

WAK

PNEUMATIC ACTUATOR

Valves and valve equipment

Design

WAK series pneumatic actuators are aluminum alloy actuator which incorporate latest mechanical technology, materials available and our patented technology, through designing, developing, testing and engineering application, we have obtained a high grade product with the characteristics of reliability, high performance, long cycle life, large adjustment, highest levels of corrosion protection, wide selection of model with easy and economy.

Structure

1. Indicator

Position indicator with NAMUR is convenient for mounting accessories such as limit switch box, positioner and so on.

2. Pinion

The pinion is high-precision and integrative, made from nickel alloy steel, full conform to the latest standards of ISO5211, DIN3337, NAMUR. The dimensions can be customized and the stainless steel is available.

3. Actuator body

According to the different requirements, the extruded aluminum alloy ASTM6005 body can be treated with



hard anodized, powder polyester painted (different colors is available such as blue, orange, yellow etc.) or PTFE or nickel plated.

4. End caps

Die-casting aluminum powder polyester painted in different colors, PTFE or nickel plated.

5. Pistons

The twin rack pistons are made from die-casting aluminum treated with hard anodized or made from cast steel with galvanization .Symmetric mounting position, long cycle life and fast operation, reversing rotation by simply inverting the pistons.

6. Travel adjustment

external stroke adjustment screw can adjust $\pm 4^\circ$ at the position of 90° .

7. High performance springs

Preloaded coating springs are made from the high quality material for resistant to corrosion and longer cycle life, which can be demounted safely and conveniently to satisfy different requirements of torque by changing quantity of springs.

8. Bearings & guides

Made from low friction, long-life compound material, to avoid the direct contact between metals. The maintenance and replacement are easy and convenient.

9. O-rings

NBR rubber o-rings provide trouble-free operation at standard temperature ranges. For high and low temperature, viton or silicone is used.

Features

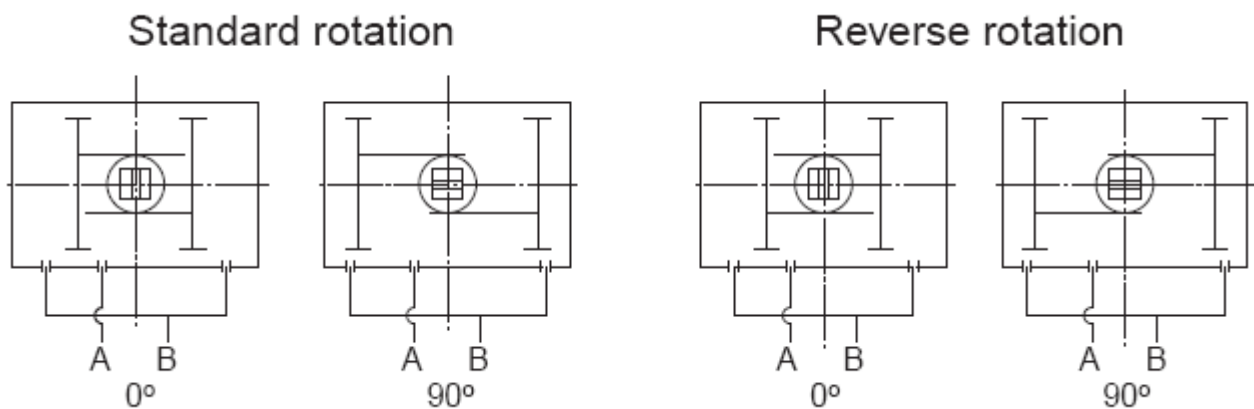
-Extruded aluminum ASTM6005 body with both internal and external corrosion protection having honed cylinder surface for longer life and low coefficient of friction.

-Dual piston rack and pinion design for compact construction, symmetric mounting position, high -cycle life

- 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 coated spring for simple versatile range, greater safety and corrosion resistance, longer cycle life.
- Die-casting teeth on piston and pinion for accurate low backlash make rack and pinion engagement with maximum efficiency, having long term corrosion resistance with stainless steel fasteners.
- Full conformance to the latest specifications:ISO5211, DIN3337 and NAMUR or product interchangeability and easy mounting of solenoids, limit switches and other accessories.

Operating Principle

Double acting



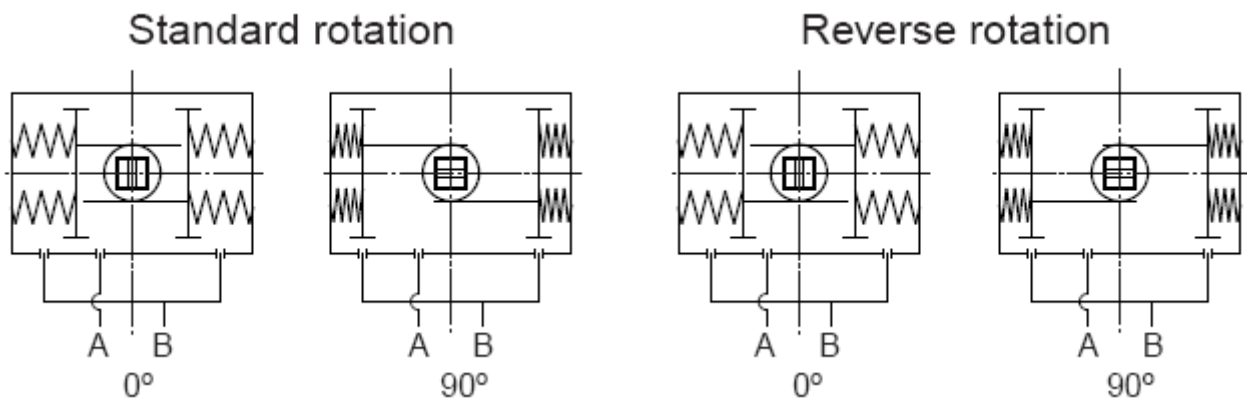
Standard rotation:

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

Reverse rotation:

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

Spring return



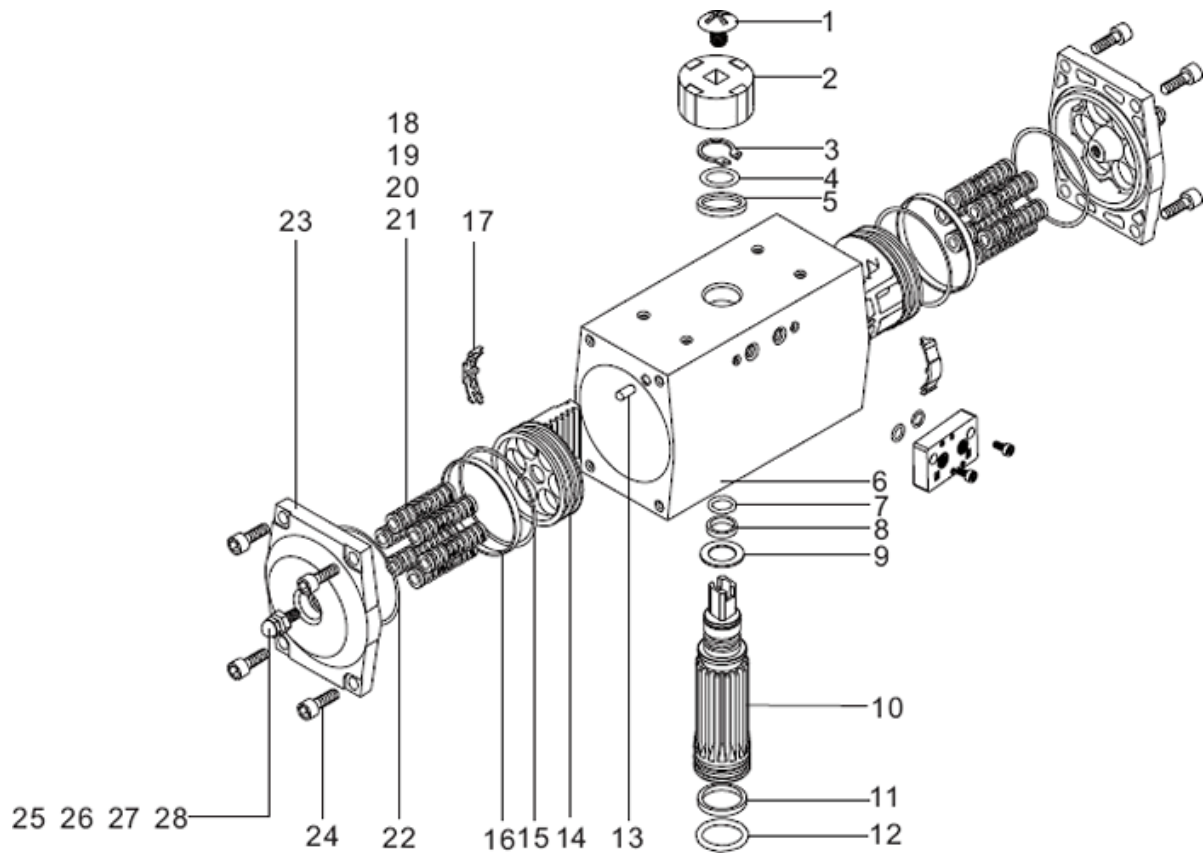
Standard rotation:

Air to port A forces the pistons outwards, causing the springs to compress, the pinion turns counter clockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The pinion turns clockwise while air is being exhausted from port A.

Reverse rotation:

Air to port A forces the pistons outwards, causing the springs to compress, the pinion turns clockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The pinion turns counter clockwise while air is being exhausted from port A.

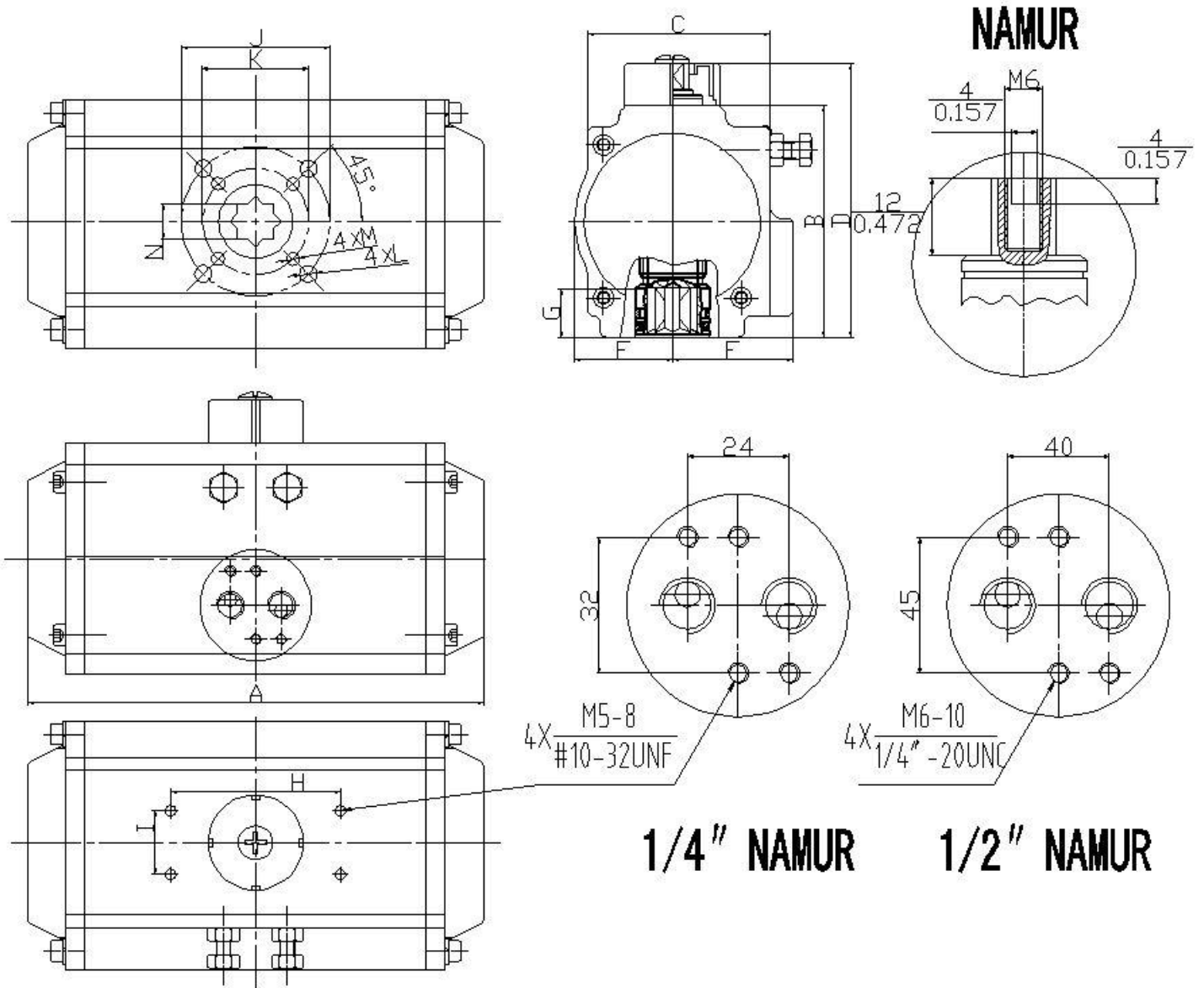
Assemble, Parts and Material



No.	Description	Qty	Standards Material
1	Indicator Screw	1	plastic
2	Indicator	1	plastic
3	Snap Ring	1	Stainless steel
4	Washer	1	Stainless steel
5	Outside Washer	1	Polyoxymethylene
6	Body	1	Aluminum alloy
7	O-ring(Top)	1	Viton/NBR
8	Bearing Top	1	Polyoxymethylene
9	Inside Washer	1	Polyoxymethylene
10	Pinion	1	Alloy steel
11	Bearing Bottom	1	Polyoxymethylene
12	O-ring Bottom	1	Viton/NBR
13	Plug	2	NBR
14	Piston	2	Die-casting aluminum/steel
15	Piston O-ring	2	Viton/NBR
16	Piston Bearing	2	Polyoxymethylene
17	Guide Piston	2	Nylon66
18	Spring	*	Spring steel
19	Spring Retainer(L)	*	Nylon66

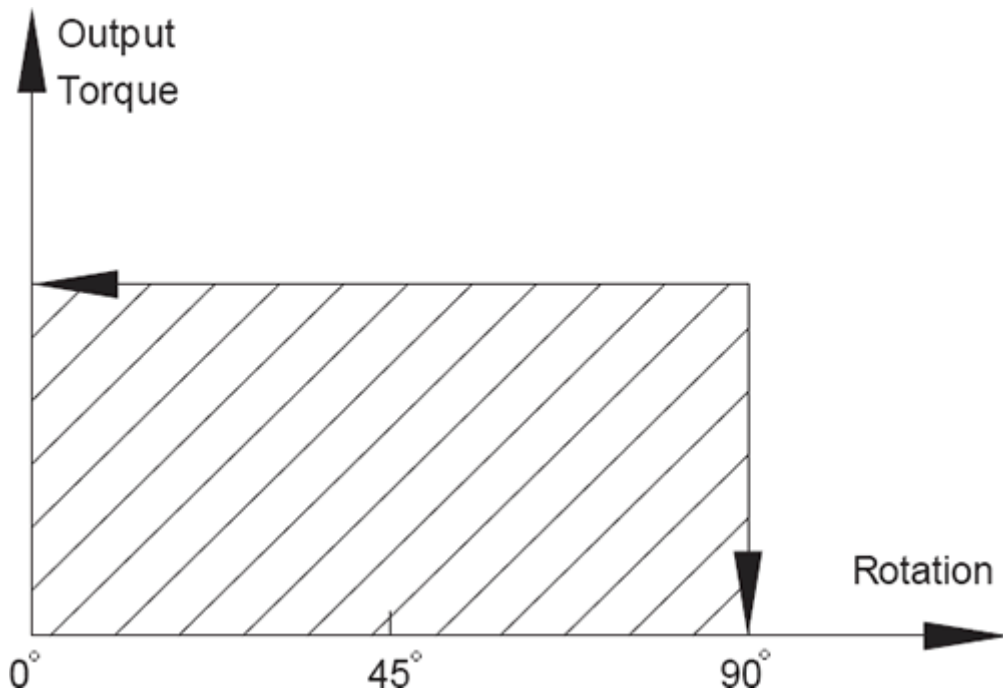
20	Spring Retainer(R)	*	Nylon66
21	Retainer Connector	*	Brass
22	End-Cap O-ring	2	Viton/NBR
23	End-Cap	2	Die-casting aluminum
24	End-Cap Stop Screw	8	Stainless steel
25	Adjust Screw	2	Stainless steel
26	Adjust Screw Nut	2	Stainless steel
27	Adjust Screw Washer	2	Stainless steel
28	Adjust Screw O-ring	2	Viton/NBR

Dimension



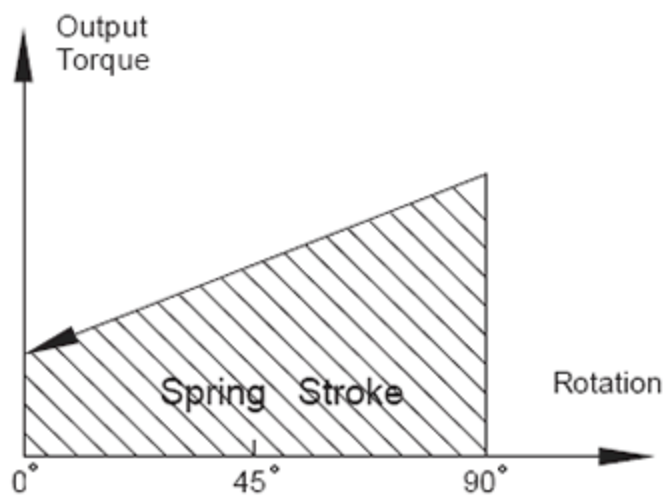
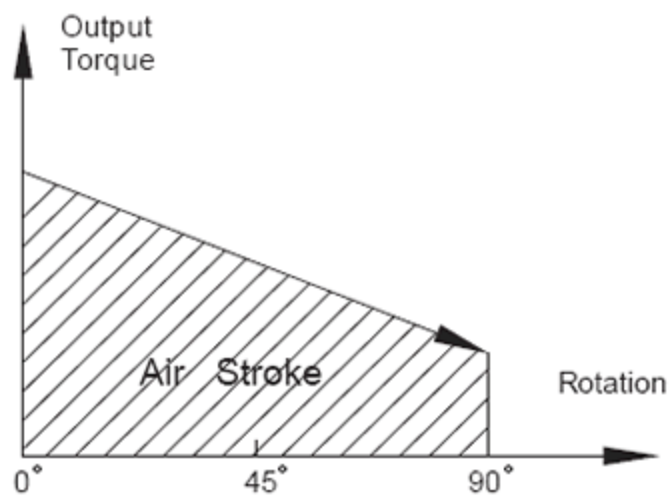
Model	A	B	C	D	E	F	G	H	I	N	J	K	L	M	AIR CONNERCTIO N
HIC-032	110	45	45	65	22.5	22.5	12	50	25	9	F03		M5x7.5		1/8"
	4.33	1.77	1.77	2.56	0.89	0.89	0.47	1.97	0.98	0.35			#10-24UNF		
HIC-052	160	72	65	92	30	41.5	14	80	30	11	F05	F03	M6*10	M5x7.5	1/8" or 1/4"(std)
	6.30	2.83	2.56	3.62	1.18	1.63	0.55	3.15	1.18	0.43				1/4"-20UNC	
HIC-063	190	88	72	108	36	47	18	80	30	14	F07	F05	M8*13	M6*10	1/8" or 1/4"(std)
	7.48	3.46	2.83	4.25	1.42	1.85	0.71	3.15	1.18	0.55				5/16"-20UNC C	
HIC-075	206	100	81	120	42	53	20	80	30	14	F07	F05	M8*13	M6*10	1/8" or 1/4"(std)
	8.11	3.94	3.19	4.72	1.65	2.09	0.79	3.15	1.18	0.55				5/16"-20UNC C	
HIC-083	216	109	92	129	46	57	21	80	30	17	F07	F05	M8*13	M6*10	1/8" or 1/4"(std)
	8.5	4.29	3.62	5.08	1.81	2.24	0.83	3.15	1.18	0.67				5/16"-20UNC C	
HIC-092	260	117	98	137	50	58.5	22	80	30	17	F07	F05	M8*13	M6*10	1/8" or 1/4"(std)
	10.24	4.61	3.86	5.39	1.97	2.30	0.87	3.15	1.18	0.67				5/16"-20UNC C	
HIC-105	286	133	110	153	58	62	26	80	30	22	F10	F07	M10*16	M8*13	1/4"
	11.26	5.24	4.33	6.02	2.28	2.44	1.02	3.15	1.18	0.87				3/8"-20UNC	
HIC-125	340	155	125.5	175	67.5	75	27.5	80	30	22	F10	F07	M10*16	M8*13	1/4"
	13.39	6.10	4.94	6.89	2.66	2.95	1.08	3.15	1.18	1.06				3/8"-20UNC	
HIC-140	412	173	137.5	193	75	77	32	80	30	27	F12	F10	M12*20	M10*16	1/4"
	16.22	6.81	5.41	7.60	2.95	3.03	1.26	3.15	1.18	1.06				1/2"-20UNC	
HIC-160	480	198	158	218	87	87	34	80	30	27	F12	F10	M12*20	M10*16	1/4"
	18.90	7.80	6.22	8.58	3.43	3.43	1.34	3.15	1.18	1.06				1/2"-20UNC	
HIC-190	538	232	189	262	103	103	40	130	30	36	F14		M16*24		1/4"
	21.18	9.13	7.44	10.3	4.06	4.06	1.57	5.12	1.18	1.42			5/8"-20UNC		
HIC-210	568	257	210	287	113	113	40	130	30	36	F14		M16*24		1/4"
	22.36	10.12	8.27	11.30	4.45	4.45	1.57	5.12	1.18	1.42			5/8"-20UNC		
HIC-240	660	291	245	321	130	130	49	130	30	46	F16		M20*26		1/4" or 3/8"(std)
	26.0	11.46	9.65	12.64	5.12	5.12	1.93	5.12	1.18	1.81			3/4"-20UNC		
HIC-270	740	330	273	360	147	147	49	130	30	46	F16		M20*26		1/4" or 3/8"(std)
	29.13	13.0	10.57	14.17	5.79	5.79	1.93	5.12	1.18	1.81			3/4"-20UNC		

Out torque table of double acting



OUTPUT TORQUE OF DOUBLE ACTING ACTUATORS (Unit:Nm)						
Model	Air supply pressure (Unit:Bar)					
	3	4	5	6	7	8
HIC-GT32	4.6	6.1	7.6	9.2	10.7	12.2
HIC-AT052	12.0	16.0	20.0	24.0	28.0	32.0
HIC-AT063	21.7	28.9	36.1	43.4	50.6	57.8
HIC-AT075	35.0	46.6	58.3	69.9	81.6	93.2
HIC-AT083	42.8	57.0	71.3	85.5	99.8	114.0
HIC-AT092	67.6	90.1	112.6	135.2	157.7	180.2
HIC-AT105	97.7	130.3	162.9	195.5	228.0	260.6
HIC-AT125	173.3	231.0	288.8	346.5	404.3	462.0
HIC-AT140	260.7	347.6	434.5	521.4	608.3	695.2
HIC-AT160	397.2	529.6	662.0	794.4	926.8	1059.2
HIC-AT190	640.2	853.6	1067.0	1280.4	1493.8	1707.2
HIC-AT210	879.8	1173.1	1466.4	1759.4	2052.9	2346.2
HIC-AT240	1379.0	1838.6	2298.3	2757.9	3217.6	3677.2
HIC-AT270	1939.2	2585.6	3232.0	3878.4	4525.8	5171.2

Out torque table of spring return



OUTPUT TORQUE OF SPRING RETURN ACTUATORS (Unit:Nm)

OUTPUT TORQUE OF SPRING RETURN ACTUATORS (Unit:Nm)													
Output torque of air to springs												Springs' output	
Air pressure		3Bar		4Bar		5Bar		6Bar		7Bar			
Model	Spring	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
	Q.ty	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
HIC-AT052	5	8.1	5.8	13.1	9.8							3.9	6.2
	6	7.3	4.6	12.3	8.9							4.7	7.4
	7	6.5	3.3	10.5	7.3							5.5	8.7
	8			10.1	6.4	14.2	10.5					6.3	9.9
	9			8.9	4.9	12.9	8.9					7.1	11.1
	10			8.5	3.9	12.6	8.0	16.8	12.1			7.9	12.4
	11			7.3	2.4	11.3	6.4	15.3	10.4	19.3	14.4	8.7	13.6
	12					11.0	5.5	15.2	9.6	18.5	13.1	9.5	14.9
HIC-AT063	5	14.6	13.6	21.8	20.8							7.1	8.1
	6	13.2	8.7	20.4	15.9							8.5	13
	7			19.0	13.8	26.2	20.1					9.9	15.1
	8			17.6	11.6	24.9	18.8					11.3	17.3
	9			16.0	9.4	23.4	16.6					12.7	19.5
	10			14.8	7.6	22.1	14.5	29.2	21.7	36.4	28.9	14.1	21.6
	11					20.6	12.3	27.9	19.6	35.1	26.8	15.5	23.8
	12					19.3	10.2	26.4	17.4	33.6	24.6	17	26
HIC-AT075	5	24.2	20.3	35.8	31.9							10.8	14.7
	6	18.9	13.1	29.5	23.4							12.9	17.6
	7	16.7	11.2	27.3	21.8							15.1	20.6
	8			25.2	17.5	35.8	27.8					17.2	23.5
	9			23	16	33.6	26.6					19.4	26.4
	10			20.9	11.6	31.5	21.9	42.6	32.2	60.1	52.2	21.5	29.4
	11			18.7	10.1	29.3	20.1	38.3	29.7	57.9	49.3	23.7	32.3

	12					27.2	16	36.3	26.3	55.8	46.3	25.8	35.3
HIC-AT083	5											14.8	20.6
	6	25.1	18.1	39.3	32.2							17.7	24.7
	7											20.7	28.8
	8			33.4	24.1	47.7	38.4					23.6	32.9
	9											26.6	37
	10			27.2	15.9	41.8	30.2	56	44.4	70.3	58.7	29.5	41.1
	11											32.5	45.2
	12					35.9	22	50.1	36.2	64.4	50.5	35.4	49.4
HIC-AT092	5											23	32.9
	6	40	28.1	62.5	50.6							27.6	39.5
	7											32.3	46.1
	8			53.3	37.4	75.8	59.9					36.8	52.7
	9											41.4	59.3
	10			44.1	24.2	66.6	46.7	94.6	69.4	111.7	91.9	46	65.9
	11											50.6	72.5
	12					57.4	33.5	80	56.2	102.5	78.7	55.2	79.1
HIC-AT0105	5											31.8	49.3
	6	59.6	38.5	92.2	71.1							38.1	59.2
	7											44.5	69
	8			79.5	51.4	107.1	84					50.8	78.9
	9											57.2	88.8
	10			66.8	31.7	99.4	64.3	132	86.8	164.5	129.3	63.5	98.6
	11											69.9	108.5
	12					86.7	44.6	119.3	77.1	151.8	109.6	76.2	118.4
HIC-AT125	5											57.5	86.3
	6	104	70	162	128							69	103.5
	7											75.9	113.9
	8			139	93	197	151					92	138
	9											103.5	155.3
	10			116	59	174	116	232	174	289	232	115	172.5
	11											126.5	189.8
	12					151	82	209	140	266	197	138	207
HIC-AT140	5											86.9	130
	6	156	105	243	200							104.3	156
	7											121.6	182
	8			209	140	296	227					139	208
	9											156.4	234
	10			174	88	261	175	348	261	435	348	173.8	260
	11											191.1	286
	12					226	123	313	209	400	296	208.5	312
HIC-AT160	5											134.4	196.6
	6	236	161	368	294							161.3	236

	7											188.1	275.3
	8			315	215	447	347					215	314.6
	9											241.9	353.9
	10			261	136	393	269	526	401	658	534	268.8	393.3
	11											295.6	432.6
	12					339	190	472	323	604	455	322.5	471.9
HIC-AT190	5											214.4	318.5
	6	382	257	596	471							257.3	382.2
	7											300.1	445.9
	8			511	344	296	227					343	509.6
	9											385.9	573.3
	10			425	217	638	430	852	643	1066	857	428.8	637
	11											471.6	700.7
	12					553	303	766	516	979	729	514.5	764.4
HIC-AT210	5											294.4	438.8
	6	527	353	820	647							353.3	526.5
	7											412.1	614.3
	8			702	471	955	764					471	702
	9											529.9	789.8
	10			584	296	878	589	1171	882	1471	1175	588.8	877.5
	11											647.6	965.3
	12					760	413	1053	707	1353	1000	706.5	1053
HIC-AT240	5											462.5	686
	6	824	556	1284	1015							555	823.2
	7											647.5	960.4
	8			1099	741	1558	1201					740	1098
	9											832.5	1235
	10			914	467	1373	926	1833	1386	2293	1846	925	1372
	11											1017.5	1509
	12					1188	652	1648	1112	2108	1571	1110	1646
HIC-AT270	5											653.8	961.6
	6	1155	785	1801	1432							784.5	1154
	7											915.3	1346
	8			1540	1047	2186	1693					1046	1539
	9											1176.8	1731
	10			1278	662	1925	1309	2571	1955	3217	2602	1307.5	1923
	11											1438.3	2116
	12					1663	924	2309	1571	2956	2217	1569	2308

Operating Conditions

1. Operating media Dry or lubricated air, the non-corrosive gasses or oil
2. Air supply pressure Double acting:2~8Bar;Spring return:2~8Bar
3. Operating temperature Standard(NBR O-ring): -20°C~+80°C Low temperature(Silicon rubber O-ring): -40°C~+80°C

High temperature(Fluorubber O-ring): -20°C~+150°C

4. Travel adjustment

Have adjustment range of $\pm 4^\circ$ for the rotation at 90°

5. Lubrication

Under normal operating condition, need not accrete lubricant

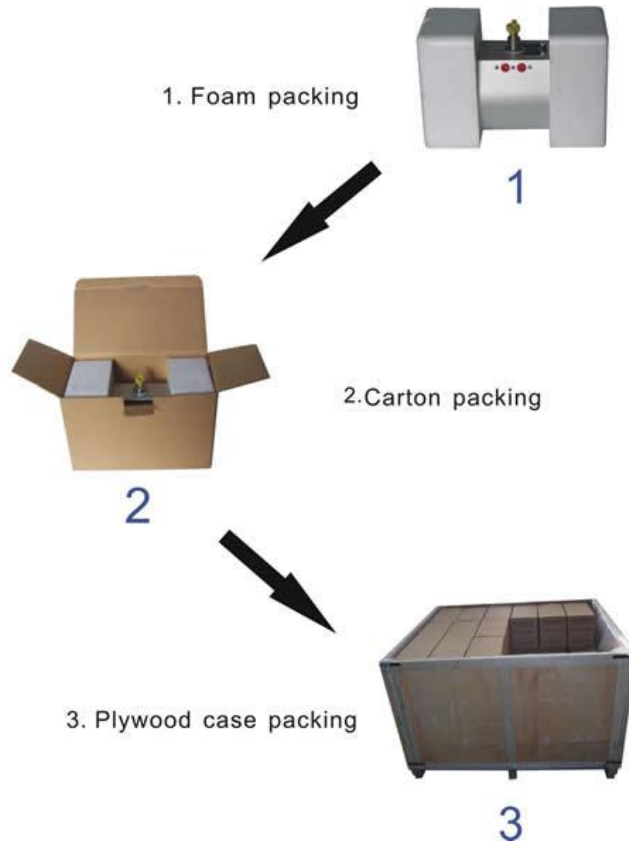
6. Application

Either indoor or outdoor

7. Highest pressure

The maximum input pressure is 10 Bar

Packing conditions : Packing in cartons with foams, then in plywood case.



WAK

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Valves and valve equipment

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