Pneumatic Actuator

DA/SR Pneumatic actuator

Extruded aluminum ASTM6005 body with bath internal and external corrosion protection having honed cylinder surface for longer life and low coefficient of friction.

- Dual piston rack and pinion design for compact construction, symmetric mounting position, high-cycle fife and fast operation, reverse rotation can be accomplished in the field by simply inverting the pistons.

- Multiple bearings and guides on racks and pistons, low friction, high cycle life and prevent shaft blowout.

- Modular preloaded spring cartridge design, with coatedspring for simple versatile range, greater safely and corrosion resistance, longer cycle life.

- Fully machined teeth on piston and pinion for accurate low backlash rack and pinion ˇˇˇˇengagement, maximum efficlency. Stalnless steel fasteners for long term corroslon resistance

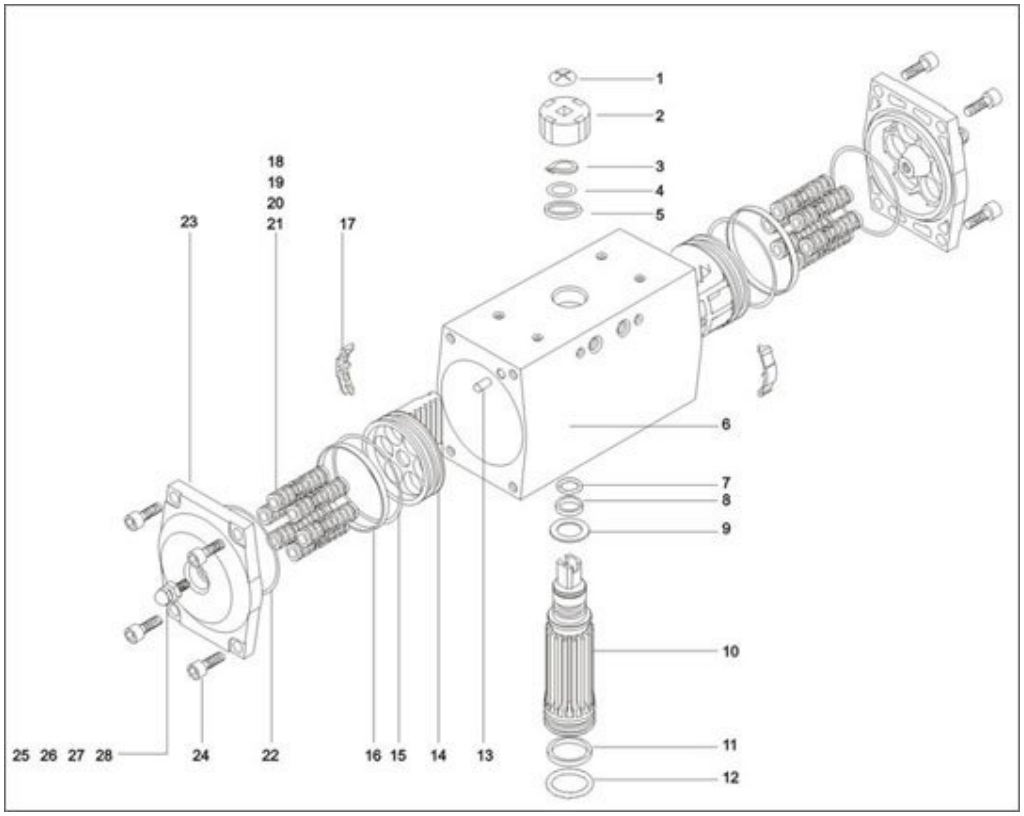
- Full conformance to the latest specifications: IS05211,DIN 3337 and Namur or product inter changeahility and easy mounting of solenoids, limit switches and other aocessodes.

Operating conditions:
Operating media---------- Dry or lubricated air,the non-corrosive gases or oil
Rotation angle---------- 90˚
Air Supply Pressure --------- 2 ~ 8 Bar (30~115PSIG)

Temperature Range:
Standard version ---------- -20˚C~ 80˚C
Low Temperature version ---- -40˚C ~ 80˚C
High Temperature version---- -20˚C ~ 150˚C

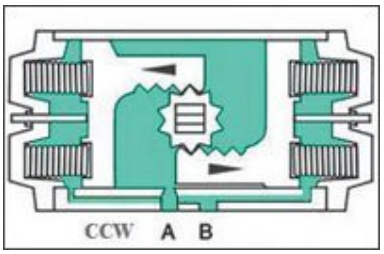
Lubrication:Under nomal operating condition,need not accrete lubticant

Actuator Parts and Material

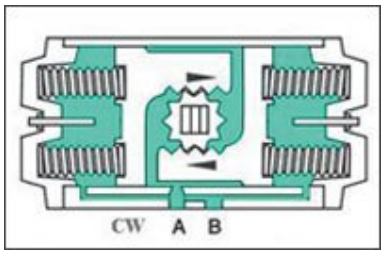


NO.	Description	Qty	Standards Material
1	Indicator Screw	1	Stainless steel
2	Indicator	1	Plastic
3	Snap Ring	1	Stainless steel
4	Washer	1	Stainless steel
5	Outside Washer	1	Engineering Plastics
6	Boby	1	Alluminum Alloy
7	O-ring(Top)	1	Viton/NBR
8	Bearing Top	1	Engineering Plastics
9	Inside Washer	1	Engineering Plastics
10	Pinion	1	Alloy steel
11	Bearing Bottom	1	Engineering Plastics
12	O-ring Bottom	1	Viton/NBR
13	Plug	2	NBR
14	Piston	2	Die-casting alluminum/steel
15	Piston O-ring	2	Viton/NBR
16	Piston Bearing	2	Engineering Plastics
17	Guide Piston	2	Nylon 66
18	Spring	*	Spring steel
19	Spring Retainer(L)	*	Nylon 66
20	Spring Retainer(R)	*	Nylon 66
21	Retainer Connector	*	Brass
22	End-Cap O-ring	2	Viton/NBR
23	End-Cap	2	Die-casting alluminum/steel
24	End-Cap Stop Screw	2	Spring steel
25	Adjust Screw	2	Spring steel
26	Adjust Screw Nut	2	Spring steel
27	Adjust Screw Washer	2	Spring steel
28	Adjust Screw O-ring	2	Viton/NBR

Operating Principle
Spring Return Sctuators
Operating Principle & standard Rototation

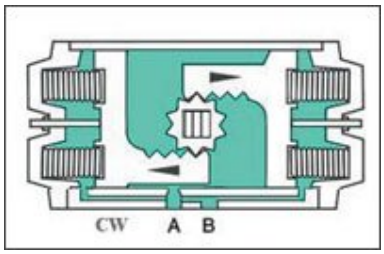


Normally closed type

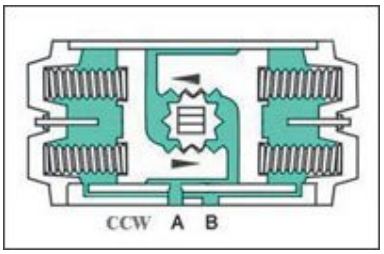


Air to port A forces the pistons outwards,causing the springs to compress,The pinion tums counter-clockwise while air is being exhausted from Port B.

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



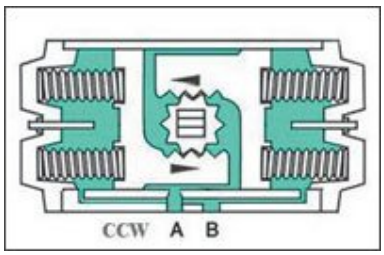
Normally closed type



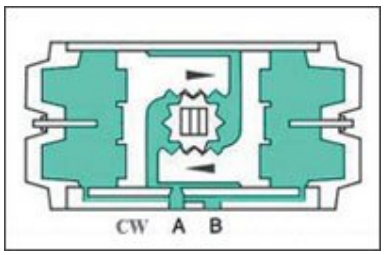
Air to port A forces the pistons outwards,causing the springs to compress,The pinion tums clockwise while air is being exhausted from Port B.

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

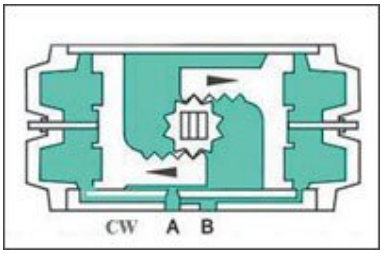
Double Acting Actuators
Operating Principle & Standard Rotation



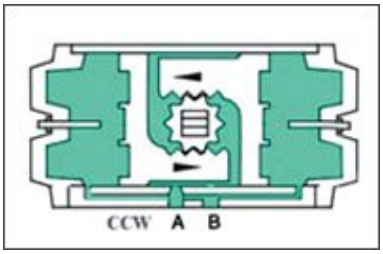
Air to port A forces the pistons outwards,causing the pinion to tum counter-clockwise while the air is being exhausted from Port B.



Air to Port B forces the pistons inwards,causing the pinion to tum clockwise while the air is being exhausted form Port A.

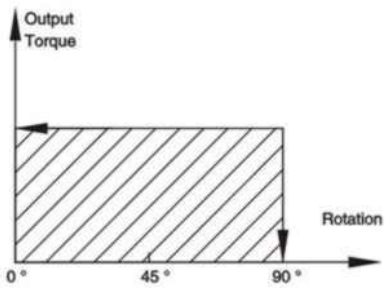


Air to port A forces the pistons outwards,causing the pinion to tum clockwise while the air is being exhausted from Port B.



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

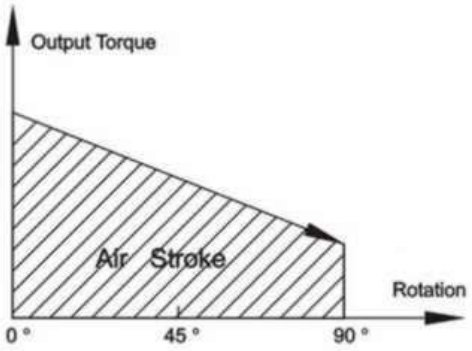
Output Torque of Double Acting Actuators

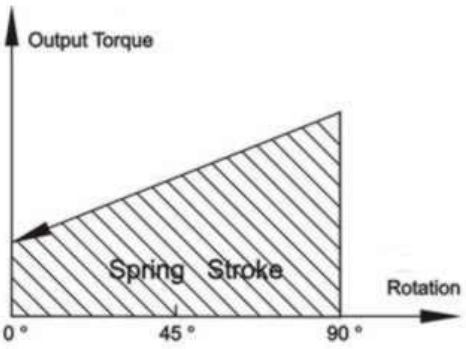


OUTPUT TORQUE OF PNEUMATIC ACTUATOR WITH DOUBLE ACTING (UNIT:NM)

(Model)	Air pressure(Bar)									
	2	2.5	3	4	4.5	5	5.5	6	7	8
DA-32	3.1	3.8	4.6	6.1	6.9	7.6	8.4	9.2	10.7	12.2
DA-45	6.0	7.6	9.1	12.1	13.6	15.1	16.6	18.1	21.1	24.2
DA-52	8.1	10.1	12.1	16.1	18.1	20.2	22.2	24.2	28.2	32.3
DA-63	14.2	17.8	21.3	28.4	32.0	35.5	39.1	42.6	49.7	56.8
DA-75	20.1	25.2	30.2	40.3	45.3	50.3	55.4	60.4	70.5	80.5
DA-83	30.8	38.5	46.2	61.6	69.4	77.1	84.8	92.5	107.9	123.3
DA-92	45.4	56.8	68.2	90.9	102.3	113.6	125.0	136.3	159.1	181.8
DA-105	65.8	82.2	98.7	131.6	148.0	164.4	180.9	197.3	230.2	263.1
DA-125	103	128	154	205	231	256	282	308	359	410
DA-140	175	219	263	351	395	439	482	526	614	702
DA-160	267	334	401	535	601	668	735	802	935	1069
DA-190	431	538	646	861	969	1077	1185	1292	1508	1723
DA-210	526	658	789	1052	1184	1316	1447	1579	1842	2105
DA-240	773	966	1160	1546	1740	1933	2126	2320	2706	3093
DA-270	1174	1468	1761	2349	2642	2936	3229	3523	4110	4697
DA-300	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
DA-350	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
DA-400	3256	4069	4883	6511	7325	8139	8953	9767	11394	13022

Output Torque of Spring Return Actuators





OUTPUT TORQUE OF PNEUMATIC ACTUATOR WITH SPRING RETURN (UNIT: NM)

(Model)	Air pressure(Bar)																			
		2		2.5		3		4		5		6		7		8		(Springs'output)	
	(Spring Q.ty)	0 ° Start	90 ° End	0 ° Start	90 ° End	0 ° Start	90 ° End	0 ° Start	90 ° End	0 ° Start	90 ° End	0 ° Start	90 ° End	0 ° Start	90 ° End	0 ° Start	90 ° End	90 ° Start	0 ° End
SR-45	5	3.0	1.2	4.6	2.8													4.6	2.9
	6	2.3	0.2	3.9	1.8	5.4	3.3											5.5	3.5
	7			3.3	0.8	4.8	2.3	7.8	5.3									6.5	4.1
	8					4.2	1.3	7.2	4.3	10.2	7.3							7.4	4.6
	9							6.6	3.4	9.6	6.4	12.6	9.4					8.3	5.2
	10							6.0	2.4	9.0	5.4	12.0	8.4	15.0	11.4	18.1	14.5	9.2	5.8
	11									8.4	4.4	11.4	7.4	14.4	10.4	17.5	13.5	10.1	6.4
	12									7.8	3.5	10.8	6.5	13.8	9.5	16.9	12.6	11.1	7.0
SR-52	5	3.7	1.6	5.7	3.6													6.2	4.2
	6	2.8	0.3	4.8	2.3	6.8	4.3											7.4	5.1
	7			3.9	1.0	5.9	3.0	9.9	7.0									8.6	5.9
	8					5.0	1.7	9.0	5.7	13.1	9.8							9.9	6.8
	9							8.1	4.4	12.2	8.5	16.2	12.5					11.1	7.6
	10							7.2	3.1	11.3	7.2	15.3	11.2	19.3	15.2	23.4	19.3	12.4	8.5
	11									10.4	5.9	14.4	9.9	18.4	13.9	22.5	18.0	13.6	9.3
	12									9.5	4.6	13.5	8.6	17.5	12.6	21.6	16.7	14.8	10.1
SR-63	5	7.0	3.2	10.6	6.8													10.4	6.8
	6	5.6	1.0	9.2	4.6	12.7	8.1											12.5	8.2
	7			7.7	2.4	11.2	5.9	18.3	13.0									14.6	9.6
	8					9.8	3.7	16.9	10.8	24.0	17.9							16.7	10.9
	9							15.4	8.6	22.5	15.7	29.6	22.8					18.8	12.3
	10							14.0	6.4	21.1	13.5	28.2	20.6	35.3	27.7	42.4	34.8	20.9	13.7
	11									19.7	11.3	26.8	18.4	33.9	25.5	41.0	32.6	22.9	15.0
	12									18.2	9.1	25.3	16.2	32.4	23.3	39.5	30.4	25.0	16.4
SR-75	5	9.0	4.9	14.1	10.0													14.5	10.5
	6	6.8	1.8	11.9	6.9	16.9	11.9											17.4	12.7
	7			9.7	3.9	14.7	8.9	24.8	19.0									20.3	14.8
	8					12.4	5.8	22.5	15.9	32.5	25.9							23.2	16.9
	9							20.3	12.9	30.3	22.9	40.4	33.0					26.1	19.0
	10							18.1	9.8	28.1	19.8	38.2	29.9	48.3	40.0	58.3	50.0	29.0	21.1
	11									25.9	16.8	36.0	26.9	46.1	37.0	56.1	47.0	31.9	23.2
	12									23.7	13.7	33.8	23.8	43.9	33.9	53.9	43.9	34.7	25.3
SR-83	5	14.2	6.6	21.9	14.3													23.0	15.8
	6	10.8	1.7	18.5	9.4	26.2	17.1											27.6	19.0
	7			15.2	4.6	22.9	12.3	38.3	27.7									32.2	22.1
	8					19.6	7.4	35.0	22.8	50.5	38.3							36.8	25.3
	9							31.6	18.0	47.1	33.5	62.5	48.9					41.4	28.5
	10							28.3	13.2	43.8	28.7	59.2	44.1	74.6	59.5	90.0	74.9	46.0	31.6
	11									40.5	23.8	55.9	39.2	71.3	54.6	86.7	70.0	50.6	34.8
	12									37.1	19.0	52.5	34.4	67.9	49.8	83.3	65.2	55.2	38.0

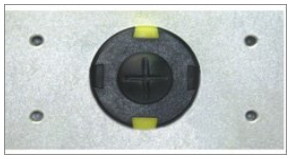
OUTPUT TORQUE OF PNEUMATIC ACTUATOR WITH SPRING RETURN (UNIT: NM)

(Model)	Air pressure(Bar)																	
	(Spring Q.ty)	2		2.5		3		4		5		6		7		8		(Springs'output)	
		0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	90° Start	0° End
SR-92	5	20.8	9.2	32.2	20.6													34.4	23.3
	6	15.9	2.0	27.3	13.4	38.7	24.8											41.2	28.0
	7			22.4	6.1	33.8	17.5	56.5	40.2									48.1	32.7
	8					28.9	10.3	51.6	33.0	74.3	55.7							55.0	37.3
	9							46.7	25.8	69.4	48.5	92.1	71.2					61.9	42.0
	10							41.8	18.5	64.5	41.2	87.2	63.9	110.0	86.7	132.7	109.4	68.7	46.7
	11									59.5	34.0	82.2	56.7	105.0	79.5	127.7	102.2	75.6	51.4
	12									54.6	26.8	77.3	49.5	100.1	72.3	122.8	95.0	82.5	56.0
SR-105	5	32.5	14.0	48.9	30.4													49.2	31.6
	6	25.8	3.6	42.2	20.0	58.7	36.5											59.1	38.0
	7			35.6	9.7	52.1	26.2	85.0	59.1									68.9	44.3
	8					45.4	15.8	78.3	48.7	111.1	81.5							78.7	50.6
	9							71.7	38.4	104.5	71.2	137.4	104.1					88.6	56.9
	10							65.0	28.0	97.8	60.8	130.7	93.7	163.6	126.6	196.5	159.5	98.4	63.3
	11									91.1	50.4	124.0	83.3	156.9	116.2	189.8	149.1	108.3	69.6
	12									84.5	40.1	117.4	73.0	150.3	105.9	183.2	138.8	118.1	75.9
SR-125	5	47.9	20.5	72.9	45.5													78.4	52.4
	6	36.9	4.0	61.9	29.0	87.9	55.0											94.1	62.8
	7			50.8	12.5	76.8	38.5	127.8	89.5									109.7	73.3
	8					65.8	22.0	116.8	73.0	167.8	124.0							125.4	83.8
	9							105.8	56.5	156.8	107.5	208.8	159.5					141.1	94.2
	10							94.8	40.0	145.8	91.0	197.8	143.0	248.8	194.0	299.8	245.0	156.8	104.7
	11									134.8	74.5	186.8	126.5	237.8	177.5	288.8	228.5	172.4	115.2
	12									123.7	58.0	175.7	110.0	226.7	161.0	277.7	212.0	188.1	125.7
SR-140	5	84.7	39.3	128.7	83.3													129.0	85.8
	6	66.6	12.1	110.6	56.1	154.6	100.1											154.8	102.9
	7			92.6	29.0	136.6	73.0	224.6	161.0									180.5	120.1
	8					118.5	45.8	206.5	133.8	294.5	221.8							206.3	137.3
	9							188.5	106.7	276.5	194.7	363.5	281.7					232.1	154.4
	10							170.4	79.5	258.4	167.5	345.4	254.5	433.4	342.5	521.4	430.5	257.9	171.6
	11									240.3	140.4	327.3	227.4	415.3	315.4	503.3	403.4	283.7	188.7
	12									222.3	113.2	309.3	200.2	397.3	288.2	485.3	376.2	309.5	205.9
SR-160	5	120.0	47.7	187.0	114.7													208.3	139.7
	6	90.6	3.9	157.6	70.9	224.6	137.9											250	168
	7			128.2	27.0	195.2	94.0	329.2	228.0									292	196
	8					165.8	50.2	299.8	184.2	432.8	317.2							333	223
	9							270.4	140.3	403.4	273.3	537.4	407.3					375	251
	10							241.0	96.4	374.0	229.5	508.0	363.5	641.0	496.5	775.0	630.5	417	279
	11									344.6	185.6	478.6	319.6	611.6	452.6	745.6	586.6	458	307
	12									315.2	141.7	449.2	275.7	582.2	408.7	716.2	542.7	500	335
SR-190	5	220	105	327	212													293	190
	6	178	40	285	147	393	255											352	227
	7			243	82	351	190	566	405									410	265
	8					309	125	524	340	740	556							469	303
	9							482	275	698	491	913	706					527	341
	10							440	210	656	426	871	641	1087	857	1302	1072	586	379
	11									614	361	829	576	1045	792	1260	1007	645	417
	12									572	296	787	511	1003	727	1218	942	703	455
SR-210	5	237	126	369	258													360	260
	6	179	46	311	178	442	309											432	313
	7			253	99	384	230	647	493									503	365
	8					326	150	589	413	853	677							575	417
	9							531	333	795	597	1058	860					647	469
	10							473	253	737	517	1000	780	1263	1043	1526	1306	719	521
	11									679	437	942	700	1205	963	1468	1226	791	573
	12									621	357	884	620	1147	883	1410	1146	863	625

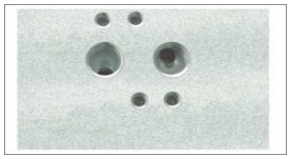
OUTPUT TORQUE OF PNEUMATIC ACTUATOR WITH SPRING RETURN (UNIT: NM)

(Model)	Air pressure(Bar)																		
	(Spring Q.ty)	2		2.5		3		4		5		6		7		8		(Springs'output)	
		0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	90° Start	0° End
SR-240	5	341	190	534	383													525	389
	6	255	73	448	296	642	460											630	467
	7			361	150	555	344	941	730									735	544
	8					469	227	855	613	1242	1000							840	622
	9							768	496	1155	883	1542	1270					945	700
	10							682	380	1069	767	1456	1154	1842	1540	2229	1927	1050	778
	11									983	650	1370	1037	1756	1423	2143	1810	1155	855
	12									896	533	1283	920	1669	1306	2056	1693	1260	933
SR-270	5	585	346	879	640													745	530
	6	467	181	761	475	1054	768											894	636
	7			644	309	937	602	1525	1190									1043	742
	8					819	437	1407	1025	1994	1612							1192	848
	9							1289	859	1876	1446	2463	2033					1341	954
	10							1171	694	1758	1281	2345	1868	2932	2455	3519	3042	1490	1060
	11									1640	1115	2227	1702	2814	2289	3401	2876	1639	1166
	12									1523	950	2110	1537	2697	2124	3284	2711	1788	1272
SR-300	5	715	347	1097	729													1061	730
	6	553	112	935	494	1316	875											1273	876
	7			772	258	1153	639	1916	1402									1485	1022
	8					991	403	1754	1166	2517	1929							1697	1168
	9							1592	930	2355	1693	3118	2456					1909	1314
	10							1430	695	2193	1458	2956	2221	3719	2984	4482	3747	2122	1460
	11									2030	1222	2793	1965	3556	2748	4319	3511	2334	1606
	12									1868	986	2631	1749	3394	2512	4157	3275	2546	1752
SR-350	5	982	393	1553	964													1702	1173
	6	721	15	1292	586	1863	1157											2043	1408
	7			1031	208	1602	779	2745	1922									2383	1642
	8					1341	401	2484	1544	3626	2686							2724	1877
	9							2224	1165	3366	2307	4508	3449					3064	2112
	10							1963	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346
	11									2844	1551	3986	2693	5129	3836	6271	4978	3745	2581
	12									2584	1172	3726	2314	4869	3457	6011	4599	4086	2816
SR-400	7	1215	56	2028	869													2880	1837
	8			1736	411	2550	1225											3292	2100
	9					2259	768	3887	2396									3703	2362
	10					1967	311	3595	1939	5223	3567							4115	2624
	11							3303	1482	4931	3110	6559	4738					4526	2887
	12							3012	1025	4640	2653	6268	4281	7895	5908	9523	7536	4938	3149
	13									4348	2195	5976	3823	7603	5450	9231	7078	5349	3412
	14									4057	1738	5685	3366	7312	4993	8940	6621	5761	3674
	15									3765	1281	5393	2909	7020	4536	8648	6164	6172	3937
	16											5101	2452	6728	4079	8356	5707	6584	4199

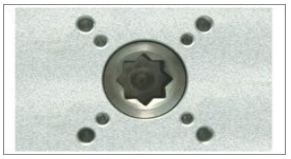
Actuator Dimension



Connection dimensions of the top conform to standard VDI/VDE3845 NAMURŁ¬convenient to install limit switch and localizer.

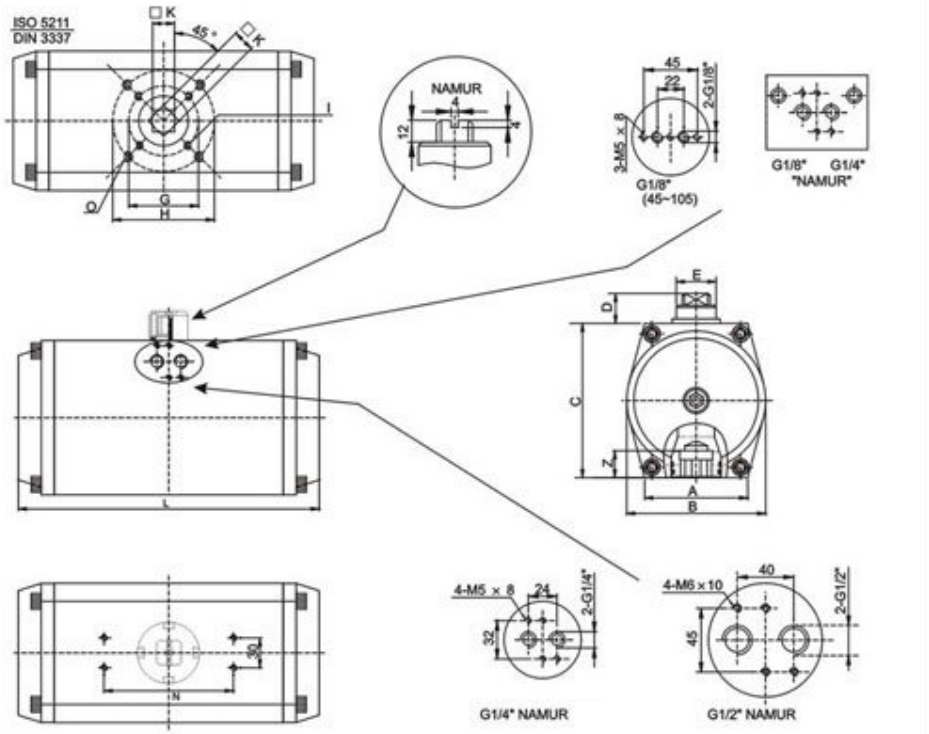


Connection dimensions of the side conform to standard VDI/VDE 3845 NAMURŁ¬fit for installing solenoid valve.



Connection dimensions of the bottom conform to standards 1S05211 and DIN3337 and can connect with valve directly.
Star and enient to rectangular holes are conv-connect with valves directly.

Actuator Dimension Table



Unit : mm

Model	A	B	C	D	E	G	H	I	K	L	N	O	Z	Air Connection
DA/SR-45	48	58	65	20	40	Φ 36	Φ 50	M5 × 8	11	150	80	M6 × 10	14	G1/8"
DA/SR-52	50	59	74	20	40	Φ 36	Φ 50	M5 × 8	11	150	80	M6 × 10	14	G1/8"
DA/SR-63	60	72	88	20	40	Φ 50	Φ 70	M6 × 10	14	165	80	M8 × 13	18	G1/8"
DA/SR-75	65	83	100	20	40	Φ 50	Φ 70	M6 × 10	14	187	80	M8 × 13	18	G1/8"
DA/SR-83	67	91	110	20	40	Φ 50	Φ 70	M6 × 10	17	214	80	M8 × 13	21	G1/8"
DA/SR-92	76	104	120	20	40	Φ 50	Φ 70	M6 × 10	17	266	80	M8 × 13	21	G1/8"
DA/SR-105	84	114	132.5	20	40	Φ 70	Φ 102	M8 × 13	22	276	80	M10 × 16	26	G1/8"
DA/SR-125	103	137	160	30	56	Φ 70	Φ 102	M8 × 13	22	306	130	M10 × 16	26	NAMUR G1/4"
DA/SR-140	107	152	171.5	30	56	Φ 102	Φ 125	M10 × 16	27	400	130	M12 × 20	31	NAMUR G1/4"
DA/SR-160	110	174	197	30	56	Φ 102	Φ 125	M10 × 16	27	465	130	M12 × 20	31	NAMUR G1/4"
DA/SR-190	115	206	225	30	80		Φ 140		36	530	130	M16 × 25	40	NAMUR G1/4"
DA/SR-210	135	226	255	30	80		Φ 140		36	535	130	M16 × 25	40	NAMUR G1/4"
DA/SR-240	155	256	290	30	80		Φ 165		46	602	130	M20 × 25	50	NAMUR G1/4"
DA/SR-270	170	294	320	30	80		Φ 165		46	715	130	M20 × 25	50	NAMUR G1/2"
DA/SR-300	196	324	348	30	80		Φ 165		46	742	130	M20 × 25	60	NAMUR G1/2"
DA/SR-350	220	380	402	30	80		Φ 165		46	860	130	M20 × 25	60	NAMUR G1/2"

Air Consumption

Air volume opening & closing

Unit: L

Model	Volume opening	Volume closing
DA-32	0.04	0.04
DA-45	0.08	0.11
DA-52	0.11	0.14
DA-63	0.20	0.23
DA-75	0.29	0.38
DA-83	0.41	0.55
DA-92	0.62	0.91
DA-105	0.94	1.18
DA-125	1.47	1.85

Model	Volume opening	Volume closing
DA-140	2.43	3.20
DA-160	3.65	5.03
DA-190	5.9	7.9
DA-210	7.4	9.7
DA-240	10.7	14.3
DA-270	16.9	22.5
DA-300	23.8	29.7
DA-350	35.1	46.3
DA-400	52.6	36

Air Consumption

Air consumption rest with Air Supply. Air volume and Action cycle times , expressions: L/Min=Air volume(Air volume Opening +Air volume closing) × [(Air Supply(Kpa)+101.3) ÷ 101.3] × Action cycle times (/min)

Model	45	52	63	75	83	92	105	125
Weight(SR)	1.12	1.20	1.85	2.40	3.25	5.10	6.10	10.40
Weight(DA)	1.05	1.07	1.70	2.18	2.95	4.35	5.35	9.40

Model	140	160	190	210	240	270	300	350	400
Weight(SR)	14.65	21.90	34.65	43.90	62.00	88.75	130.00	234.00	360.00
Weight(DA)	12.85	18.90	29.45	36.20	50.70	71.05	110.00	186.00	289.00