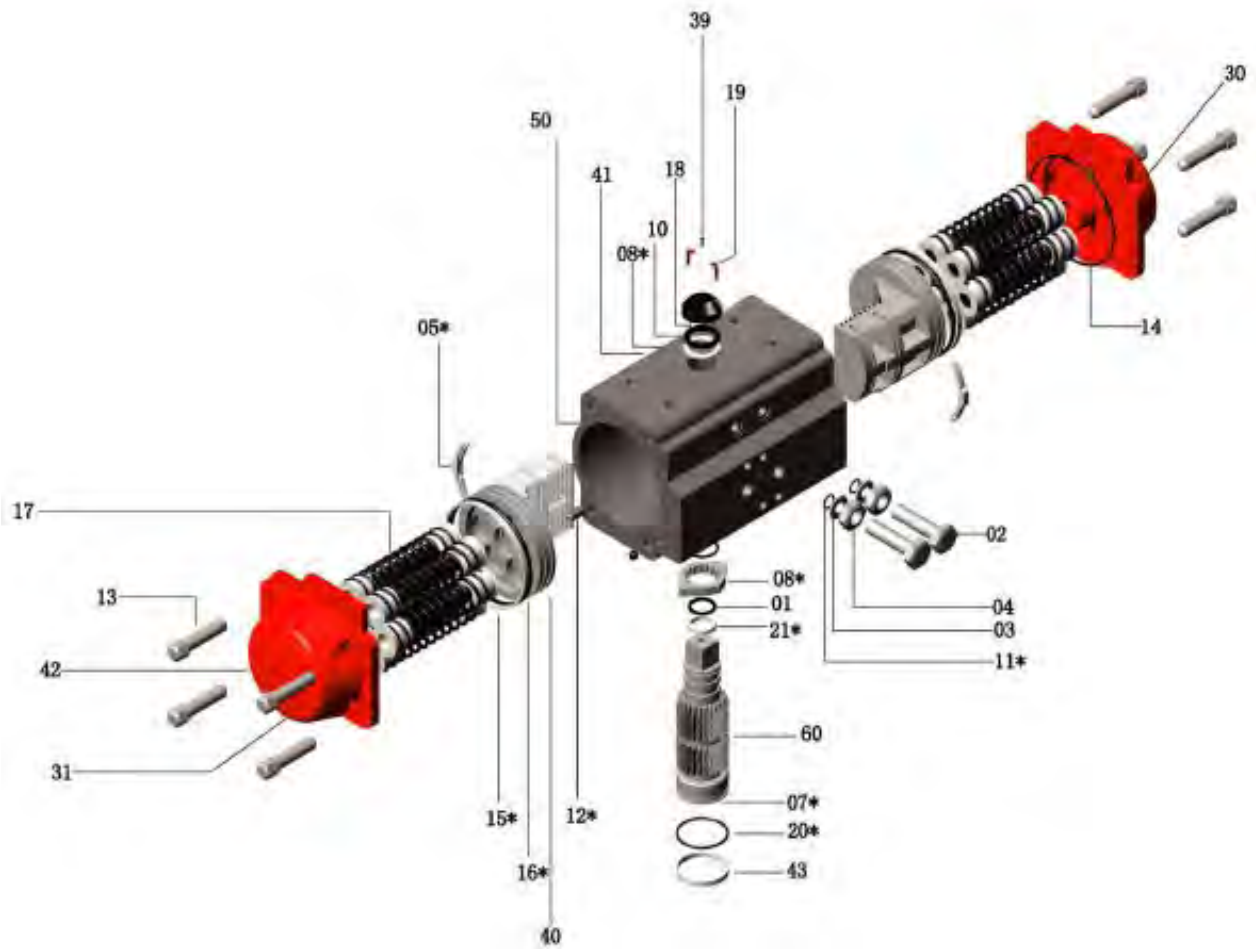




Pneumatic Actuator





The connections conform to ISO5211

Part No	Spare parts	UNIT Q. TY	PART (DESCRIPTION)	STANDARD MATERIAL	CORROSION PROTECTION "A"(A)	OPTIONAL MATERIAL
01		1	OCTI-CAM (Stop RING)	Stainless Steel (B)	.....	.....
02		2	STIP CAP SCREW	Stainless Steel	.....	.....
03		2	WASHER	Stainless Steel	.....	.....
04		2	NUT (Stop screw)	Stainless Steel	.....	.....
05*	O	2	BEARING (Piston back)	Polyphthalamide	.....	.....
06*	O	1	BEARING (Pinion top)	Nylon46	.....	.....
07*	O	1	BEARING (Pinion bottom)	Nylon46	.....	.....
0	O	2	THRUST BEARING (Pinion)	Polyphthalamide	.....	.....
09*	O□	2	PLUG	NBR	.....	FPM Silicon
10		1	THRUST WASHER (Pinion)	Stainless Steel	.....	.....
11*	O□	2	"O" RING (Stop screw)	NBR	.....	FPM Silicon
12		2	PISTON GUIDE	Polyphthalamide+GF	.....	.....
13		8 (C)	CAP SCREW (End cap)	Stainless Steel	.....	.....
14*	O□	2	"O" RING (End cap)	NBR	.....	FPM Silicon
15*	O	2	BEARING (Piston head)	Polyphthalamide	.....	.....
16*	O□	2	"O"RING (Piston)	NBR	.....	FPM Silicon
17		5-12	SPRING (Cartridge)	High alloy Spring Steel	FPM Silicon	.....
18		1	SPRING CLIP (Pinion)	High alloy Spring Steel	Nickel plated	Stainless Steel
19		1	POSITION INDICATOR	Polyphthalamide+GF	.....	.....
20*	O□	1	"O"RING (Pinion bottom)	NBR	.....	FPM Silicon
21*	O□	1	"O"RING(Pinion top)	NBR	.....	FPM Silicon
30 (D)		1	RIGHT END CAP	Die Cast Aluminum alloy	Polyester coated	.....
31 (D)		1	LEFT END CAP	Die Cast Aluminum alloy	Polyester coated	.....
39		1	CAP SCREW (Indicator)	Stainless Steel	.....	.....
40		2	PISTON	Die Cast Aluminum alloy	Anodized	.....
41		1	ACTUATOR IDENTIFICATION LABEL	Polyester-Aluminum	.....	.....
42		2	END CAP LABEL	Polyester-Aluminum	.....	.....
43		1	SPIGOT (Only on request)	Extruded Aluminum alloy	ALODUR	.....
50		1	BODY	Extruded Aluminum alloy	ALODUR	.....
60		1	DRIVE SHAFT	Steel alloy	Nickel plated	Stainless Steel

Notes:

(A) For other protection levels available see for page 11

(B) For model RP115 and bigger the OCTI-CAM material is cast iron

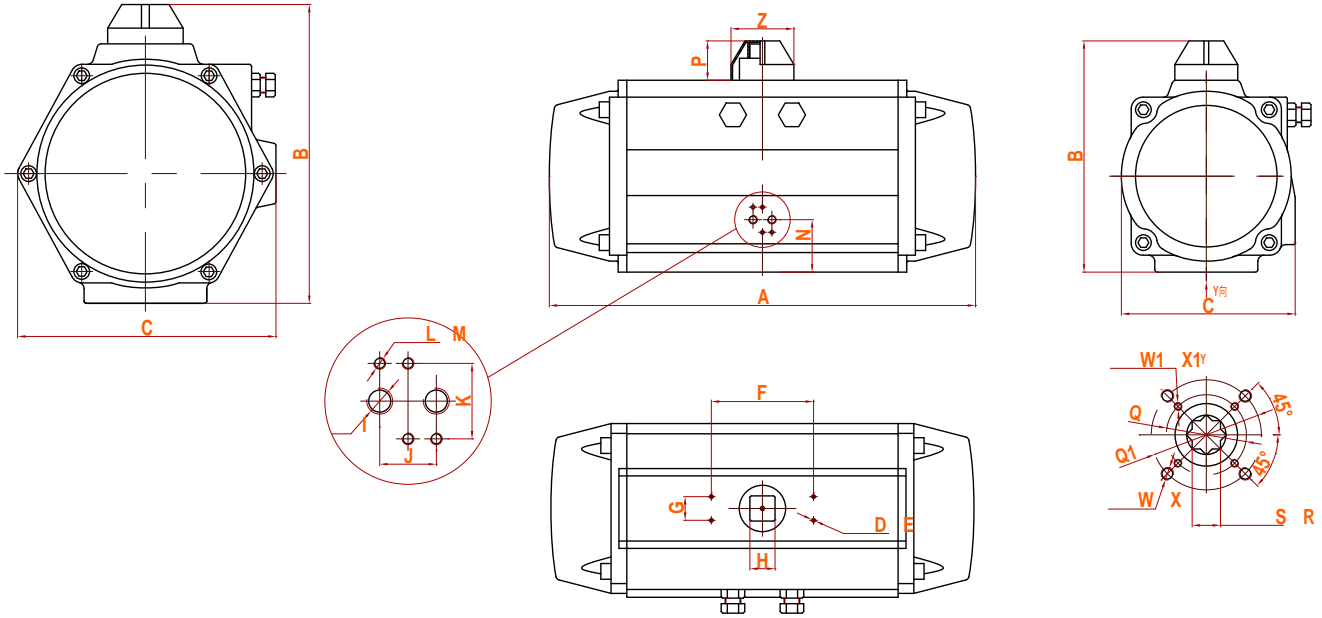
(C) For model RP265 and model RP300 the Cap screws are 12 pcs

(D) For model RP180 and bigger the 2 End Caps are symmetric

*Recommended SPARE PARTS For maintenance

○Parts Included in spare parts kit

□Parts included in "O" ring kit



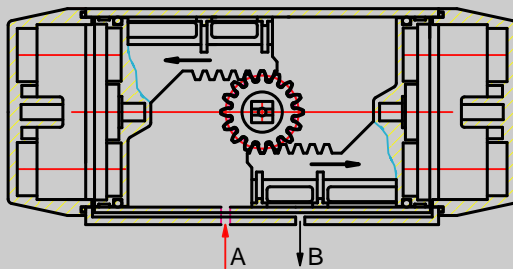
The connections conform to ISO5211

Model	RP50	RP63	RP75	RP88	RP100	RP125	RP145	RP160	RP180	RP200	RP240	RP265	RP300-1000
A	140.5	158.5	210.5	247.5	268.5	345	408.5	437.5	487	543	621	684	If need other size valve, Please contact us.
B	89	105	122	135	147	187	207	226	270.5	295	348.5	380	
C	70.5	83	94.5	106.5	123	151.5	171.5	187	204	222	262	329.5	
D	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	
E	8	8	8	8	8	8	8	8	8	8	8	8	
F	80	80	80	80	80	80	80	80	130	130	130	130	
G	30	30	30	30	30	30	30	30	30	30	30	30	
H	11	11	14.7	14.7	14.7	21	27	27	32	32	36	36	
I	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/8"	3/8"	
J	24	24	24	24	24	24	24	24	24	24	40	40	
K	32	32	32	32	32	32	32	32	32	32	45	45	
L	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	M5	
M	8	8	8	8	8	8	8	8	8	8	8	8	
N	26.5	31	30.5	33.5	37.5	46	47.5	53.5	58	62.5	78.5	165.5	
P	30	20	20	20	20	30	30	30	50	50	50	50	
R	12	16	18	18	22	27	32	34	39	40	49	69	
S	11	14	17	17	22	27	27	27	36	36	46	46	
T	12.5	16.5	19.5	19.5	23.5	28.5	33.5	35.5	41	42	51.5	71.5	
Q	42	50	50	50	70	70	102	102	140	140	165	165	
Q1			70	70	102	102	125	125					
W	M5	M6	M6	M6	M8	M8	M10	M10	M16	M16	M20	M20	
W1			M8	M8	M10	M10	M12	M12					
X	9	9	9	9	12	12	15	15	24	24	30	30	
X1			12	12	15	15	18	18					
ISO5211	F04	F05	F05/F07	F07/F07	F07/F10	F07/F10	F10/F12	F10/F12	F14	F14	F16	F16	
Z	40	40	40	40	40	56	65	65	80	80	115	115	

Model	DN Φ (mm)		Air consumption of open	Air consumption of close	open time		close time		weight	
					DA	SR	DA	SR	DA	SR
RP50	50	1/6 turn	0.09	0.15	0.2	0.25	0.25	0.3	0.96	1.06
RP63	63	1/6 turn	0.16	0.26	0.25	0.3	0.3	0.35	1.58	1.7
RP75	75	1/6 turn	0.31	0.49	0.3	0.35	0.4	0.5	2.7	3.15
RP88	88	1/5 turn	0.51	0.78	0.4	0.5	0.5	0.6	3.8	4.4
RP100	100	1/5 turn	0.71	1.11	0.5	0.6	0.7	0.9	5.4	6.51
RP125	125	1/5 turn	1.54	2.34	0.9	1.1	1.2	1.4	10.2	12.6
RP145	145	1/5 turn	2.41	3.78	1.2	11.4	1.5	1.8	14.5	18.1
RP160	160	1/4 turn	3.14	4.92	1.5	1.7	1.8	2.1	19.8	24
RP180	180	1/4 turn	4.26	6.89	2	2.2	2.4	2.8	25	31.6
RP200	200	1/4 turn	5.94	9.46	2.7	3.2	3.5	4	35.5	45.1
RP240	240	1/4 turn	10	15.2	3.5	4	4.1	4.6	53	64
RP265	265	1/4 turn	14.5	21.38	4	4.5	4.5	5	83	102
RP300 RP1000	300	If need other size valve, Please contact us.								

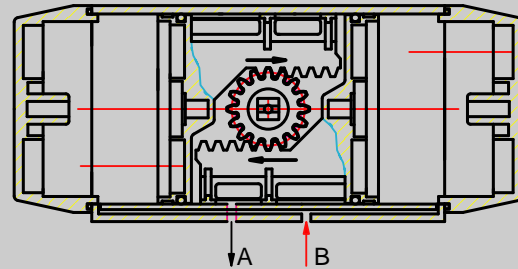
Operating Principle

Double-acting



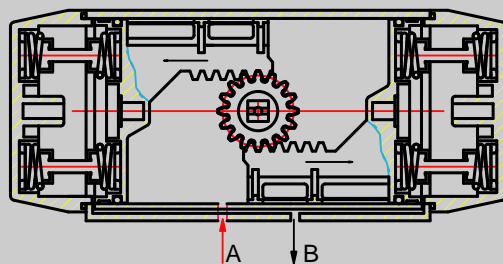
Air to Port A forces the pistons outwards, causing the pinion to turn counterclockwise while the air is being exhausted from Port B.
CCW

Standard Rotation

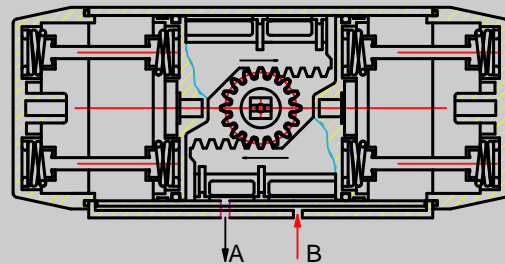


Air to Port B forces the pistons inwards, causing the pinion to turn clockwise while the air is being exhausted from Port A.
CW

Single-acting

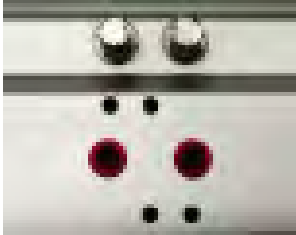


Air to Port A forces the pistons outwards, causing the springs to compress, the pinion turns counterclockwise while air is being exhausted from Port B.
CCW



Loss of air pressure, the stored energy in the springs forces the pistons inwards, the pinion turns clockwise while air is being exhausted from Port A.
CW

Side



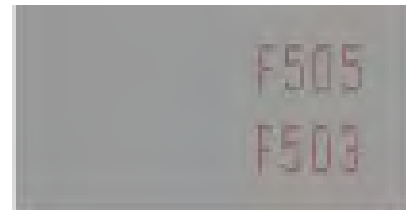
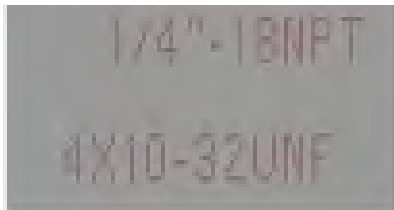
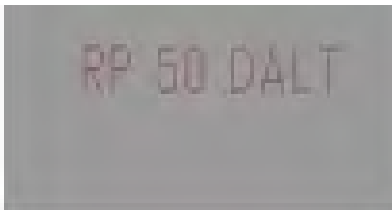
Bottom



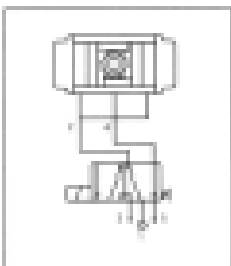
Top



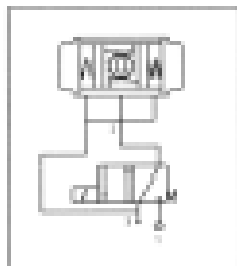
- The Side connection conforms to the VDI/VDE 3845 NAMUR standard and can be installed the solenoid valve Directly
- The top connection conforms to VDI/VDE 3845 NAMUR standard and can be installed the limit switch or positioner. solenoid Directly
- The bottom connection conforms to ISO5211 and DIN3337 standard and can be installed on the valve directly. (Star hole and square hole can be chosen according to the requirements)



Each actuator is marked with a serial number, air connection and bottom mounting holes are marked for easy track and distinction.



5/2 SOLENOID VALVE OPERATION



3/2 SOLENOID VALVE OPERATION

Top mounting pad configuration is in accordance with VDI / VDE 3845 Namur specification in order to permit simple and easy installation of the ancillary like switch boxes and positioners. ROPO can supply many different types of switch boxes and positioners for any application.

Air supply connection is in accordance with VDI / VDE3845 Namur specification to provide simple and easy solenoid valve installation direct mount avoiding piping and fittings. ROPO can also supply Namur solenoid valves: 5/2 and 3/2 way in all standard voltages, D.C. or A.C.

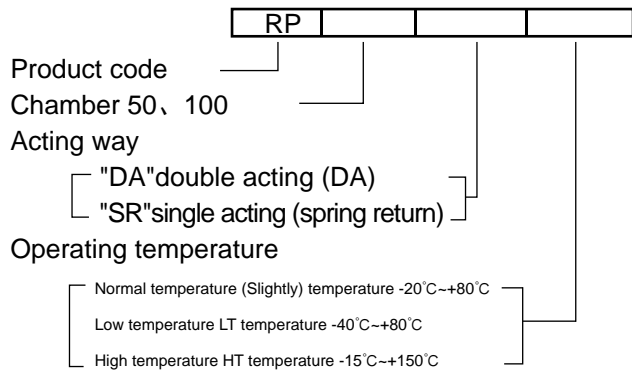
RP Series actuators

The pinion pneumatic actuator has been designed, developed and tested incorporating the latest technology and materials available. With some innovative design features. As a result of this product research we have obtained a high grade product with the following characteristics:

- *Reliability
- *High performance
- *Wider product range premitting a more economical sizing selection
- *Innovative and patented universal drive shaft and multifunction position indicator
- *Full compliance with latest worldwide specifications
- *A wide selection of highest levels of corrosion protection technology
- *Aesthetically compact and modern style with no external cavities to avoid deposit build up



Product specification



Description: Actuator Mode RP50, Type Double Acting and low temperature

Description: Actuator Mode RP88, Type single Acting (Spring return) and Normal temperature

Protection levels available

Part	A	B	C
Cylinder body	The anode carburizing (black,red, Silver, cream color...)	The anode hardens + the coating (black,red, Silver, cream color...)	Chemistry nickel plating + Transparently gathers the fat (black, red, Silver, cream color...)
End cover	Colored gathers the fat to spread the number (blue orange, Turkey, sparkling jade-like stone light black, light yellow, original cylinder is transparent)	Colored gathers the fat to spread the number (blue orange, Turkey, sparkling jade-like stone light black, light yellow, original cylinder is transparent)	Colored gathers the fat to spread the number (blue orange, Turkey, sparkling jade-like stone light black, light yellow, original cylinder is transparent)
Output shaft	Carbon steel (chemistry nickel plating)	Carbon steel (chemistry nickel plating)	Carbon steel (chemistry nickel plating)
Piston	Anode carburizing (black, gray)	Anode carburizing (black, gray)	Anode carburizing (black, gray)
Suitable situation	General situation, low acid solution	General situation, low acid solution	General situation, low acid solution
Does not recommend The use situation	Sodium hydroxide, strong acid solution nitric acid solution	Nitric acid solution	Soda, nitric acid, sulfuric acid, chloric acid and salt mistconditions

RP Actuator are designed in full compliance with the latest worldwide specification actuator accessory and valve mounting interfaces.

Bottom mounting pad (Actuator to valve interface) configured in accordance with ISO 5211 and DIN 3337 specifications

*ISO 5211 and DIN 3337 configuration permits easy installation of the actuator directly onto a valve or will interface through an ISO bracket. ISO gear boxes.

*ROPO can supply all mountig kits i.e.Assorted Square drive reducer pieces suitable for all square drive shaft, Centering rings for all sizes, Brackets and Couplings.

*Other than the standard base ISO/DIN Parallel or Diagonal square output on the drive shaft connection, we can supply a Keyed connection, Flat head connection or special customized drive connections.



Customized Service

1. Ancillaries installation without multi-function indicator

The actuator can be supplied upon request with a NAMUR that replaces the standard indicator and has the Namur drive slot permitting:

- 1) Accessories such as limit switch and positioner
- 2) Indicating the position of actuator via the Namur slot
- 3) Manual operation in emergency
- 4) Operating at high temperature.

2. 100% travelling adjustment RP

Actuators can be adjusted by $\pm 5^\circ$ at 0° and 90° . When you need the valve stop at $1^\circ, 5^\circ, 10^\circ, 25^\circ, 50^\circ, 80^\circ$, two adjustable nuts can be applied to limit between 0 and 90 as required.

3. Lock-out capability in fully-open or fully-closed position

The actuator offers an economical solution when is requested to locking the actuator in the fully-open (90°) or fully-closed (0°) position. The actuator can be supplied with a special bolt and locking device to permanently lock the actuator in position by using a padlock and preventing unwanted operation.

1. Operating media:

Dry or lubricated air or inert / non-corrosive gases on condition that they are compatible with internal actuator parts and lubricant. The operating media must have a dew point equal to -20°C (-40°F) or at least 10°C below the ambient temperature. The maximum particle size must not exceed 30.

2. Supplying pressure:

For Double Acting and spring Return actuators the maximum supply pressure is 8 Bar (116PSI). minimum supply pressure is 2.5 Bar (36PSI)

3. Silicom-silicon:

*Standard product from -20°C (-4°F) to $+80^{\circ}\text{C}$ ($+176^{\circ}\text{C}$)

*Low temperature LT actuator with silicom "O" rings from -40°C (-40°F) to $+80^{\circ}\text{C}$ ($+176^{\circ}\text{F}$)

*High temperature HT actuator with FPM "O" rings from -15°C ($+5^{\circ}\text{F}$) to $+150^{\circ}\text{C}$ ($+300^{\circ}\text{F}$) Caution: For low and high temperature service. Special grease is required. Please contact ROPO for each application. High and low temperature will vary-change the output torque of the actuator.

4. Stroke:

The stroke for ROPO actuators is as follows (see technical data:)

*Standard construction: 90° rotation with stroke adjustment at 0° and $90^{\circ}+$ or -4°

*Type Y 120° stroke: 120° rotation with stroke adjustment at 0° and $120^{\circ}+$ or -4°

*Type X 180° stroke: 180° rotation with stroke adjustment at 0° and $180^{\circ}+$ or -4°

5. Operating Time:

See Technical Data sheet

6. Lubrication:

Actuators are factory lubricated for the life under normal operating conditions.

The standard lubricant is suitable for use from -20°C (-4°F) to $+80^{\circ}\text{C}$ ($+176^{\circ}\text{F}$)

For low (LT) and high (HT) temperature service, where special grease is required please contact ROPO.

7. Construction:

Twin piston rack and pinion actuator design suitable for both indoor and outdoor installation.

8. Protection and Corrosion resistance:

Actuators are supplied with corrosion protections for normal environments. For severe duties select from the protection level table or contact ROPO.

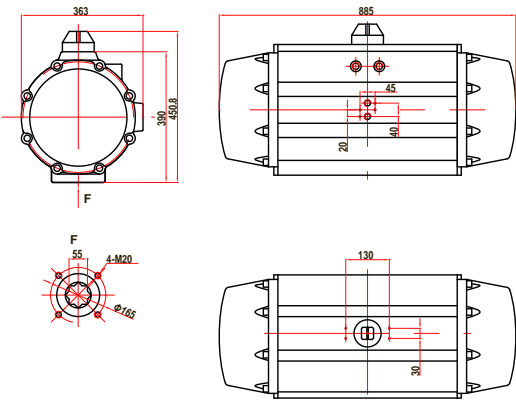
Metric-Output Torque Data

SPRING RETURN TORQUE RATINGS IN (N.m)																									
Supply Pressure Actuator Model	2.5 Bar		3 Bar		3.5 Bar		4 Bar		4.2 Bar		4.5 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar		Spring stroke 90° Start 0° End		
	0° 90°		0° 90°		0° 90°		0° 90°		0° 90°		0° 90°		0° 90°		0° 90°		0° 90°		0° 90°		0° 90°				
	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End			
RP200SR	S05	319	217	426	323	532	430	638	536	681	578	745	642	851	749								315	213	
	S06	227	154	383	260	489	367	596	473	638	515	702	579	806	686	915	792						378	255	
	S07			341	197	447	304	553	410	596	453	660	516	766	623	872	729	979	835				411	298	
	S08					404	241	511	347	553	390	617	453	723	560	830	666	936	772	1149	985		504	340	
	S09							468	284	511	327	575	390	681	497	787	603	894	709	1106	922	1319	1135	567	383
	S10											532	327	638	434	745	540	851	646	1064	859	1277	1072	630	425
	S11													596	371	702	477	809	583	1021	796	1234	1009	693	468
	S12															660	414	766	520	979	733	1192	946	756	510
RP240SR	S05	533	372	712	551	890	730	1069	908	1141	980	1248	1087	1426	1266								521	360	
	S06	461	268	640	447	746	521	997	804	1068	876	1176	983	1354	1162	1533	1340						625	43	
	S07			568	343	647	417	925	700	996	771	1104	879	1282	1057	1461	1236	1640	1415				730	505	
	S08							853	595	924	667	1032	774	1210	953	1389	1132	1568	1310	1925	1668		834	577	
	S09							781	491	852	563	959	670	1138	849	1217	1028	1496	1206	1853	1564	2210	1921	938	649
	S10											887	566	1066	745	1245	923	1423	1102	1781	1459	2138	1817	1042	721
	S11													994	640	1173	819	1351	998	1709	1355	2066	1713	1146	793
	S12															1101	715	1279	894	1637	1251	1994	1608	1251	865
RP265SR	S05	751	496	1011	755	1270	1015	1529	1274	1633	1378	1789	1533	2048	1793								801	546	
	S06	642	336	902	595	1161	854	1420	1114	1524	1217	1680	1373	1939	1632	2198	1892						961	655	
	S07			792	435	1052	694	1311	954	1415	1057	1570	1213	1830	1472	2089	1732	2349	1191				1121	764	
	S08					943	534	1202	793	1306	897	1461	1053	1721	1312	1980	1571	2239	1831				1281	873	
	S09							1069	633	1197	737	1352	893	1612	1152	1871	1411	2130	1671	2649	2189	3168	2708	1442	982
	S10											1243	732	1503	992	1762	1251	2021	1510	2540	2029	3059	2548	1602	1091
	S11													1393	832	1653	1091	1912	1350	2431	1869	2950	2388	1762	1200
	S12															1544	931	1803	1190	2322	1709	2840	2228	1922	1309
RP300SR	S05	1332	1014	1783	1465	2223	1916	2684	2365	2864	2546	3134	2818	3585	3266								1238	920	
	S06	1149	767	1599	1217	2049	1667	2500	2118	2680	2298	2950	2568	3401	3019	3851	3469						1486	1104	
	S07			1415	969	1865	1420	2316	1870	2496	2050	2766	2321	3217	2771	3667	3222	4118	3672				1733	1288	
	S08					1682	1172	2132	1623	2312	1803	2582	2073	3033	2524	3483	2974	3934	3424	4837	3993		1981	1472	
	S09							1948	1375	2128	1555	2398	1825	2849	2276	3299	2726	3750	3177	4648	3698		2229	1656	
	S10											2215	1578	2665	2028	3115	2479	3566	2929	4458	3403		2476	1839	
	S11													2481	1781	2931	2231	3382	2682	4269	3107		2724	2023	
	S12															2748	1983	3198	2434	4079	2812		2971	2207	
RP350SR	If need other size valve, Please contact us.													Out-put torque available when air supply fails											
RP1000SR																									

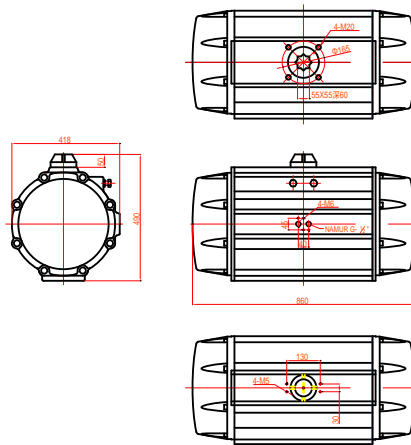
N° of The above value are the out-put torque that remain available to operate the valve when the port "2" is pressurized.

DOUBLE ACTING TORQUE RATINGS IN													
Supply Pressure Model	2.5 Bar	3 Bar	3.5 Bar	4 Bar	4.2 Bar	4.5 Bar	5 Bar	5.5 Bar	6 Bar	7 Bar	8 Bar		
RP50D A	8.3	10.0	11.6	13.3	14.0	15.0	16.6	18.3	19.9	23.3	26.6		
RP63D A	14.7	17.6	20.5	23.5	24.6	26.4	29.3	32.2	35.2	41.0	46.9		
RP75D A	29.1	34.9	40.7	46.5	48.9	52.4	58.2	64.0	69.8	81.4	93.1		
RP88D A	45.8	54.9	64.1	73.2	76.9	82.4	91.5	101	110	128	146		
RP100D A	66.5	79.8	93.1	106	112	120	133	146	160	186	213		
RP115D A	107	129	150	172	181	193	215	236	258	301	344		
RP125D A	138	166	194	222	233	249	277	305	332	388	443		
RP145D A	217	261	304	348	365	391	435	478	522	609	696		
RP160D A	284	340	397	454	477	511	567	624	681	794	908		
RP180D A	383	459	536	613	643	689	766	842	919	1072	1225		
RP200D A	532	638	745	851	893	957	1064	1170	1276	1489	1702		
RP240D A	893	1072	1251	1430	1501	1608	1787	1960	2144	2502	2859		
RP265D A	1297	1556	1815	2075	2179	2334	2594	2853	3112	3631	4150		
RP300D A	2252	2703	3153	3604	3784	4054	4504	4955	5405	6306	---		
RP350D A	If need other size valve, Please contact us.												
RP1000D A													

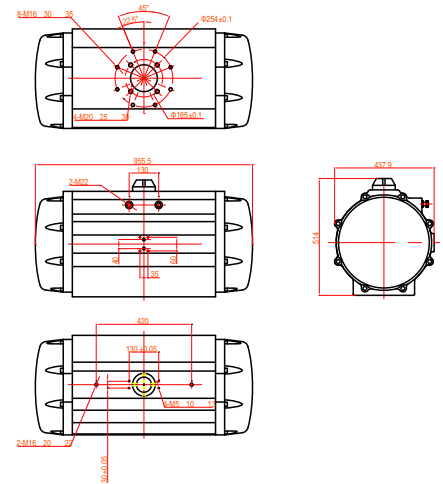
Installing Dimension details of the actuator for mounting RP300/350/400/500/600



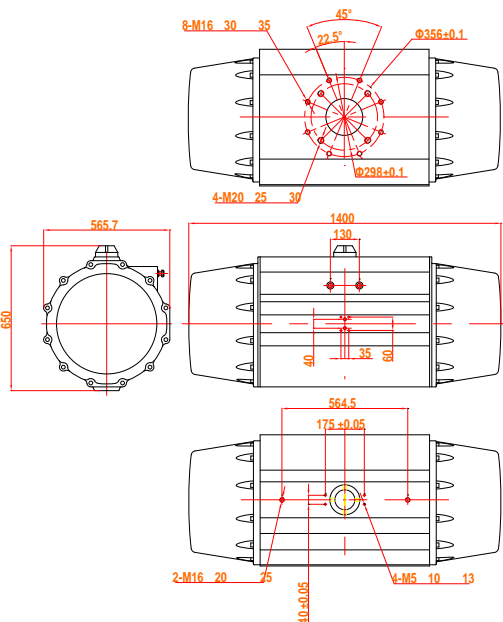
RP300



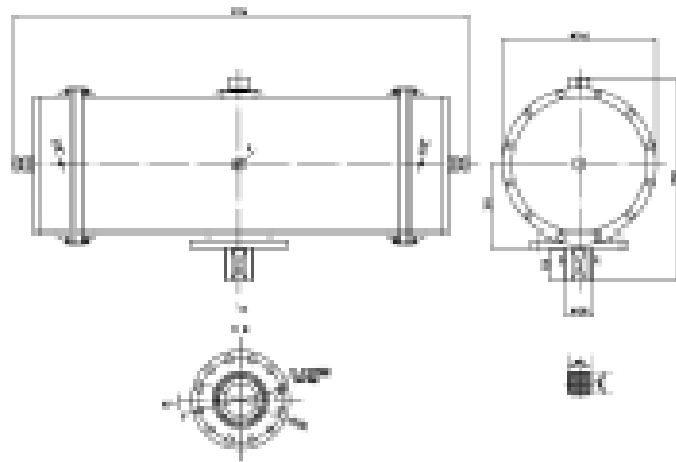
RP350



RP400

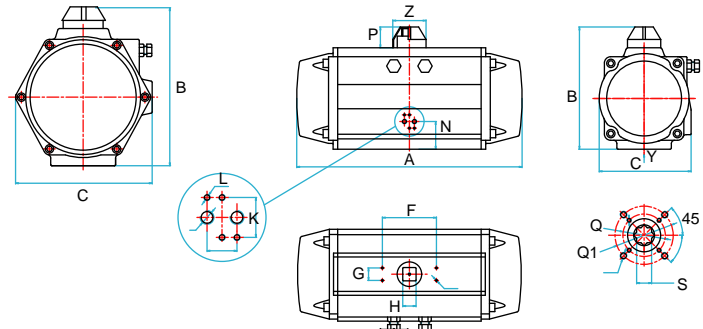


RP500



RP600

Technical data for 120° and 180° actuators in Metric and imperial dimensions



Model	Dimensions in mm								Dimensions in inch							
	RP50DA	RP63DA	RP75DA	RP88DA	RP100DA	RP125DA	RP180DA	RP200DA	RP50DA	RP63DA	RP75DA	RP88DA	RP100DA	RP125DA	RP180DA	RP200DA
Size																
A-120°	159.5	179.5	240	281	306	395	500	618	6.28	7.07	9.45	11.06	12.05	15.55	19.69	24.33
A-18°	197	221.5	298.5	348	381.5	496	626	618	7.76	8.72	11.75	13.70	15.02	19.53	24.65	30.33
B	69	85	105	115	127	157	196	245	2.72	3.35	4.02	4.53	5.00	6.18	7.72	9.65
C	59	72	84.5	97.5	111	136	169	213	2.32	2.83	3.33	3.84	4.37	5.35	6.65	8.39
D	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8	M5X8
E	4	8	8	8	8	8	8	8	0.16	0.31	0.31	0.31	0.31	0.31	0.31	0.31
F	80	80	80	80	80	80	80	80	3.15	3.15	3.15	3.15	3.15	3.15	3.15	5.12
G	30	30	30	30	30	30	30	30	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
H	30	35	55	55	55	70	85	100	1.18	1.38	1.38	2.17	2.17	2.76	3.35	3.94
Lmin	12	16	19	19	19	24	29	38	0.47	0.63	0.63	0.75	0.75	0.94	1.14	1.50
L	29	36	42.5	49.5	56	69.5	88	110	1.14	1.42	1.67	1.95	2.20	2.74	3.46	4.33
M	41.5	47	52	56.8	67	82	99	112	1.63	1.85	2.05	2.24	2.64	3.23	3.90	4.41
N	11	11	19	19	19	27	27	42	0.43	0.43	0.75	0.75	0.75	1.06	1.06	1.65
O	26.5	30	30.5	32.5	37.5	45	52	62	1.04	1.18	1.20	1.28	1.48	1.77	2.05	2.44
P	20	20	20	20	20	30	30	50	0.79	0.79	0.79	0.79	0.79	1.18	1.18	1.97
Q	42	50	50	70	70	102	125	140	1.65	1.97	1.97	2.76	2.76	4.02	4.92	5.51
Q1																
R	32	32	32	32	32	32	32	32	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
S	24	24	24	24	24	24	24	24	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
W		M6	M8	M8	M8	M10	M12	M16	M5	M6	M8	M8	M8	M10	M12	M16
W1																
T-ISO 228	1/8"	1/8"	1/8"	1/8"	1/4"	1/4"	1/4"	1/4"	1/8"	1/8"	1/8"	1/8"	1/4"	1/4"	1/4"	1/4"
ISO Flange	F04	F05	F05	F07	F07	F10	F12	F14	F04	F05	F05	F07	F07	F10	F12	F14
CH	11	14	14	17	17	22	27	36	0.43	0.55	0.55	0.67	0.67	0.87	1.06	1.42
h-min	0.5	0.5	1.5	1.5	1.5	1.5	1.5	2	0.02	0.02	0.06	0.06	0.06	0.06	0.06	0.08
X	34.5	42.5	51	57.5	63.5	78.5	98	122	1.36	1.67	2.01	2.26	2.50	3.09	3.86	4.80
Z	40	40	40	40	40	56/65	65	80/115	1.57	1.57	1.57	1.57	1.57	2.20/2.6	2.56	3.15/4.53

Model Type			RP50DA	RP63DA	RP72DA	RP88DA	RP100DA	RP125DA	RP180DA	RP200DA
			120°X180°X	120°X180°X	120°X180°X	120°X180°X	120°X180°X	120°X180°X	120°X180°X	120°X180°X
Metric system	Cylinder bore	mm	50	63	75	85	100	128	180	200
	Traveling schedule adjustment	Needs the rotation	1/6turn	1/6turn	1/6turn	1/5turn	1/5turn	1/4turn	1/4turn	1/4turn
	Opens to the air cylinder volume	(L)	0.11 0.17	0.2 0.29	0.39 0.56	0.63 0.92	0.9 1.3	1.9 2.9	3.9 5.7	4.4
	Closes to the air cylinder volume	(L)	0.18 0.27	0.32 0.47	0.61 0.88	0.97 1.4	1.42	2.9 4.2	6.2 8.8	11.8
	Open times	S(Sec)	0.26 0.31	0.33 0.39	0.39 0.47	0.52 0.63	0.65 0.79	1.17 1.41	1.95 2.36	3.51
	Closes times	S(Sec)	0.33 0.39	0.39 0.47	0.52 0.63	0.65 0.79	0.91 1.10	1.56 1.88	2.34 2.83	4.55
	Approximate weight	(Kg)	1.2 1.5	2.25	3.4 4.4	4.66	6.6 8.1	12.3 15.4	24.6 29.5	44
British system	Cylinder bore	(inch)	1.97 1.97	2.48 2.48	2.95 2.95	3.35 3.35	3.94 3.94	4.92 4.92	6.30 6.30	7.87 7.87
	Traveling schedule adjustment	Needs the rotation	1/6turn	1/6turn	1/6turn	1/5turn	1/5turn	1/4turn	1/4turn	1/4turn
	Opens to the air cylinder volume	(L)	6.7 10.4	12.2 17.7	23.8 34.2	38.5 58.2	54.4 79.4	117.3 171.1	239.6 348.3	452.5
	Closes to the air cylinder volume	(L)	11 16.5	19.6 28.7	37.3 53.8	29.3 85.6	84.3 122.2	178.4 256.7	257.8 537.8	721.1
	Open times	S(Sec)	0.26 0.31	0.33 0.39	0.39 0.47	0.52 0.63	0.65 0.79	1.17 1.41	1.95 2.36	3.51
	Closes times	S(Sec)	0.33 0.39	0.39 0.47	0.52 0.63	0.65 0.79	0.91 1.10	1.56 1.88	2.34 2.83	4.56
	Approximate weight	(Lb)	2.6 3.3	4.4 4.5	7.4 9.6	10.1 13.1	14.4 17.7	26.9 33.7	53.8 64.5	96.3

(A) The above indicated moving time of the actuator. Are obtained in the following testcons: (1)Room Temperature.(2)Actuator Stoke 120°and 180°.(3)Solenoid Valve with orifice of 4mm and a flow capacity

Qn 400L/min.(4)Inside pipe diameter 8mm.(5)Medium clean air.(6)Air supply pressure 5.5 bar(79.75psi). (7)Actuator iwthout external resistance load.

Cautions: obviously on the field applications when one Ir more of the bove parameter are different, the moveine tim will be different.

Size information

The aim of this information is to assist in the correct selection of ROPO actuators. Before fitting an RP actuator onto any valve the following data must be considered:

- * Breakaway torque of the valve + safety factor as recommended by the manufacturer / considering the operating conditions.
- * Air supply pressure available to the actuator
- * Type of actuator "DA"(double acting) or "SR" (spring return) and output torque of actuator at the available air supply pressure
- * Actuator rotation and the fail mode (to fail open or to fail open or to fail close)

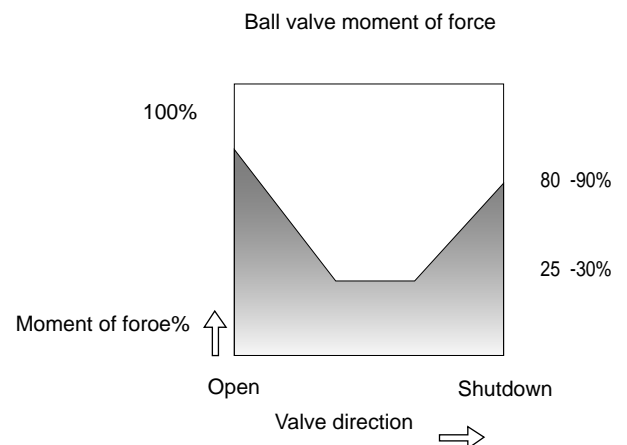
The correct selection of an actuator is critical, if the actuator is oversized the valve stem can be overstressed, on the contrary if the actuator is undersized it cannot produce enough torque to permit full valve operation.

Generally we can say that the torque required for valve operation comes from the friction between the metallic parts of the valve (for example ball or disc) and the seals (seals).

Moreover the torque is influenced by various factors depending on the type of application of the valve (service condition): service temperature, operation frequency, line and differential pressure. Flow media (lubricated, dry or slurry). The following examples show the torque characteristic for 3 types of quarter-turn valves: ball valve, butterfly valve and plug valve.

Ball valve

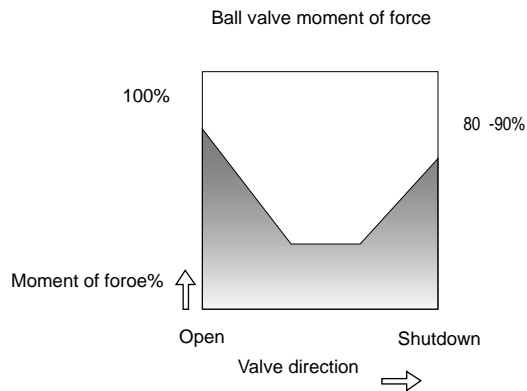
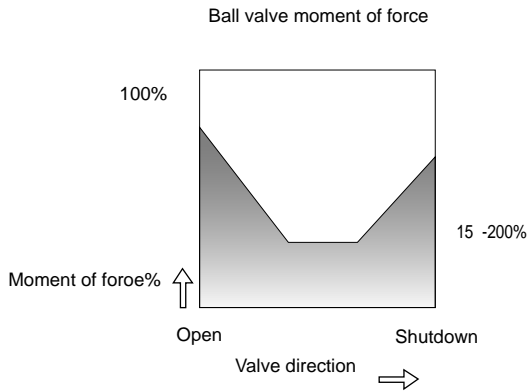
Ball valve concept of construction is based essentially on a polished ball (including a through port) contained between two seats (upstream and downstream). The ball rotation allows the flow or stops the flow through the valve. Differential of pressure between upstream and downstream pressure forces the ball against the downstream seat (floating ball design). In this case the valve torque is generated by the friction between the ball, seat, stem and packing. As shown in the diagram below the highest point of torque occurs when with the presence of pressure, and the ball in the closed position, the valve is moved to the open position (breakaway torque)



BUTTERFLY VALVE

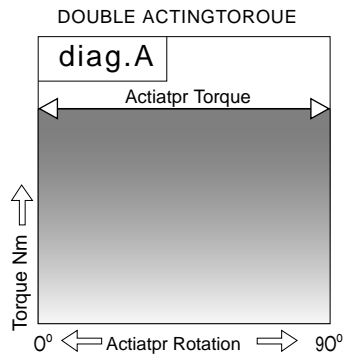
Butterfly valve concept of construction is based essentially on a disc fixed on an axis. In the closed position the disc is completely contained by the seat. The open position is achieved when the disc is rotated (through its stem) becomes parallel to the flow.

On the contrary, the closed position is achieved when the disc is perpendicular to the flow. With a butterfly valve the torque is generated by the friction between the disc, seat and the stem packing. Also torque may be effected by the differential pressure that forces on the disc. The highest point of torque, as shown in the diagram below, is in the closed position, and after only a small rotation torque is considerably reduced.



Turns on lathe the plug valve

Plug valve concept construction is based essentially on a male (plug) contained in a female cone (seat). The plug provides a through port in one direction and with its rotation into the seat the opening and closing of the valve is achieved. The torque is usually not influenced by the flow pressure, but is generated essentially by the friction between the seat and the plug, during the opening + closing cycle. The highest point of torque as shown in the diagram below, occurs in the closed position and remains high for the torque is not influenced by pressure.



Double-acting actuator selection

1. With rack and pinion construction the output torque of an actuator is obtained by multiplying the piston force (given by air supply pressure) by the pitch shaft radius (lever arm) as shown in fig. 1 less the force lost for clockwise and counterclockwise rotation.

The suggested safety factor for double acting actuators in normal working conditions is 15~20%.

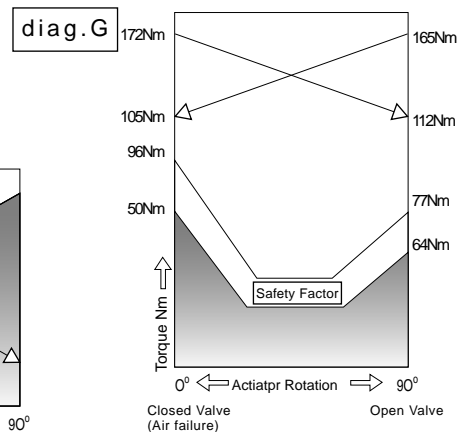
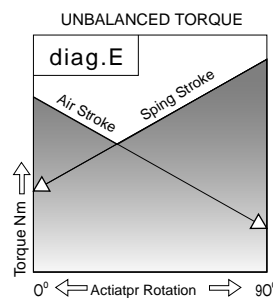
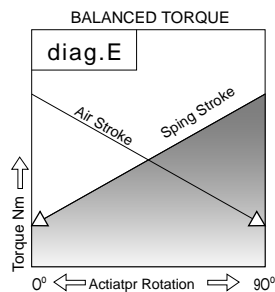
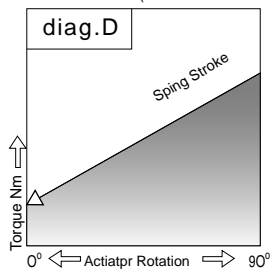
RP spring return actuators are designed to produce a balanced torque in the two conditions explained above when the number of springs per side is equal to the air pressure supply (4 bar - 4 springs each side) as shown in diagram E. For certain applications it is possible to achieve (where desired), the unbalanced torque, as shown in diagram F, by changing the relation between the number of springs per side and air pressure supply in bar (for example 6 springs and 5.5 bar or vice versa).

In spring return applications two conditions can be achieved: air failure to close or air failure to open. The suggested safety factor for spring return actuators in normal working conditions is 20-25%.

Sizing example of AT Spring Return actuator (see also technical data);

- * Spring to close (when air fails)
 - * Published ball valve torque=80Nm
 - * Safety factor (20%)=80Nm+20%=96Nm
 - * Air supply pressure available =5 bar
 - * The spring return RP actuator selected is RP 125SR10 because it produces the following values;
 - * Spring stroke 0°=105 Nm
 - * Spring stroke 90°=165 Nm
 - * Air stroke 0°=172 Nm
 - * Air stroke 90°=112 Nm
- (See also the diagram G)

SPRING STROKE(OUTPUT TORQUE)

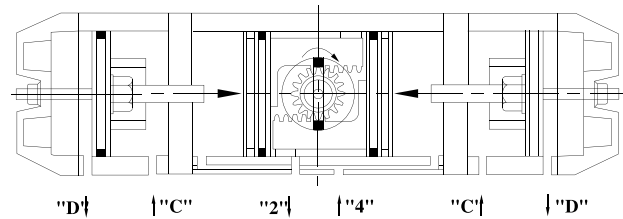


THREE POSITION ROPO ACTUATOR

Three position RoPo actuators provide an operation of 0°, 45°, 90° or 0°, 90°, 180°. The midway position is achieved by a mechanical stop of movement of the 2 auxiliary pistons. This midway stop position is adjustable. Example: 90° actuator can provide 20°, 30°, 50°, 70° etc. following is the principle of operation;

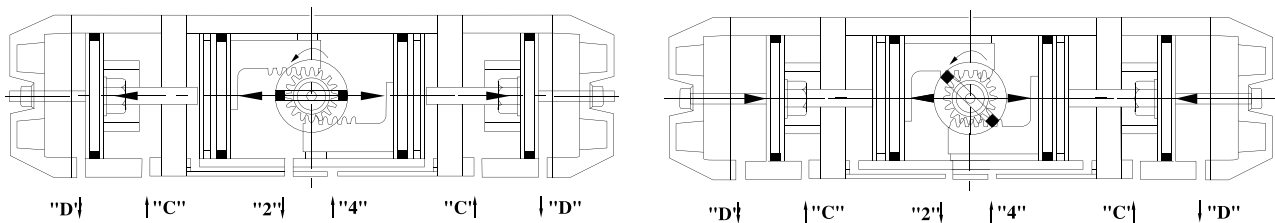
1、 Fully Closed Position

From chart 1 we can see that this position is obtained when air is supplied to port 4 and port 2 is in the state of exhaust air.



2、 Fully Open Position

From chart 2 we can see that this position is obtained when air is supplied to port 2 and port C, meantime, port 4 and port D are in the state of exhaust air.



3、 Midway Position

From chart 2 we can see that this position is obtained when air is supplied to port 2 and port D, meantime, port 4 and port C are in the state of exhaust air. In fact that the midway position is achieved by a mechanical stop of movement on the two auxiliary pistons.



Filtering relief valve * FRL

Including air relief valve, filter and automated lubricator (optional) Stable and clean to air source and lubrication to moving parts.

Limit switch

RPH type overtravel limit switch box is the operation station to transmit position signal of the valve and its actuator to the site and remote control panel.

It can be directly erected on the top of actuator and conforms to Standard VDI/VDE3845. It features manual regulation gear coupling cam, convenient regulation, transparent shell, indicator of mechanical opening and two cable entry connectors G1/2 Internal travel switch has been previously connected to wiring terminal. Two standard momentary switches with rated voltage of 200 V AV or DC and rated current of 3A. Proximity switch or other types can be selected. Both waterproof (IP67) and explosion proof (Eexd) types are available.



Solenoid valve

It is used for electrically control the pening or losing operation of the pneumatic valve and plays the role of switching air source. Solenoid valve conforms to NAMUR connection stand ard and can by divided into paste type and separate type. The double-action type has been provided with two-position five-way solenoid vale, and single-action type has been provided two-position three-way solenoid valve. The whole machine is simple and compact and features long life.

This product can be provided with basic type and explosion-proof type, the latter features explosion proof grade of Ex d ii BT4 and protection grade of IP67.