Main features& Characteristics

1 Body

The aluminium body is inside and outside coated with hard anodizing with extremely abrasion resistance, low surface roughness and optimal resistance.

2 Adjustment stroke

External stroke adjustment for 5 degrees regulation,placed on the opposite side of Namur connection for better manipulation when the solenoid valve is assembled.

3 Pinion

Electroless nickel plated carbon steel shaft against external and internal corrosion. Anti–blowout design.

4 Springs

Pre–stressed springs offer more torque and different options for their positioning. This system allows us to easily fit the necessary torque to close or ope.n the valve,offering a total safety replacement and manipu.lation.

5 Position indicator

Multi–function indicator suitable for mechanical or inductive switches is a standard feature. Many different combinations without the need to buy external indicators.

6 End caps

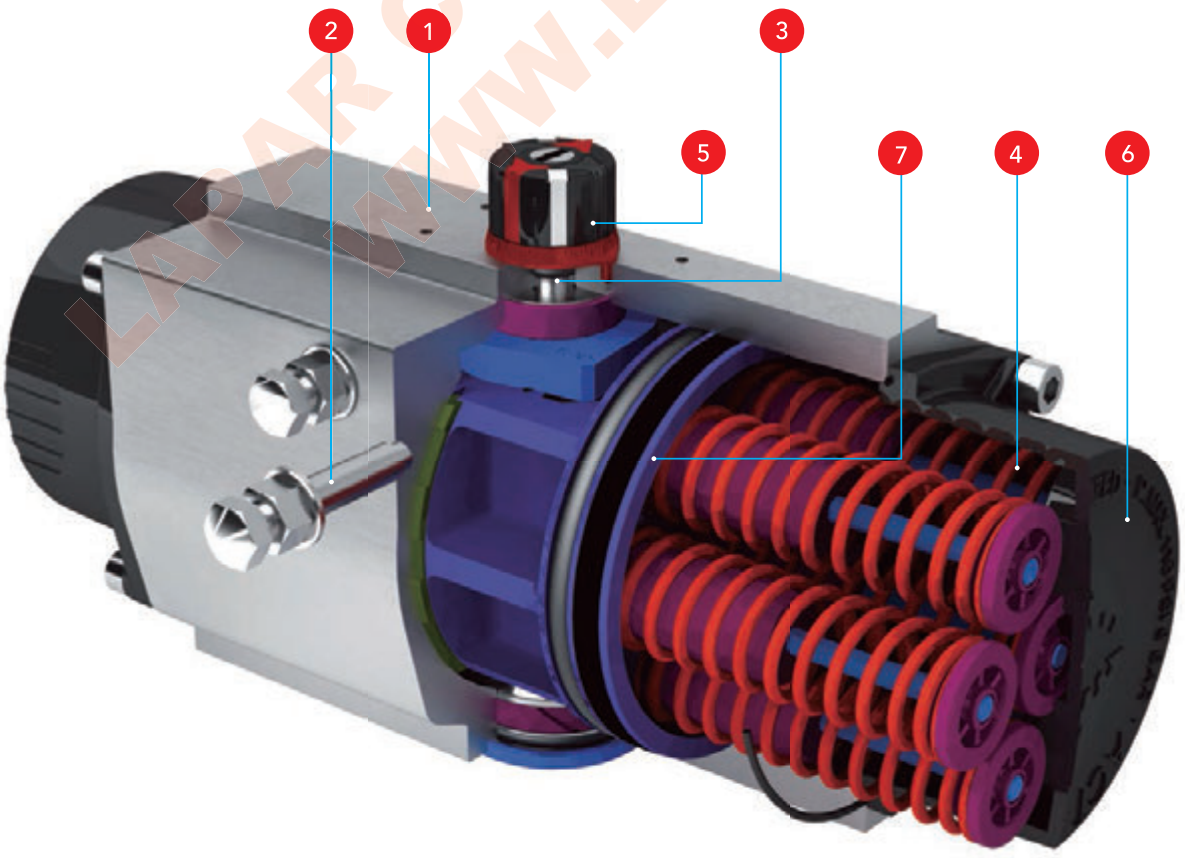
Different end caps for double or single acting for fast and safety identification without the need to read the label.

7 Pistons

Pistons are coated with special treatment for corrosion resistance. Back slash is avoided by a special tooth machining. The pistons have a 3 way guide for low friction between body and pistons. The pistons are also provided with an integral guide machined between pistons and pinion.

Connection type

The assembly of switch boxes, proximity switches or positioners, takes place by means of the Namur connection VDI/VDE 3845, which is a standard feature in all our models. The height of the axis to fulfil this Norm is of 30 mm.



Types of actuators

ADA–

Double acting actuator

ASR–

Spring return actuator

Multi–functionposition indicator

Inductive switch indicating
open or closed position

Inductive switches indicating
open and closed position

Inductive switches indicating
open and closed position
(up/down detecting switches···)

Inductive switches indicating
open and closed position
(45° detecting switches···)

Mechanical switches indicating
open and close

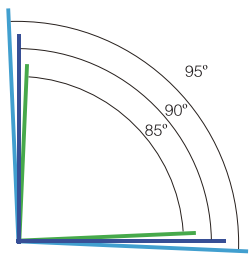
Namur connection for direct mounting
switch box

Design Features and Standards

Rack and pinion design I Linear torque I Rotation angle 90° ± 5° I Antifriction sliding bearings ILong life without maintenance I Total safety for springs replacement I Mounting of solenoid valvesacc. NAMUR Std. I Mounting of devices acc. NAMUR VDI/VDE 3845 Std. I Coupling accordingto ISO 5211 and DIN 3337 (Octogonal drive) I Multi–function position indicator suitable for mechanical and inductives direct switches.Maximum working pressure8 bar (116 psig). (Except ADA10 at 10 bar)

Bi–Directional Travel Stops

Pneumatic actuators are provided with bi–directional pinion travel stops.Side located stops allow a full ± 5° travel adjustment between 85° and 95°. These travelstops are designed to absorb the maximum rated torque of the actuator and the maximum impact loads ass–ociated with recommended travel speed.Adjustment of the counterclockwise and clockwise rotation limits is accomplished by unscrew–ing the locking nuts, turning the respective left and right stop studs to reduce or increase the travel angle and screwing the locking nuts.



Options On Request

Stainless steel pinion (304 and 316)
Fast acting actuators
Actuators with 100% travel adjustment stroke
Fire proof actuators (K–mass,blancket,other executions)

Standard	Anticorrosive C3 according EN–ISO 12944–2		Anticorrosive C5–I according to EN–ISO2944–2		Anticorrosive C5–M according to EN–ISO12944–2		Anticorrosive C4 according to EN–ISO 12944–2		Anticorrosive C4 according to EN–ISO 12944–2	
Part	Material	Coating	Material	Coating	Material	Coating	Material	Coating	Material	Coating
Body	Hard anodized	25~30 μ m	Epoxy painted	80~90 μ m	Epoxy painted	80~90 μ m	Epoxy painted	80~90 μ m	Hard anodized + ENP	25~30 μ m
End Caps	Epoxy painted	80~90 μ m	Epoxy painted	80~90 μ m	Epoxy painted	80~90 μ m	Epoxy painted	80~90 μ m	Epoxy painted	80~90 μ m
Stem	Carbon steel + ENP	25~30 μ m	SS 304		SS 316		Carbon steel + ENP	25~30 μ m	Carbon steel + ENP	25~30 μ m

Pneumatic actuators shall be protected against external corrosion resistant by proper material selection or surface treatment

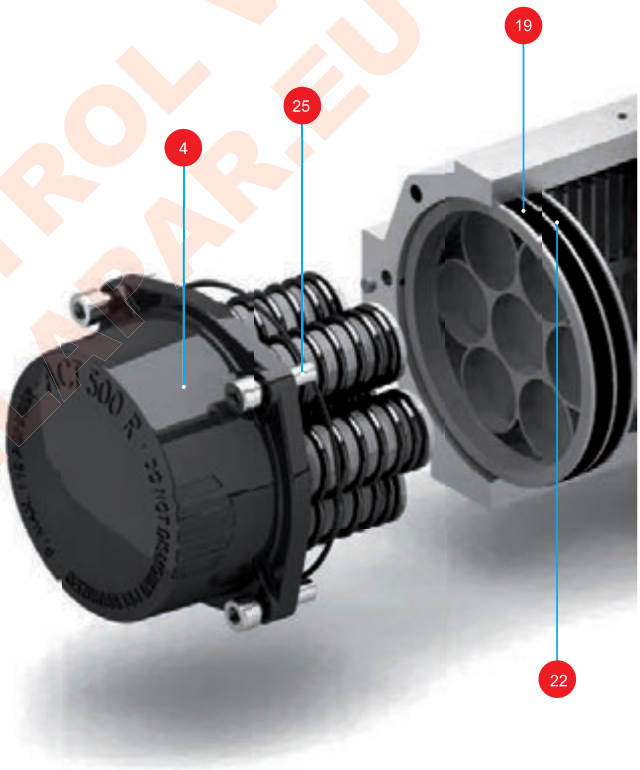
Parts& Materials

1. Body
   Aluminium Hard Anodized
2. Piston
   Aluminium
3. Pinion
   Nickel Plated Carbon Steel
4. End Caps
   Aluminium Epoxy Coated
5. Soft Pinion Washer*
   PA6.6 Polyamide PA 6,6
5. Slide Piston*
   Polyamide PA 6,6 + 30% G.F.
8. Pinion Washer *
   Stainless Steel
9. Upper Pinion Bearing*
   Polyamide PA 6,6 Size 500& greater in Reinforced Br.
10. Stop
    ASTM A 105
11. Spring’s Long Support
    Polyamide PA 6,6
12. Spring’s Short Support
    Polyamide PA 6,6
13. Leveling Screw
    Stainless Steel
14. Bolt
    Stainless SteelA 105
15. Spring
    DIN 2076 · D–5.6
16. Position Indicator
    Polypropylene
17. Cam
    Polypropylene
18. Centering Ring
    Nickel Plated Carbon Steel
19. Slide Guide*
    Polyamide PA 6,6 + 30% G.F.
20. Lower Pinion Bearing*
    Polyamide PA 6,6
22. O–Ring*
    NBR
23. O–Ring*
    NBR
24. O–Ring*
    NBR
25. Bolt
    Stainless Steel
26. O–Ring*
    NBR
27. O–Ring*
    NBR
28. Washer
    Stainless Steel
29. Slip Washer*
    Stainless Steel
30. Nut
    Stainless Steel
31. Nut
    Stainless Steel

Position Indicator

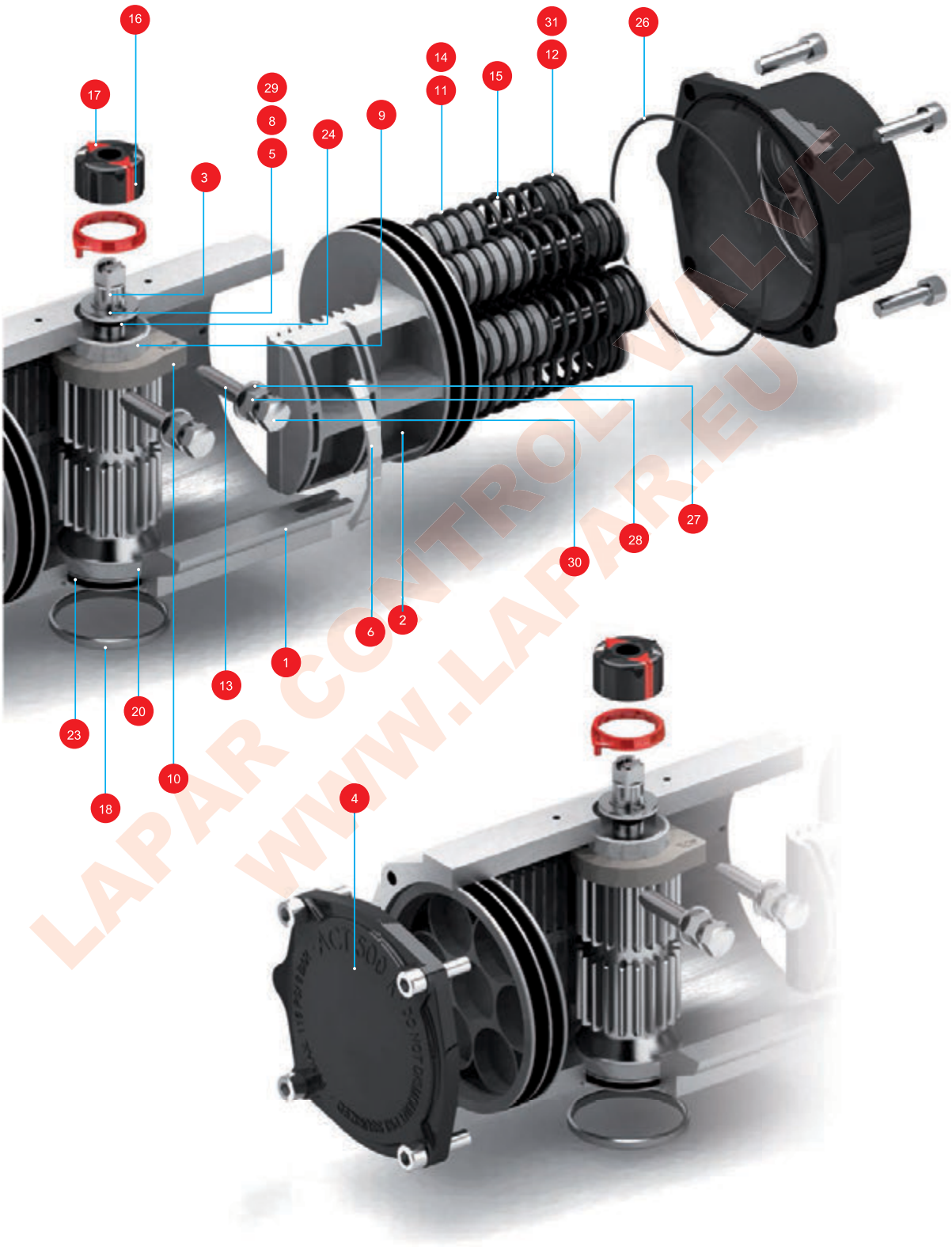
20~850

1200~4000

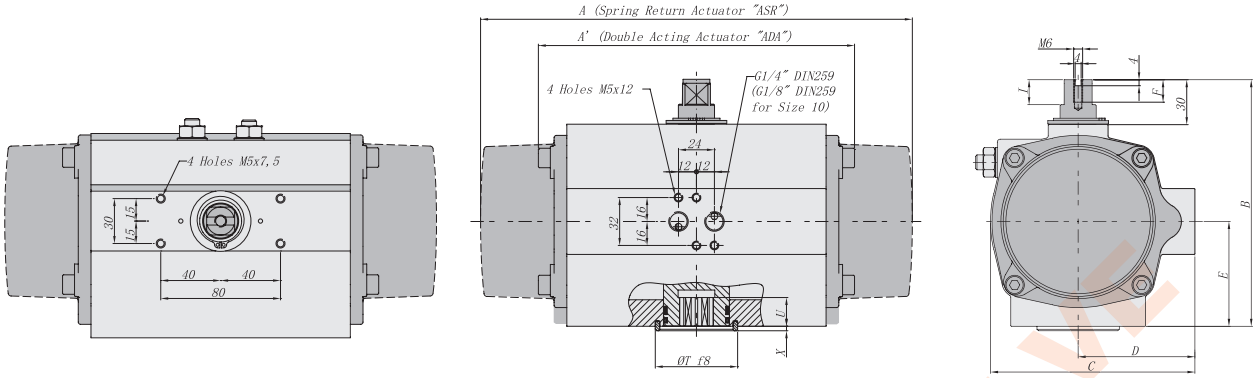


- Lug **
  Nickel Plated Carbon Steel
- Stop Washer Pinion **
  Stainless Steel

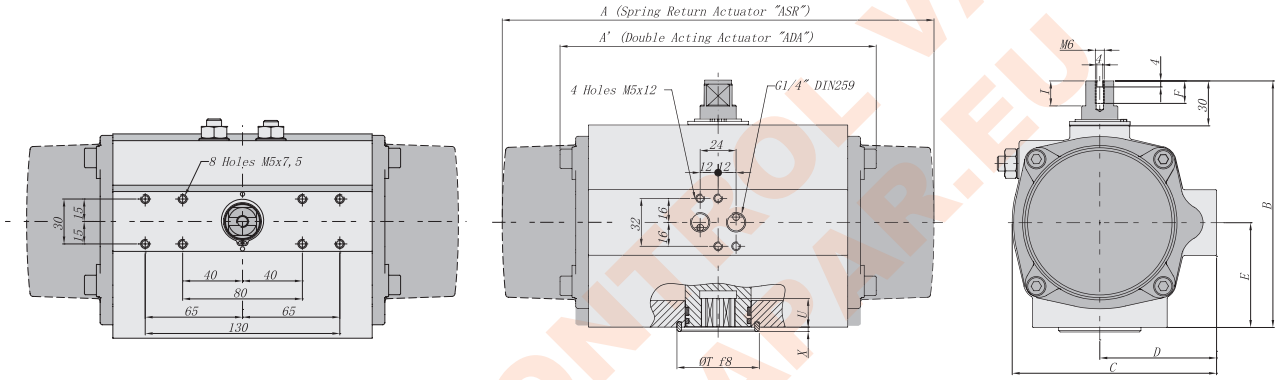
*: Recommended spare parts
**: Only for sizes 2500 & 4000



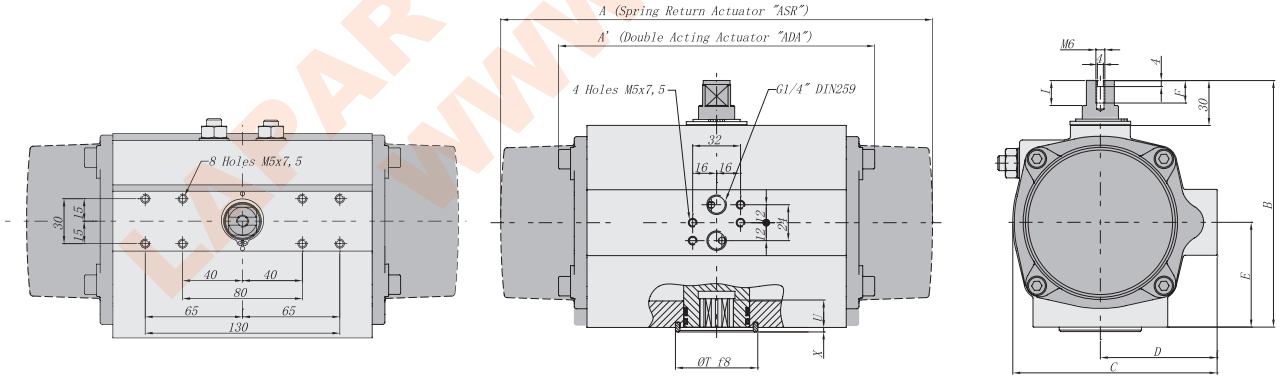
SIZE 10 & 20 & 40 & 80 & 130 & 200 & 300 & 500 & 850



SIZE 1200 & 1750



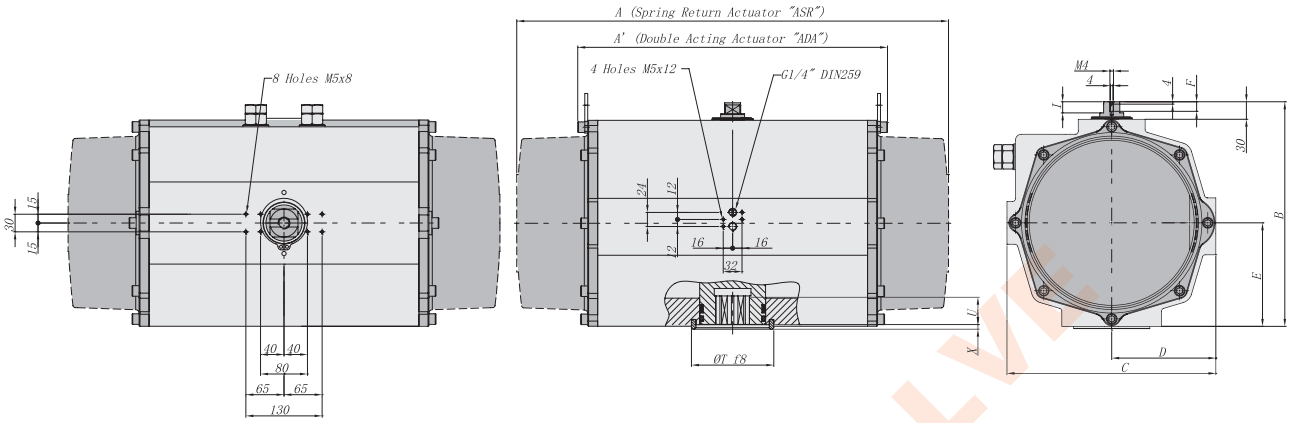
SIZE 2100



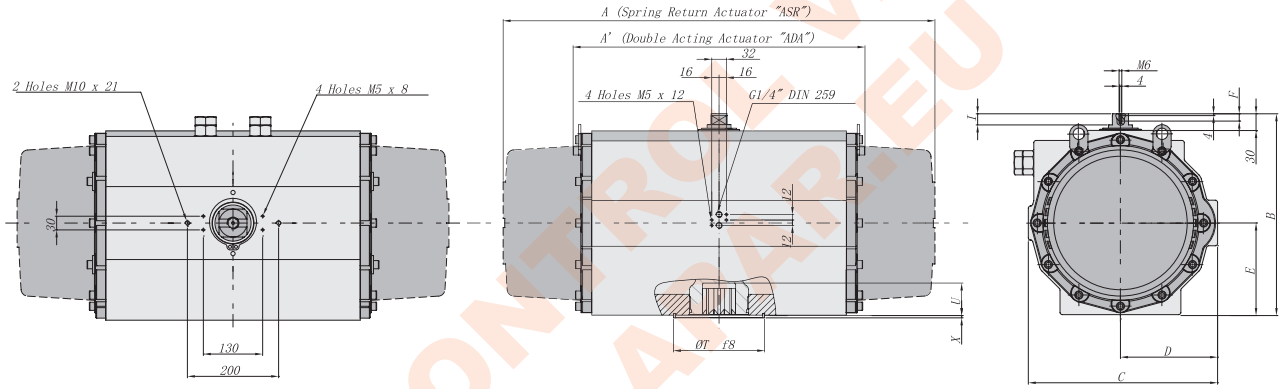
Unit:mm

SIZE	A	A'	B	C	D	E	F	I	R	øS	ISO 5211	øL	MxV	ISO 5211	øL1	M1xV1	øT	X	U
10	-	100	76	56	33	23	9	6	9	12.5	F03	36	M5x8	-	-	-	11	2	12
20	163	145	96	76	48	34	9	12.5	9	12.5	F03	36	M5x8	F05	50	M6x10	25	2	10
20	163	145	96	76	48	34	9	12.5	14	18.1	F05	50	M6x10	-	-	-	35	3	12
20	163	145	96	76	48	34	9	12.5	14	18.1	F04	42	M5x10	-	-	-	35	3	12
40	195	158	115	91	56	45	9	12.5	14	18.1	F04	42	M5x10	-	-	-	35	3	12
40	195	158	115	91	56	45	9	12.5	14	18.1	F05	50	M6x10	-	-	-	35	3	12
80	217	177	137	111	66	55	12	12.5	17	22.5	F05	50	M6x10	F07	70	M8x16	55	3	19
130	258	196	147	122	71	60	12	12.5	17	22.5	F05	50	M6x10	F07	70	M8x16	55	3	22
200	299	225	165	135.5	78	70	12	12.5	17	22.5	F07	70	M8x16	F10	102	M10x16	55	3	23

SIZE 2500

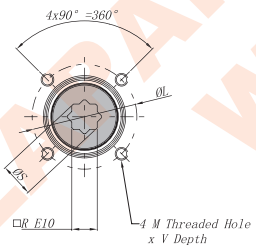


SIZE 4000

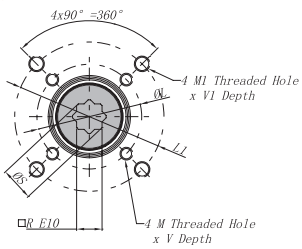


ISO5211

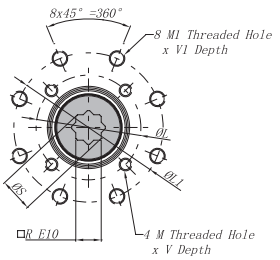
SIZE 10 & 20 & 40 & 500
1750 & 2100 & 2500



SIZE 10 & 80 & 130 & 200
300 & 850 & 1200



SIZE 4000



Unit:mm

SIZE	A	A'	B	C	D	E	F	I	R	øS	ISO 5211	øL	MxV	ISO 5211	øL1	M1xV1	øT	X	U
300	348.5	273	182	152.5	86	80	12	12.5	22	28.5	F07	70	M8x16	F10	102	M10x16	70	3	24
500	397	304	199	173	96	85	12	12.5	22	28.5	F10	102	M10x16	-	-	-	70	3	32
850	473	372	221	191.5	106	98	12	12.5	27	36.5	F10	102	M10x17	F12	125	M12x20	85	3	39
1200	560	439	249	212.5	116	114	16	18.6	36	48.5	F10	102	M10x17	F14	140	M16x26	100	4	48
1750	601	461	280	242.5	131	130	16	18.6	36	48.5	F14	140	M16x26	-	-	-	100	4	50
2100	702	510	313	276.5	148	147	16	18.6	46	60.1	F16	165	M20x29	-	-	-	130	4	50
2500	738	518	383	356	177.5	176.5	16	18.6	46	60.2	F16	165	M20x29	-	-	-	130	4	58
4000	940	630	434	415	213	201	16	18.6	55	72.5	F16	165	M20x30	F25	254	M16x30	200	4	60

ADA:Nm

SIZE	Output torque for double acting in Nm																				Weight (kg)
	3 bar		3,5 bar		4 bar		4,5 bar		5 bar		5,5 bar		6 bar		6,5 bar		7 bar		8 bar		10 bar	
	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	
10	6		8		9		10		11		11.5		12		12		13		14		15		0.64
20	9.7		11.4		13		14.6		16.2		17.8		19.5		21.1		23		26		-		1.4
40	20.3		23.7		27.1		30.5		33.9		37.3		41		44		47		54		-		2.1
80	38.5		44.9		51.3		57.7		64.1		70.5		77		83		90		103		-		3
130	59.1		68.9		78.7		88.6		98.4		108.3		118		128		138		157		-		3.8
200	88		102		117		131		146		161		175		190		205		234		-		5.6
300	145		170		194		218		242		267		291		315		339		388		-		8.5
500	217		253		289		325		361		397		433		469		505		577		-		11.2
850	359		419		479		538		598		658		718		778		837		957		-		16.9
1200	519		606		692		779		865		952		1038		1125		1211		1384		-		25.8
1750	707		824		942		1060		1178		1295		1413		1531		1649		1884		-		32.5
2100	1086		1267		1448		1629		1810		1991		2172		2353		2534		2896		-		49.7
2500	1730		2019		2307		2596		2884		3172		3461		3749		4038		4614		-		69.6
4000	2408		2809		3210		3612		4013		4414		4816		5217		5618		6421		-		129.4

ASR:Nm

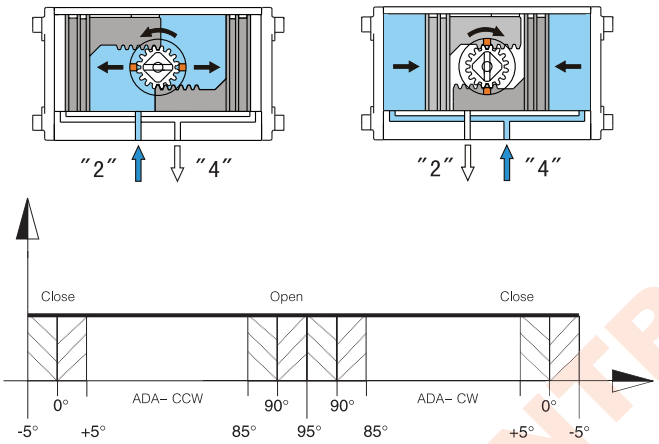
A: Standard

SIZE	Type Pressure	Output torque for spring return in Nm																				Spring Stroke		Weight (kg)
		3 bar		3,5 bar		4 bar		4,5 bar		5 bar		5,5 bar		6 bar		6,5 bar		7 bar		8 bar		END	START	
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	
20	S04			8	5	9	7	11	8	13	10	14	12	16	13	17	15	19	17	22	20	4	7	1.51
	S06 A									11	7	12	9	14	10	15	12	17	13	20	17	7	11	1.54
	S08											10	5	12	7	14	9	15	10	18	14	9	15	1.56
40	S04	16	14	20	17	23	20	26	24	30	27	33	30	37	34	40	37	43	41	50	47	5	8	2.17
	S06	14	10	18	14	21	17	24	20	28	24	31	27	34	30	38	34	41	37	48	44	7	12	2.20
	S08			15	10	19	14	22	17	26	20	29	24	32	27	36	30	39	34	46	41	10	16	2.23
	S10							20	14	24	17	27	20	30	24	34	27	37	30	44	37	12	20	2.26
	S12									21	13	25	17	28	20	32	24	35	27	42	34	15	24	2.29
	S14 A											23	13	26	17	30	20	33	24	40	30	17	28	2.32
80	S04	31	27	38	34	44	40	50	46	57	53	63	59	70	66	76	72	82	78	95	91	9	13	3.28
	S06	27	21	34	28	40	34	47	41	53	47	59	53	66	60	72	66	79	73	92	86	13	20	3.36
	S08					37	29	43	35	49	41	56	48	62	54	69	61	75	67	88	80	17	27	3.43
	S10							39	29	46	36	52	42	59	49	65	55	71	61	84	74	22	33	3.51
	S12									42	30	48	36	55	43	61	49	68	56	81	69	26	40	3.58
	S14 A											45	31	51	37	58	44	64	50	77	63	30	47	3.65
130	S06	43	36	52	46	62	56	72	65	82	75	92	85	102	95	111	105	121	115	141	134	19	27	4.40
	S08			47	38	57	48	67	58	76	68	86	77	96	87	106	97	116	107	135	127	26	36	4.50
	S10					51	40	61	50	71	60	81	70	91	80	100	89	110	99	130	119	32	45	4.60
	S12							56	42	65	52	75	62	85	72	95	82	105	92	124	111	39	54	4.70
	S14 A											70	54	80	64	89	74	99	84	119	103	45	64	4.80
200	S06	61	49	76	63	90	78	105	92	119	107	134	122	149	136	163	151	178	166	207	195	31	46	6.50
	S08			67	50	81	65	96	79	111	94	125	109	140	123	154	138	169	152	198	182	42	61	6.70
	S10					72	52	87	66	102	81	116	96	131	110	146	125	160	139	189	169	52	77	6.90
	S12							78	53	93	68	107	83	122	97	137	112	151	126	180	156	63	92	7.00
	S14 A											99	70	113	84	128	99	142	113	172	143	73	107	7.30
300	S06	102	75	126	99	151	123	175	148	199	172	223	196	247	220	272	245	296	269	344	317	51	83	9.65
	S08			112	76	136	100	160	124	185	148	209	173	233	197	257	221	281	245	330	294	68	111	9.92
	S10					122	76	146	101	170	125	194	149	219	173	243	198	267	222	315	270	85	138	10.20
	S12							131	77	156	101	180	126	204	150	228	174	253	198	301	247	102	166	10.50
	S14 A											165	102	190	126	214	151	238	175	287	223	119	193	10.80
500	S06	152	119	188	155	224	191	260	227	296	263	333	299	369	335	405	371	441	407	513	480	76	115	13.33
	S08	131	86	167	122	203	158	239	194	275	231	311	267	347	303	383	339	419	375	492	447	101	153	13.84
	S10					181	126	217	162	254	198	290	234	326	270	362	306	398	342	470	414	126	192	14.35
	S12							196	129	232	165	268	201	304	238	340	274	376	310	449	382	152	230	14.85
	S14 A											247	169	283	205	319	241	355	277	427	349	177	268	15.36
850	S06	260	209	320	269	380	328	440	388	500	448	559	508	619	568	679	627	739	687	858	807	116	177	19.7
	S08	227	159	287	218	347	278	407	338	467	398	526	458	586	518	646	577	706	637	826	757	155	236	20.3
	S10			254	168	314	228	374	288	434	348	494	408	553	467	613	527	673	587	793	707	193	295	20.9
	S12							341	238	401	298	461	358	521	417	580	477	640	537	760	657	232	353	21.6
	S14 A											428	307	488	367	547	427	607	487	727	607	271	412	22.2
1200	S06	373	289	460	376	546	462	633	549	720	635	806	722	893	808	979	895	1066	981	1239	1154	171	271	30.1
	S08	325	213	411	299	498	386	584	472	671	559	758	645	844	732	931	818	1017	905	1190	1078	229	361	31.1
	S10	276	136	363	222	449	309	536	395	622	482	709	569	795	655	882	742	969	828	1142	1001	286	451	32.2
	S12					401	232	487	319	574	405	660	492	747	578	833	665	920	751	1093	924	343	541	33.2
	S14 A									525	329	612	415	698	502	785	588	871	675	1044	848	400	631	34.3
1750	S06	477	349	595	466	712	584	830	702	948	820	1066	937	1183	1055	1301	1173	1419	1291	1654	1526	270	421	39.3
	S08	400	229	518	347	636	465	754	582	871	700	989	818	1107	936	1225	1053	1342	1171	1578	1407	360	562	41.0
	S10			441	228	559	345	677	463	795	581	912	699	1030	816	1148	934	1266	1052	1501	1287	451	702	42.7
	S12							600	344	718	461	836	579	954	697	1071	815	1189	933	1425	1168	541	843	44.4
	S14 A									642	342	759	460	877	578	995	695	1113	813	1348	1049	631	983	46.0
2100	S06	702	509	883	690	1064	871	1245	1052	1426	1233	1607	1414	1788	1595	1969	1776	2150	1957	2512	2319	384	577	60.3
	S08	574	316	755	497	936	678	1117	859	1298	1040	1479	1221	1660	1402	1841	1583	2022	1764	2384	2126	512	770	62.5
	S10			627	305	808	486	989	667	1170	848	1351	1029	1532	1210	1713	1391	1894	1572	2256	1934	640	962	64.2
	S12							861	474	1042	655	1223	836	1404	1017	1585	1198	1766	1379	2128	1741	768	1154	66.3
	S14 A									914	463	1095	644	1276	825	1457	1006	1638	1187	2000	1549	896	1347	68.0
2500	S06	1299	1045	1587	1333	1876	1622	2164	1910	2453	2199	2741	2487	3029	2775	3318	3064	3606	3352	4183	3929	508	806	85.9
	S08	1155	816	1444	1105	1732	1393	2020	1682	2309	1970	2597	2258	2886	2547	3174	2835	3462	3124	4039	3700	677	1075	89.4
	S10			1300	876	1588	1165	1877	1453	2165	1742	2453	2030	2742	2318	3030	2607	3319	2895	3895	3472	846	1344	92.9
	S12					1444	936	1733	1225	2021	1513	2310	1802	2598	2090	2886	2378	3175	2667	3752	3243	1015	1613	96.4
	S14 A							1589	996	1877	1285	2166	1573	2454	1861	2742	2150	3031	2438	3608	3015	1184	1882	99.9
4000	S06	1763	1262	2165	1663	2566	2065	2967	2466	3369	2867	3770	3269									758	1348	158.7
	S08	1549	880	1950	1282	2351	1683	2752	2084	3154	2485	3555	2887	3956	3288	4358	3689	4759	4091	5068	4399	1011	1797	164.7
	S10					2136	1301	2538	1702	2939	2104	3340	2505	3742	2906	4143	3307	4544	3709	4853	4017	1264	2246	170.8
	S12							2323	1320	2724	1722	3125	2123	3527	2524	3928	2926	4329	3327	4638	3636	1516	2696	176.9
	S14 A											2911	1741	3312	2142	3713	2544	4115	2945	4423	3254	1769	3145	182.9

Practical data

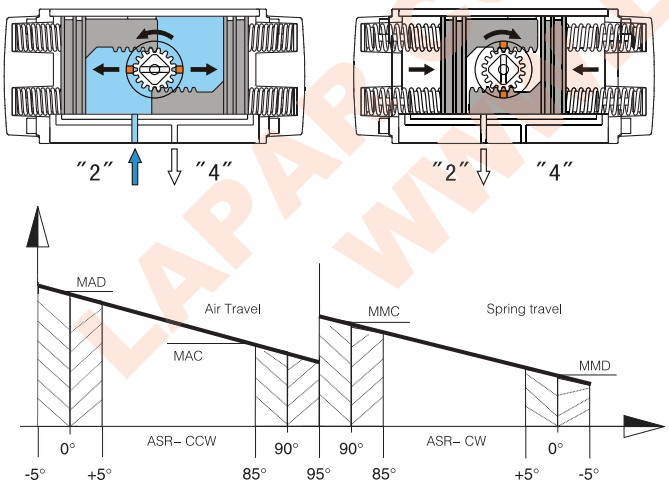
Practical data	Type	10	20	40	80	130	200	300	500	850	1200	1750	2100	2500	4000
	Bore (mm)	32	45	60	80	90	104	125	140	160	180	210	250	300	350
Working time (S)	ADA– CCW	0.02	0.04	0.08	0.11	0.15	0.15	0.30	0.40	0.80	1.20	1.80	2.30	2.80	3.00
	ADA– CW	0.02	0.04	0.08	0.11	0.15	0.22	0.40	0.50	0.90	1.50	2.00	2.60	3.10	3.50
	ASR– CCW	0.08	0.12	0.20	0.27	0.32	0.50	0.70	0.90	2.20	2.30	2.80	3.30	3.80	4.30
	ASR– CW	0.12	0.18	0.29	0.40	0.50	0.60	0.85	1.10	2.60	2.80	3.20	3.70	4.20	5.00
Weight (Kg)	ADA	0.64	1.4	2.1	3	3.8	5.6	8.5	11.2	16.9	25.8	32.5	40.8	69.6	129.4
	ASR		1.56	2.32	3.65	4.8	7.3	10.8	15.36	22.2	34.3	46	52.6	99.9	182.9
Air consumption chart (L)	CCW	0.035	0.13	0.27	0.64	0.77	1.19	1.93	2.95	4.7	6.95	9.8	11.6	27	33.2
	CW	0.28	0.09	0.23	0.47	0.76	1.2	1.73	2.74	3.86	4.64	9.3	10.2	25	32
Working temperature	–30~100℃ Standard Construction														
	–15~150℃ High temperature Construction (With FKM O–rings)														
	–40~80℃ Low temperature Construction (With Silicone O–rings)														
	–55℃~80℃ Extreme low temperature Construction (With Silicone O–rings and 316 pinion)														

Selection and working principle of ADA



With reference to the above diagram it can be noted that the torque of a double acting actuator remains constant through–out the complete action. The user can decide on which model to choose according to his/her own specifi c requirements, using the following guidelines:
1. Defi ne the maximum torque of the valve to automate.
2. To obtain a safety factor increase the torque value chosen by 25%–50% (subject to the type of valve and working conditions).
3. Once the torque value suggested is obtained consult the torque chart and in relation to the corresponding air pressure fi nd a torque value exact to or exceeding the one obtained.
4. Once the torque value is determined move horizontally to the column "model" to fi nd the actuator model required.

Selection and working principle of ASR



With reference to the above diagram the torque of a spring return actuator is not constant but decreasing. This is due to the action of the springs that when compressed during air actuation counteract the piston movement and accumulate energy which will be available in a decreasing way during the rotation inversion.
The torque given by the actuator is defined by four fundamental values.
Opening rotation
MAD = Actuator torque with unfolded springs
MAC = Actuator torque with compressed springs.
Closing rotation
MMC = Torque with compressed springs.
MMD = Torque with unfolded springs
The user can decide on which model to chose according to his/her own specific requirements, using the following guidelines:
1. Define the maximum torque of the valve to automate.
2. To obtain a safety factor increase the torque value chosen by 25% – 50% (subject to the type of valve and working conditions).
3. Once the torque value suggested is obtained consult the torque chart and in relation to the corresponding air pressure find the torque value exact to or exceeding the one obtained, taking account of the lower value between the MMD and MAC values.
4. Once the torque value is determined move horizontally to the column "model" to find the actuator model required.