

# SHANGHAI CIPHY INDUSTRY CO.,LTD.

## Aluminums Shall

### Dual Action and Single Action Type (Spring Return) Pneumatic Actuators

**MODEL NO: AND(S)AFL**



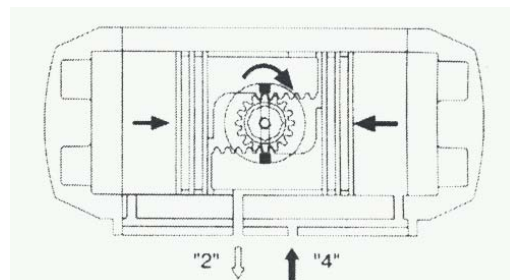
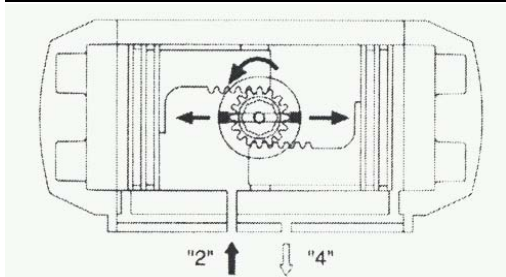
**Pneumatic Actuators PRODUCT'S SIZE:**

FROM	TO
52mm	200mm

#### **structural feature and technical characteristics:**

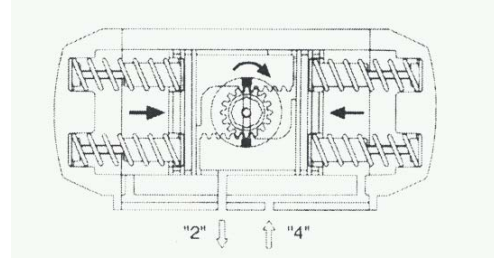
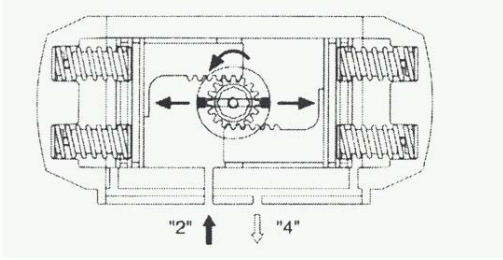
Structural feature	Dual-piston driven, toothed bar and gear driven, structure is compact, position of assembly is symmetrical, motion is swift, turning of output axis can be changed through simple reversal of piston. Output of angle travel:0°~90°. DA stands for dual action; SR stands for single action; namely type of spring return.
Cylinder body	Extruded aluminum alloy cylinder body. The surface is treated by anticathode oxidation which greatly improves the rigidity and anti-corrosion. The internal surface of cylinder is honed and processed so that the friction coefficient is low and the service life is long.
Baring	The output axis and the piston have chosen high quality bearing which have good stability and sealing, low friction coefficient, large range of applicable temperature and long service lift.
"O"Seal ring	Common type: nitrile butadiene oil resistant rubber. Fluoroelastomer and silicon rubber are used in applicable situation of high and low temperature. Use relevant lubricant.
Regulation of stroke	There are two individual travel set screws on the front face of the cylinder body, the travel can be adjusted $\pm 5^\circ$ exactly between 0° and 90° location which keeps in line with the open and close position of the valve.
Multi functional indicator	Inside there are 4x4 standard groove and M6 internal screwed hole which can be smartly mounted with accessories and all-purpose sensor. Embedment of different colors makes visual feeling clear. Embedment of stainless steel is used to install accessible sensor.
Output axis	There are inner octagonal hole at the lower end which accord with ISO05211/DIN3337 and can be expediently carried out interchange of parallel square and diagonally square. Key connections which appointed by users can be available.
Air port	Accord with VDI/VDE3845NAMUR, criterion which can be simply and easily mounted with solenoid valve.
Design of single return	The operation organ of single and dual action have the same cylinder bodies and end shields. It is assembled type pre-load spring groupware. By increasing or removing spring and realizing scene conversion.
Mounting hole	Top mounting hole accords with VDI/VDE3845 which can mounted with locator limit switch box. Bottom mounting hole accords with ISO05211/DIN3337 which can easily mounted with valve, manual organ or bracket.

#### **Operation principle and rotation direction:**



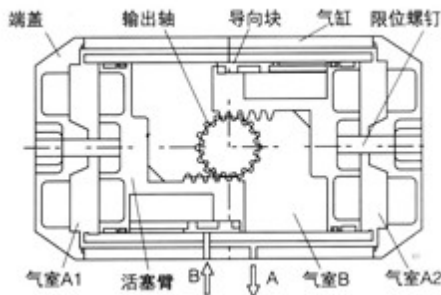
when pressure of air supply enters from port 2 and forces pistons to detach and move toward direction of end shields,

air exhausts from port 4,thus anti-clockwise turning is made.when pressure of air supply enters from port 4 and force pistons to fold,the air exhausts from port 2,thus clockwise turning is made.

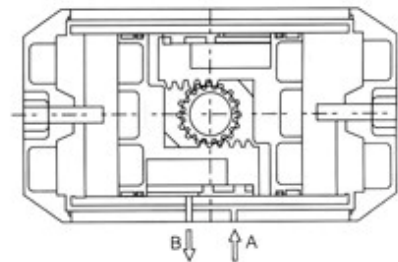


when pressure of air supply enters from port 2and forces pistons to detach and move toward direction of end shields, while compresses the spring, air exhausts from port 4,thus anti-clockwise turning is made. when it is out of or power failure, the spring pushes piston folding and air exhausts from 2,then clockwise turning is made. According to requirements, AIRTORQUE carries out special for swift operation organ and it's the service lift is related yo ordinary operation time.

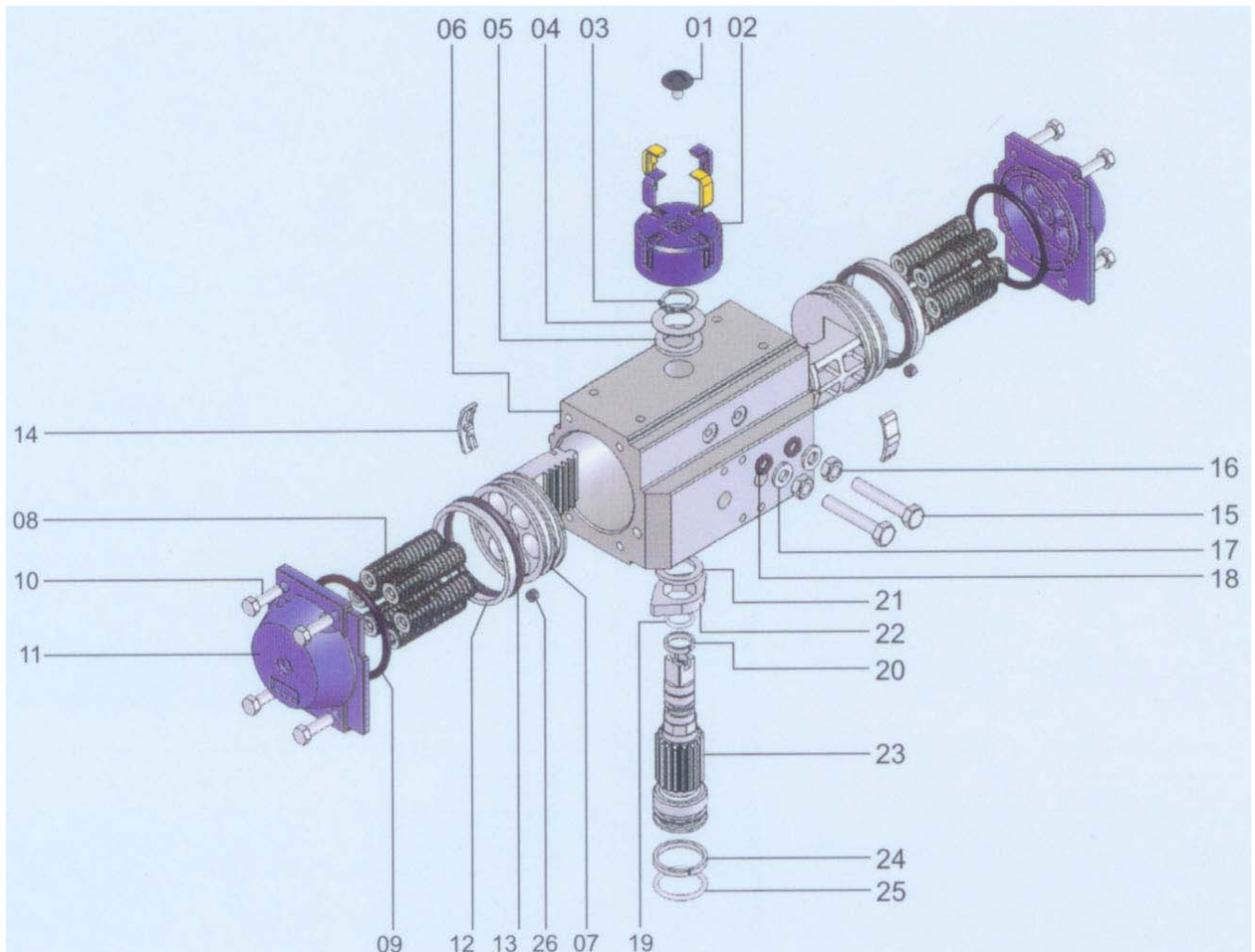
**Dual Action:**



Port B is fed with air, port A losses air,Pushes. two-piston separated and moved to both ends while the output axis turns anti-clockwise.



Port A is fed with air and port B losses air,Pushing two pistons folded and moved to the center point while the output axis turns clockwise.



**Part Name and Material:**

No.	Part Name	Qty	Material	Available Material
01	Stub	1	Platic	
02	Position indicator	1	Nylon	
03	Spring washer	1	Stainless Steel	
04	Pushing Washer	1	Stainless Steel	
05	Pushing Bearing	1	PTFE	
06	Body	1	Extruded Aluminum	
07	Pistons	2	Cast Aluminum	
08	Spring	0-12	Spring Steel	
09	O-ring	2	NBR	Viton
10	Stub	8	Stainless Steel	
11	Cap	2	Cast Aluminum	
12	Pistons Bearing	2	PTFE	
13	Piston O-ring	2	NBR	Viton
14	PISTON THRUST BLOCK	2	PTFE	
15	Stop Bolt	2	Stainless Steel	
16	Nut	2	Stainless Steel	
17	Washer	2	Stainless Steel	
18	Stop Bolt O-Ring	2	NBR	Viton
19	Top Pinion O-Ring	1	NBR	Viton
20	Top Pinion Bearing	1	PTFE+15% Graphite	
21	Pinion Spacer Ring	1	PTFE+15% Graphite	
22	Stop Adjustment	1	Alloy steel	
23	Pinion	1	Alloy Steel	Stainless Steel
24	Low Pinion Bearing	1	PTFE+15% Graphite	
25	Low Pinion Ring	1	NBR	Viton
26	Anti-friction Ring	2	NBR	

Model No.	Type	Spring Num.	ISO5211 Flange	Stem square	O-Ring
ANFL-050	D=DUO ACTION CLOCKWISE STD	5	F03-F05	11mm	STD: NBR (Normal)  HT: High Tempareture  LT: low Tempareture
ANFL-065			F05-F07	14mm	
ANFL-075			F05-F07	17mm	
ANFL-085			F05-F07	17mm	
ANFL-110	S=SPRING RESET CLOCKWISE STD	8	F07-F10	22mm	
ANFL-125			F07-F10	22mm	
ANFL-160			F10-F12	27mm	
ANFL-200			F14	36mm	
ANFL-240	S0=SPRING RESET SPRING OPEN	12	F16	46mm	
ANFL-270			F16	46mm	
ANFL-300			F25	55mm	

**Dual Action Operation Organ Output Drawing:**

**Torque of Duo Action Type:**

Model No.	AIR PRSSURE (BAR)								
	3	3.5	4	4.5	5	5.5	6	7	8
ANDAFL-050	10.7	12.50	14.32	16.08	17.84	19.68	21.44	25.04	28.56
ANDAFL-065	19.6	22.8	26.08	29.4	32.7	35.8	39.1	45.6	51.2
ANDAFL-075	35.0	40.7	46.5	52.4	58.2	64.0	69.8	81.4	93.1
ANDAFL-085	52.2	60.9	69.6	78.3	86.9	95.9	104.5	121.6	138.7
ANDAFL-110	129	150	172	193	215	236	258	301	344
ANDAFL-125	166	194	222	249	277	305	332	388	443
ANDAFL-140	261	304	348	391	435	478	522	609	696
ANDAFL-160	340	397	454	511	567	624	681	794	908
ANDAFL-200	638	745	851	957	1064	1170	1276	1489	1702

**Single Action Type (Spring Return):**

↑ B ↓ A

B口进气，A口失气，推动两活塞分开，向两端移动，输出轴逆时针方向转动。  
Pushes two-piston separated and moved to both ends while the output axis turns anti-clockwise.

↓ B

B口失气，弹簧力推动两活塞合拢，向中心移动，输出轴顺时针方向转动。  
B port losses air, spring force pushes two Piston folded and moved to the center point while the output axis turns clockwise.

**安装形式**

关	开	关	开
A	B	C	D

**单动作执行机构力矩输出图 Single action operation organ torque output drawing**



**Torque of Single Action Type:**

MOD	SET	Spring Torque (N.M)		Torque (N.M)																	
				3Bar		3.5Bar		4Bar		4.5Bar		5Bar		5.5Bar		6Bar		7Bar		8Bar	
		0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90
ANSA FL-050	2	5.35	8.92			10.26	6.70	12.49	9.56	14.72	11.16	16.95	13.39	19.18	15.62	21.42	17.86	25.90	22.34	30.38	26.82
	3	8.02	13.38			7.59	2.24	9.82	4.47	12.05	6.70	14.28	8.93	16.51	11.16	18.75	13.40	23.23	17.88	27.71	22.36
	4	10.70	17.84							9.37	2.24	11.60	4.47	13.83	6.70	16.07	8.94	20.55	13.42	25.03	17.90
	5	13.38	22.30											11.16	2.24	13.40	4.48	17.88	8.96	22.36	13.44
	6	16.05	26.76													10.72	0.00	15.18	4.48	19.66	8.96
ANSA FL-065	2	9.77	16.29			18.73	12.22	22.80	16.29	26.87	20.36	30.94	24.43	35.01	28.50	39.08	32.57	47.23	40.72	55.38	48.87
	3	14.66	24.43			13.84	4.07	17.91	8.14	21.98	12.21	26.05	16.28	30.12	20.35	34.19	24.42	42.34	32.57	50.49	40.72
	4	19.55	32.58					12.02	0.00	17.94	4.07	21.16	8.14	25.23	12.21	29.30	16.28	37.45	24.43	45.60	32.58
	5	24.44	40.72									16.29	0.00	20.36	4.07	24.43	8.15	32.58	16.30	40.73	24.45
	6	29.33	48.87													19.55	0.00	27.70	8.15	35.85	16.30
ANSA FL-075	2	11.10	17.30	23.80	17.60	29.70	23.40	35.50	29.20	41.30	35.00	47.10	40.90								
	3	13.30	20.80	21.60	14.10	27.50	19.90	33.30	25.80	39.10	31.60	44.90	37.40	50.70	43.20						
	4	19.90	31.20			23.00	13.00	28.80	18.80	34.70	24.70	40.50	30.50	46.30	36.30	52.10	42.10	63.70	53.70		
	5	24.30	38.10							30.20	17.70	36.10	23.60	41.90	29.40	47.70	35.20	61.50	46.80	71.00	58.50
	6	26.50	14.50											37.50	22.40	43.30	28.30	54.90	39.90	66.50	51.50
ANSA FL-085	2	14.23	23.15	30.81	21.01	38.55	28.75	46.29	36.49	54.03	44.23	61.77	51.97	69.51	59.71	77.25	67.45	92.73	82.93	108.21	98.41
	3	21.35	34.72	22.99	8.23	30.73	15.97	38.47	23.71	46.21	31.45	53.95	53.95	61.69	46.93	69.43	54.67	84.91	70.15	100.39	85.83
	4	28.47	46.30			22.90	3.31	30.64	11.05	38.38	18.79	46.12	46.12	53.86	34.27	34.27	61.60	77.08	57.49	92.56	72.97
	5	35.59	57.87							30.56	6.07	38.30	38.30	13.81	21.55	21.55	53.78	69.26	44.77	84.74	60.25
	6	42.71	69.45									30.47	30.47	1.09	8.83	8.83	45.95	61.43	32.07	76.91	47.55
ANSA FL-110	2	31.96	51.97	64.87	42.89	81.53	59.55	98.19	76.21	114.85	92.87	131.51	109.53	148.17	126.19	164.83	142.85	198.15	176.17	231.47	209.49
	3	47.94	77.96	47.31	14.32	63.97	30.98	80.63	47.64	97.29	64.30	113.95	80.96	130.61	97.62	147.27	114.28	180.59	147.60	213.91	180.92
	4	63.92	103.95			46.41	2.42	63.07	19.08	79.73	35.74	96.39	52.40	113.05	69.06	129.71	85.72	163.03	119.04	196.35	152.36
	5	79.90	129.94							62.17	7.18	78.83	23.84	95.49	40.50	112.15	57.16	145.47	90.48	178.79	123.80
	6	95.88	155.93											77.93	11.95	94.59	28.61	127.91	61.93	161.23	95.13
ANSA FL-125	2	56.06	91.16	99.13	60.56	125.91	87.34	152.69	114.12	179.47	140.90	206.25	167.25	233.03	194.46	259.81	221.24	313.38	274.80	366.95	328.36
	3	84.09	136.75	68.33	10.46	95.11	37.24	121.89	64.02	148.67	90.80	175.45	117.58	202.23	144.36	229.01	171.14	282.58	224.70	336.15	278.26
	4	112.12	182.33					91.09	13.93	117.87	40.71	144.65	67.49	171.43	94.27	198.21	121.05	251.78	174.61	305.35	228.17
	5	140.15	227.92									113.84	17.39	140.62	44.17	167.40	70.95	220.97	124.51	274.54	178.07
	6	168.19	273.50													136.59	20.88	190.16	74.44	243.73	128.00
ANSA FL-140	2	74.29	120.81	156.03	104.91	195.64	144.52	235.52	184.13	274.86	223.74	314.47	263.35	354.08	302.96	393.69	342.57	472.91	421.79	552.13	501.01
	3	111.44	182.21	115.20	38.53	154.81	78.14	194.42	117.75	234.03	157.36	273.64	196.97	313.25	236.58	352.86	276.19	432.08	355.41	511.30	434.63
	4	148.59	241.62			133.99	11.76	153.60	51.37	193.21	90.98	232.82	130.59	272.43	170.20	312.04	209.81	391.26	289.03	470.48	368.25
	5	185.74	302.02							152.39	24.60	192.00	64.21	231.61	103.82	271.22	350.44	350.44	222.65	429.66	301.87
	6	222.89	362.43											190.78	37.45	230.39	309.61	309.61	156.28	388.83	235.50
ANSA FL-160	2	104.76	171.77	214.04	140.41	268.90	195.27	323.76	250.13	378.62	304.99	433.48	359.85	488.34	414.71	543.20	469.57	652.92	579.29	762.64	689.01
	3	157.14	257.65	156.48	46.03	211.34	100.89	266.20	155.75	321.06	210.61	375.92	265.47	430.78	320.33	485.64	375.19	595.36	484.91	705.08	594.63
	4	209.52	343.54			153.78	6.51	208.64	61.37	263.50	166.23	318.36	171.09	373.22	225.95	428.08	280.81	537.80	390.53	647.52	500.25
	5	261.90	429.42							205.94	21.85	260.80	76.71	315.66	131.57	370.52	186.43	480.24	296.15	589.96	405.87
	6	314.28	515.31											258.10	37.20	312.96	92.06	422.68	201.78	532.40	311.50
ANSA FL-200	2	190.14	316.90	332.63	193.33	422.88	283.58	513.13	373.83	603.38	464.08	693.63	554.33	783.88	583.44	874.13	734.83	1055	915.33	1235.1	1096
	3	285.21	475.35	228.16	19.21	318.41	109.46	408.66	199.71	498.91	289.96	589.16	380.21	679.41	470.46	769.66	560.71	950.16	741.21	1130.6	921.71
	4	380.28	633.80					304.18	25.59	394.43	115.84	484.68	206.09	574.93	296.34	665.18	386.59	845.68	567.09	1026.2	747.59
	5	475.35	792.25									380.21	31.97	470.46	122.22	560.71	212.47	741.21	392.97	921.71	573.47
	6	570.42	950.70													456.24	38.40	636.74	218.90	817.24	399.40

**Selection of pneumatic operation organ:**

Dual action; Under normal operating condition, recommended reliable coefficient of dual action operation organ is 15-20%

For example; torque of valve=50N.m

Reliable coefficient (20%)

Torque of operation organ =  $50 \times 1.2 = 60 \text{N.m}$

Pressure of air supply = 0.5Mpa

Refer to list, under pressure of 5bar, dual action operation organ at least generates DA85 by 60N.m.

**Single action :**

There are two kinds of output torque ;

First, it is gained by compressing the spring resulting from compressing air. In such condition, force created by pressure of air supply forcing pistons subtracts created by compressed spring, and output torque descends gradually from max. of jumping-off till 90° which is minimum.

Second, it is gained by resting force of spring when air exhausts. In such condition, because of gradual elongation of spring, output torque descends from max. of 90° to minimum of 0°.

For example; valve moment = 80N.m

Confidence coefficient (20%)

Pressure of air supply = 4bar

Torque of operation organ =  $80 \times 1.2 = 96 \text{N.m}$

Refer to list, the selected single action operation organ is SR140 s3

while under air source pressure, minimum torque is 117.75N.m

when the spring resets, minimum torque is 111.44N.m

when butterfly valve is closed, the torque turned on is large, single action operation organ can be economically selected through skillful use of opening and closing of air exhaustion.



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