

# **RACK AND PINION ACTUATORS**

## *BRA-SERIES*



**SPACK**   
Actuators & Controls



## QUALITY ASSURANCE

Spacx Actuators & Controls is the supplier of choice for clients who seek reliable, professional and fast delivery of actuators. Through their extensive knowledge and experience, Spacx Actuators & Controls can expertly advise its customers and provide a high quality product that meets the specifications and requirements of each client. The Spacx management team is dedicated to implementing, facilitating and continuously improving our rigorous quality control systems. We adhere to quality control systems in all our activities.

## BRA SERIES ALUMINUM ALLOY ACTUATOR

- ▶ Extruded aluminum ASTM6005 body with internal and external corrosion protection.
- ▶ Honed cylinder surfaces, multiple bearings and guides for low friction and longer lifetime expectancy.
- ▶ Dual rack and pinion design for compact and symmetric construction.
- ▶ Shaft design to prevent blow-out.
- ▶ Modular design for simple field reversing of the fail action.
- ▶ Pre-charged spring cartridges for safe removal.
- ▶ Fully machined rack and pinion for accurate teeth engagement to minimize backlash.
- ▶ Stainless steel fasteners for long term corrosion resistance.
- ▶ Full in compliance with international standards ISO5211 and DIN3337 for valve interface and NAMUR to ensure easy assembly of solenoids and limitswitch enclosures.



**Travel Adjustment**

External travel stops, +/- 5° independently adjustable in both directions.

**Indicator**

High visibility position indicator.

**High performance springs**

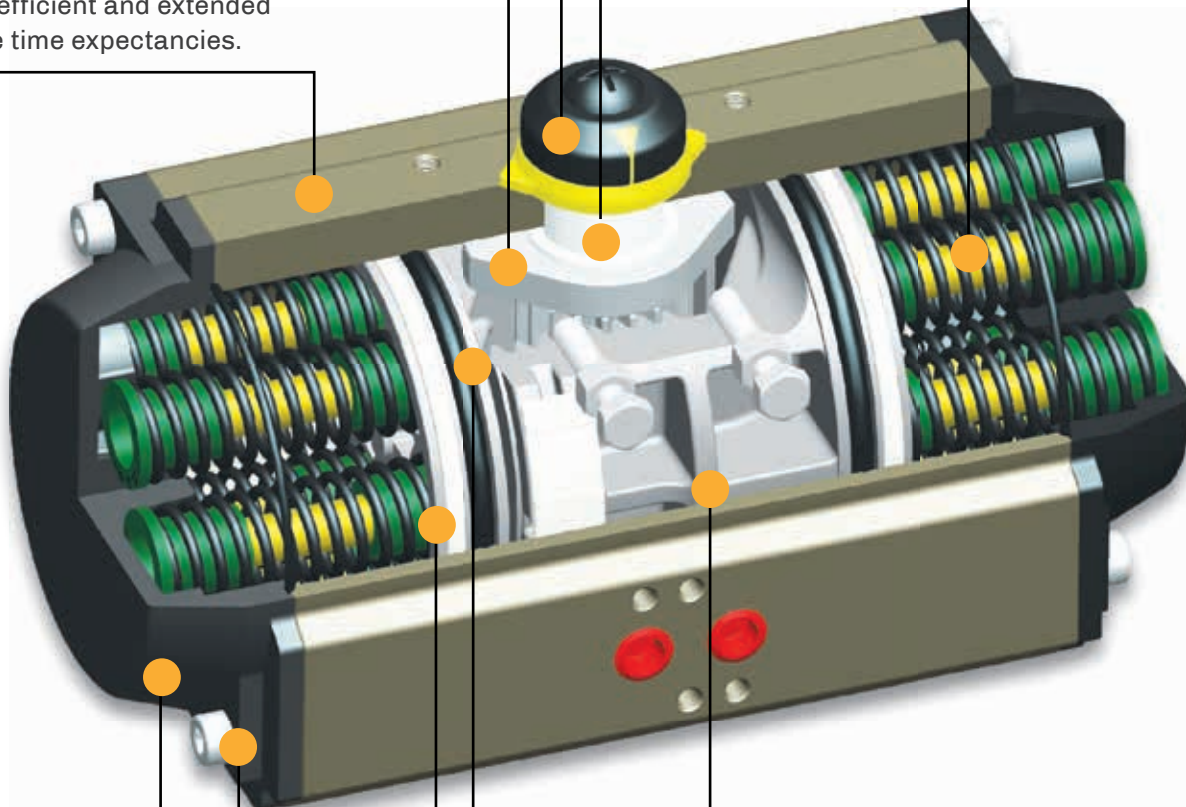
Strong corrosion resistant pre-compressed spring cartridges, safely removable.

**Actuator Body**

Hard anodized extruded aluminum alloy body, precision machined and honed for low friction coefficient and extended life time expectancies.

**Pinion**

High precision nickel alloy steel pinion to ISO 5211.



**End caps**

Die cast powder coated endcaps.

**Seals**

NBR seals for standard temperature range -20°C to +80°C.

**Pistons**

Dual rack & Pinion design, die cast aluminum hard anodized pistons for symmetrical construction and simple field reversible.

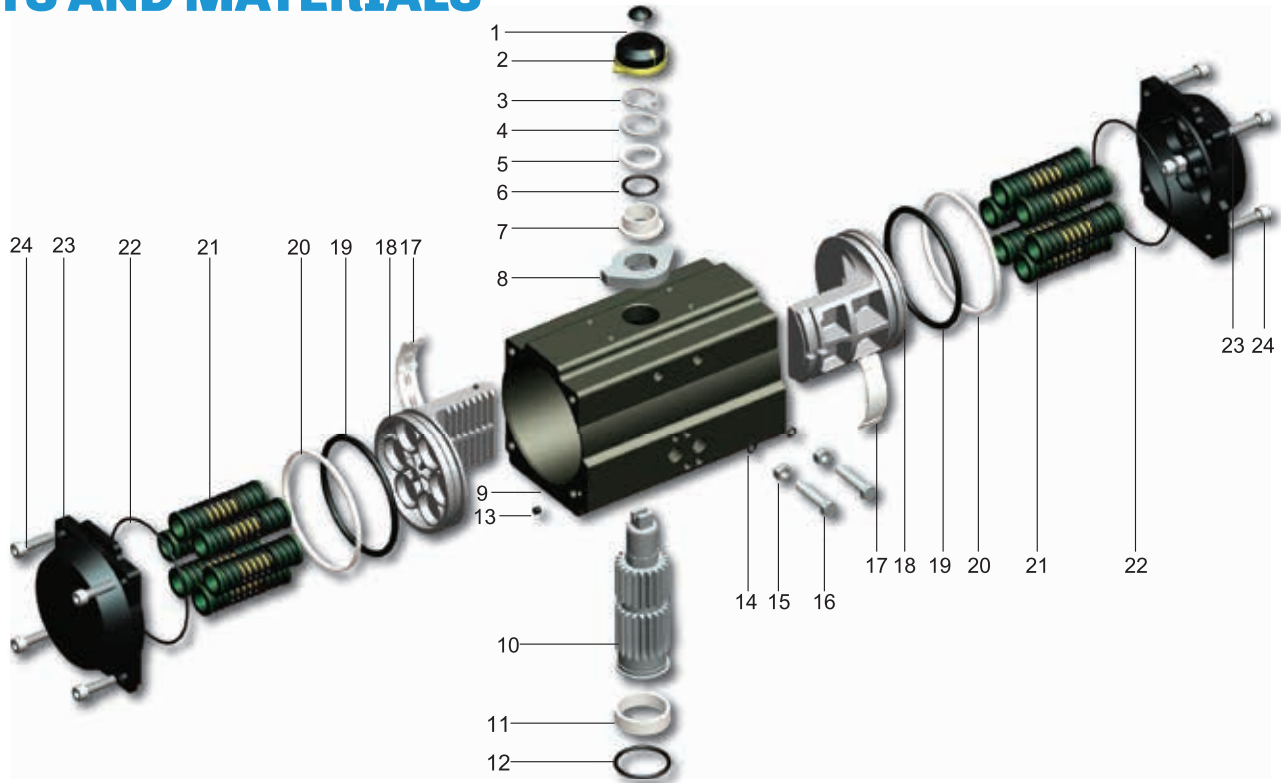
**Fasteners**

Stainless steel fasteners for long term corrosion resistance.

**Bearings & guide**

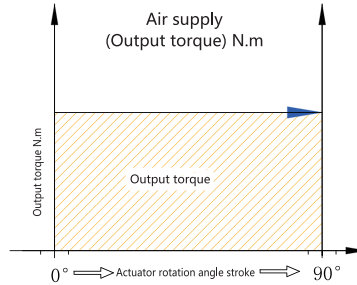
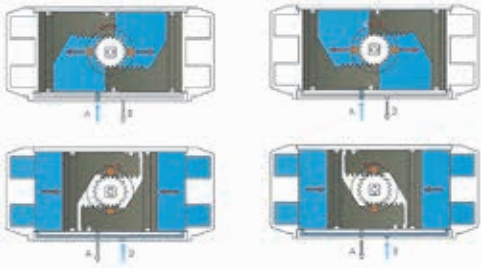
To ensure low friction, easy replaceable.

# PARTS AND MATERIALS



No	Description	Qty	Standard Material	Surface Treatment		Optional Material
				Surface standard	Optional surface treatment	
1	Indicator Screw	1	Engineering Plastics			
2	Indicator	1	Engineering Plastics			
3	Circlip	1	Stainless Steel			
4	Thrust Washer	1	Stainless Steel			
5	Outside Washer	1	Engineering Plastics			
6	O-ring (pinion top)	1	NBR			Viton\Silicone
7	Inside Washer	1	Engineering Plastics			
8	Positioning cam	1	S45C	Nickel plated		
9	Body	1	6005-T5	Hard anodized	Hard anodized + Epoxy polyester or PTFE\Nickel plated	
10	Pinion	1	S45C	Nickel plated		Stainless Steel
11	Bearing (pinion bottom)	1	Engineering Plastics			
12	O-ring (pinion bottom)	1	NBR			Viton\Silicone
13	Plug	2	NBR			Viton\Silicone
14	O-ring (Adjust screw)	2	NBR			Viton\Silicone
15	Nut (Adjust screw)	2	SUS304			
16	Adjust screw	2	SUS304			
17	Guide (piston)	2	Engineering Plastics			
18	Piston	2	Aluminum alloy		Anodized	
19	O-ring (piston)	2	NBR			Viton\Silicone
20	Bearing (piston)	2	Wear-resistant composite materials			
21	Spring	0-12	High quality spring steel	Dip coating		
22	O-ring (End cap)	2	NBR			
23	End cap	2	Aluminum alloy	Power paint	PTFE\Nickel plated	
24	Cap screw	8	SUS304			

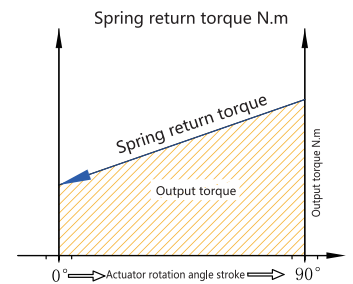
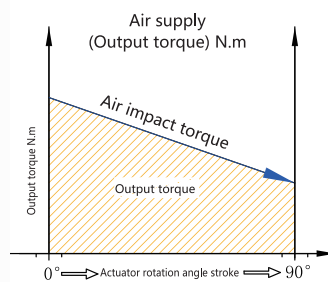
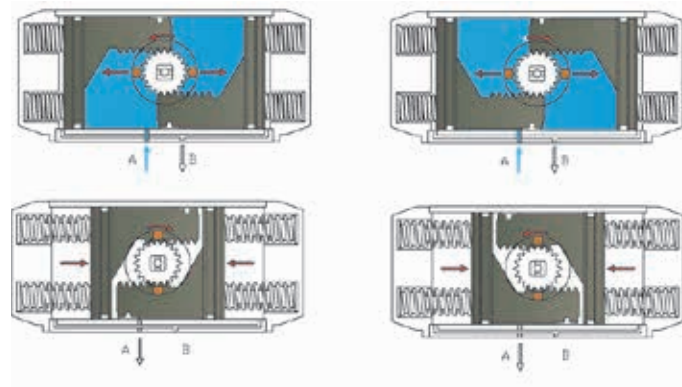
## OPERATING PRINCIPLE OF DOUBLE ACTING ACTUATOR



Upon air supply to the actuator cylinder port A, between the pistons, the pistons will move outwards causing the shaft to rotate, at the same time the cavities behind the pistons are vented through port B.

Upon air supply to the actuator cylinder port B, behind the pistons, the pistons will move inwards causing the shaft to rotate in opposite direction. at the same time the cavity between the pistons is vented through port A.

## OPERATING PRINCIPLE OF SPRING RETURN ACTUATOR



Upon air supply to the actuator cylinder port A, between the pistons, the pistons will move outwards causing the shaft to rotate, at the same time the cavities behind the pistons are vented through port B and the springs are compressed.

Upon loss of air supply to the actuator cylinder port A, the pre-charged springs will drive the pistons to the inward position causing the shaft to rotate in opposite direction.

## TECHNOLOGY AND CHARACTERISTICS

BRA series Rack & Pinion actuators are machined and produced according to the highest international standards to achieve a very low friction and to extend the lifetime expectancy beyond 1 million cycles. The actuators are standard finished with a hard anodized treatment for excellent corrosion protection

- Output torques ranging from 8NM to well over 10000NM
- Up to 8 bar(g) maximum supply air
- Pre-charged spring cartridges for safe removal
- Stainless Steel fasteners for long term corrosion resistance
- Dual rack for symmetrical construction



- Operating temperature  
Standard:  $-20^{\circ}\text{C} + 80^{\circ}\text{C}$   
Low temperature:  $-40^{\circ}\text{C} + 80^{\circ}\text{C}$   
High temperature:  $-15^{\circ}\text{C} + 150^{\circ}\text{C}$
- Rotating angles  $90^{\circ}$ ,  $120^{\circ}$ ,  $135^{\circ}$ ,  $180^{\circ} \pm 5^{\circ}$  end of travel stop screws
- Mounting Flanges standard according to ISO5211 and DIN3337
- Conform IEC61508, and suitable for use in a SIL-3 environment as a single device
- Suitable for use in hazardous environment to CE, ATEX 94/9/EG
- Dual rack for symmetrical construction

# DOUBLE ACTING ACTUATORS TORQUE RATINGS IN NM

Model	Air Supply Pressure									
	2 bar	2.5 bar	3 bar	4 bar	4.5 bar	5 bar	5.5 bar	6 bar	7 bar	8 bar
BRA0012DA	5	6	7	10	11	12	13	14	17	19
BRA0020DA	8	10	12	16	18	20	22	24	28	32
BRA0035DA	14	18	22	29	32	36	40	43	50	57
BRA0050DA	20	25	31	41	46	51	56	61	71	81
BRA0075DA	31	39	47	62	70	78	86	94	109	125
BRA0110DA	46	57	69	92	103	115	126	138	161	184
BRA0160DA	67	83	100	133	150	166	183	200	233	266
BRA0255DA	101	126	151	201	226	251	276	302	352	402
BRA0435DA	172	215	258	344	387	430	473	516	602	688
BRA0665DA	268	334	401	535	602	669	736	803	937	1070
BRA1000DA	427	533	640	854	960	1067	1174	1280	1494	1707
BRA1200DA	532	665	798	1064	1198	1331	1464	1597	1863	2129
BRA1800DA	774	968	1161	1548	1742	1935	2129	2322	2709	3096
BRA2700DA	1176	1470	1763	2351	2645	2939	3233	3527	4115	4703
BRA3800DA	1545	1932	2318	3091	3477	3863	4250	4636	5409	6181
BRA5700DA	2314	2892	3471	4628	5206	5784	6363	6941	8098	9255
BRA8000DA	3297	4121	4945	6594	7418	8242	9066	9890	11539	13187

## SIZING DOUBLE ACTING ACTUATORS

To select the most suitable double acting actuator for the application, the following information is required.

For example:

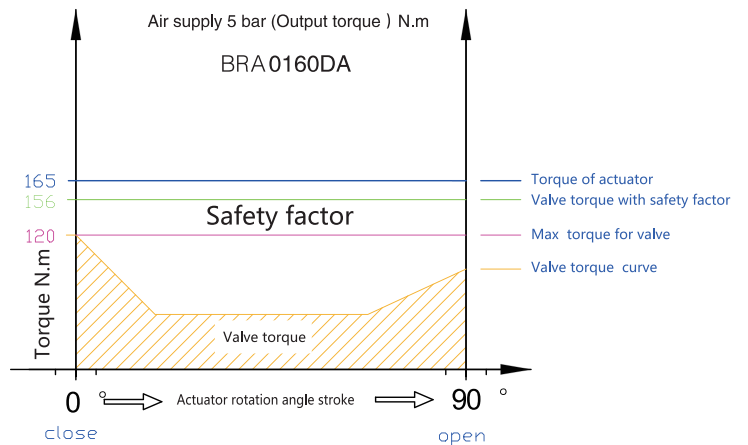
Valve torque given = 120 Nm

Safety factor required = 30%

Air supply pressure = 5 bar

$$=120 \text{ Nm} + 30\% = 156 \text{ Nm}$$

According to the table the correct actuator to select is a BRA0160DA with 166 Nm at 5 bar.



# SPRING RETURN ACTUATORS TORQUE RATINGS IN NM

Model	Spring	Output torque																Springs	Output
		2.5 Bar		3 Bar		4 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar			
		QTY	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°		
BRA0012SR	2					4.6	2.5	6.9	4.9	8.1	6.1	9.3	7.3	11.7	9.7	14.1	12.1	7.0	5.0
	5	5.8	3.8	7.9	5.9														
BRA0020SR	6	5.0	2.6	7.0	4.6	11.1	8.7												
	7	4.1	1.3	6.2	3.4	10.2	7.4	14.2	11.4	16.3	13.5							8.7	5.9
	8			5.3	2.1	9.4	6.2	13.4	10.2	15.4	12.2	17.4	14.2					10.0	6.8
	9			4.5	0.9	8.5	4.9	12.5	8.9	14.6	11.0	16.6	13.0	20.6	17.0			11.2	7.6
	10					7.7	3.7	11.7	7.7	13.7	9.7	15.7	11.7	19.8	15.8			12.5	8.5
	11					6.8	2.4	10.8	6.4	12.9	8.5	14.9	10.5	18.9	14.5	23.0	18.6	13.7	9.3
	12							10.0	5.2	12.0	7.2	14.0	9.2	18.1	13.3	22.1	17.3	15.0	10.2
BRA0035SR	5	10.9	7.2	14.5	10.7	21.6	17.9												
	6	9.6	5.1	13.1	8.6	20.2	15.7	27.3	22.8									12.7	8.2
	7	8.2	3.0	11.7	6.5	18.9	13.6	26.0	20.7	29.5	24.3							14.8	9.6
	8			10.4	4.4	17.5	11.5	24.6	18.6	28.2	22.2	31.7	25.7	38.8	32.8			16.9	11.0
	9			9.0	2.3	16.1	9.4	23.2	16.5	26.8	20.0	30.3	23.6	37.5	30.7			19.1	12.3
	10					14.7	7.3	21.9	14.4	25.4	17.9	29.0	21.5	36.1	28.6	43.2	35.7	21.2	13.7
	11					13.4	5.1	20.5	12.3	24.0	15.8	27.6	19.4	34.7	26.5	41.8	33.6	23.3	15.1
BRA0050SR	12							19.1	10.1	22.7	13.7	26.2	17.3	33.3	24.4	40.5	31.5	25.4	16.4
	5	14.6	10.6	19.7	15.6	29.8	25.7											14.6	10.5
	6	12.5	7.6	17.6	12.7	27.7	22.8	37.7	32.8									17.6	12.7
	7	10.4	4.7	15.5	9.7	25.5	19.8	25.6	29.9	40.7	34.9							20.5	14.8
	8			13.4	6.8	23.4	16.9	33.5	27.0	38.6	32.0	43.6	37.1	53.7	47.1			23.4	16.9
	9			11.2	3.9	21.3	14.0	31.4	24.1	36.4	29.1	41.5	34.1	51.6	44.2			26.3	19.0
	10					19.2	11.0	29.3	21.1	34.3	26.2	39.4	31.2	49.5	41.3	59.5	51.4	29.3	21.2
BRA0075SR	11					17.1	8.1	27.2	18.2	32.2	23.2	37.3	28.3	47.3	38.4	57.4	48.4	32.2	23.2
	12							25.1	15.3	30.1	20.3	35.2	25.4	45.2	35.4	55.3	45.5	35.1	25.3
	5	22.8	15.3	30.5	23.0	45.9	38.4											23.3	15.8
	6	19.6	10.6	27.3	18.3	42.8	33.8	58.2	49.2									28.0	19.0
	7	16.5	6.0	24.2	13.7	39.6	29.1	55.0	44.5	62.7	52.3							32.6	22.1
	8			21.0	9.0	36.4	24.4	51.9	39.9	59.6	47.6	67.3	55.3	82.7	70.7			37.3	25.3
	9			17.8	4.4	33.3	19.8	48.7	35.2	56.4	42.9	64.1	50.6	79.6	66.1			41.9	28.4
BRA0110SR	10					30.1	15.1	45.5	30.6	53.3	38.3	61.0	46.0	76.4	61.4	91.8	76.8	46.6	31.6
	11					27.0	10.5	42.4	25.9	50.1	33.6	57.8	41.3	73.2	56.8	88.7	72.2	51.2	34.8
	12							39.2	21.2	46.9	29.0	54.7	36.7	70.1	52.1	85.5	67.5	55.9	37.9
	5	33.5	22.1	44.9	33.5	67.7	56.2											34.8	23.3
	6	28.9	15.1	40.2	26.5	63.0	49.3	85.7	72.0									41.7	28.0
	7	24.2	8.2	35.6	19.6	58.3	42.3	81.1	65.1	92.4	76.4							48.7	32.7
	8			30.9	12.6	53.6	35.4	76.4	58.1	87.8	69.5	99.1	80.9	121.9	103.6			55.6	37.4
BRA0160SR	9			26.2	5.7	49.0	28.4	71.7	51.2	83.1	62.5	94.5	73.9	117.2	96.7			62.6	42.0
	10					44.3	21.5	67.1	44.2	78.4	55.6	89.8	67.0	112.6	89.7	135.3	112.5	69.5	46.7
	11					39.6	14.5	62.4	37.3	73.8	48.6	85.1	60.0	107.9	82.8	130.6	105.5	76.5	51.4
	12							57.7	30.3	69.1	41.7	80.5	53.0	103.2	75.8	126.0	98.5	83.4	56.0
	5	51	33	67	49	100	82											50	32
	6	44	23	61	39	94	72	127	105									60	38
	7	38	13	54	29	87	62	120	95	137	111	153	128					70	44
BRA0255SR	8			48	19	81	52	114	85	130	101	147	118	180	151			80	51
	9			42	9	75	42	108	75	124	91	141	108	173	141			90	57
	10					68	32	101	65	118	81	134	98	167	131	200	164	100	63
	11					62	22	95	55	111	72	128	88	161	121	194	154	110	70
	12							89	45	105	62	122	78	155	111	187	144	120	76
	5	75	48	101	74	152	125											80	52
	6	63	30	88	55	138	106	188	156									95	63
BRA0255SR	7	52	14	77	39	128	90	178	140	203	165	228	190					111	73
	8			67	24	117	74	167	124	192	149	218	174	268	225			127	84
	9			56	8	107	58	157	108	182	133	207	158	257	209			143	94
	10					96	42	146	92	171	117	197	143	247	193	297	243	159	105
	11					86	26	136	76	161	101	186	127	236	177	287	227	175	115
	12							125	60	150	86	176	111	226	161	276	211	191	126

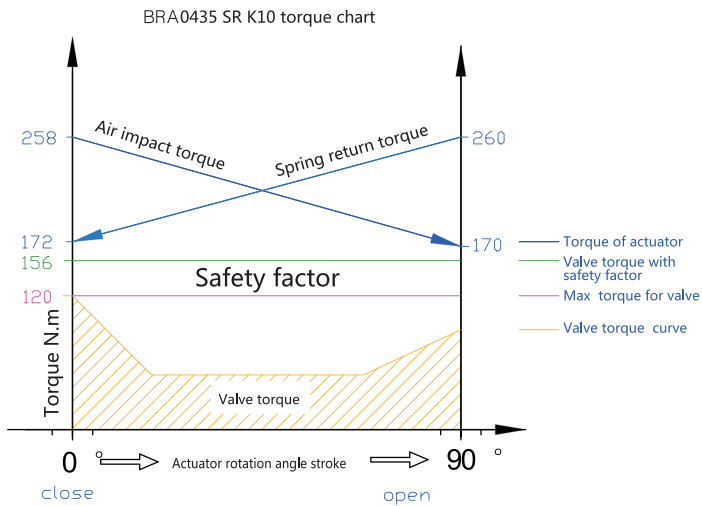


# SPRING RETURN ACTUATORS TORQUE RATINGS IN NM

Model	Output torque																			
	Spring	2.5 Bar		3 Bar		4 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar		Springs	Output	
	QTY	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°	
BRA0435SR	5	129	85	172	128	258	214											130	86	
	6	112	59	155	102	241	188	327	274									156	103	
	7	95	33	138	76	224	162	310	248	353	291	396	334					182	120	
	8			120	50	206	136	292	222	335	265	378	308	464	394				208	138
	9				103	24	189	109	275	195	318	238	361	281	447	367			234	155
	10						172	83	258	169	301	212	344	255	430	341	516	427	261	172
	11						155	57	241	143	284	186	327	229	413	315	499	401	287	189
	12								224	117	267	160	310	203	396	289	482	375	313	206
	BRA0665SR	5	193	121	260	188	393	321											211	139
		6	165	79	232	146	365	279	498	412									254	167
		7	137	37	204	103	337	236	470	369	537	436							296	195
		8			176	61	309	194	442	327	509	394	575	460	709	593			338	223
9				148	19	281	152	414	285	481	351	548	418	681	551			381	251	
10						253	109	387	243	453	309	520	376	653	509	786	642	423	279	
11						226	67	359	200	425	267	492	333	625	466	758	600	465	307	
12									331	158	397	225	464	291	597	424	730	557	508	335
BRA1000SR		5	333	221	440	328	654	541											312	200
		6	293	159	400	265	614	479	827	692									375	240
		7	253	96	360	203	574	416	787	630	894	736							437	280
		8			320	140	534	354	747	567	854	674	960	781	1174	994			500	320
	9			280	78	494	291	707	505	814	611	920	718	1134	931			562	360	
	10					454	229	667	442	774	549	880	656	1094	869	1307	1082	625	400	
	11					414	166	627	380	734	486	840	593	1054	806	1267	1020	687	440	
	12								587	317	694	424	800	531	1014	744	1227	957	750	480
	BRA1200SR	5	390	281	523	414	789	680											385	275
		6	335	204	468	337	734	603	1001	869									462	330
		7	280	127	413	260	679	526	946	792	1079	925							539	385
		8			358	183	624	449	891	715	1024	848	1157	981	1423	1247			616	440
9				303	106	569	372	836	638	969	771	1102	904	1368	1170			693	495	
10						514	295	781	561	914	694	1047	827	1313	1093	1579	1359	770	550	
11						459	218	726	484	859	617	992	750	1258	1016	1524	1282	846	605	
12									671	407	804	540	937	673	1203	939	1469	1206	923	660
BRA1800SR		5	552	390	745	583	1130	968											572	411
		6	470	276	663	469	1048	854	1433	1239									687	493
		7	388	162	580	354	965	739	1351	1124	1543	1317							801	575
		8			498	240	883	625	1268	1010	1461	1202	1653	1395	2038	1780			915	657
	9			416	125	801	510	1186	895	1379	1088	1571	1280	1956	1665			1030	739	
	10					719	396	1104	781	1297	973	1489	1166	1874	1551	2259	1936	1144	821	
	11					637	281	1022	666	1215	859	1407	1051	1792	1437	2177	1822	1259	903	
	12								940	552	1133	745	1325	937	1710	1322	2095	1707	1373	985
	BRA2700SR	5	859	602	1152	894	1737	1479											860	602
		6	739	430	1031	722	1616	1307	2201	1892									1032	723
		7	618	258	911	550	1496	1135	2080	1720	2012								1204	843
		8			790	378	1375	963	1960	1548	2252	1840	2545	2133	3129	2717			1376	964
9				670	206	1255	791	1839	1376	2132	1668	2424	1961	3009	2545			1548	1084	
10						1134	619	1719	1204	2011	1496	2304	1789	2888	2373	3473	2958	1720	1205	
11						1014	447	1598	1032	1891	1324	2183	1617	2768	2201	3353	2786	1892	1325	
12									1478	860	1770	1152	2063	1445	2647	2029	3232	2614	2064	1446
BRA3800SR		5	1145	788	1531	1175	2304	1947											1143	787
		6	987	560	1374	946	2147	1719	2919	2491									1372	944
		7			1216	717	1989	1490	2762	2263									1601	1102
		8			1059	489	1832	1261	2604	2034	2991	2420	3377	2807	4150	3579			1829	1259
	9					1674	1033	2447	1805	2833	2192	3220	2578	3992	3351			2058	1416	
	10					1517	804	2290	1577	2676	1963	3062	2349	3835	3122	4608	3895	2287	1574	
	11					1360	575	2132	1348	2519	1734	2905	2121	3678	2893	4450	3666	2515	1731	
	12								1975	1119	2361	1506	2748	1892	3520	2665	4293	3437	2744	1888
	BRA5700SR	5	1654	1095	2232	1674	3389	2831											1797	1238
		6	1406	736	1985	1314	3142	2471	4298	3628									2156	1486
		7			1737	955	2894	2112	4051	3269									2516	1734
		8			1489	595	2646	1752	3803	2909	4382	3488	4960	4066	6117	5223			2875	1981
9						2399	1393	3555	2550	4134	3128	4712	3707	5869	4864			3235	2229	
10						2151	1034	3308	2190	3886	2769	4465	3347	5622	4504	6778	5661	3594	2477	
11								3060	1831	3639	2409	4217	2988	5374	4145	6531	5302	3953	2724	
12								2812	1472	3391	2050	3969	2629	5126	3785	6283	4942	4313	2972	
BRA8000SR		7	2190	1249	3014	2073	4662	3721											2872	1931
		8	1914	838	2738	1662	4387	3311	6035	4959	6859	5783							3283	2207
		9			2462	1252	4111	2901	5759	4549	6583	5373							3693	2483
		10			2186	842	3835	2490	5483	4139	6307	4963	7132	5787	8780	7435			4103	2759
	11					3559	2080	5207	3728	6032	4552	6856	5377	8504	7025			4514	3035	
	12					3283	1669	4931	3318	5756	4142	6580	4966	8228	6615	9877	8263	4924	3311	



# SIZING SPRING RETURN ACTUATORS



To select the most suitable Spring return actuator for the application, the following information is required,

For example:

Valve torque given = 120 Nm

Safety factor required = 30%

Air supply pressure = 5 bar

Fail action = Close

$$=120 \text{ Nm} + 30\% = 156 \text{ Nm}$$

According to the table the correct actuator to select is a BRA0435SR10-FC with 172 Nm end of spring.

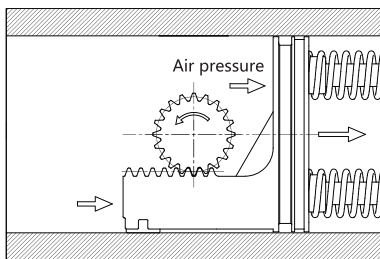


Figure 1

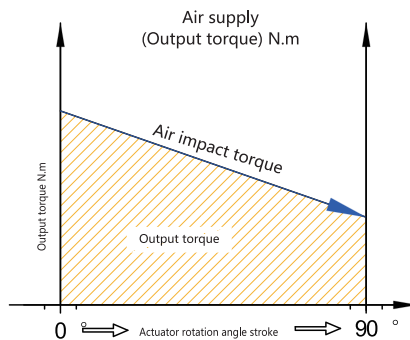


Figure A

(figure 1, Figure A)

Output torque of the air stroke

Upon air supply into the actuators cylinder between the two pistons, the pistons will move outwards compressing the springs and drive the output shaft. The output torque will gradually decrease due to increase of spring compression.

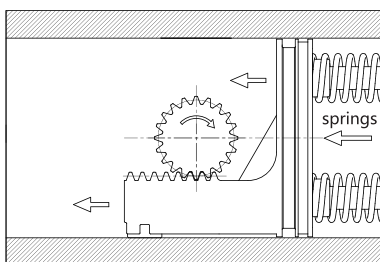


Figure 2

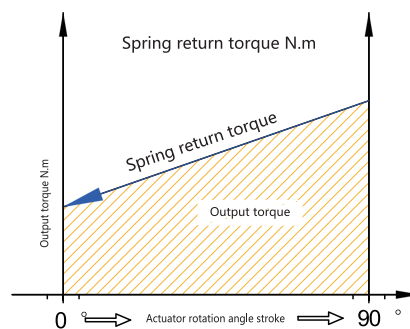


Figure B

(figure 2, Figure B)

Output torque of the spring stroke

Upon loss of air supply from the actuators cylinder between the two pistons, the pistons will move inwards due to the relaxation of the springs and drive the output shaft to the fail position. The output torque will then gradually decrease.

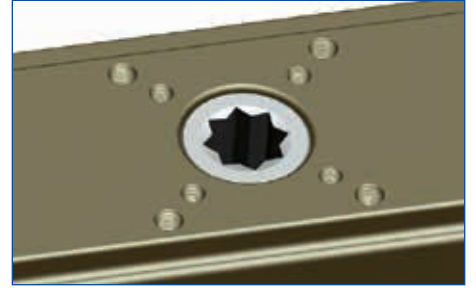
## MOUNTING STANDARD



Solenoid connection according to NAMUR VDI/VDE-3845 standards



Top drilling for accessories and shaft end according to NAMUR VDI/VDE-3845 standards



Mounting interface according to ISO5211 and DIN 3337 standards

## SPRING CONFIGURATIONS



Shown are the spring locations per piston.



Prior to selecting an actuator the following factors must be taken into account:

- Air supply pressure minimum and maximum
- Actuator type, double acting or spring return (single acting)
- In the event of spring return, choosing the desired fail mode, open or close
- Maximum allowable valve stem torque

The information above can be a reason to select an alternative spring size to reduce the output torque on the air stroke.

Alternatively a filter/regulator can be added to the control system.

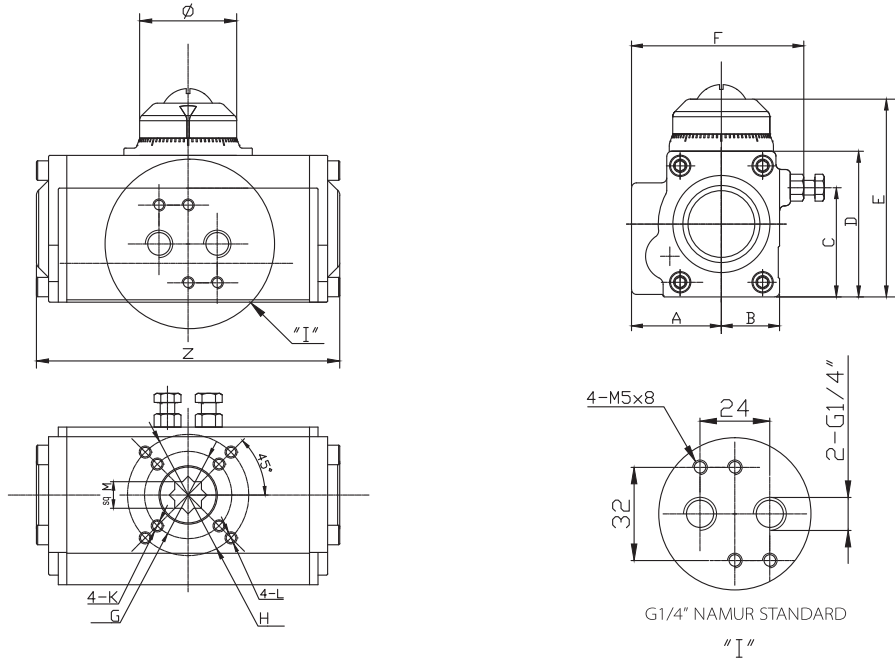
- Safety Factor

The safety factor is normally 1 given by the valve manufacturer or is a project requirement. If no safety factors are stated it is recommended to add the following factors to the net valve torque figures.

- |                                   |         |
|-----------------------------------|---------|
| • Clean lubricating medium        | add 30% |
| • Non-lubricating medium          | add 40% |
| • Dry gas or air                  | add 40% |
| • Abrasive non-lubricating medium | add 50% |



# DIMENSIONS IN MM FOR BRA0012



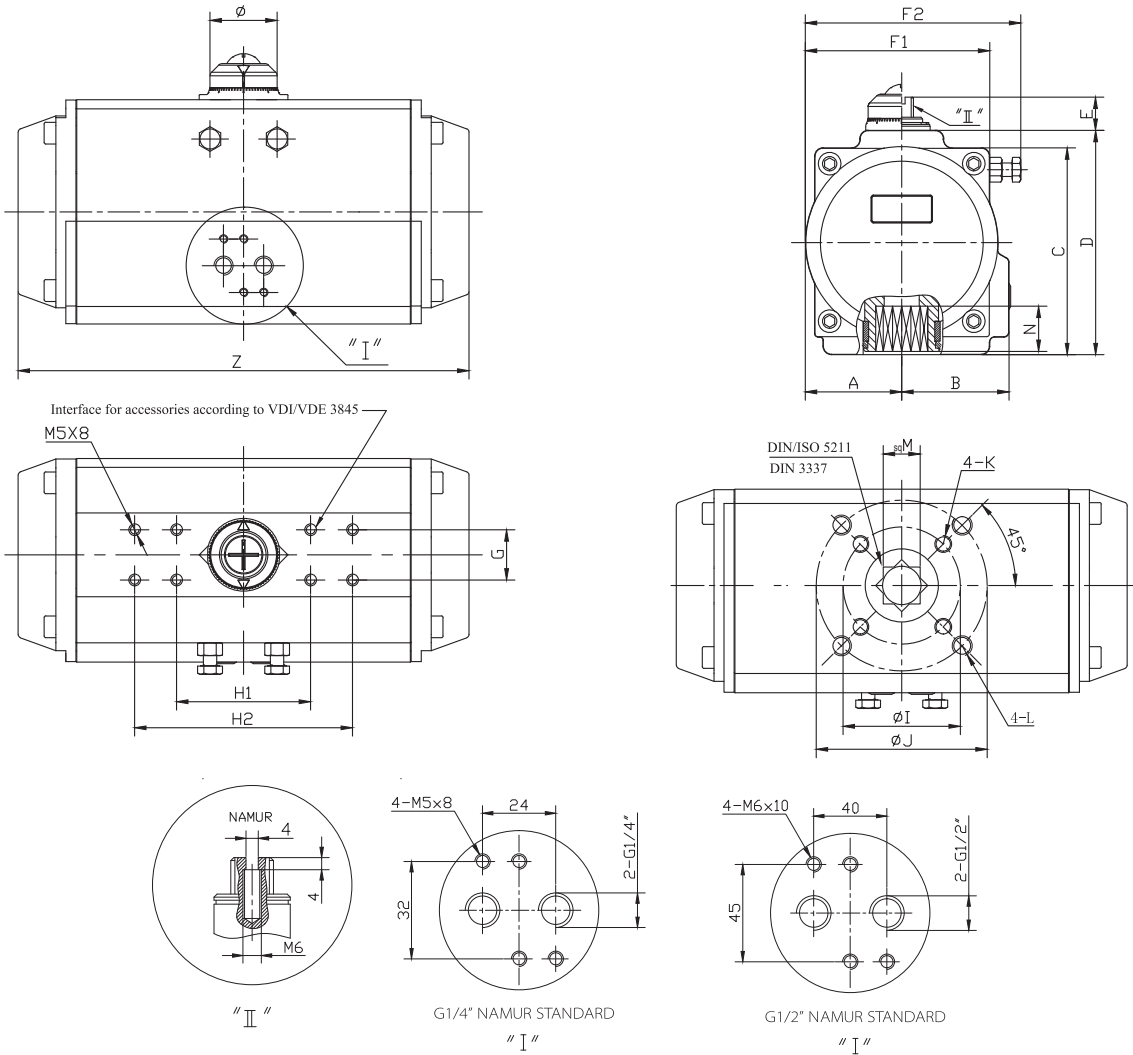
Model	A	B	C	D	E	F	ØG	ØH	K	L	sq M	Z	Ø	Air connection
BRA0012DA	37	24	45	60	81,5	65,5	36	50	M5	M6	11	125	40	NAMUR G1/4"
BRA0012SR	37	24	45	60	81,5	65,5	36	50	M5	M6	11	150	40	NAMUR G1/4"

Model	Air pressure Unit: N.m							
	2 bar	3 bar	4 bar	5 bar	5,5 bar	6 bar	7 bar	8 bar
BRA0012DA	5	7	10	12	13	14	17	19

Model	Air pressure Unit: N.m												"Output torque of spring"		
	4 Bar		5 Bar		5,5 Bar		6 Bar		7 Bar		8 Bar				
	Spring	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
BRA0012SR	K2	4.6	2.5	6.9	4.9	8.1	6.1	9.3	7.3	11.7	9.7	14.1	12.1	7.0	5.0

Model	Weight	"Air volume opening (L)"	"Air volume closing (L)"
BRA0012DA	1.0 kg	0.072	0.078
BRA0012SR	1.1 kg	0.072	0.072

# DIMENSIONS IN MM FOR BRA0020 TO BRA8000



Model	A	B	C	D	E	F1	F2	G	H1	H2	ØI	ØJ	K	L	sq M	N	Z	Ø	Air Connection
BRA0020	30.50	41.50	65.50	72.00	20	65.50	80.50	30	80		36	50	M5 x 8	M6 x 10	11	14	150	40	NAMUR G1/4"
BRA0035	36.00	47.00	81.00	88.00	20	72.50	88.20	30	80		50	70	M6 x 10	M8 x 13	14	19	172	40	NAMUR G1/4"
BRA0050	42.50	53.00	94.00	100.00	20	81.50	94.40	30	80		50	70	M6 x 10	M8 x 13	14	19	188	40	NAMUR G1/4"
BRA0075	46.00	57.00	98.50	109.00	20	92.00	116.70	30	80		50	70	M6 x 10	M8 x 13	17	23	221	40	NAMUR G1/4"
BRA0110	50.00	58.50	111.00	117.00	20	98.00	124.00	30	80		50	70	M6 x 10	M8 x 13	17	23	268	40	NAMUR G1/4"
BRA0160	58.00	64.00	123.50	134.50	20	110.00	131.00	30	80		70	102	M8 x 13	M10 x 16	22	31	279	40	NAMUR G1/4"
BRA0255	68.00	75.00	146.00	156.50	30	128.00	149.00	30	80	130	70	102	M8 x 13	M10 x 16	22	31	322	55	NAMUR G1/4"
BRA0435	76.00	77.00	161.50	173.50	30	138.50	163.50	30	80	130	102	125	M10 x 16	M12 x 20	27	35	406	55	NAMUR G1/4"
BRA0665	87.50	87.50	185.50	198.50	30	159.00	184.50	30	80	130	102	125	M10 x 16	M12 x 20	27	35	475	55	NAMUR G1/4"
BRA1000	103.50	103.50	216.50	231.00	30	189.50	223.50	30	130		140			M16 x 25	36	40	544	80	NAMUR G1/4"
BRA1200	113.50	113.50	236.00	256.00	30	211.00	245.00	30	130		140			M16 x 25	36	40	562	80	NAMUR G1/4"
BRA1800	130.50	130.50	266.50	292.00	30	246.50	288.00	30	130		165			M20 x 25	46	58	642	80	NAMUR G1/4"
BRA2700	147.50	147.50	302.00	331.00	30	274.00	315.50	30	130		165			M20 x 25	46	58	740	80	NAMUR G1/2"
BRA3800	162.00	173.00	329.00	352.00	30	312.00	361.00	30	130		165			M20 x 25	46	55	774	80	NAMUR G1/2"
BRA5700	190.00	195.00	382.00	408.00	30	362.00	426.00	30	130		165	254	M20 x 25	M16 x 25	46	55	912	80	NAMUR G1/2"
BRA8000	260.00	260.00	440.00	464.00	30	450.00	514.00	30	130		165	254	M20 x 25	M16 x 25	55	60	945	80	NAMUR G1/2"

## WEIGHT

Model	Cylinder Size	Double acting (DA)	Single acting (SA)
		Weight	Weight
BRA0075	Ø83	3.40 kg	3.70 kg
BRA0110	Ø92	4.55 kg	5.15 kg
BRA0160	Ø105	5.90 kg	6.60 kg
BRA0255	Ø125	9.20 kg	10.35 kg
BRA0435	Ø140	12.00 kg	14.10 kg

Model	Cylinder Size	Double acting (DA)	Single acting (SA)
		Weight	Weight
BRA1800	Ø240	54.50 kg	65.60 kg
BRA2700	Ø270	79.00 kg	98.40 kg
BRA3800	Ø300	99.00 kg	122.00 kg
BRA5700	Ø350	156.00 kg	197.00 kg
BRA8000	Ø400	212.00 kg	255.00 kg

## DISPLACEMENT

NO	Model	Double acting (DA)		Single acting (SR)	
		Air volume opening (L)	Air volume closing (L)	Air volume opening (L)	Air volume closing (L)
1	BRA0012	0.07	0.08	0.07	0.07
2	BRA0020	0.12	0.17	0.12	0.14
3	BRA0035	0.21	0.29	0.21	0.24
4	BRA0050	0.29	0.43	0.29	0.37
5	BRA0075	0.42	0.65	0.42	0.55
6	BRA0110	0.68	0.97	0.68	0.81
7	BRA0160	0.92	1.35	0.92	1.14
8	BRA0255	1.47	2.13	1.47	1.84
9	BRA0435	2.37	3.57	2.37	2.83
10	BRA0665	3.77	5.42	3.77	4.49
11	BRA1000	5.90	8.36	5.90	7.47
12	BRA1200	7.26	11.52	7.26	10.56
13	BRA1800	10.70	17.44	10.70	16.07
14	BRA2700	15.90	25.60	15.90	23.86
15	BRA3800	23.50	28.00	23.50	26.50
16	BRA5700	34.50	45.20	34.50	42.40
17	BRA8000	52.20	56.00	52.20	54.00

# OPTIONS

Outside our standard range, the following options are available:

- Extended rotation angle on double acting actuators of 120, 135 or 180 degrees
- Low temperature -40°C to +80°C
- High temperature -15°C to +150°C
- Epoxy powder coating
- Position feedback monitors and air supply accessories

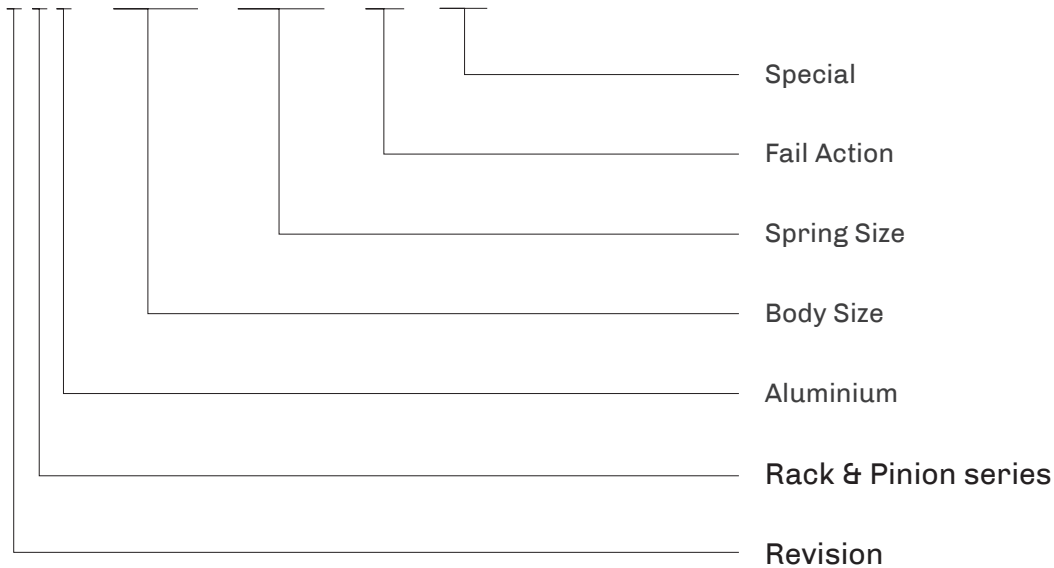
# CYLINDER DIAMETERS IN MM.

Model	BRA0012	BRA0020	BRA0035	BRA0050	BRA0075	BRA0110	BRA0160	BRA0255	BRA0435
Cylinder Size	Ø40	Ø52	Ø63	Ø75	Ø83	Ø92	Ø105	Ø125	Ø140

Model	BRA0665	BRA1000	BRA1200	BRA1800	BRA2700	BRA3800	BRA5700	BRA8000	
Cylinder Size	Ø160	Ø190	Ø210	Ø240	Ø270	Ø300	Ø350	Ø400	

# MODEL NUMBER DESIGNATION

BRA - 0075 - SR12 - FC - XX:

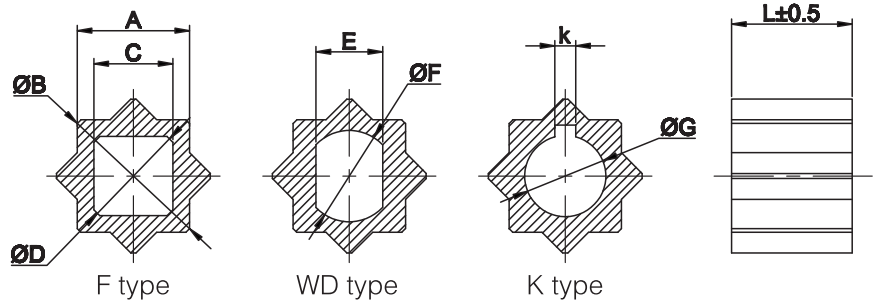




# INTERNAL ADAPTOR

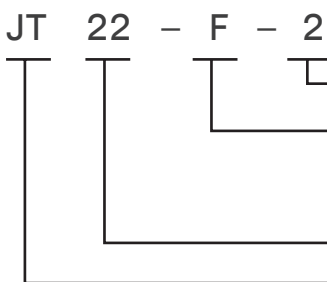
## Product features

- High strength cold forged steel, impact resistant
- Other sizes on request



		F type				WD type		K type		L
		A	ΦB	C	ΦD	E	ΦF	k	ΦG	
		mm	mm	mm	mm	mm	mm	mm	mm	mm
JT14	1	14	18.2	9	12.5					16
	2	14	18.2	11	15.2					16
JT17	1	17	22.2	11	15.2					19
	2	17	22.2	14	19.2					19
	3	17	22.2			10.00	14.10			19
	4	17	22.2			11.00	16.10			19
	5	17	22.2					3	12.80	19
JT19	1	19	25.2	11	15.2					21
	2	19	25.2	14	19.2					21
	3	19	25.2	17	23.2					21
	4	19	25.2			11.00	16.10			21
	5	19	25.2					3	12.80	21
JT22	1	22	28.2	14	19.2					24
	2	22	28.2	17	23.2					24
	3	22	28.2	19	26.2					24
	4	22	28.2			11.00	16.10			24
	5	22	28.2			13.00	19.10			24
	6	22	28.2					5	15.90	24
	7	22	28.2					5	19.05	24
JT27	1	27	36.2	17	23.2					29
	2	27	36.2	19	26.2					29
	3	27	36.2	22	26.2					29
	4	27	36.2			13.00	19.10			29
	5	27	36.2			16	22.10			29
	6	27	36.2					5	19.05	29
	7	27	36.2					5	22.20	29
JT36	1	36	48.2	19	26.2					38
	2	36	48.2	22	29.2					38
	3	36	48.2	27	37.2					38
	4	36	48.2			16.00	22.10			38
	5	36	48.2			22.00	30.10			38
	6	36	48.2					8	28.70	38
	7	36	48.2					8	31.80	38
JT46	1	46	60.2	27	37.0					48
	2	46	60.2	36	49.2					48
	3	46	60.2					8	31.80	48
	4	46	60.2					10	33.30	48
	5	46	60.2					10	38.10	48
	6	46	60.2					12	41.40	48

## STANDARD ORDERING GUIDE



- Code for adaptor spec
- Code for hole type = F means square hole  
WD means flat hole  
K means round hole with keyway
- Outside square across flats size



## VALVE AUTOMATION / DISTRIBUTION

Spacx Actuators & Controls is the Authorized Distributor Channel for Bettis pneumatic, hydraulic and electric actuators. We are able to supply all Bettis valve actuators including:

Bettis CBB / CBA300-series

Bettis G-series

Bettis Electric

Hytork XL-range



## SPACX ROTARY PNEUMATIC & HYDRAULIC ACTUATORS

Spacx Type BYX & Type BCX actuators provide highly reliable actuation for 90° valves and dampers based on the simplicity and reliability of the well proven yoke mechanism. The modular design of the Type BYX & Type BCX allow for the simple removal of the piston cylinder and / or spring cylinder for routine maintenance without having to disconnect the actuator from the valve. The cover of the main actuator body can also be removed to allow easy access to the cam mechanism for inspection or preventative maintenance. Spacx Type BYX & Type BCX actuators are available for both pneumatic and hydraulic applications in either double acting or spring return configurations with a full range of control accessories. Materials of construction include in either steel construction or 316 stainless steel construction with drive shafts of 316 or 17-4PH stainless steel.

PNEUMATIC ACTUATOR	HYDRAULIC ACTUATOR
<b>OPERATING MEDIA</b> Air (dry or lubricated) or noncorrosive gas operating media.	<b>OPERATING MEDIA</b> Mineral oil or equal operating fluid.
<b>SUPPLY PRESSURE RANGE</b> 2 to 10 barg	<b>SUPPLY PRESSURE RANGE</b> Low : 2 to 10 barg High : 10 to 210 barg



# SPACX CONTROL SYSTEMS FOR PNEUMATIC & HYDRAULIC ACTUATORS

## CONTROL SYSTEMS

The ancillary control systems for actuators are of fundamental importance for providing actuator performance, functionality and reliability.

## SOLENOID CONTROL

3/2-Way Single Coil, 5/2-Way Single or Dual Coil versions in both General Purpose and Hazardous Area Options (Ex ia, Ex d & Ex m) in either Stainless Steel, Brass or Aluminium Construction.

## POSITION MONITORS

Mechanical or Proximity End of Travel Switch / Sensor, 4 to 20 mA Feedback or Bus Communication versions in both General Purpose and Hazardous Area Options (Ex ia & Ex d) in either Stainless Steel, Aluminium or Engineered Resin Construction.

## POSITIONER CONTROL

Pneumatic, Electro-Pneumatic or Digital versions in both General Purpose and Hazardous Area Options (Ex ia & Ex d) in either Stainless Steel or Aluminium Construction.

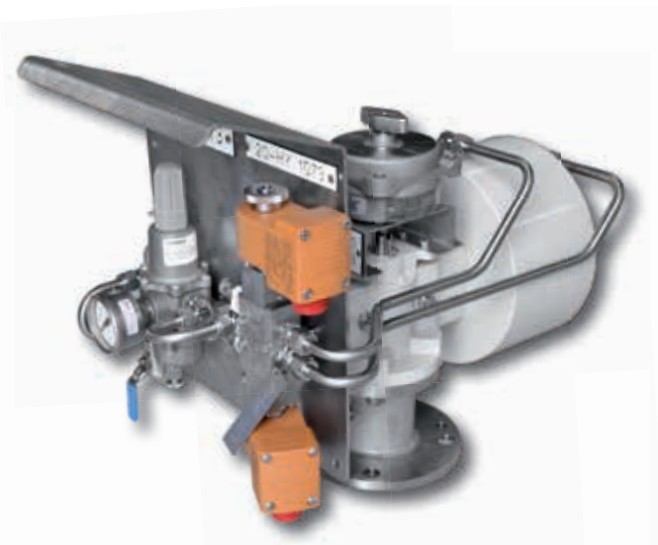
## MISCELLANEOUS CONTROLS

Speed Control, Pilot Valves, Quick Exhaust Systems, Partial Stroke Testing Systems, Pressure Relief Valves and Others.

## SPACX

Spacx has considerable experience in this field and can supply bespoke control systems for both pneumatic and hydraulic valve systems to satisfy all of the end client's operational requirements.

Self-contained hydraulic control system for monitoring pipeline pressures and providing shutdown capability where external power sources are not available.





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