

اکچویٹور پنوماتیک

MODEL :-



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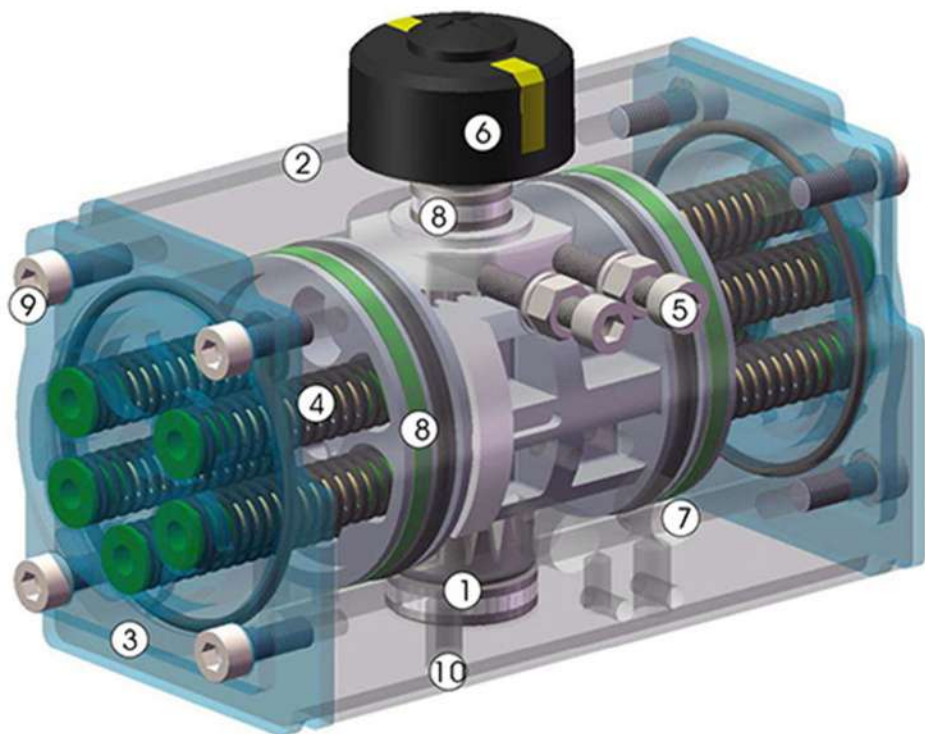
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Description And Model Preparation ATD/ATS40-400

BTD / BTS Series Of New Valve Pneumatic Actuator



BTD/BTS new rack and pinion pneumatic actuator by the zhejiang KST company combines the latest technology at home and abroad, through the three-dimensional model of innovation and optimization of CAD design, beautiful shape compact, modern styling; and adopt practical new materials, new processes, so that the product quality, more reliable; more standard selection of more affordable; products fully meet the latest international standards, technical specifications, to meet current and future needs.

- ① Dual piston rack and pinion design of symmetric structures, rapid and smooth movement, high precision, high output power by a simple change in the direction of the piston assembly positions available anti-rotation.
- ② High quality extruded aluminum alloy cylinder block, by precision machining the hole and the external surface of hard anodized (anodic oxidation under special circumstances + Teflon coating), longer life, low friction coefficient.
- ③ Integrated design, all the double acting and single-function actuator models have the same cylinder and end caps, easily removed by installing a spring or spring to change the mode of action.
- ④ Combined pre-spring break Hean whole group, whether in the assembly process or use on-site in both convenient and safe to install or change the

⑤ The external side of the two single independent adjustment screw has been number of springs, installed in the valve for the actuator is precisely to facilitate, control valve open and valve closed position, For the whole trip conditioned office is also configured in two cover a longer adjustment screws.

⑥ Multi-position indicator, on-site visual instructions, consistent with VDI/VDE3845, NAMUR standard slot, the output can be installed and all the accessories, such as limit switch box, electric positioner, position sensor (Pepperl and Fuchs, Turck).

⑦ Gas source interface line NAMURstandard, direct safety plaquesNAMUR standard solenoid valve.

⑧ Rack on the back of the composite bearing and piston guide ring and the output shaft bearings to prevent metal on metal friction and increasing lubrication, so a low friction, long life.

⑨ All fasteners are stainless steel, long-term corrosion resistance.

⑩ Connection part of the line with new international standard ISO5211, DIN3337 (F03-F25) makes products with interchangeable, versatile.

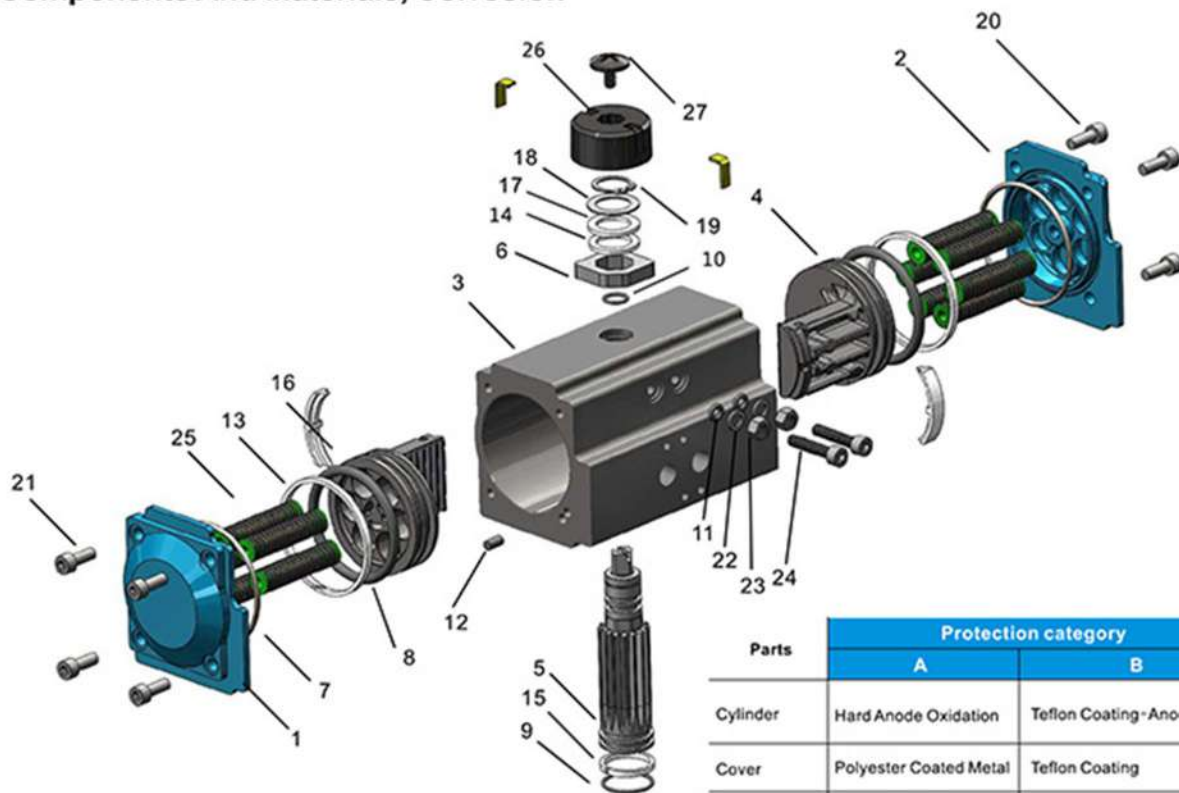
Components And Materials, Corrosion BT-D/ATS032-270

Model preparation

BT-160 S-K10 F10/12 P27-90-B-A

- ⑨. Corrosion Resistance Grade: A, B
- ⑧. Ambient Temp.: Standard-B, Low Temp.: D, High Temp.: G
- ⑦. Rotation Angle : 0°~90°, 0°~120°, 0°~180°, 3 Position , 0°~45°~90°
- ⑥. Shaft Size Code: P-Star Square, H-Parallel Opposite Hole, W Two Key Hole
- ⑤. Connection: ISO5211 Standard, Flange Size, F03-F25, Star Square, 9-55
- ④. Spring QTY: K5/K6/K7/K8/K9/K10/K11/K12/K13/K14/K15/K16, Not Available for Double Acting
- ③. Type: D-Double Acting, S-Spring Return
- ②. Cylinder Size: 40~400
- ①. BT Series Pneumatic Actuator

Components And Materials, Corrosion

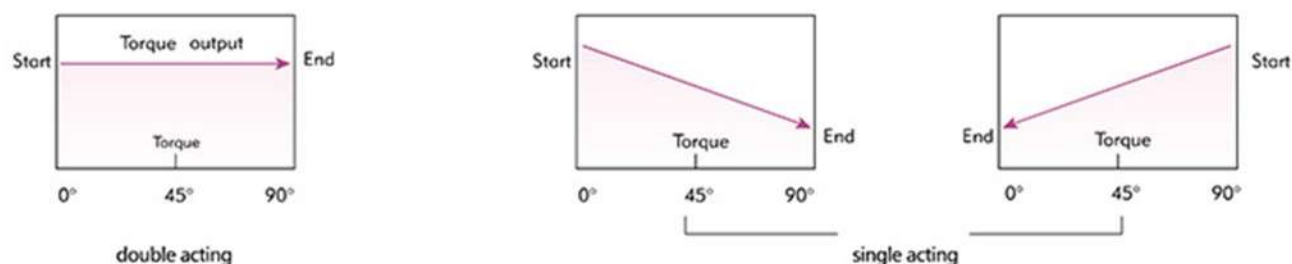


Parts	Protection category	
	A	B
Cylinder	Hard Anode Oxidation	Teflon Coating-Anode Sclerosis
Cover	Polyester Coated Metal	Teflon Coating
Output shaft	Carbon Steel Electroless Nickel Plating	Electroless Nickel Plating Or Stainless Steel
Use Occasion	General Situation	General Occasions Or Low Concentrations Of Acidic Environment

Pneumatic Actuator BT Series

Part Number	Each number	Part Name	Standard Materials	Selected Materials
01	1	Left Cover	Aluminum Die Casting	Stainless steel
02	1	Right Cover	Aluminum Die Casting	Stainless steel
03	1	body	Aluminum extrusion	Stainless steel
04	2	Piston	Aluminum Die Casting	----
05	1	Output shaft	Carbon Steel	Stainless steel
06	1	Cam adjustment	Carbon Steel	----
07 *	2	O-ring (cover)	NBR	Fluorine or silicone rubber
08 *	2	O-ring (Piston)	NBR	Fluorine or silicone rubber
09 *	1	O-ring (output shaft bottom)	NBR	Fluorine or silicone rubber
10 *	1	O-ring (output shaft at the top)	NBR	Fluorine or silicone rubber
11 *	2	O-ring (adjusting screw)	NBR	Fluorine or silicone rubber
12 *	2	Plug (Cylinder)	NBR	Fluorine or silicone rubber
13 *	2	Bearing (Piston)	POM	----
14 *	1	Bearing (output shaft at the top)	POM	----
15 *	1	Bearing (output shaft bottom)	POM	----
16 *	1	Guide with Bearing (Piston back)	POM	----
17 *	2	Thrust bearings (output shaft)	POM	----
18	2	Gasket (output shaft)	Stainless steel	----
19	1	Flexible file ring	Spring steel	----
20	8	Cover bolt	Stainless steel	----
21	8	Cover Gasket	Stainless steel	----
22	2	Gasket	Stainless steel	----
23	2	Nut	Stainless steel	----
24	2	Adjustment bolt	Stainless steel	----
25	5-16	Spring Components	Alloy spring steel	----
26	1	Position indicator	POM	----
27	1	Screw of indicator	POM	----

Torque Diagram



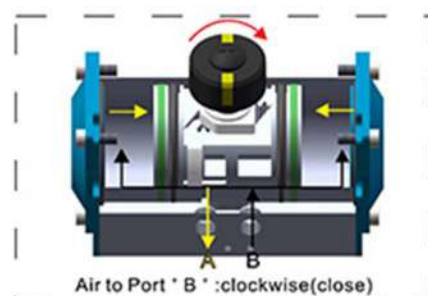
Double Acting Operation

Selection of double acting actuators

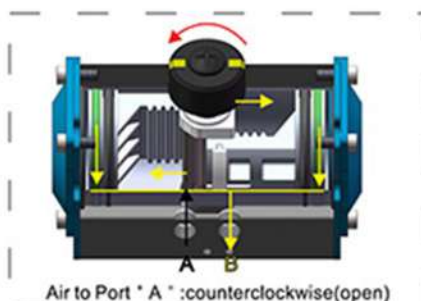
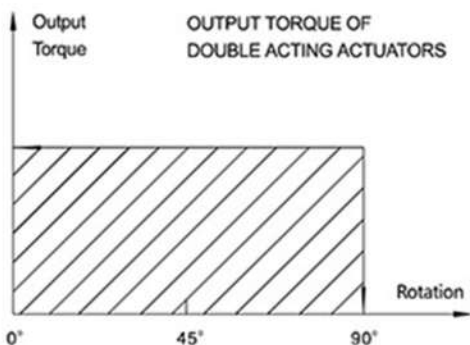
The suggested safety factor for double acting actuators under normal working conditions is 20%-30%

Example:

- The torque needed by valve=100 N.m
 - The torque considered safety factor $100 \times (1+30\%) = 130 \text{ N.m}$
 - Air Supply=5 Bar
- According to double acting torque table, we can choose the minimum model is BT-105D.



Pneumatic Actuator BT Series



* Pistons must be inverted to reverse actuator rotation

Spring Return Operation

Selection of single action actuators

Under normal operating conditions, a single actuator to consider the role of the safety factor of 30% -50%.

For example:

Valve required torque = 100N.m

Safety torque = $100 \times (1 + 30\%) = 130\text{N.m}$

according to single acting actuator output torque table, we can find AT-145S K10

Torque following

Implementation process 0° = 216.8N.m air

Implementation process 90° = 175.8N.m air

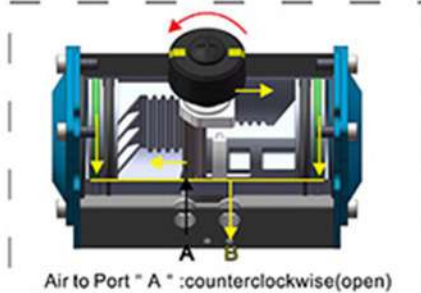
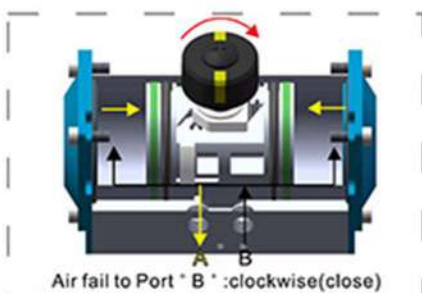
Spring stroke 0° = 172N.m

Spring stroke 90° = 258N.m

output Torque bigger than all our needs

Note:

Single action during the spring return actuators, actuator B hole ventilation does not affect actuator output torque, instead it's helpful of spring return



* Spring force makes the actuator clockwise when the air is exhausted at port "A"

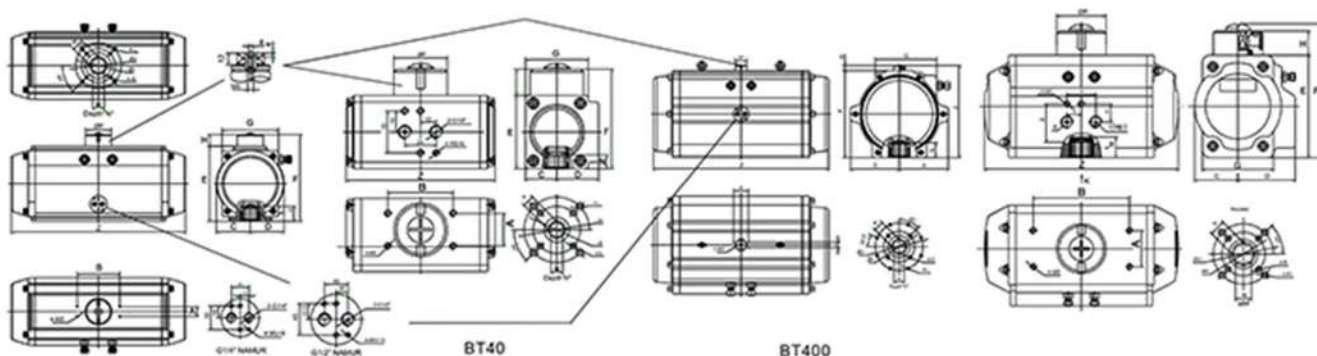
* When air fail to counterclockwise is required, the pistons must be inverted

Pneumatic Actuator BT Series

Double Acting Actuator Output Torque(Nm)

Model	Air supply pressure(Unit:Bar)								
	3bar	3.5bar	4bar	4.5bar	5bar	5.5bar	6bar	7bar	8bar
BT- 40D	5.7	6.7	7.6	8.6	9.5	10.5	11.4	13.3	15.2
BT- 52D	12.0	14.0	16.0	18.0	20.0	22.0	24.0	28.0	32.0
BT- 63D	21.0	24.5	28.0	31.5	35.0	38.5	42.0	49.0	56.0
BT- 75D	30.0	35.0	40.0	45.0	50.0	55.0	60.0	70.0	80.0
BT- 83D	45.7	53.3	61.0	68.6	76.2	83.8	91.4	106.7	121.9
BT- 92D	67.4	78.7	89.9	101.2	112.4	123.6	134.9	157.4	179.8
BT-105D	97.6	113.9	130.2	146.4	162.7	179.0	195.2	227.8	260.3
BT-125D	152.2	177.6	203.0	228.3	253.7	279.1	304.4	355.2	405.9
BT-140D	260.3	303.7	347.0	390.4	433.8	477.2	520.6	607.3	694.1
BT-160D	396.6	462.7	528.8	594.9	661.0	727.1	793.2	925.4	1057.6
BT-190D	639.3	745.9	852.4	959.0	1065.5	1172.1	1278.6	1491.7	1704.8
BT-210D	781.0	911.2	1041.4	1171.5	1301.7	1431.9	1562.0	1822.4	2082.7
BT-240D	1147.6	1338.8	1530.1	1721.3	1912.6	2103.9	2295.1	2677.6	3060.2
BT-270D	1742.9	2033.4	2323.8	2614.3	2904.8	3195.3	3485.8	4066.7	4647.7
BT-300D	2390.8	2789.3	3187.8	3586.2	3984.7	4383.2	4781.6	5578.6	6375.5
BT- 350D	3580	4176	4773	5369	5966	6563	7159	8352	9546
BT- 400D	5100	5950	6800	7650	8500	9350	10200	11900	13600

Dimensional Drawing



BT52, BT63, BT75, BT83, BT92, BT105, BT125, BT140, BT160

BT190, BT210, BT240, BT270, BT300, BT350

Dimension

Unit (mm)

Model	A	B	C	D	E	F	G	H	I	I-1	J	J-1	K	L	M	N	P	Z	Air
BT-40	25	50	24	32	56	76	48	20	36	F03	50	F05	M5×8	M6×10	9	10	42	110	1/8"
BT-52	30	80	30	42.5	72.4	92.4	50.5	20	36	F03	50	F05	M5×8	M6×10	11	14	42	150	1/4"
BT-63	30	80	36	47	88.5	108.5	69.5	20	50	F05	70	F07	M6×10	M8×13	14	18	42	171	1/4"
BT-75	30	80	42.5	53	100	120	78	20	50	F05	70	F07	M6×10	M8×13	14	18	42	186	1/4"
BT-83	30	80	46.5	57	109.5	129.5	86	20	50	F05	70	F07	M6×10	M8×13	17	21	42	206	1/4"
BT-92	30	80	50	58	117	137	90	20	50	F05	70	F07	M6×10	M8×13	17	21	42	265	1/4"
BT-105	30	80	57.5	64	135	155	104.5	20	70	F07	102	F10	M8×13	M10×16	22	26	42	272	1/4"
BT-125	30	80	67.5	74.5	157	187	120.5	30	70	F07	102	F10	M8×13	M10×16	22	26	62	304	1/4"
BT-140	30	80	75.5	75.5	174	204	125	30	102	F10	125	F12	M10×16	M12×20	27	32	62	395	1/4"
BT-160	30	130	87	87	198	228	143	30	102	F10	125	F12	M10×16	M12×20	27	32	80	462	1/4"
BT-190	30	130	103	103	231	262	172	30			140	F14		M16×25	36	40	80	552	1/4"
BT-210	30	130	113	113	257	287	194	30			140	F14		M16×25	36	40	80	556	3/8"
BT-240	30	130	130	130	292	322	230	30			165	F16		M20×30	46	50	80	630	1/2"
BT-270	30	130	147	147	331	361	253	30			165	F16		M20×30	46	50	80	750	1/2"
BT-300	30	130	161	172	354	384	290	30			165	F16		M20×30	46	50	90	772	1/2"
BT-350	30	130	190	190	410	440	334	30	165	F16	254	F25	M20×30	8-M16×25	46	50	90	860	1/2"
BT-400	30	130	262	262	466	496	330	30	165	F16	254	F25	M20×30	8-M16×25	55	72	90	938	1/2"

Air Consumption

Air Consumption

Model	Max. Pressure	Rotation Angle	Temp.	Lap No. For Each 1 Degree Stroke	Diameter	Cylinder Volume		Open/Close Time		Weight	
BT-52S	Lubrication or dry of compressed air 8bar	(0°-90°) ± 5° or full itinerary 0°-90°	B(normal) NBR O-ring -20~+80°C G(High Temperature) Viton O-ring -15~+150°C D(Low Temperature) Silicone O-ring -40~+80°C	1/6	52	0.1	0.2	DA 0.6 SR 2.0	DA 0.6 SR 0.5	DA 1.30 SR 1.42	0.0095
BT-63S				1/6	63	0.2	0.3	DA 0.7 SR 2.0	DA 0.7 SR 1.0	DA 2.05 SR 2.25	0.0135
BT-75S				1/5	75	0.3	0.5	DA 0.8 SR 2.0	DA 0.7 SR 1.0	DA 2.65 SR 2.95	0.0210
BT-83S				1/5	83	0.5	0.8	DA 0.9 SR 2.5	DA 0.8 SR 1.0	DA 3.30 SR 3.70	0.0365
BT-92S				1/5	92	0.7	1.1	DA 1.0 SR 3.0	DA 1.0 SR 1.0	DA 4.55 SR 5.30	0.0600
BT-105S				1/4	105	1.2	1.8	DA 1.5 SR 3.0	DA 1.5 SR 1.0	DA 5.80 SR 6.70	0.0730
BT-125S				1/4	125	1.5	2.3	DA 2.0 SR 4.0	DA 2.0 SR 1.0	DA 8.95 SR 10.35	0.1100
BT-140S				1/4	140	2.4	3.8	DA 2.5 SR 4.0	DA 2.5 SR 1.0	DA 13.35 SR 15.35	0.1865
BT-160S				1/4	160	3.1	4.9	DA 4.0 SR 4.0	DA 3.0 SR 1.5	DA 19.20 SR 23.10	0.2695
BT-190S				1/4	190	4.5	7.3	DA 5.0 SR 5.0	DA 4.0 SR 3.0	DA 31.05 SR 36.80	0.4792
BT-210S				1/4	210	6.8	11.2	DA 5.0 SR 6.0	DA 5.0 SR 3.0	DA 39.00 SR 45.50	0.5001
BT-240S				1/4	240	10	15.2	DA 6.0 SR 12	DA 6.0 SR 4.0	DA 53.00 SR 64.00	0.9167
BT-270S				1/4	270	14.5	21.4	DA 8.0 SR 15	DA 8.0 SR 6.0	DA 76.00 SR 95.20	1.6000
BT-300S				1/4	300	23.8	29.7	DA 12 SR 18	DA 12 SR 8.0	DA 100.0 SR 128.2	2.3500
BT-350S				1/4	350	35.1	46	DA 14 SR 20	DA 14 SR 10	DA 186.0 SR 216.0	2.5001
BT-400S				1/4	400	52.6	56	DA 15 SR 25	DA 15 SR 12	DA 243.0 SR 279.0	3.0001

Air consumption rest with Supply. Air volume and Action cycle times, expressions

$$L/Min = \text{Air volume} (\text{Air volume Opening} + \text{Air volume closing}) \times [(\text{Air Supply (Kpa)} + 101.3) \div 101.3] \times \text{Action cycle times} / (\text{min})$$

Common aults and inspection, troubleshooting

Failure phenomenon	Inspection Items	Solution
Pneumatic valve can not move	1. When solenoid valve is normal, coil is burned or not, or whether solenoid valve core is blocked by foreign matter.	Solenoid valve replacement, replacement coils, remove stolen property.
	2. Test the pneumatic actuator separately with air supply, check whether sealing ring and cylinder is damaged.	Replace a bad ring and cylinder.
	3. Impurities in the valve blocks the valve core.	Remove impurities, replace damaged parts.
	4. The handle is in manual position.	change the handle to pneumatic position
Slow motion, crawling	1. Air supply pressure is not enough.	The increase of gas supply pressure (0.4-0.7Mpa)
	2. Output torque of pneumatic actuator is too small.	Increase the pneumatic actuator Production.
	3. Valve coil or other valve components are too tight.	Re-assembly adjustments.
	4. Air supply pipe is plugged and flow is too small.	Exclude plug, replace the filter cartridge.
Reply devices without signal	1. Short circuit or disconnection of power occurs.	Maintenance of power lines.
	2. Cam position inside the switch box is not accurate.	Adjust the cam to the correct location
	3. Micro switches is damaged.	Replacement Micro Switch



علی صنعت

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