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Hanmusen

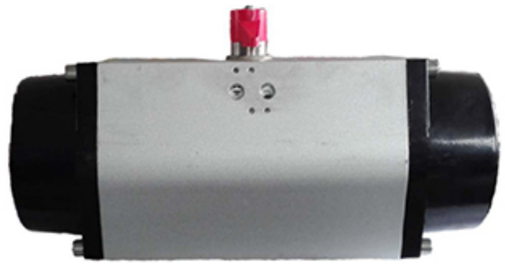
汉姆森阀门
HANMUSEN VALVE

阀门气动执行器

VALVES PNEUMATIC ACTUATOR

双作用式GTD　单作用式GTE

DOUBLE ACTING OR SPRING RETURN



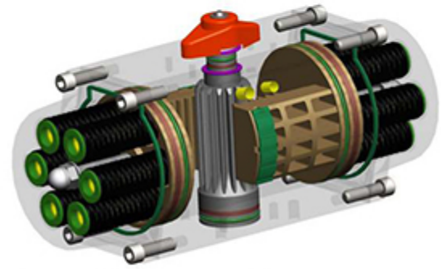
浙江汉姆森自控阀门有限公司
ZHEJIANG HANMUSEN AUTOMATION CONTROL VALVE CO., LTD.

2018 Edition

附件图形 Attachment graphic

目录 Catalogue

主要特点 Main characteristics



1、相同规格有双作用式、单作用式(弹簧复位)。
2、标准旋转轴角度可调节-5° ~+5° 范围。
3、所有滑动部件采用塑料轴承衬套、导向，保持最小摩擦力，并有效地抵抗磨损。
4、外壳表面阳极化电镀，防腐蚀保护；旋转轴镀硬质镍磷合金；螺丝、螺母为不锈钢。
5、单作用式弹簧预装在弹簧座内，很容易装配或增补弹簧数量。
6、连接、安装接口标准化模块设计，方便配装球阀、蝶阀、信号盒及控制附件。
7、可选择旋转方向顺时针旋转或逆时针旋转；两端调节螺丝可调节小于标定角度调整。
8、特殊的腐蚀环境可采用不锈钢外壳(请于我们联系)。

1 .For the same specification, there are double acting and single acting actuators (spring restore).
2.The angle of the rotary axis can be adjuted within the range of-5° ~+5° .
3.Plastic bearing bushing and pilot are adopted in all sliding parts, which can obtain minimum fraction and have a good effect on abrasion resistant.
4.The cover surface is anodized to protect it from corrosion, the rotary axis is hard nickel phosphorus plated; and the screws and nuts are stainless steel.
5.The single acting spring is prefixed in the spring holder, and it is easy to fix or add new springs.
6.The installation and connection interface is designed of normalized modular structure, which makes it easy to install ball valve, butterfly valve, signal block and control accessories.
7.The rotating direction can be in clockwise or counter clockwise alternatively, and the adjusting screw on either side can adjust the angle to be smaller than the standard.
8.In special corrosive environment, a stainless steel cover can be used. (Please contact us)

	标准参数 Standard Parameters	特殊参数 Special Parameters
基本设计 Basic design	气动双活塞执行器。 Pneumatic double piston actuator 型号GTD=双作用式。 Type GTD=double acting 型号CTE=单作用式(有弹簧返回)。 Type GTE=single acting	三个位置执行器有两个特殊活塞。 Three position actuators and two special pistons.
制造特点 Manufacture Characteristics	超宽面齿条(活塞)小齿轮传动技术。 活塞及齿轮和壳体接触面有低磨擦材料制成的滑动轴承衬套、导向。 单作用式有保险弹簧座。 Super broad rack(piston) with small gear drive The contact surface of piston and gear with the cover is made of sliding bearing liner and pilot of small abrasion material. The single acting actuator has safety spring holder.	
采用标准 Standard adopted	执行器与阀门连接： 四个或八个螺栓孔符合标准DIN/IS0 5211，轴装配孔符合标准DIN 3337。 执行器与控制阀连接： GTD/GTE100+350符合标准NAMUR或VDI/VDE 3845， GTD/GTE040+090通过转接板连接。执行器与信号盒连接，符合VDI/VDE 3845 Connection between actuator and valve: Four or eight fbolts meets standard DIN/ISO5211, and the axis fitting hole meets standard DIN3337 Connection between actuatorfand control vavle: GTD/GTE 100+350 meets standard NAMUR or VDI/VDE 3845 GTD/GTE040+090 is connected by connection plate Connection between actuator and signal-block: Meets VDI/VDE 3845	可供选择的装配轴孔有多种形状尺寸选择。 With many optional fitting axis hole of different shapes and sizes.
零件材料 Component Material	壳体：铝合金表面阳极化处理。 Cover: anodized alum alloy 端盖：铝合金表面喷塑处理。 Terminal cover: plastic sprayed alum alloy 活塞/齿条：铝合金。 Piston/rack: alum alloy 密封O型圈：丁晴橡胶=NBR70。 O gasket: nitrile-rubber 轴承垫圈/导环：塑料。 Bearing washer/pilot ring: plastic	可外壳与端盖：喷塑处理。 特殊放腐蚀环境：可选不锈钢材料(请与我们联系) O型圈：氟橡胶 Cover and terminal caover: plastic svraved Special corrosive environment: optional stainless steel (Please contact us) O gasket: fluorine rubber
工作环境温度 Operation ambient temperature	-20 ~ 80℃	-40 ~ +160℃
回转角度 Rotating angle	双作用式=90° 单作用式=90° 标准执行器旋转轴角度从两端可调节-4° ~+4° 。 Double acting=90° Single acting=90° Rotary axis angle of the actuator can be adjusted -4° ~+4° from either side	根据需要选择顺时针方向旋转或逆时针方向旋转。 三个位置执行器有0—45—90° ，0—60—120° ，0—90—180° ，0—120—240° 。 Select the rotary direction of clockwise or counter clockwise, the three position actuator has 0-45-90° 0-60-120° , 0-90-180°
输出扭矩 Output torque	3 ~ 9000Nm	
空气压力 Air pressure	2 ~ 8bar，最大10bar。 2~8bar, max 10bar	
附 件 Accessories	电磁阀、电气定位器、限位开关(有机械式、接近式)、气源处理三联件(有减压器、过滤器、油雾器)、手操机构。 Solenoid vavlc, electrical locator, spacing switch (mechanical and proximity switch), three fittings for air source treatment(pressure reducer, filter, oil mister) and manual manipulation mechanism.	调节角度和两位切断联锁装置。 Adjustment angle and two-position cut-off interlock

工作原理 Operation principle

双作用式 Double acting

压缩空气从气口(B)进入气缸两活塞(c)之间中腔时，使两活塞分离向气缸两端方向移动，两端气腔的空气通过气口(A)排出，同时使两活塞(C)的齿条同步带动输出轴(D)(齿轮)逆时针方向旋转90度。可以从两端调整微量角度，松动螺母(E)用内六角扳子拧动调节螺栓(F)调整所需角度，锁紧螺母(E)。反之压缩空气则从气口(A)进入气缸两端气腔时，使两活塞向气缸中间方向移动，中间气腔的空气通过气门(B)排出，同时使两活塞(C)的齿条同步带动输出轴(D)(齿轮)顺时针方向旋转90度。

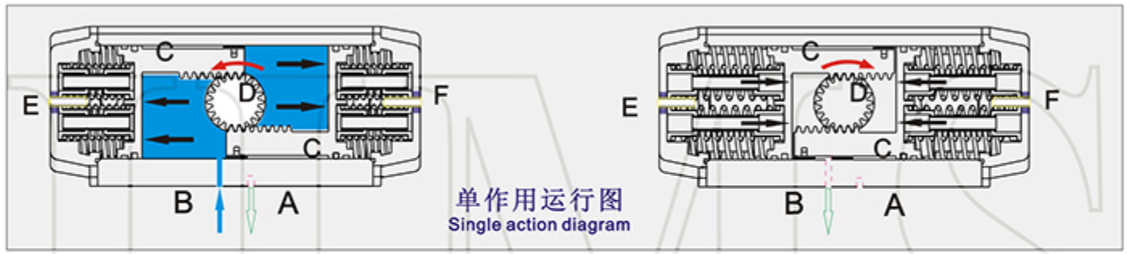
When compressed air goes into the middle cavity, which is between the two pistons in the cylinder through port (B), it separates the pistons and make it move towards either end, while the air in air cavity on either end will be released from port (A), and at the same time, the racks of two pistons simultaneously drive the output axis (D) (gear) to rotate counter-clockwise of 90° . The micro-angle can be adjusted from either end by loosing the nut (E) and screw the adjusting bolt (F)by a socket screw wrench, and then tighten the nut. Contrarily, when compressed air goes into the air cavity on either end of the cyclinder through port (A), the two pistons will move towards the center of the cyclinder, and the air in the middle cavity willbe released from the port (B), and at the same time, the racks of two pistons syncronously drive the output axis (D) (gear) to rotate clockwise of 90° .

双作用运行图
Double acting diagram

单作用式(弹簧复位) Single acting(spring restore)

压缩空气从气口(B)进入气缸两活塞(c)之间中腔时,使两活塞分离向气缸两端方向移动,迫使两端的弹簧压缩,两端气腔的空气通过气口(A)排出,同时使两活塞(c)的齿条同步带动输出轴(D)(齿轮)逆时针方向旋转90度。在压缩空经过电磁阀换向后,气缸的两活塞在弹簧的弹力下向中间方向移动，中间气腔的空气从气口(B)排出,同时使两活塞(C)的齿条同步带动输出轴(D)(齿轮)顺时针方向旋转90度,可以从两端调整微量角度,松动螺母(E)用内六角扳手拧动调节螺栓(F)调整所需角度,锁紧螺母(E)。

When compressed air goes into the middle cavity, which is between the two pistons in the cylinder through port (B), it separates the pistons and make it move towards either end, thus make the spring compressed, while the air in air cavity on either end will be released from port (A), and at the same time, the racks of two pistons simultaneously drive the output axis (D) (gear) to rotate counter-clockwise of 90~ After the compressed air is reversed by the solenoid valve, the two pistons in the cylinder will move towards the center by the elastic force of the spring, the air in the middle cavity will be released from the port (B), and at the same time, the racks of two pistons simultaneously drive the output axis (D) (gear) to rotate clockwise of 90~ . The micro-angle can be adjusted from either end by loosing the nut (E) and screw the adjusting bolt (F)by a socket screw wrench, and then tighten the nut.



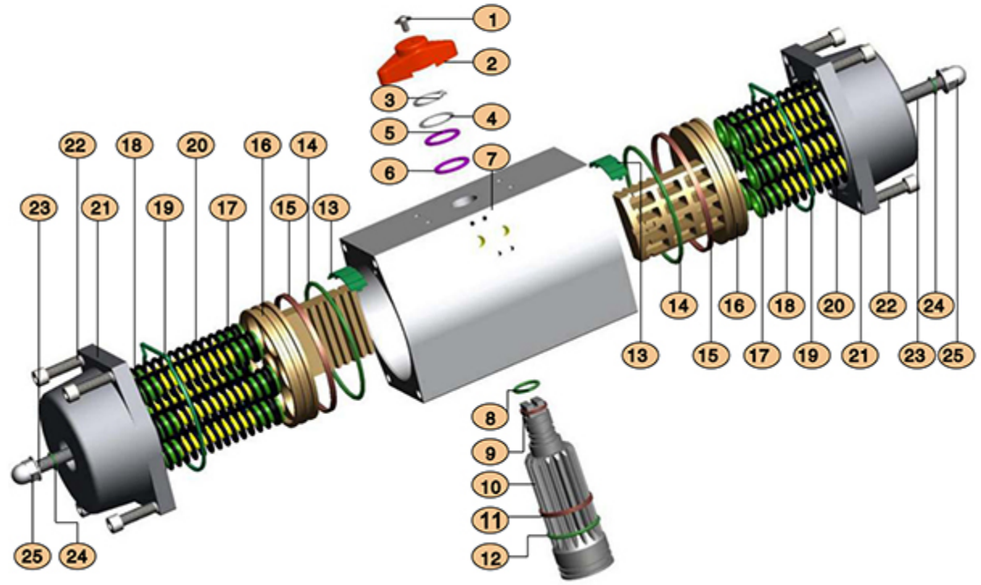
单作用运行图
Single action diagram

型号编制 Model Preparating

GTE 127 -090- F10- P22- S10

- 弹簧数量 Number of springs — 6-12=两端合计弹簧数量 Total number of springs at both ends
- 输出孔尺寸 Output hole size — P:正四方连接 Positive square connection; H:平行对边连接 Parallel to edge connection; Q:健槽园孔 Health trough holes
- 连接尺寸 Connection size — ISO5211(F03-F25)符合国际标准 In line with international standards
- 旋转角度 Rotation angle — 90° /120° /180° 转角度 Rotation angle; 0° ~90° /0° ~180° 调节角度 Full adjustment angle; 0° ~45° ~90° /0° ~90° ~180° 三位置角度 Three position angle
- RDSC规格大小 RDSC Size — 052-300执行器规格 Actuator Specifications
- 作用方式 Mode of action — GTD:双作用 Double acting; GTE:单作用 Single acting

零件和材料 Parts and Material



序号 No	名称 Name	材料 Material
1	指示器螺钉 Indicator screw	工程塑料 Engineering plastic
2	指示器 Indicator	不锈钢 Stainless steel
3	卡簧 Circlip	不锈钢 Stainless steel
4	垫圈 washer	不锈钢 Stainless steel
5	外垫片 Outer gasket	工程塑料 Engineering plastic
6	内垫片 Inner gasket	工程塑料 Engineering plastic
7	缸体 Cylinder block	铝合金型材 Aluminum alloy profile
8	轴上O形圈 On-axis O-ring	丁晴橡胶 Ding Qing rubber
9	轴上轴承 On-shaft bearing	工程塑料 Engineering plastic
10	齿轮轴 Gear shaft	45#碳钢镀镍 Carbon steel nickel plating
11	轴下轴承 Down shaft bearing	工程塑料 Engineering plastic
12	轴下O形圈 Under the shaft O-ring	工程塑料 Ding Qing rubber
13	活塞导板 Piston guide	丁晴橡胶 Engineering plastic
14	活塞O形圈 Piston O-ring	丁晴橡胶 Ding Qing rubber
15	活塞轴承 Piston bearing	氟碳复合材料 Fluorocarbon composite
16	活塞 Piston	压铸铝合金 Die-cast aluminum alloy

防腐等级使用环境 Anti-corrosion level use environment		
名称 Name	普通环境 Ordinary environment	低酸.碱性环境 Low acid.alkaline environment
缸体 Cylinder block	阳极硬化 Anode hardening	阳极硬化+特氟浓 Anode hardening+Teflon
端盖 End cap	聚脂涂层 Polyester coating	特氟浓涂层 Teflon coating
齿轮轴 Gear shaft	碳钢镀镍 Carbon steel nickel plating	不锈钢 Stainless steel

序号 No	名称 Name	材料 Material
17	弹簧座 Spring seat	工程塑料 Engineering plastic
18	弹簧 spring	弹簧钢 Stainless steel
19	端盖密封圈 End cap seal	丁晴橡胶 Ding Qing rubber
20	弹簧轴 Spring shaft	铜合金管 Copper alloy tube
21	端盖 End cap	压铸铝合金 Die-cast aluminum alloy
22	端盖螺丝 End cap screw	不锈钢 Stainless steel
23	调节螺丝 Adjustment screw	不锈钢 Spring steel
24	调节螺丝O形圈 Adjustment screw O-ring	丁晴橡胶 Ding Qing rubber
25	球形螺母 Spherical nut	不锈钢 Stainless steel

执行器选型 Actuator selection

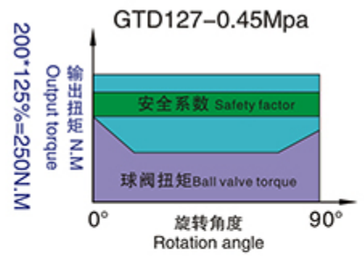
选用气动执行器时，在已经确定阀门的扭矩上，再乘以安全系数，清洁.低摩擦润滑的介质乘以120%安全系数，水蒸气或非润滑的液体介质乘以125%安全系数，非润滑的浆料液体介质乘以130%安全系数，非润滑的干气介质乘以140%安全系数，非润滑的干气颗粒粉料介质乘以160%安全系数。

When using a pneumatic actuator, multiply the torque of the valve by the safety factor, clean. Low friction lubrication medium multiplied by 120% safety factor, water vapor or non-lubricated liquid medium multiplied by 125% safety factor, non The lubricated slurry liquid medium is multiplied by a 130% safety factor, the non-lubricated dry gas medium is multiplied by a 140% safety factor, and the non-lubricated dry gas particulate powder medium is multiplied by a 160% safety factor.

GTD双作用型执行器选用示例 Double acting actuator selection example

已知球阀的扭矩为200N.M，气源压力为0.45Mpa,介质为非润滑的水蒸气，考虑到安全因素，执行器应选扭矩为200*125%=250N.M,查找双作用输出扭矩表气源压力0.45Mpa，然后沿该行垂直查找相近或相等的扭矩数据，选273N.M,再沿该行向左查找其型号为GT127型。

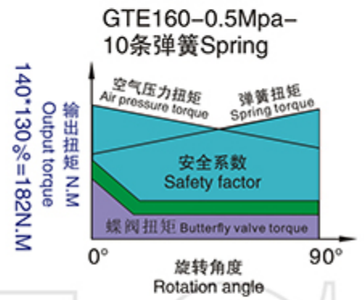
It is known that the torque of the ball valve is 200N.M, the pressure of the air source is 0.45Mpa, and the medium is non-lubricated water vapor. Considering the safety factor, the actuator should select the torque of 200*125%=250N.M to find the double acting output torque. The surface air source pressure is 0.45Mpa, then find the similar or equal torque data vertically along the line, select 273N.M, and then search the left side of the line for the model number GTD127.



GTE单作用型执行器选用示例 Single-acting actuator selection example

已知蝶阀的扭矩为140N.M，气源压力为0.5Mpa,介质为非润滑的浆料液体介质，考虑到安全因素，执行器应选扭矩140*130%=182N.M,查找单作用输出扭矩表气源压力0.5Mpa，然后沿垂直查找相近或相等的扭矩数据选245N.M,还应该查找下弹簧终点扭矩不少于180N.M,最终确定其型号为GTE160型。

The butterfly valve has a torque of 140N.M and a gas source pressure of 0.5Mpa. The medium is a non-lubricating slurry liquid medium. For safety reasons, the actuator should select a torque of 140*130%=182N.M to find a single-acting output. Torque gauge air supply pressure 0.5Mpa, then find the similar or equal torque data in the vertical selection 245N.M, should also find the lower spring end torque not less than 180N.M, and finally determine its model is GTE160 type.



执行器参数 Actuator parameter

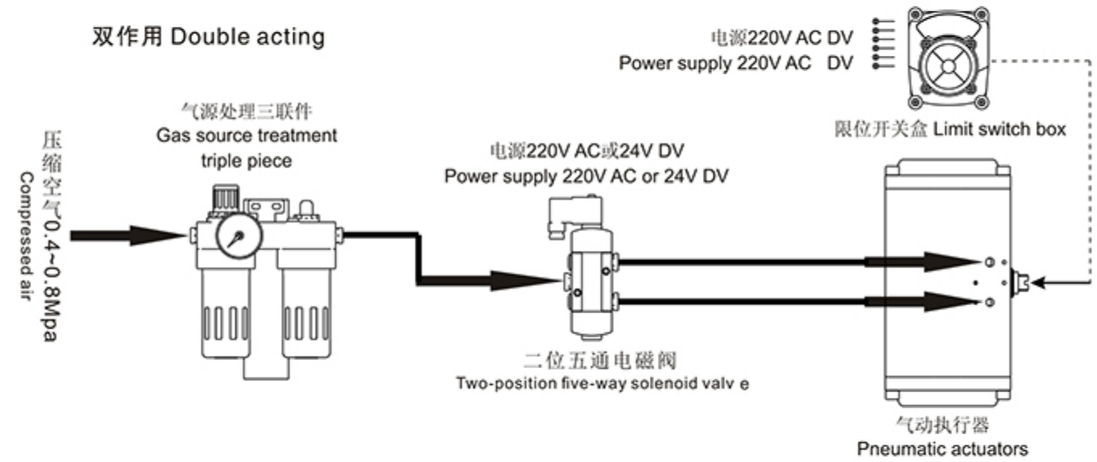
型号 Model	气缸容积L Cylinder volume		GTD开关时间S GTD switch time		GTE开关时间S GTE switching time		重量Kg Weight	
	开No	关Off	开No	关Off	开No	关Off	GTD	GTE
GT052	0.08	0.15	0.2	0.3	0.25	0.3	0.8	
GT063	0.17	0.24	0.42	0.5	0.45	0.5	1.35	1.55
GT083	0.27	0.39	1.1	1.2	1.2	1.3	2.53	2.98
GT110	0.59	0.87	1.5	1.8	1.8	2.1	4.95	5.94
GT127	0.95	1.48	2.0	2.5	2.3	2.5	8.85	10.6
GT140	1.45	2.33	2.1	2.6	2.4	2.8	12.2	21.9
GT160	2.35	2.96	2.3	2.7	2.6	3.0	16.1	30.0
GT190	3.22	3.12	2.7	3.5	3.2	3.4	26.0	41.6
GT210	3.97	4.61	3.3	4.2	4.1	4.1	31.2	52.8
GT250	7.84	11.8	3.9	5.3	4.7	5.2	72.0	86.5
GT280	10.9	16.6	4.7	5.6	5.3	6.0	82.0	100.2
GT300	13.6	19.8	4.9	5.9	6.1	7.0	92.0	153.4

注意事项 Precautions

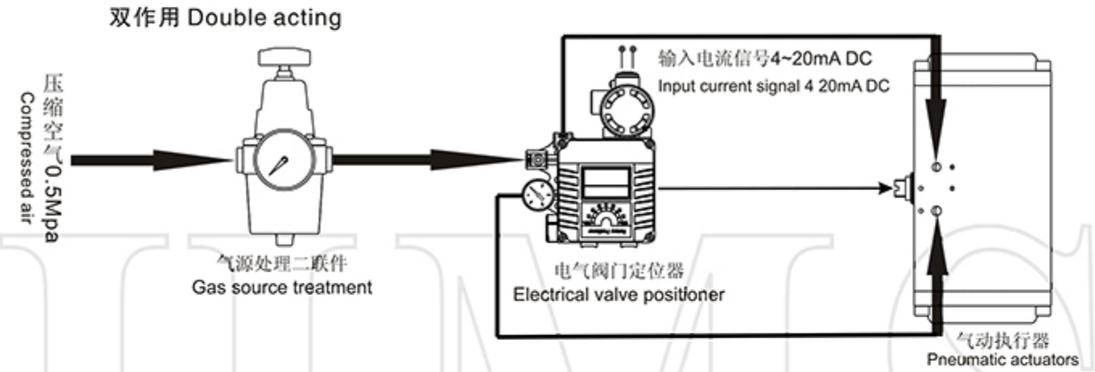
1.最大气源压力为0.8Mpa.
2.旋转角度为 90° .
3.标准温度ST-20° +80° 丁 晴橡胶O形圈/高温HT-15° +150° 氟橡胶O形圈/低温LT-40° +80° 硅橡胶O形圈
4.动作时间以下条件测得:中性干净压缩空气压力0.5Mpa/ 管子长度5M,行程角度90° ,温度20° C./执行器空载.

1. The maximum source pressure is 0.8Mpa.
2. The angle of rotation is 90 °
3. Standard temperature ST -20 ° + 80° nitrile rubber O-ring / high temperature HT -15 ° +150 ° Fluororubber O-ring / low temperature LT -40° +80° silicone rubber O-ring.
4. Action time measured under the following conditions: neutral clean compressed air pressure 0.5Mpa /Pipe length 5M / stroke angle 90° / temperature 20° C / actuator no load.

开关式控制线路图Switching control circuit diagram



调节式控制线路图 Adjustable control circuit diagram



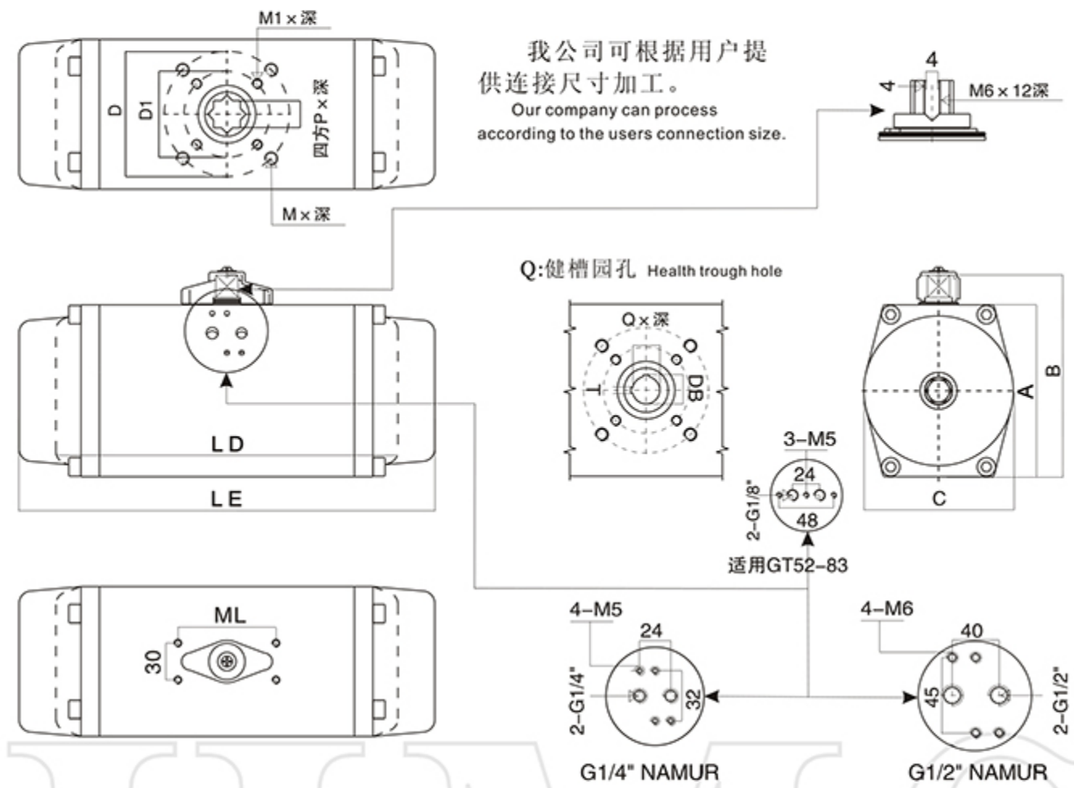
GTD双作用输出扭矩Double acting output torque (N.M)

型号 Model	气源压力(Mpa)Air pressure										
	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.80
GTD052	11.9	14.3	16.7	19.1	21.4	23.8	26.2	28.6	31	33.4	38.2
GTD063	18.6	22.4	26.1	29.9	33.6	37.3	41.1	44.8	48.6	52.3	59.8
GTD083	37.8	45.4	52.9	60.5	68.1	75.7	83.2	90.8	98.4	105.9	121.1
GTD110	94.9	113.9	132.9	151.9	170.9	189.9	208.9	227.9	246.9	265.9	303.9
GTD127	151.9	182.3	212.7	243.1	273.4	303.8	334.2	364.6	394.9	425.4	486.1
GTD140	230.7	276.9	323.1	369.2	415.4	461.5	507.7	553.8	600	646.2	738.5
GTD160	301.4	361.7	421.9	482.3	542.5	602.8	663.1	723.4	783.7	844.1	964.6
GTD190	495.9	595.1	694.2	793.4	892.6	991.8	1091	1190	1289	1388	1586
GTD210	605.8	726.9	848.1	969.3	1090	1211	1332	1453	1575	1696	1938
GTD250	1177	1413	1648	1884	2119	2355	2590	2826	3061	3297	3768
GTD280	1661	1994	2326	2658	2991	3323	3655	3988	4320	4652	5317
GTD300	2119	2543	2967	3391	3815	4239	4662	5086	5510	5934	6782

GTE单作用输出扭矩(N.M)Single acting output torque

型号 Model	弹簧数量 Number of springs	气源压力(Mpa)Air pressure N.M 0.3Mpa 开始 0° Start	0.3Mpa 结束 90° End	0.4Mpa 开始 0° Start	0.4Mpa 结束 90° End	0.5Mpa 开始 0° Start	0.5Mpa 结束 90° End	0.6Mpa 开始 0° Start	0.6Mpa 结束 90° End	0.7Mpa 开始 0° Start	0.7Mpa 结束 90° End	0.8Mpa 开始 0° Start	0.8Mpa 结束 90° End	弹簧力矩 Spring torque 开始 90° Start	弹簧力矩 结束 0° End
GTE063	6	16.5	9.8	24	17.3	31.4	24.7	38.9	32.2					12.6	5.9
	8	14.6	5.6	22.1	13.1	29.5	20.5	37	28	44.5	35.5			16.8	7.8
	10			20.1	9	27.5	16.4	35	23.9	42.5	31.4	50	38.9	20.9	9.8
	12					25.5	12.1	33	19.6	40.5	27.1	48	34.6	25.2	11.8
GTE083	6	30.7	16.9	45.8	32	61	47.2	76.1	62.3					28.5	14.7
	8	25.8	7.3	40.9	22.4	56.1	37.6	71.2	52.7	86.3	67.8			38.1	19.6
	10			36	12.9	51.2	28.1	66.3	43.2	81.4	58.3	96.6	73.5	47.6	24.5
	12					46.3	18.5	61.4	33.6	76.5	48.7	91.7	63.9	57.2	29.4
GTE110	6	77.9	37.1	115.9	75.1	153.9	113.1	191.9	151.1					76.8	36
	8	65.9	11.5	103.9	49.5	141.9	87.5	179.9	125.5	217.9	163.5			102.4	48
	10			91.9	23.9	129.9	61.9	167.9	99.9	205.9	137.9	243.9	175.9	128	60
	12					117.9	36.3	155.9	74.3	193.9	112.3	231.9	150.3	153.6	72
GTE127	6	124.7	62.8	185.5	123.6	246.2	184.3	307	245.1					119.5	57.6
	8	105.5	23	166.3	83.8	227	144.5	287.8	205.3	348.6	266.1			159.3	76.8
	10			147.1	43.9	207.8	104.6	268.6	165.4	329.4	226.2	390.1	286.9	199.2	96
	12					188.6	64.7	249.4	125.5	310.2	186.3	370.9	247	239.1	115.2
GTE140	6	181.5	97.5	274.1	190.1	366.4	282.4	458.7	374.7					179.1	95.1
	8	149.9	37.8	242.5	130.4	334.8	222.7	427.1	315	519.5	407.4			238.8	126.7
	10			210.8	70.7	303.1	163	395.4	255.3	487.8	347.7	580.1	440	298.5	158.4
	12					262.3	103.3	354.6	195.6	447	288	539.3	380.3	358.2	199.2
GTE160	6	251.9	147.5	372.5	268.1	493	388.6	613.6	509.2					214.2	109.8
	8	215.3	76.1	335.9	196.7	456.4	317.2	577	437.8	697.7	558.5			285.6	146.4
	10			299.3	125.3	419.8	245.8	540.4	366.4	661.1	487.1	781.6	607.6	357	183
	12					383.2	174.4	503.8	295	624.5	415.7	745	536.2	428.4	219.6
GTE190	6	413.9	208.3	612.2	406.6	810.6	605	1008.8	803.2					386.8	181.2
	8	353.5	79	551.8	277.3	750.2	475.7	948.4	673.9	1146.4	871.9			516.1	241.6
	10			491.5	148.6	689.9	347	888.1	545.2	1086.1	743.2	1284.1	941.2	644.8	301.9
	12					629.4	217.9	827.6	416.1	1025.6	614.1	1223.6	812.1	773.9	362.4
GTE210	6	455.2	199.6	697.6	442	939.3	683.7	1181.3	925.7					527.3	271.7
	8	364.6	24.1	607	266.5	848.7	508.2	1090.7	750.2	1333.7	993.2			702.8	362.3
	10			516.4	90.5	758.1	332.2	1000.1	574.2	1243.1	817.2	1485.1	1059.2	878.8	452.9
	12					667.6	157	909.6	399	1152.6	642	1394.6	884	1054	543
GTE250	6	939.6	484.8	1410.6	955.8	1881.6	1426.8	2352.6	1897.8					928.2	473.4
	8	781.7	176	1252.7	647	1723.7	1118	2194.7	1589	2665.7	2060			1237	631.3
	10			1094.9	337	1565.9	808	2036.9	1279	2507.9	1750	2978.9	2221	1547	789.1
	12					1408.1	499	1879.1	970	2350.1	1441	2821.1	1912	1856	946.9
GTE280	6	1329.8	697	1993.8	1361	2658.8	2026	3323.8	2691					1297	664.2
	8	1108.4	264	1772.4	928	2437.4	1593	3102.4	2258	3766.4	2922			1730	885.6
	10			1551	496	2216	1161	2881	1826	3545	2490	4210	3155	2162	1107
	12					1995	728	2660	1393	3324	2057	3989	2722	2595	1328
GTE300	6	1583	805	2431	1653	3279	2501	4126	3348					1738	960
	8	1263	226	2111	1074	2959	1922	3806	2769	4654	3617			2317	1280
	10			1791	494	2639	1342	3486	2189	4334	3037	5182	3885	2897	1600
	12					2319	763	3166	1610	4014	2458	4862	3306	3476	1920

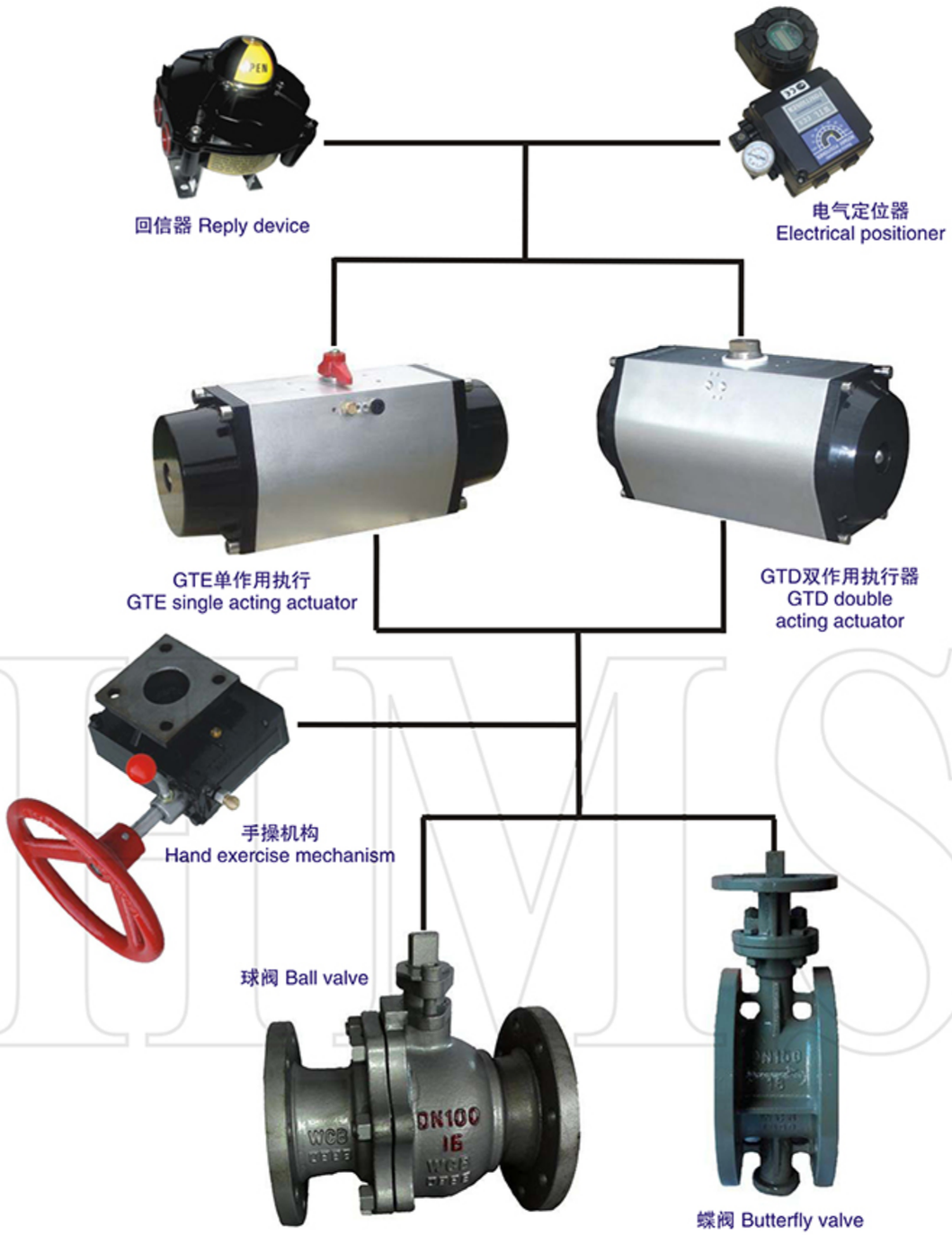
外形连接尺寸图表(mm) Shape connection size chart



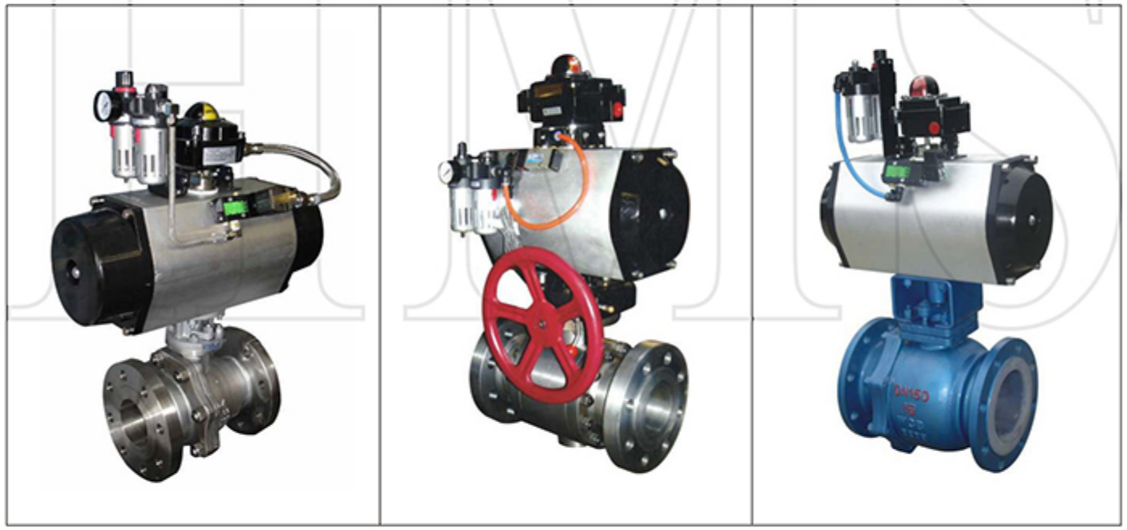
尺寸表 Dimension Tabie

型号 Model	L D	L E	A	B	C	ML	D1	M1×深	Q×深	T	DB	D	M×深	P×深
GT–052	140		73	95	61	80	φ36	M5×8	φ12.8×30	3	14.2	φ50	M6×10	11×14
GT–063	168	188	88	110	70	80	φ50	M6×10	φ12.8×30	3	14.2	φ70	M8×13	14×18
GT–083	200	260	110	132	91	80	φ50	M6×10	φ15.9×30	5	18.4	φ70	M8×13	17×21
GT–110	255	338	140	162	120	80	φ70	M8×13	φ19.1×30	5	21.6	φ102	M10×16	22×26
GT–127	310	375	160	190	141	80	φ70	M8×13	φ19.1×30	5	21.6	φ102	M10×16	22×26
GT–140	345	408	174	204	152	130	φ102	M10×16	φ22.3×35	5	24.8	φ125	M12×18	27×31
GT–160	380	435	198	228	175	130	φ102	M10×16	φ22.3×35	5	24.8	φ125	M12×18	27×31
GT–190	450	556	232	262	207	130			φ28.6×40	8	32.1	φ140	M16×20	36×50
GT–210	468	568	245	275	225	130			φ28.6×40	8	32.1	φ140	M16×20	36×50
GT–250	556	678	302	332	270	130			φ31.8×45	8	35.3	φ165	M20×25	46×60
GT–280	602	770	330	360	300	130			φ33.4×50	8	37.4	φ165	M20×25	46×60
GT–300	700	805	352	382	324	130			φ38.4×50	10	42.4	φ165	M20×25	46×60

GT执行器组合图形 Actuator combination graphic



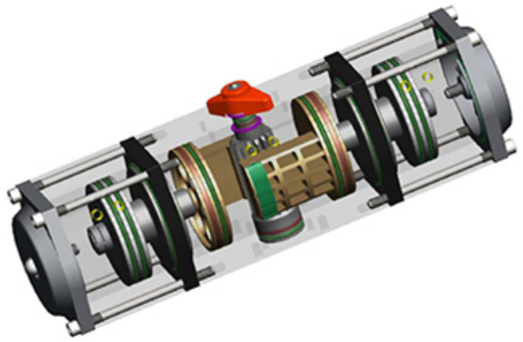
GT型图形与应用 Graphics and applications



三位置气动执行器 Three position pneumatic actuator

三位置气动执行器分为 0° -90° 、0° -120° 和0° -180° 在主气缸气口A进气后，推动活塞向两端运动，在两端加装定位气缸.活塞等机械装置，来限制执行器运行角度，来实现某些特殊场所，需要做二次角度开启中间位置，我公司可按要求生产15° -180° 任意二次角度开启优质产品。

The three-position pneumatic actuator is divided into 0° -90° .0° -120° and 0° -180° After the intake of the main cylinder port A, push the piston to move to both ends, and install the positioning cylinder at both ends. Piston Such mechanical devices, to limit the operating angle of the actuator, to achieve some special places, need to do the second angle to open the intermediate position, our company can produce 15° -180° any secondary angle to open quality products as required.。

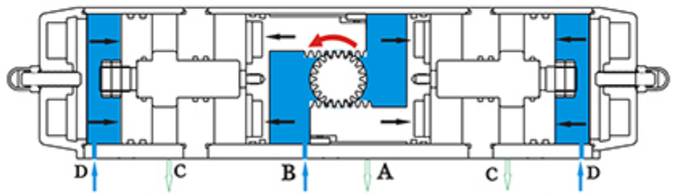


工作原理 Working principle

三位置气动执行器的操作，需要设计一套电磁阀控制回路来完成操作，控制原理见下说明：

The operation of the three-position pneumatic actuator requires the design of a solenoid valve control circuit to complete theoperation. The control principle is as follows.

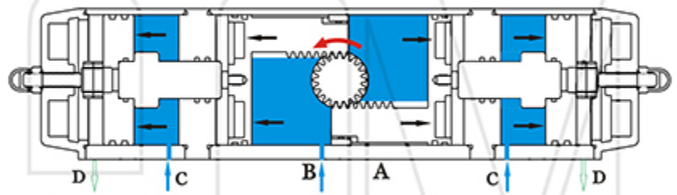
位置1-中间位置 Position 1 - intermediate position



The air source pressure enters from the B hole and the D hole at the same time, the air is discharged from the A hole and the C hole, the compressed air in the B hole pushes the piston to move outward, and the compressed air in the D hole pushes the piston to move inward, so that the actuator reaches the specified angle.

气源压力同时从B孔和D孔进入，空气从A孔和C孔排出,B孔中压缩空气推动活塞向外运动，而D孔中压缩空气推动活塞向内运动，使执行器达到指定的角度。

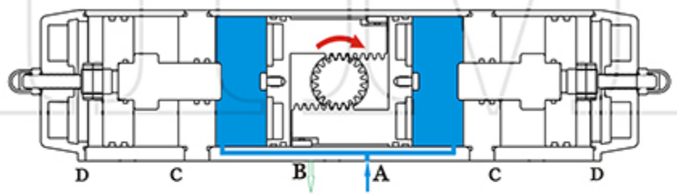
位置2-全开位置 Position 2 - fully open position



The air source pressure enters from the B hole and the C hole at the same time, the air is discharged from the A hole and the D hole, and the compressed air in the B hole pushes the piston to move outward, and the compressed air in the C hole also pushes the piston to move outward, and drives the gear shaft counterclockwise. Rotation causes the actuator to fully open.

气源压力同时从B孔和C孔进入,空气从A孔和D孔排出,B孔中压缩空气推动活塞向外运动，而C孔中压缩空气也推动活塞向外运动，带动齿轮轴逆时针旋转使执行器达到全开。

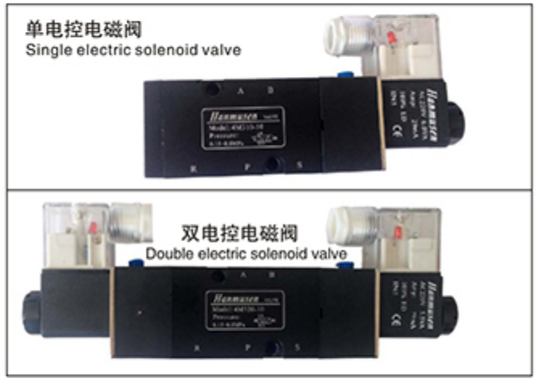
位置3-全关位置 Position 3 - fully closed position



The cylinders at both ends do not work, the air source pressure enters A, the air is discharged from the B hole, and the compressed air in the A hole pushes the piston to move inward, driving the gear shaft to rotate clockwise, so that the actuator is fully closed. The spring is installed in the main cylinder. When the gas is cut off, the power is off, or the working condition is faulty, the piston in the main cylinder is forced to rotate clockwise by the spring force to return to the fully closed position.

两端气缸不工作，气源压力进入A中，空气从B孔排出,A孔中压缩空气推动活塞向内运动，带动齿轮轴顺时针旋转，使执行器达到全关。在主气缸内安装弹簧，在断气，断电时或工况故障，通过弹簧弹力迫使主气缸中活塞顺时针旋转，回到全关位置。

附件-电磁阀Appendix-Solenoid valve



GTE-配电磁阀
GTE-Solenoid valve

一.概述 overview

HMS4M-电磁阀是用于气动阀门开启或关闭的电控元件。它符合NAMUR连接标准,直接安装气动执行器侧面，无需管子连接。根据仪表控制系统要求需要选择单电控或双电控；两位五通双电控电磁阀配双作用执行器,两位五通单电控电磁阀配单作用执行器，整机简单.紧凑.体积小.寿命可达50万次以上。该产品有本安基本型(IP67)以及防爆级别ExmIIBT6,其防爆级别适用于工厂的易爆环境场所。

HMS4M type solenoid valve is used for pneumatic valve opened or closed electronic components. It accord with standard of NAMUR connection, install pneumatic actuator side directly, without the pipe connection. According to the request of instrument control system needs to choose single or double electric control electric control; Two five-way solenoid valves with actuators with double acting, two the 3-way magnet valve (with single-acting actuator, the machine is simple, compact, small volume, the life can reach more than 500000 times. The product has the basic Ann (Ip67), as well as the level of explosion-proof Exmll BT6, its level of explosion-proof apply to factory and explosive environment.

二.主要技术参数main technical parameters

内容 content	型号Model			
	4M-210	4M-220	4M-310	4M-320
工作温度 Working temperature	-20～75℃			
换向时间(S) Reversing time(s)	0.05			
输入电流 Input current	-0.1～5A			
输入电压 input voltage	20～250DV/AV			
防爆等级 Explosion-proof grade	ExdllBt6			
防护等级 Protection grade	IP67			
防爆温度 Blast temperature	-20～85℃			
气源接口 Air interface	PT(PF)(G) 1/4			
材质 material	6063铝合金 aluminum alloy			
重量 weight	200g	320g	300g	400g

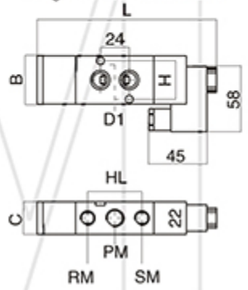
三.型号编制Model establishment

HMS4M-3-10-2

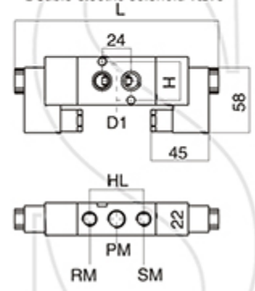
- 1-管接式;2-板接式
  1 - Pipe joint type; 2 - Plate type.
- 10-单电控;20-双电控
  10 - Single electronic control
  20 - Double electric control
- 2-型系列；3-型系列
  2-Type series; 3-Type series
- 本公司电磁阀
  Electromagnetic valve of the company

四.外形连接尺寸Contour connection size

单电控电磁阀
Single electric solenoid valve



双电控电磁阀
Double electric solenoid valve



型号 model	L	B	C	H	HL	D1	PM	RM/SM
4M-210	118	35	22	24	36	Φ4.5	PT1/4	PT1/8
4M-220	170	35	22	24	36	Φ4.5	PT1/4	PT1/8
4M-310	137	40	27	28	45	Φ5.5	PT3/8	PT1/4
4M-320	190	40	27	28	45	Φ5.5	PT3/8	PT1/4

注:本公司可按用户要求配制电磁阀。
Note: solenoid valve can be made according to the requirements of customers of the company.

附件-限位行程开关盒Appendix-limit switch box

一.概述 overview

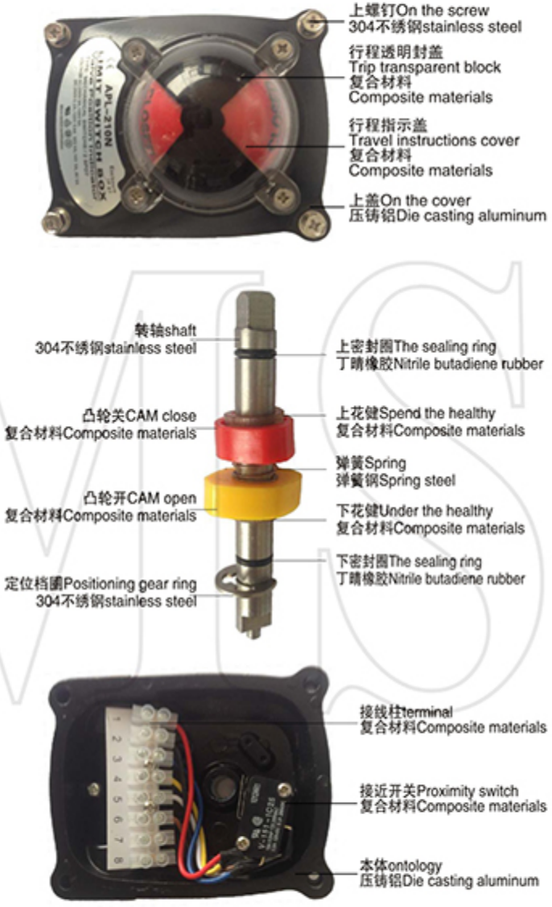
APL-N系列三种规格和ITS300型限位行程开关盒是传送角行程执行器和阀门位置信号的装置。它符合NAMUR标准安装，直接安装在执行器上部。其主要特点有:现场可视位置指示器，快速调整位置凸轮;可调式凸轮通过花健和弹簧安装，只要开关凸轮脱离花健便可旋转调整所需的位置，防掉外壳螺钉和两个电缆进口PT1/2管接口。内部行程开关预先连接接线终端。8个接线端子，可用于电磁阀的远程控制连接。

APL – N series three kinds of specifications and type ITS300 limit switch box is transmitted quarter-turn actuators and valve position signal of the device. It accord with NAMUR standard to install, directly installed in the upper actuator. Its main features are: the visual position indicator, CAM quickly adjust position; Adjustable CAM by flowers and spring installation, as long as the switch CAM from take nutriiite can rotate to adjust the desired location, off enclosure screw and two cable import PT1/2 interface. Internal travel switch connection terminals in advance. Eight terminals and can be used for electromagnetic valve remote control connection.

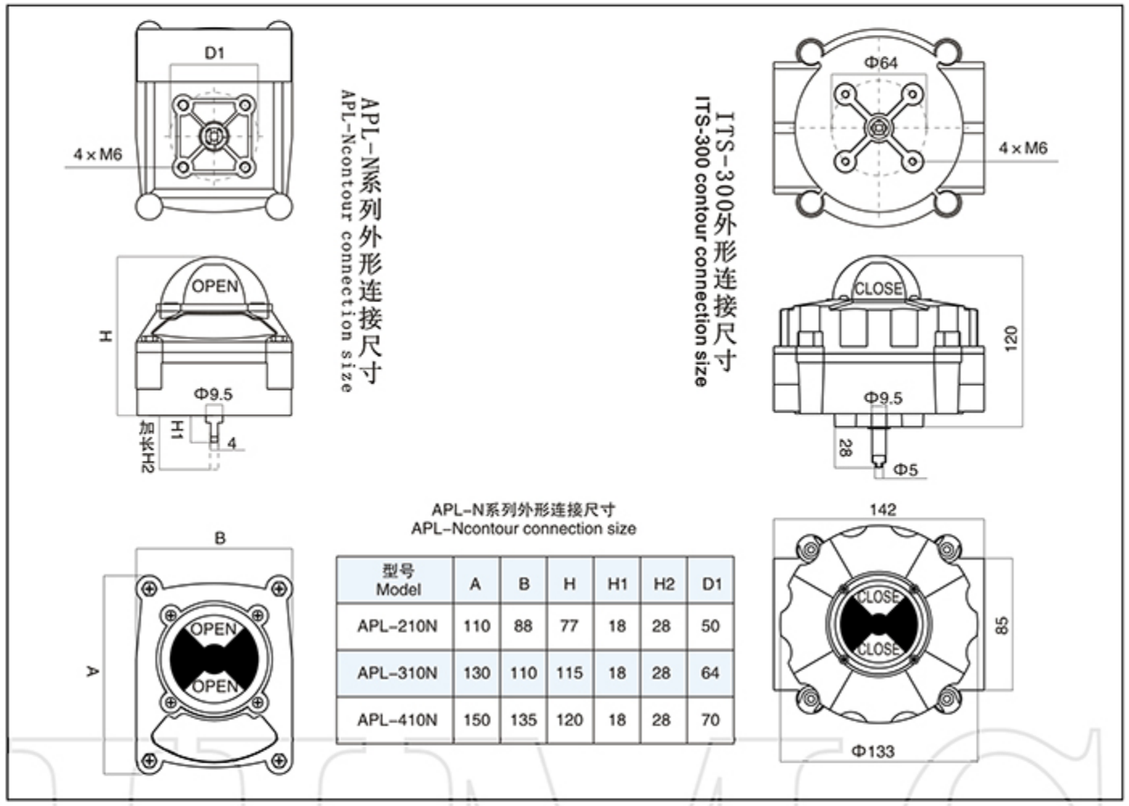
二.主要技术参数main technical parameters

内容 content	型号Model			
	APL-210N	APL-310N	APL-410N	ITS300
工作温度 Working temperature	-20～70℃			
工作角度 Work Angle	0～90°			
输入电流 Input current	-0.1～5A			
输入电压 input voltage	20～250DV/AV			
防爆等级 Explosion-proof grade	------			ExdIIBt6
防护等级 Protection grade	IP67			
防爆温度 Blast temperature	-20～85℃			
电源接口 Power interface	PT(NPT)/PF(G) 1/2			
材质 material	压铸铝 Die casting aluminum			
重量 weight	0.36Kg	1.2Kg	1.6Kg	1.5Kg

三.零件明细 parts subsidiary



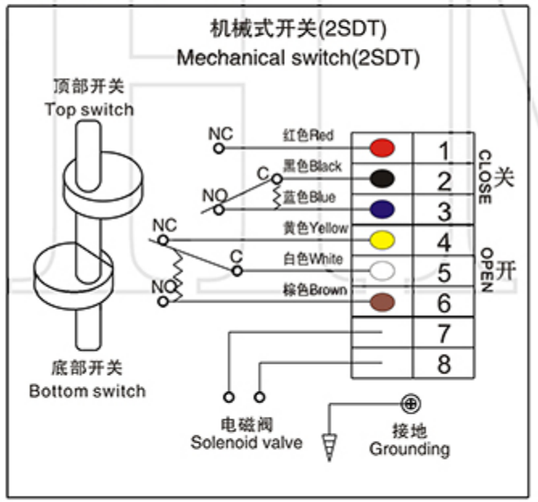
四.外形连接尺寸Connection size shape

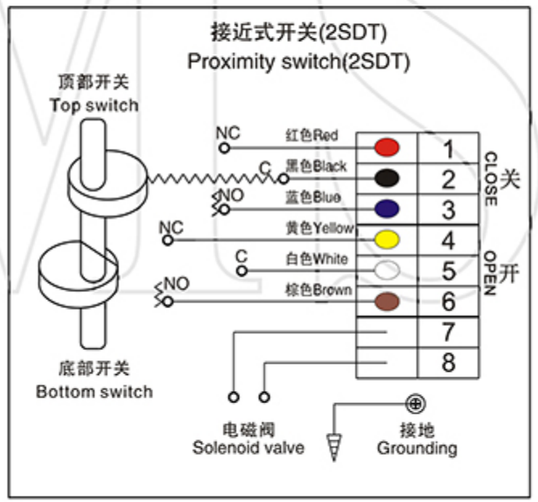


APL-N系列外形连接尺寸
APL-Ncontour connection size

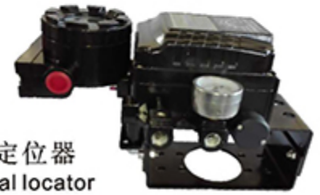
型号 Model	A	B	H	H1	H2	D1
APL-210N	110	88	77	18	28	50
APL-310N	130	110	115	18	28	64
APL-410N	150	135	120	18	28	70

五.接线图Wiring diagram

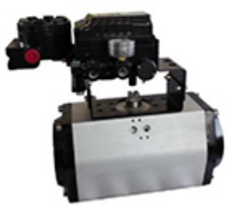




附件-电气定位器Appendix - Electrical locator



电气定位器
Electrical locator



电气定位器
+GTD执行器
Electrical positioner
+ GTD actuator

一.概述 overview

YT-1000TR系列电气定位器与气动执行器配套使用，输入4~20DCmA的直流电信号转换成输出气压力，控制执行机构的动作。同时根据执行机构的位移行程进行反馈，使阀门的位置能够按调节器输出的控制信号进行正确定位。

YT-1000TRS用于角行程单作用式(弹簧复位)气动执行器;YT-1000TRD用于角行程双作用式气动执行器。

YT - 1000 tr series electrical locator with pneumatic actuators, input 4 ~ 20 dcma is converted into dc signal output gas pressure and control action of the actuator.At the same time, according to feedback by the displacement of the actuator stroke enables the position of the valve according to the regulation Output control signals for correct positioning.

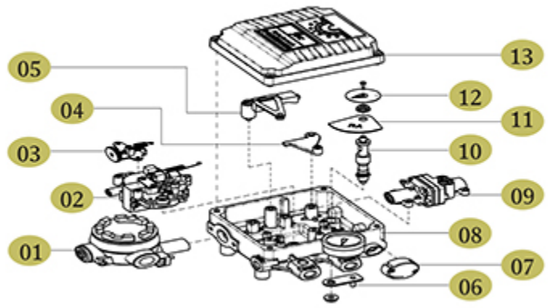
YT - 1000 TRS for quarter-turn single acting (spring return pneumatic actuators.

YT - 1000 TRD for quarter-turn double-acting pneumatic actuators.

二.技术参数 Main Technical parameters

内容 content		YT-1000	
		YT-1000-RD	YT-1000-RS
		双作用double-acting	单作用single-acting
输入信号 The input signal		4~ 20mADC	
阻抗 impedance		250 ± 15Ω	
供给压力 Supply pressure		1.4~7.0kgf/cm²	
角行程 Angular travel		0~90°	
气源接口 Air interface		PT(NPT)1/4	
压力表接口 Pressure gauge interface		PT(NPT)1/8	
电源接口 The power interface		PF 1/2(G 1/2)	
防爆等级 Explosion-proof grade		KTL:ExdmIIBT5 ExdmIICT5 ExdmIIBT6 ATEX:EExmdIIBT5;JIS:ExsdIIBT5 CSA:ExmdIIBT5;NEPSI:ExiaIICT6	
防护等级 Protection grade		IP 67	
环境温度 Working temperature	工作温度 Working temperature	标准型standard:-20~70 C° 高温型High temperature type:-20~120 C° 低温型Low temperature type:-40~70 C°	
	防爆温度 Blast temperature	-20~60 C°	
线性 Linear		± 1.0% F.S	
滞后度 Degree of lag		1.0% F.S	
灵敏度 The sensitivity		± 0.5% F.S	± 0.2% F.S
重复性 repetitive		± 0.5% F.S	
空气消耗量 Air consumption		3LPM(Sup=1.4kgf/cm²,20psi)	
流量 Flow to		80LPM(Sup=1.4kgf/cm²,20psi)	
材质 The material		压铸铝 Die casting aluminum	
重量 The weight of the		2.8Kg(6.2Lb)	

三.零件明细The parts subsidiary



序号 No	名称 Name	材料 Material
1	接线盒 Terminal block	压铸铝 Die casting aluminum
2	力矩马达 Torque motor	复合材料 Composite materials
3	零点调节旋钮 Zero adjustment knob	复合材料 Composite materials
4	连接件 fittings	压铸铝 Die casting aluminum
5	量程调节件 Range adjusting piece	压铸铝 Die casting aluminum
6	反馈杆 Feedback pole	304不锈钢 304 stainless steel
7	排气盒 Exhaust box	复合材料 Composite materials
8	下本体 The ontology	压铸铝 Die casting aluminum
9	先导阀 Pilot valve	压铸铝 Die casting aluminum
10	反馈轴 The feedback shaft	304不锈钢 304 stainless steel
11	凸轮 CAM	304不锈钢 304 stainless steel
12	指示器 indicator	复合材料 Composite materials
13	上盖 On the cover	压铸铝 Die casting aluminum

四.维护Maintenance

1.定位器的气源处理装置应使用精度小于5μm的空气过滤器。

2.内部的节流部位如有灰尘，会引起零点漂移等现象，因此在定期保养时应使用清洗装置，保持喷嘴畅通。

3.阀座的调整与定位器灵敏及泄气量直接有关，在出厂检验时已经调好，在使用中尽量不要调整。

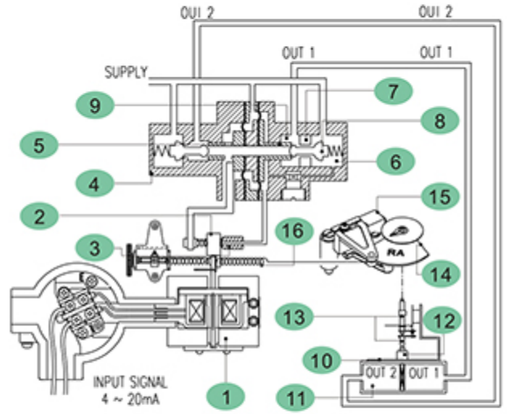
1. The locator air handling unit should be used air filter precision is less than 5 microns.

2. Inside the throttling parts such as dust, will cause the phenomenon such as zero drift, so in regular maintenance should be used when cleaning device, keep clear of the nozzle.

3. The adjustment of the seat is associated with a sensitive and discouraged locator directly, at the time of factory inspection has been set, in use as far as possible not to adjust.

五.YT-1000R工作原理 working principle

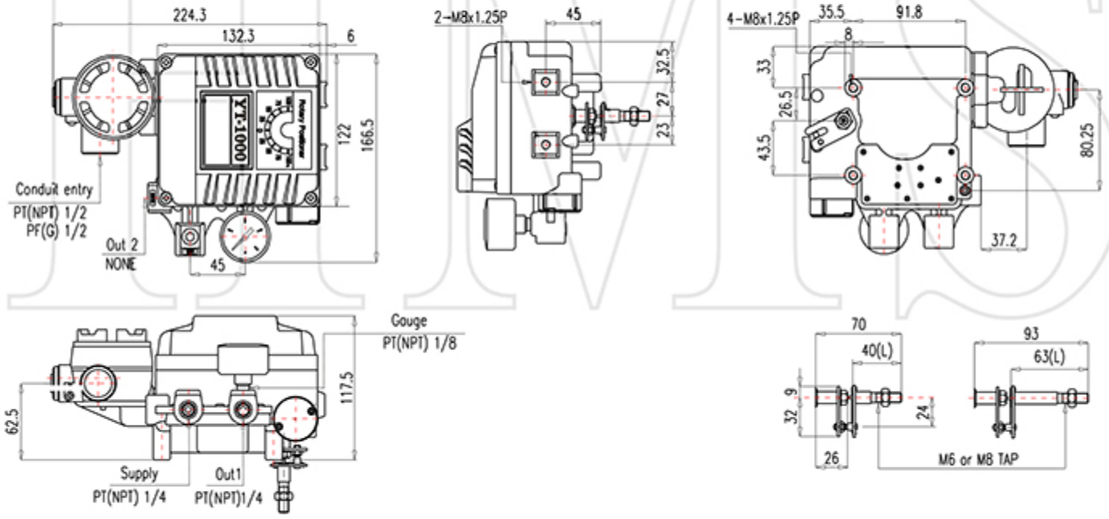
为了打开阀门增加电流信号,力矩马达1产生电磁场,挡板2受电磁场力远离喷嘴3。喷嘴3和挡板2间距变大,排出先导阀4内部的线轴5上方气压。受其影响线轴5向右边移动,推动挡住底座7的阀芯8气压通过底座7,输入到角行程气动执行机构10。随着角行程气动执行机构气室11内部压力增加,执行机构推杆12旋转,通过反馈杆13把执行机构推杆12的位移变化传达到滑板14这个位移变化又传达到量程15反馈杆,拉动量程弹簧16当量程弹簧16和力矩马达1的力保持平衡时,挡板2回到原位,减小与喷嘴3间距。随着通过喷嘴3排出空气量的减小,线轴5上方气压增加,线轴5回到原位,阀芯8重新堵住底座7,停止气压输入到角行程气动执行机构10,当角行程气动执行机构10的运动停止时，定位器保持稳定状态。



YT-1000R原理图
YT – 1000 r principle diagram

In order to open the valve to increase the current signal, the torque motor 1 generates an electromagnetic field,the baffle 2 is subjected to an electromagnetic field forceAway from the nozzle 3. The distance betweenthe nozzle 3 and the baffle 2 becomes large, and the air pressure above the bobbin 5 inside the pilot valve 4 is discharged.The spool 5 is moved to the right by its influence, and the valve body 8, which blocks the base 7, is pushed through the base 7,Corner Pneumatic Actuator 10. With the increase in the pressure inside the air chamber 11 of the aerial actuator,The actuator stem 12 is rotated and the displacement of the actuator stem 12 is transmitted to the displacement of the slider 14 is also transmitted to the range 15 of the feedback lever, pulling the span spring 16 when the span spring 16 and the moment of the torque motor 1 are maintained in balance, the baffle 2 is returned to its original position, and the distance from the nozzle 3 is reduced. along with The amount of air discharged through the nozzle 3 is reduced, the air pressure above the bobbin 5 is increased, the bobbin 5 is returned to its original position, and the spool 8 Re-block the base 7, stop the air pressure input to the angular stroke pneumatic actuator 10, when the angular stroke pneumatic When the movement of the mechanism 10 is stopped, the retainer remains in a steady state.

六.YT-1000R外形尺寸 Overall dimensions



附件-手动操作机构 Attachment - manual operating mechanism

一.蜗轮式手动机构 The worm gear type manually

手动机构是双作用气动执行器辅助操作工具，用于0–90° 角行程开启阀门。气源正常情况下，用气动驱动阀门，当气源压力暂停，需要开启或关闭阀门时，启用手动机构进行人工驱动。

Manual mechanism is double–acting pneumatic actuators auxiliary operation tools, used in 0–90° Angle of open valve. Air under normal circumstances, use pneumatic drive valve, when the air pressure to suspend, need to open or close the valve, to enable manual drive manually.

二.蜗轮式手动机构的操作说明 The worm gear type manual instructions

1.启用手动机构时，拨出限位销，逆时针将手柄旋转180°至上部，限位销自动限位，旋转手轮，进行手动操作。反之突现气动操作。

2.手动操作时，顺时针转动手轮，阀门开启，逆时针转动手轮，阀门关闭。

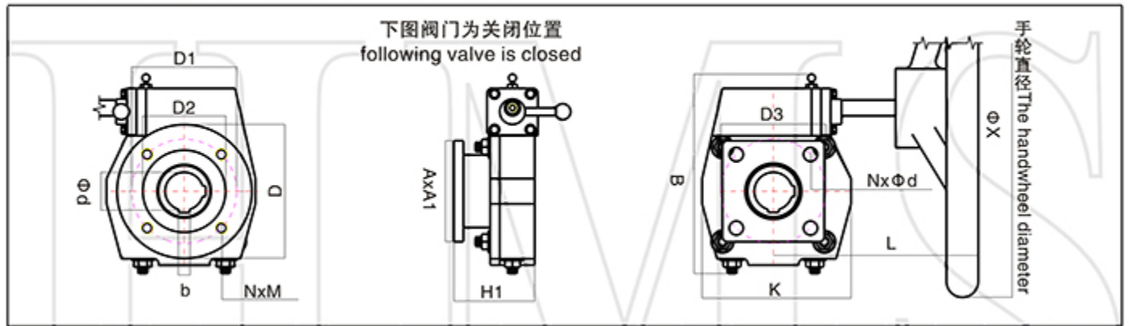
3.手动操作时，必须关闭气源;手动和气动不可同时使用，否则会使驱动装置损坏;使用气动前，必须检查手动机构处于气动驱动状态，即手柄在下方位置。

1.Enable manual institutions, allocated limit pin, will handle counterclockwise rotation 180 ° is supreme, limit pin automatic spacing, rotate handwheel, manual operation. Vice dash forward show pneumatic operation.

2.Manual operation, turn the handwheel clockwise, the valve opens, turn the handwheel counterclockwise, the valve closed.

3.Manual operation, must be closed gas source; Manual and pneumatic cannot be used at the same time, otherwise you will make the driving gear damage; Using pneumatic, must be checked manually agency is in a state of pneumatic drive, the handle is in below location.

三.外形及连接尺寸 The shape and connection size



型号 Model	D	D1	D2	Φd	b	N×M	A×A1	D3	N×Φd	H1	ΦX	配标准件 With standard parts	L	B	K	选配执行器 Equipped with actuators
XLHJ–26	90	70	55	22.2	8	4×M8	64×64	70	4×Φ9	87	250	M8×30	192	166	104	GT063–GT083
XLHJ–38	125	70	55	22.2	8	4×M8	100×100	102	4×Φ12	84	300	M10×35	195	191	125	GT083–GT160
		102	70	32	10	4×M10										
				38			110×110	125	4×Φ14	87		M12×40				
XLHJ–54	175	125	85	36	10	4×M12	110×110	125	4×Φ14	93	300	M12×40	233	234	175	GT190–GT210
		140	100	48	14	4×M16	130×130	140	4×Φ18	102		M16×55				
XLHJ–80	210	140	100	48	14	4×M16	156×135	140	4×Φ18	127	400	M16×55	277	311	234	GT210–GT250
		165	130	60	18	4×M20	156×156	165	4×Φ22	127		M20×60				
XLHJ–78	210	165	130	76.2	20	4×M20	162×162	165	4×Φ22	128	600	M20×60	323	350	276	GT280–GT300

维护与保养 Maintenance and maintenance

1.气动执行器为现场仪表，在运转中的产品应定期进行维护和保养，保证气动阀门处于常年整洁、润滑良好、附件齐全，并正常运转。

2.气源应保持干燥、清洁、定期对与执行器相应配合使用的空气过滤器进行放水、排污，以免污物进入电磁阀和执行器，影响正常工作。

3.执行器外部保持清洁无粉尘堆积，执行器应不受水蒸气、水、油污的沾染。气动执行器的密封应良好，各密封面、点应完整牢靠，严密无损。气缸进、排气口接头不允许有损伤，气缸和气源管线的各部位应仔细检查，保证气源压力正常。气源管线不允许有凹陷，保持气源畅通，不得有影响使用性能的泄漏。

4.电磁阀、气源三联件的气源管路各连接处应完好无损，电器部分的 电源信号应无缺相、短路、断路故障，外壳防护接头连接应紧实、严密，防止进水、受潮与灰尘侵蚀，保证电磁阀、阀位回讯器的正常工作。手动操作机构应润滑良好，传动灵活。

5.对于阀门的各运动部位应定期清洁并加润滑油脂，以免产生磨损和腐蚀。法兰和连接支架上的紧固螺栓不可缺少，螺纹无损伤、松动现象。

6.阀门填料压盖松紧适当，保证阀杆处无介质泄漏，避免造成阀杆处受填料摩擦力过大、擦伤阀杆密封面等。

7.气动执行器维护与保养很重要，在正常工作情况下每月检验不少于一次，每年检修一次，只有做到正常维护才能保证气动仪表控制系统处于良好的工作状态。

1. Pneumatic actuators for the field instruments, products should be regular maintenance and maintenance in operation, ensure the neatness of pneumatic valve is in all the year round, good lubrication, the attachment is complete, and the normal operation.

2. The air should be kept dry, clean, regular with actuators with the use of air filter corresponding to water, sewage, lest dirt into the solenoid valve and actuator, affect the normal work.

3. The actuator external clean without dust accumulation, actuators shall not affected by water vapor, water, oil contamination. Pneumatic actuator seal should be good, the sealing surface and point shall be complete, rigorous condition. Cylinder is not permitted in the inlet and outlet joint injury, each part of the cylinder and air pipes should be carefully check, ensure the normal order of the air pressure. Air tube ?

4. The solenoid valve, air source sanlian pieces of air pipe joints shall be intact, the power of the electric appliance part, short circuit, open circuit fault signal should be complete, enclosure protection joint connection should be tight, tight, prevent the erosion of water, be affected with damp be affected with damp and dust, guarantee of solenoid valve, valve position to dispatch work properly. Manual operating mechanism should be good lubrication, flexible transmission.

5. For the movement parts of the valve should be clean and regularly add grease, lest produce wear and corrosion. The bolt flange and bracket on the indispensable, no damage, loose thread.

6. The valve packing gland elastic properly to ensure that the valve stem without medium leakage, avoid to cause stem excessive packing friction, abrasion, valve stem seal face, etc.

7. Maintenance of pneumatic actuator is very important, in the case of normal work inspection of not less than once a month, maintenance once a year, only do normal maintenance to ensure that the pneumatic instrument control system are in good working .

故障排除 Troubleshooting

故障现象 The fault phenomenon	检查项目 Check the project	解决方法 The solution
气动执行器不动作 Pneumatic actuators is not action	1.电磁阀是否正常.线圈是否烧坏.阀芯是否被脏物卡死 2.对执行器单独供气检验，是否正常工作，如气缸串气不正常，拆开执行器检查密封件是否已损坏，气缸内孔表面是否已损坏。 3.手动机构的手柄处于手动位置。 1. The solenoid valve is normal, whether the coil is burnt,valve core dirt stuck. 2. The actuator gas inspection alone, whether to work properly,such as cylinder mixes up is not normal, apart of board Line check whether the seal is damaged, cylinder bore surface is damaged. 3. Manual institutions handle in the manual position.	1.检查电磁阀的接线、更换线圈、清除脏物。 2.更换已坏密封圈，更换气缸。 3.将手柄扳到气动位置。 1. Check the connection, replace the coil of solenoid valve, remove the dirt. 2. Replace damaged seal ring, replace the cylinder. 3. Pull the lever to pneumatic position.
气动执行器动作迟缓.爬行 Pneumatic actuators slow. crawling	1.气源压力不够,气源管路堵塞流量过小。 2.执行器扭矩过小。 3.阀门阀芯或其它阀件装配太紧不合理。 1. Air pressure is not enough, air supply pipe plug ?ow is too small. 2. The actuator torque is too small. 3. The valve core or other valve assembly is too tight is not reasonable.	1.增加气源压力到0.4~0.7MPa范围内,排除堵塞。 2.增大执行器型号规格。 3.重新修理并装配，调整阀门的开启力。 1. Air pressure is increased to 0.4 ~ 0.7 MPa range, eliminate congestion. 2. Increase the perform shape speci?cations. 3. To repair and assembly and adjustment valve opening force.
回信器无信号 Reply, no signal	1.信号电源线路短路、断路,行程开关损坏。 2.开关位置不正确。 1. The short circuit, open circuit, signal power circuit trip switch is damaged. 2. The switch position is not correct.	1.维修电源线路,更换行程开关 2.重新调整到正确位置。 1. The maintenance of the power supply circuit, replace the travel switch. 2. To adjust to the correct position.