace O-rings and support rings.

Note: Use a high quality grease when installing new parts. (See table on page 1.)

4. Replace circlip locking rings. The rounded inner edge is to be toward the center of the actuator. Do not spread more than necessary to get it over the shaft. It should fit tightly in the groove with no play.

REPLACEMENT OF O-RING AND SUPPORT BAND FOR DA ACTUATORS

Replacement of the piston O-ring is required if the O-ring is not holding air pressure.

1. Vent actuator.
2. Remove end plate(s) (5).
3. Rotate drive shaft (15) until the pistons are at the end of the cylinder. This can be done by turning the drive shaft with a wrench on the flats or by clamping the shaft between soft jaws in a vise and turning the actuator. Insert two close fitting rods in the holes on the end of the piston and, squeezing them, pull the piston(s) from the cylinder.
4. Replace O-ring (12).
5. Replace wear band (14).
6. Replace the support element (9). It should "pop" off with minimal effort.
7. Grease cylinder surface before reassembling. See table on page 1.
8. Install piston. Ensure that pistons are lined up so that roller bearing (21) engages scotch yoke correctly. Once pistons are in place, turn the drive shaft to draw pistons in and confirm proper engagement.
9. Mount end plates.
10. Replace O-ring (3) under lock nut (2).
11. Turn drive shaft to extend pistons and fine adjust end of travel stop (1).
12. Tighten lock nut (2)

NOTE: For two piston actuators (RC 220DA, RC 240DA, RC 260DA, RC 280DA), it is important that both travel stops contact pistons equally.

REPLACEMENT OF O-RING AND SUPPORT BAND FOR SR ACTUATORS

Refer to figures 2 & 3

1. Loosen lock nut (29).
2. Rotate tensioning screw (26) counterclockwise until you feel resistance and turn one more full turn.
3. Remove screws (4).
4. Remove spring pack from actuator.
5. Follow steps 3 through 8 for DA actuators.

Assembling

6. Replace O-Ring on spring cartridge(s) and end plate, if applicable.
7. Mount spring assembly with pistons in their innermost position. On sizes RC 230 through RC 280, turn spring assembly so that one of three support points lies between bosses on piston and pins engage holes in piston.
8. Install screws (4).
9. Rotate tensioning screw clockwise until resistance abates, and turn one more full turn.
10. Tighten locknut (29).

CHANGING DA TO SR ACTUATORS

All DA actuators can be changed to SR actuators by adding spring conversion kits as follows:

1. Pretension spring assembly using item (26). Refer to Table 1 and Figure 4.
2. Vent actuator.
3. Remove end plates.
4. Follow instructions above for removing piston(s) (10).
5. Rotate shaft 90^0.
6. Grease cylinder surface see table on page 1.
7. Turn pistons 180^0 about their axis and reinstall them per figure 3.
8. Follow instructions above for reinstalling pistons.

Note: Refer to instruction on assembling SR actuators above for installation of spring paks.

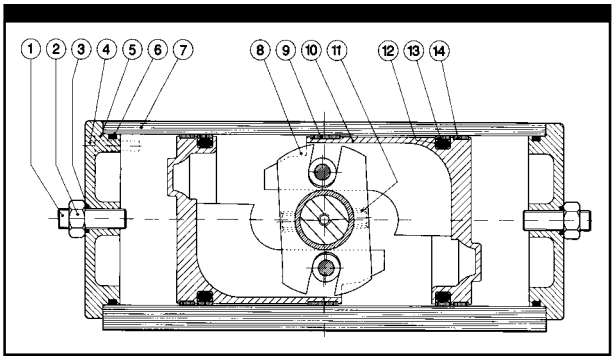


Figure 1 - RC 200-DA from above

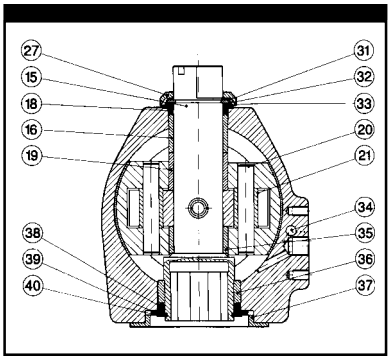


Figure 2 - Top Side

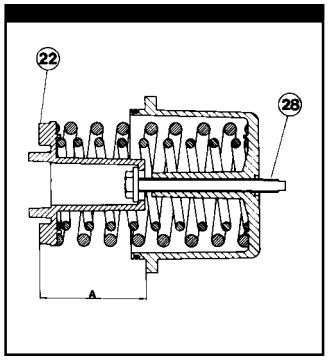


Figure 4 - Spring Pack Pretensioning

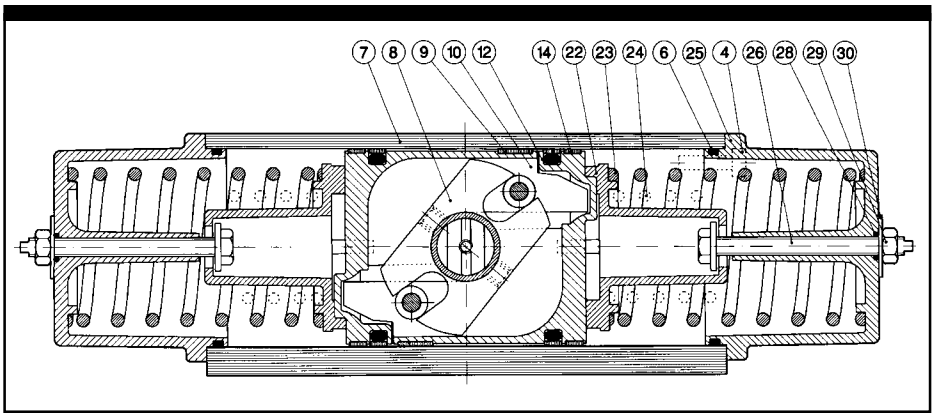


Figure 3- RC 200-SR from above

Actuator	Dimension "A" inches (mm)	
210-220	1.61	(41)
230-240	2.44	(62)
250-260	3.43	(87)
270-280	5.39	(137)

Table 1 - Pretensioning Dimension "A"

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

CAUTION

Do not remove the protective tube (50) and handwheel from the spring housing as long as the springs are under tension. This procedure must be followed for safe removal of pretensioned spring housings.

DISASSEMBLY MUST BE PERFORMED EXACTLY AS FOLLOWS. SERIOUS INJURY OR DAMAGE COULD RESULT FROM FAILURE TO FOLLOW THESE INSTRUCTIONS. CONTACT REMOTE CONTROL IF AT ALL UNCERTAIN.

1. Shut off pneumatic (or hydraulic) supply and vent actuator.
2. Confirm that the springs are fully extended as shown in figure 5. This can be confirmed by observing that the flats on the top drive shaft are 90° to the actuator axis on a "Fail Close" (fails CW) when viewed from the top of the actuator and parallel to the axis on a "Fail Open" (fails CCW) when viewed from the top of the actuator.
3. Turn the handwheel so that the threaded stem (51) moves toward the actuator until it stops and the stem can just barely be seen in the plastic tube (49).
4. For sizes RC 220, 240, 260 and 280 (i.e. actuators with two pistons): adjust the tensioning screw (26) in the opposite spring housing counter clockwise until it contacts the spring guide (22). Remove the spring housing by removing the screws (4).
5. Turn the handwheel until there is resistance and the threaded stem (51) can be seen slightly to the right of neutral position "N" (see figure 5).
6. Remove the spring housing of the manual override by removing the retaining screws (4) and turn the handwheel several turns in the direction which gives the least resistance.

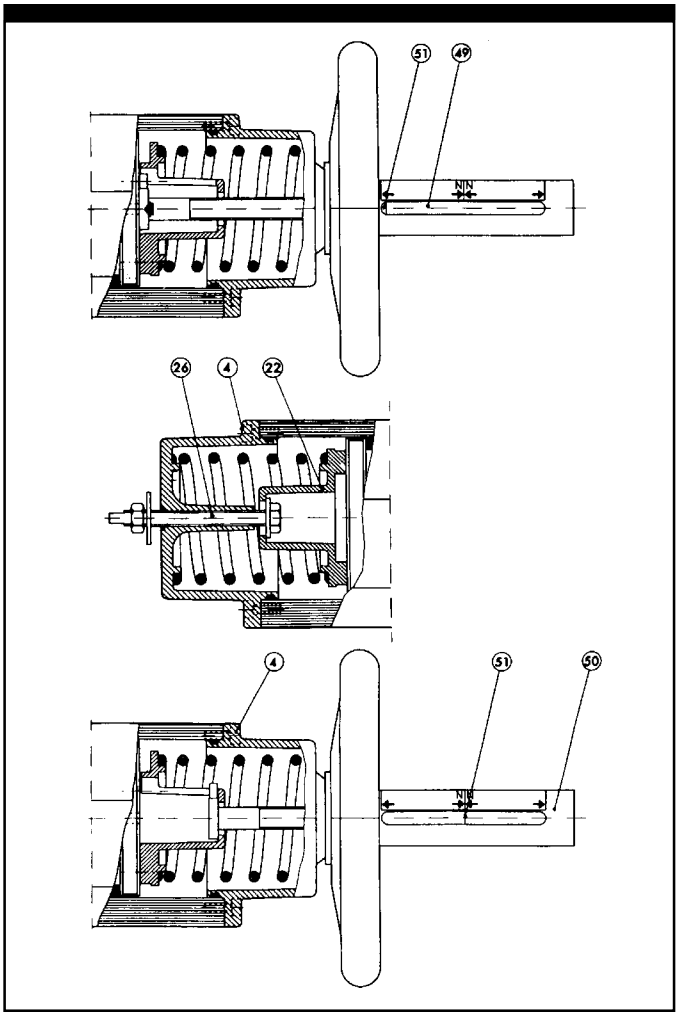


Figure 5

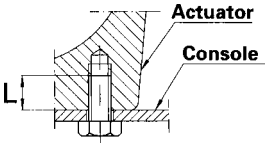
MATERIAL TABLE FOR RC 210-280

Item Number	Description	Quantity RC 200DA	Quantity RC 200-SR	Material	Surface Treatment
1	Adjusting screw[1]	1	--	Sizes 210-260: Stainless steel 270, 280: Steel	 Zinc plated
2	Lock nut[1]	1	--	Sizes 210-260: Stainless steel 270, 280: Steel	 Zinc plated
3	O-ring[1]	1	--	Nitrile	
4	Screw	8-16	8-16	Sizes 210-260: Stainless steel 270, 280: Steel	 Zinc plated
5	End plate with center hole[1]	1	--	Aluminum	Anodized
6	O-ring	2	2	Nitrile	
7	Cylinder	1	1	Aluminum	Anodized
8	Scotch yoke	1	1	Steel	
9	Support element[1]	1	1	POM/PTFE	
10	Piston[1]	1	1	Aluminum	
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	Drive shaft	1	1	Sizes 210-260: Stainless steel 270, 280: Steel	 Yellow chromated
16	Bearing, upper	1	1	Polymer material	
17	End plate without center 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	Aluminum	
23	Spring external[1]	--	1	Sizes 210-260: Alloyed spring steel 270, 280 Spring steel	 Corrosion protected
24	Spring internal[1,5]	--	1	Alloyed spring steel	Corrosion protected
25	Spring housing[1]	--	1	Aluminum	Anodized
26	Pre-tensioning screw[1]	--	1	Sizes 210-260: Stainless steel 270, 280: Steel	 Zinc plated
27	Indicator	1	1	Polymer material	
28	O-ring[1]	--	1	Nitrile	
29	Lock nut[1]	--	1	Sizes 210-260: Stainless steel 270, 280 Spring steel	 Zinc plated
30	Marking washer[1]	--	1	Aluminum	Anodized
31	Circlip, upper	1	1	Sizes 210-260: Stainless spring steel 270, 280: Spring steel	 Corrosion protected
32	Middle Washer	1	1	Sizes 210-260: Stainless steel 270, 280: Steel	 Corrosion protected
33	Support washer, upper	1	1	Polymer material, chemically resistant	
34	Seal[1]	1	1	Sizes 210-260: Stainless steel 270, 280: 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	Circlip	1	1	Sizes 210-260: Stainless spring steel 270, 280: Spring steel	 Corrosion protected

1. For actuators sizes 220, 240, 260 and 280: double the quantity. 2. RC 240 has triple roll pins.
3. RC 270-280 have steel pin. 4. Not shown. Does not exist for sizes 220, 240, 260 and 280.
5. Only for sizes 270 and 280.

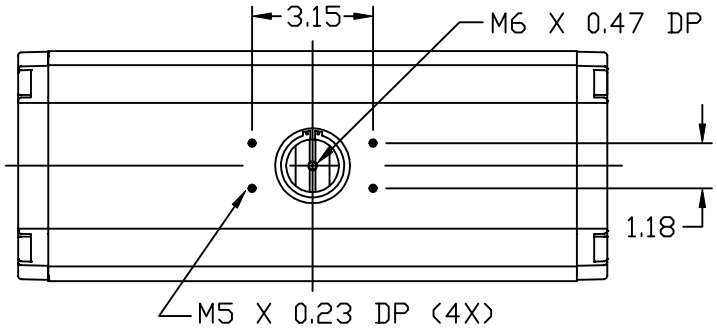
TIGHTENING TORQUES FOR SCREWS AND LOCK NUTS

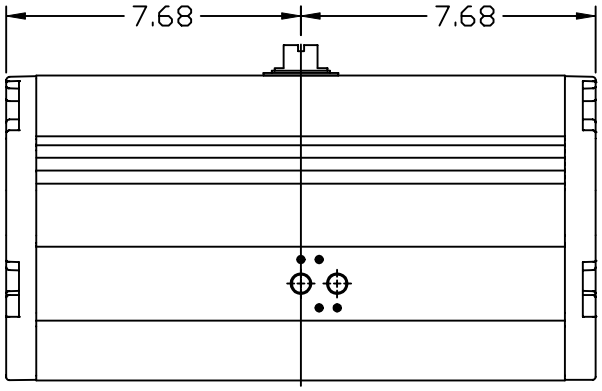
The actuators must be screwed onto the mounting brackets with the correct torque in order to be stable during operation. Use maximum screw length possible without the threads bottoming. Tightening torque values are expressed in in.-lb.

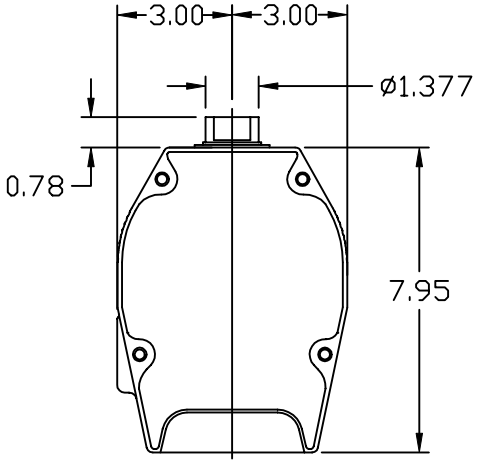


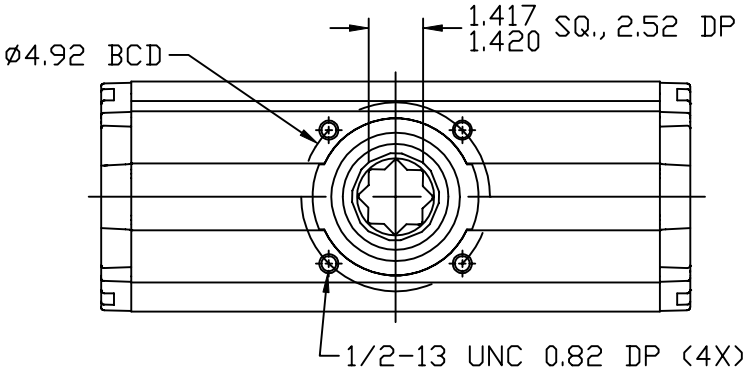
Actuator	End Plate Screw	Locknut	
		DA	SR
	(4)	(2)	(29)
RC 210-220	49	177	80
RC 230-240	49	354	159
RC250-260	204	797	310
RC 270-280	673	1062	708

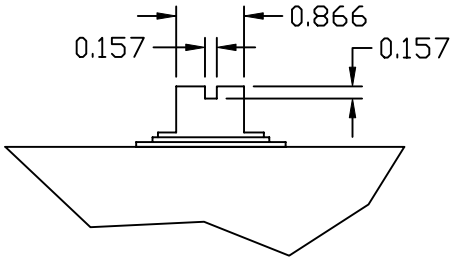
Actuator	DIN Flange	Thread	Lmax (mm)	Screw Length (mm)									
				32 (8)	.39 (10)	.47 (12)	.55 (14)	.63 (16)	.71 (18)	.79 (20)	.94 (24)	1.10 (28)	1.26 (32)
RC 210	F05	1/4"	.43 (11)	88	91								
RC 220	F05	1/4"	.43 (11)	88	91								
RC 230-240	F07	5/16"	.55 (14)		168	186	186						
	F10	3/8"	.67 (17)			283	319	319					
RC 250-260	F10	3/8"	.67 (17)			283	319	319					
	F12	1/2"	.83 (21)				611	708	761	761			
RC 270	F14	5/8"	.98 (25)					1018	1151	1274	1522		
	170 X 110	5/8"	.98 (25)					1018	1151	1274	1522		
RC 280	F12	1/2"	.98 (25)					708	761	761	761		
	F16	3/4"	1.26 (32)								2080	2451	2682
	F25	5/8"	.98 (25)					1018	1151	1274	1522		

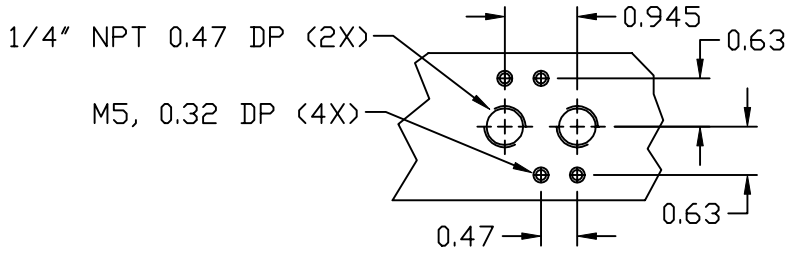












ENVELOPE DIMENSIONS
RC265-DA ACTUATOR

SCALE:	APPROVED BY:	DRAWN BY EC
DATE: 6/22/00		REVISED

Remote Control

REMOTE CONTROL, INC.

P.O. Box 275, North Kingstown, RI 02852

DRAWING NUMBER	REV
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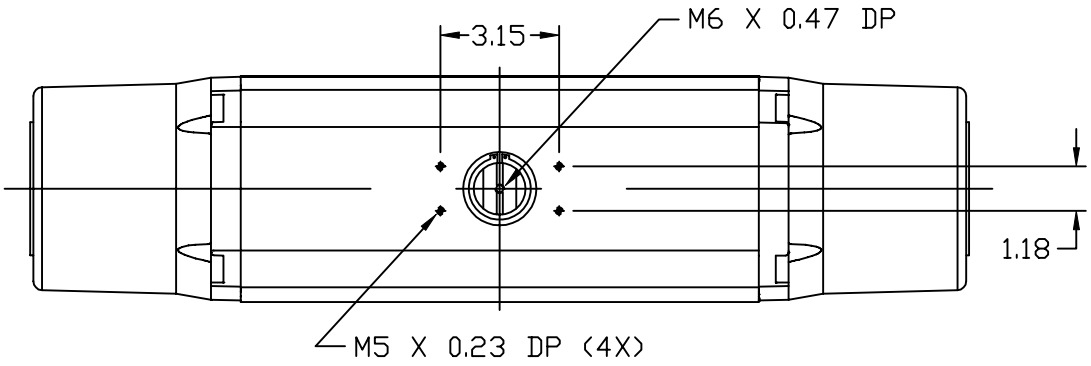

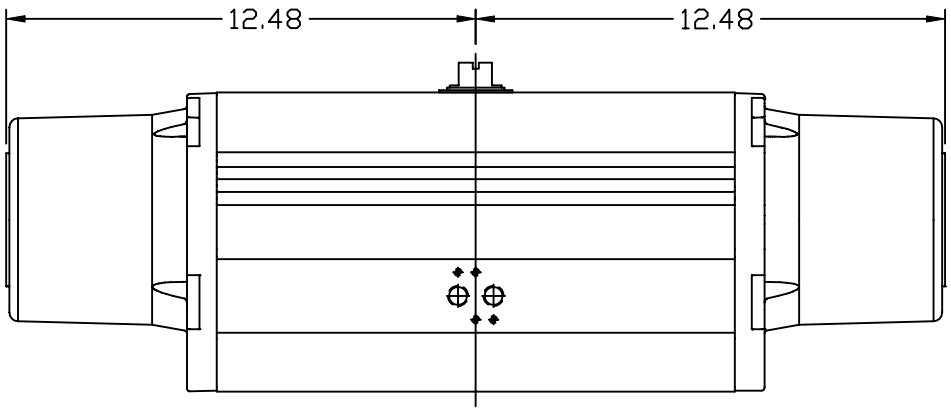

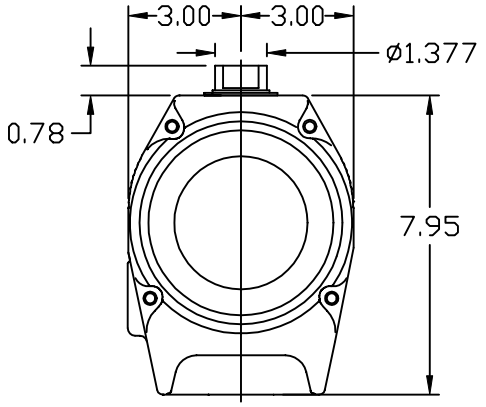

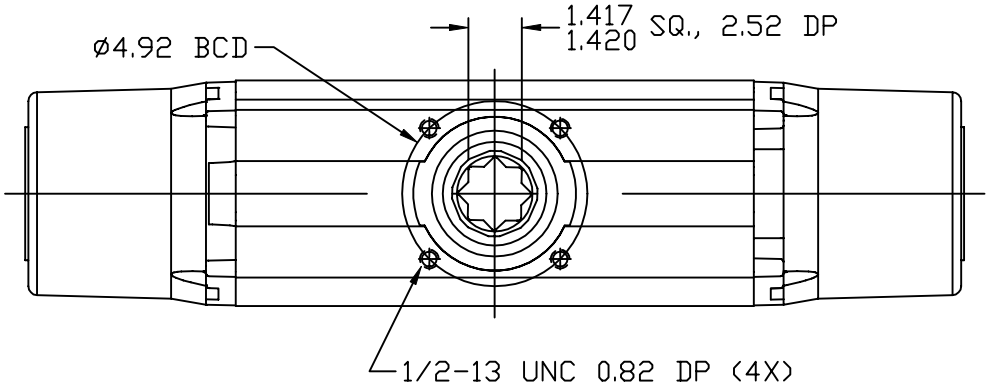

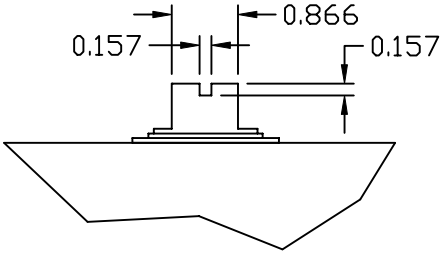

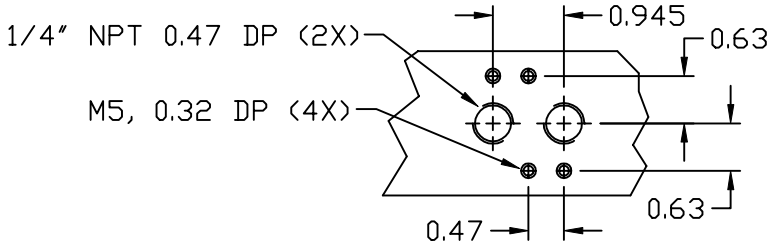

ENVELOPE DIMENSIONS
RC265-SR ACTUATOR

SCALE:	APPROVED BY:	DRAWN BY EC
DATE: 6/22/00		REVISED

Remote Control

REMOTE CONTROL, INC.

P.O. Box 275, North Kingstown, RI 02852

DRAWING NUMBER	REV
265SRD	—