康赛特阀门

Ksaite

阀门电动装置 使用說明書

The Guide Book of Electric Actuator for valves

Ksaite

# Ksaite

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产品说明
Product Introduction

　　阀门电动装置设计独特、外秀内刚，运转寿命超出同类产品标准的十倍。可谓钻石般耐久，以一当十。回转型阀门电动装置系列产品以卓越的性能，无可争辩的优势，当令您刮目相看！

◆功能强劲：智能型、比例式、开关式、各类信号输出型应有尽有；
◆体积小巧：体积仅相当于同类产品的35%左右；
◆轻便宜人：重量仅相当于同类产品的30%左右；
◆美观大方：铝合金压铸外壳、精细流畅、且可减少电磁干扰；
◆精密耐磨：蜗轮输出轴一体化设计避免了键联结的间隙、传动精度高，采用特殊铜合金锻造、强度高、耐磨性好；
◆安全保证：通过AC1500V耐压检测，F绝缘电机，安全有保障；
◆配套简单：采用单相电源、外接线路简单，也可做380V、直流电源；
◆使用方便：免加油、免点检、防水防锈、任意角度安装；
◆保护装置：双重限位、过热保护、过载保护；
◆多种速度：全行程时间9秒、13秒、15秒、30秒、50秒、100秒（出厂前已设定）；
◆防腐防锈：整机支架、联轴器、螺钉均采用不锈钢；
◆智能数控：智能控制模块高度集成于电动装置本体中，无需外接定位器。数字设定、数字整定、高度精确、自我诊断、一机多能。

Valve electric appliance owns characteristics of special design、beautiful appearance、strong function、operation endurance exceeding ten times of standard of same kind of product, it may be called to be endurable as diamond. The rotation valve electric appliance series product has a completely mew appraisal from customers with its supper performance and peerless advantage.

◆Powerful function: intelligently、proportionally type、switch type、 it has all kinds of signal output type you wish for;
◆Small volume: the volume is just about thirty five percent of product , of same kind;
◆Be portable: its weight is just about thirty percent lf procuct, lf same kind;
◆Beautiful appearance: outer casing is pressure-cast with Al alloy, fine and evenly, reducing electromag-netic disturbance;
◆Wear-resistance: the worm-wheel output axle, integration design avoids the stitch closure in connection place of key , the transmission precision high, forged with special copper alloy, with features of high strength and supper wear-resistance;
◆Safety guarantee: has passed AC 1500Vpressure-withstand test, F grade of insulated electric machine, which guarantees the operation safety;
◆Easily forming complete set: adopting single-phase power, simplifying wire connection from outside; it also can be 380V DC power;
◆Using simply: don 't need add-oil、 point-check, and owns performance of waterproof and antirust, could be installed at any angle;
◆Protection appliance: double position-limiting、over-hot protection、overload protection (optionally);
◆Many kinds of speed: whole stroke time has many kinds as 9s、13s、15s、30s、50s、100s(before dispatching from the factory in order to establish);
◆Antirust and anticorrosion: complete-machine support、both coupling and screw are made of stainless steel;
◆Intelligently numerically-control: the function of intelligently controlling module, height is integrated into electric appli-ance, body, the externally-connected localizer is not required. Numerically setting、 numerically regulating、 highly accurate、self-diagnosis、many functions on one machine.
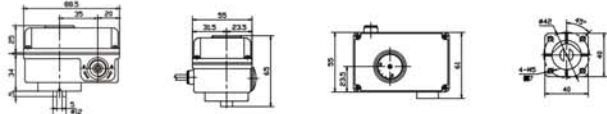
外观及各部名称
Appearance and name of every part

1	箱体	case body
2	开度计	open meter
3	进线线锁	wire-in wire lock
4	手柄轴橡胶盖	handle shaft rubber cover
5	免支架安装	No-bracket installation
6	减速盖	deceleration cover
7	电气盖	electric cover
8	接线盖	wiring cover
9	手柄轴孔	handle-axle hole
10	输出轴	output shaft
11	转接套	Adapter sleeve
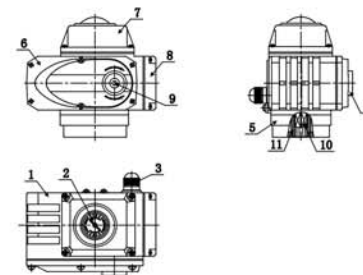
外型尺寸 Overall Dimension

KST-02	
KST-05	
KST-10	
KST-20/40/60	
KST-100/200	

KST-02性能参数　KST-02 Performance Parameter

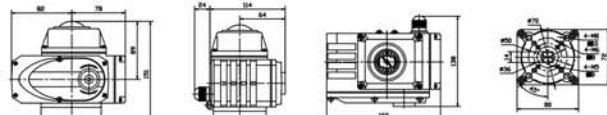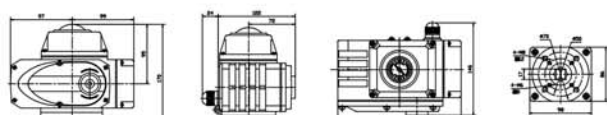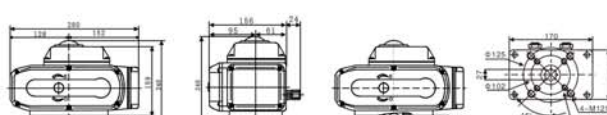|	
型号 Model	KST-02
电源 Power Supply(V)	AC85-260
输出力矩 output torque(Nm)	6
动作范围 Motion Scope(°)	0-90
动作时间 Motion Time(s)	7（second）
额定电流 Rated Current(A)	0.2
驱动电机 Drive Motor(W)	4.6
保护装置 Protection Device	马达保护热敏电阻　开闭双侧机械限制挡块 Thermistor motor protection had bilateral mechanical limit
开度检出 Opening Detection	全开、全闭位置查出元件：a.全开 红色（LED）b.全闭 绿色（LED） Wide-open, full closed position to identify components: a. Wide-open: red(LED) b. Full closed: green(LED)
输出信号 Output Signal	全开、全闭输出信号（NPN晶体管，集电极电流，发射极共用）（接点容量：DC50V，20mA） Wide-open, full closed output signals(NPN transistor, common emitter; the collector current)(connection capacity: DC50V,20mA)
使用环境 Environment	温度：25℃～+55℃ 湿度：10-90%RH　Temperature: 25℃～+55℃ Humidity:10-90%RH
出力轴 Output Shaft	SUS303, Φ:12, 沟Ditch:5, 深度Depth:5
手柄轴 Handle Shaft	六角孔 对角：4mm(有盖) Hexagonal holes Diagonal:4mm(with lid)
防水性 Waterproof	JIS C0920 等级6（相当IP65）JIS C0920 Grade 6 (quite Ip65)
安装方向 Install direction	360度全方向　360-degree omni-directional
配线电缆 Distribution Cable	0.3×6芯电缆（Core Cable）30cm
本体材质 Body Material	铝合金压铸件Al Alloy die casting
涂装色 Colour of Coating	灰白色Gray and white
重量 Weight(kg)	0.5

KST-05性能参数　KST-05 Performance Parameter

型号 Model	KST-05				
电源 Power Supply(V)	DC24	AC24	AC110	AC220	AC380
输出力矩 Output toque(Nm)	50				
90° 动作时间 Motion times(s)	7	20			
回转角度范围 Scope of rotary angle (°)	0~360				
电机功率 Motor Power(w)	10	15			
额定电流 Rated current(A)	0.5	2.2	0.48	0.24	0.15
整体重量 Machine Weight(kg)	2.3	2.7			
绝缘电阻 Insulation Resistance (MΩ)	DC24V: 100/250VDC　AC110/220V/380V: 100/500VDC				
耐压等级 Voltage Resistance Rating	DC24V: 500VAC, AC110/220V: 1500VAC, AC380V: 1800VAC. (1分钟 1Minute)				
防护等级 Protection Level	IP68				
安装方位 Installation Position	360° 任意角度安装Rotary degree: 360°				
电气接口 Electriad connection	M18×1.5防水电缆接头。电源线、信号线各一个 Each one or M18×1.5 water-proof cable connectors.　Electric Power Lines.　Signal Lines				
环境温度 Environment temperature	-30℃～+60℃				
电路控制 Circuit control	B型、S型、K型、R型、A型、D型、H型、T型				
任选功能 Optional function	◆过力矩保护器 ◆除湿加热器　◆Over torque protectors ◆Dehumidify heater				

KST-10性能参数 KST-10 Performance Parameter

型号 Model	KST-10				
电源 Power Supply(V)	DC24	AC24	AC110	AC220	AC380
输出力矩 Output toque(Nm)	100				
90°动作时间 Motion times(s)	10	30			
回转角度范围 Scope of rotary angle(°)	0~360				
电机功率 Motor Power(w)	20	25			
额定电流 Rated current(A)	0.85	3	0.7	0.32	0.2
整体重量 Machine Weight(kg)	4	4.3			
绝缘电阻 Insulation Resistance (MΩ)	DC24V: 100/250VDC AC110/220V/380V: 100/500VDC				
耐压等级 Voltage Resistance Rating	DC24V: 500VAC, AC110/220V: 1500VAC, AC380V: 1800VAC. (1分钟 1Minute)				
防护等级 Protection Level	IP68				
安装方位 Installation Position	360°任意角度安装Rotary degree: 360°				
电气接口 Electriad connection	M18×1.5防水电缆接头、电源线、信号线各一个 Each one or M18×1.5 water-proof cable connectors. Electric Power Lines. Signal Lines				
环境温度 Environment temperature	-30℃~+60℃				
电路控制 Circuit control	B型、S型、K型、R型、A型、D型、H型、T型				
任选功能 Optional function	◆过力矩保护器 ◆除湿加热器 ◆Over torque protectors ◆Dehumidify heater				

KST-20/40/60性能参数 KST-20/40/60 Performance Parameter

型号 Model	KST-20					KST-40					KST-60				
电源 Power Supply(V)	DC24	AC24	AC110	AC220	AC380	DC24	AC24	AC110	AC220	AC380	DC24	AC24	AC110	AC220	AC380
输出力矩 Output toque(Nm)	200					400					600				
90°动作时间 Motion times(s)	12	30/60				15	30/60				20	45/60			
回转角度范围 Scope of rotary angle(°)	0~90					0~90					0~90				
电机功率 Motor Power(W)	40					70	90				90				
额定电流 Rated current(A)	1.2	7.5	1.6	0.88	0.4	2.5	9	2.2	1	0.48	2.5	9	2.2	1	0.5
整体重量 Machine Weight(kg)	8.7	9.3				8.8	10				8.8	10			
绝缘电阻 Insulation Resistance (MΩ)	DC24V: 100/250VDC AC110/220V/380V: 100/500VDC														
耐压等级 Voltage Resistance Rating	DC24V: 500VAC AC110/220V: 1500VAC AC380V: 1800VAC. (1分钟 1Minute)														
防护等级 Protection Level	IP68														
安装方位 Installation Position	360°任意角度安装Rotary degree: 360°														
电气接口 Electriad connection	M18×1.5防水电缆接头、电源线、信号线各一个 Each one or M18×1.5 water-proof cable connectors. Electric Power Lines. Signal Lines														
环境温度 Environment temperature	-30℃~+60℃														
电路控制 Circuit control	B型、S型、K型、R型、A型、D型、H型、T型														
任选功能 Optional function	◆过力矩保护器 ◆除湿加热器 ◆Over torque protectors ◆Dehumidify heater														

KST-100/200系列外形尺寸及性能参数 KST-100/200 series appearance drawing and performance data

性能 Performance \ 型号 Model / 电源(V) Power	KST-100				KST-200			
	AC24	AC110	AC220	AC380	AC24	AC110	AC220	AC380
电机功率 Motor Power(w)	100				100			
额定电流 Rated current(A)	9	2.2	1.2	0.48	9	2.2	1.2	0.48
输出力矩 Output torque(Nm)	800/1000				2000			
90°动作时间 Motion time(s)	30/50				100			
电路控制 Circuit control	B型、S型、K型、R型、A型、D型、H型、T型							
回转角度范围 Scope of rotary angle(°)	0~90							
整体重量 Machine Weight(kg)	11.2				11.8			
耐压等级 Voltage Resistance Rating	AC110V/AC220V:1500VAC, AC380V:1800VAC(分钟/Minute)							
绝缘电阻 Insulation Resistance(MΩ)	100MΩ/500VDC							
防护等级 Protection Level	IP-68							
环境温度 Environment temperature	-30℃~+60℃(其它温度可定做)（The custom-made according to the other temperature）							
安装角度 Installation angle	安装 Rotary degree:360°							
箱体材质 Case material	铝合金压铸件Aluminium die-casting components							
选装功能 Optional function	◆过力矩保护 ◆加热除湿器Overload protection function、heating and dehydrating device							

智能调节型系列性能参数　Modulating type series appearance drawing and performance data

型号 Model 电源 Power 性能 Performance	KST-05A	KST-10A	KST-20A	KST-40A	KST-60A	KST-100A	KST-200A
电源 Power	DC24V/AC24V、AC110V、AC220V、AC380V；50/60HZ						
电机功率 Motor Power	15W	25W	40W	90W	90W	100W	100W
额定电流 Rated current	0.24A (AC220V)	0.32A (AC220V)	0.88A (AC220V)	1A (AC220V)	1A (AC220V)	1.2A (AC220V)	1.2A (AC220V)
输出力矩 Output torque	50Nm	100 Nm	200 Nm	400 Nm	600 Nm	1000 Nm	2000 Nm
运行时间 Action time	20S	30S	30S	30S	45S	50S	100S
转动角度 Rotary angle	0~360°		0~90°				
输入号信 Input signal	4~20mA.DC、1~5V.DC、0~10V.DC（其它可出厂前选定）（Others would be set before sale）						
输出号信 Output signal	4~20mA.DC（其它可出厂前选定）（Others would be set before sale）						
精度等级 Precision grade	1%						
重量 Weight	2.7kg	4.3kg	9.3kg	10kg	10kg	11.2kg	11.8kg
耐压等级 Voltage Resistance Rating	DC24V:500VAC/1min		1500VAC/1min				
绝缘电阻 Insulation Resistance	DC24V:100MΩ/300VDC		100MΩ/500VDC				
防护等级 Protection Level	IP-68						
环境温度 Environment temperature	-30℃~+60℃(其它温度可定做)（The custom-made according to the other temperature）						
安装角度 Installation angle	任意角度Any angle						
箱体材质 Installation angle	铝合金压铸件Aluminium die-casting components						
选装功能 Case material	过力矩保护、加热除湿器Overload protection unction、heating and dehydrating device						

Optional function

产品线路图及电源　Power and product wiring drawing

Z型：02开关型

电源要求全闭全开输出信号（NPN晶体管集电极电流）的配线本装置有专用电缆(30cm)。
接线说明：
1. 配线工程应由该由有资格的电气工程师按电气设备本技术标准进行；
2. 雨天或湿度很高时，禁止进行配线工程；
3. 配线确认要线图，正确连接；
4. 本装置有专用电缆，不需要内部配线；
5. 绝对禁止打开上开盖；（已有电缆）
6. 通电电源，绝对禁止开、闭两个开关同时通接。

Fully closed and fully open the power output (NPN transistor collector current) of the wiring of the device has a dedicated cable(30cm).
Wiring instructions:
1. the wiring works should be qualified electrical engineers, electrical equipment by hormones and standards;
2. rain or humidity is very high, against the wiring works;
3. make sure wiring diagram, properly connected;
4. the device has a dedicated cable, without the internal wiring;
5. the absolute prohibition of the upper lid open; (existing cable)
6. the power, the absolute prohibition of open and close the two switches are connected.

B型:开关型（标准型）

通过开关电路实现阀门开启和关闭操作，并输出一组指示阀门全开、全闭的有源位置型号。
接线说明：
1. 端子1接电源零线；
2. 电源相线与端子2接通时为"关"运行；
3. 电源相线与端子3接通时为"开"运行；
4. 电源相线与端子2接通到位时，端子4所接"全开信号"指示灯亮；
5. 电源相线与端子3接通到位时，端子5所接"全关信号"指示灯亮；

The opening or closing operation is realized by switching "open" or "lose" he circuit, outputting a group of full open or close active signals.
Wiring Instruction:
1. Terminal 1 connect with null line.
2. "Open" operation when terminal 2 contacted with phase line.
3. "Lose" operation when terminal 3 contacted with phase line.
4. open lamp in terminal 4 on when "open" operation.
5. shut lamp in terminal 5 on when "close" operation.

S型：无源触点型

通过开关电路实现阀门启动和关闭操作，并输出一组指示阀门全开、全闭的无源位置型号。
接线说明：
1. 端子1接电源零线；
2. 电源相线与端子2接通时为"关"运行；
3. 电源相线与端子3接通时为"开"运行；
4. 端子4为无源触点公共端；
5. "开"运行到位时，端子5接通"全开位号"；
6. "关"运行到位时，端子6接通"全关位号"；

The opening or closing operation is realized by switching "open" or "close" the circuit, outputting a group of full open or close passive signals.
Wiring Instruction:
1. Terminal 1 connect with null line.
2. "open" operation when terminal 2 contacted with phase line.
3. "close" operation when terminal 3 contacted with phase line.
4. Terminal 4 is the passive contact common end.
5. open lamp in terminal 4 on when "open" operation.
6. Shut lamp in terminal 4 on when "close" operation.

K型：带位置发生器

通过开关电路实现阀门的开启和关闭操作，同时输出与阀门开闭角度相对应的电流信号。
接线说明：
1. 电源输入端的"N"为零线，"L"接相线；
2. 电源输入端的"L"接到"开"时，向开关方向运行；
3. 电源输入端的"L"接到"关"时，向关方向运行；
4. "输出信号"端的"+"接输出信号的正极，"-"接输出信号的负极。

The opening or closing operation is realized by switching "open" or "lose" the circuit, outputting a relative group of open or close degree current signals.
Wiring Instruction:
1. Power input end "N" connect null line, "L" connect phase line.
2. Valve open when "L" connect with "open".
3. Valve close when "L" connect with "shut".
4. "+" of input terminal connect with the positive pole of output signal. "-" connect with passive pole of output signal.

R型：开度信号型

通过开关电路实现阀门开启和关闭操作，来输出与开度们们置相对应的电阻信号。
接线说明：
1. 端子1接电源零线；端子5为电位器动臂；
2. 电源相线与端子2接通时为"关"运行；
3. 端子4为电位器低端；"开"运行到时，端子4与5之间的电阻值随阀门开度增大。
4. 端子6为电位器高端；"关"运行到时，端子5与6之间的电阻值随阀门关度增大。

The opening angle of valves is controlled by switch circuit, with potentiometer out putting resistance signal corresponding valves opening angle.
Wiring Instruction:
1. Terminal 1 connect with null line. Terminal 5 is the potentiometer woring arm.
2. "open" operation when terminal 2 contacted with phase line. "lose" operation when terminal 3 contacted with phase line.
3. Terminal 4 is the potentiometer low terminal. When open operation, the resistance between terminal 4 and 5 will increase with the opening degree.
4. Terminal 6 is the potentiometer high terminal. When close operation, the resistan cevalue between terminal 4 and 5 will increase with the closing degree.

产品线路图及电源　Power and product wiring drawing

A型：智能调节型

通过外部计算机或工业仪表输入的标准信号来控制阀门的开闭角度，并同步反馈输出相对应的标准信号。

接线说明：
1. "电源" 输入端 "N" 接零线，"L" 接相线；
2. "外控" 端的 "+" 接输入信号的正极，"-" 接输入信号的负极；
3. "反馈" 端的 "+" 接输出信号的正极，"-" 接输出信号的负极。

The opening or closing degree is realized by the standard signal through external computer or industry meter. Mean while output the relative stardard signals.

Wiring Instrument:
1. Power input end "N" connect null line, "L" connect phase line.
2. The "+" of "N" connect with the positive pole of input signal, "–" connect with negative pole of input signal.
3. The "+" of "OUT" connect with the positive pole of output signal, "–" connect with negative pole of output signal.

D型：直流开关型

通过切换外部直流电源的正负极性，实现阀门的 "开" 和 "关" 操作，同时输出一组指示阀门全开或全关的无源触点信号。

接线说明：
1. 端子接电源正极时，端子2接电源负极为 "开" 操作；
2. 端子1接电源负极时，端子2接电源正极为 "关" 操作；
3. 端子4为无源触点的公共端；
4. "开" 运行到位时，端子5为 "全开信号"；
5. "关" 运行到位时，端子6为 "全关信号"。

According to the single conductivity of diode, the opening or closing operation can brealized bye means of the exchanging of the positive polarity and the negative polarity and the negative polarity of DC power supply and output a group of full open or close passive signals.

Wiring Instrument:
1. "open" operate when terminal 1 connect with power positive pole, terminal 2connect with ne gative pole.
2. "lose" perate when terminal 1 connect with power negative pole, terminal 2connect with Positive pole.
3.Terminal 4 is the passive contact common end.
4.open lamp in terminal 5 on when "open" operation.
5.Shut lamp in terminal 6 on when "lose" operation.

H型：三相开关型

通过开关电路实现阀门启闭和关闭操作，并输出一组指示阀门全开、全关的有源位置型号。

接线说明：
1. 端子1、2、3，接三相交流电，通过外部侧相电路实现电机的正反转；
2. 端子4为外部控制电路的公共点；
3. 端子5为 "开" 运行控制；
4. 端子6为 "关" 运行控制；
5. "开" 运行到位时，端子8为 "全开信号"；
6. "关" 运行到位时，端子9为 "全关信号"。

The opening or closing operation is realized by switching "open" or "close" the circuit, outputing a group of full open or close passive signals.

Wiring Instruction:
1. Terminal 1, 2, 3 connected with 3-phase power. By means of the external phase reversing circuit, running normally or reversibly of motor.
2.Terminal 4 is the common point of external control circuit.
3.Terminal 5 is "open" operation control.
4.Terminal 6 is "close" operation control.
5.Terminal 7 is passive contact common point.
6.Terminal 8 be full open signal when "open" run position.
7.Terminal 9 be full close signal when "close" run position.

T型：三相无源触点型

通过开关电路实现阀门开启和关闭操作，并输出一组指示阀门全开、全关的有源位置型号。

接线说明：
1. 端子1、2、3，接三相交流电，通过外部侧相电路来实现电机的正反转；
2. 端子4为外部控制电路的公共点；
3. 端子5为 "开" 运行控制；
4. 端子6为 "关" 运行控制；
5. "开" 运行到位时，端子8为 "全开信号"；
6. "关" 运行到位时，端子9为 "全关信号"。

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6.Terminal 8 be full open signal when "open" run position.
7.Terminal 9 be full close signal when "close" run position.

电源电压　Power, Voltage

◆ 请按产品铭牌或接线图选取电源电压。几种可能的电压如下：

◆ Please choose power volt according to product, nameplate or wiring coil, the possible volt listed as followings:
AC380V±10% 50/60HZ; AC220V±10% 50/60HZ; DC24V

*注：电源选用AC380V时，接线时注意相线的顺序，要保证行程开关能正确控制阀门的开和关，否则会损坏执行器。

*Notes: when choosing AC380V, the power, wiring should take notice of sequence of phase line and ascertain that the stroke switch should correctly control on and off of valve, or else, the actuator would be damaged

保险丝、断路开关的选用：
为发挥好的保护电动执行器、消除电路短路、降低事故伤害，可以在每台电动执行器电源输入端加接断路开关，并按下表选用合适的熔断器。

Selection of fuse、breaking switch:
In order to protect the actuator and avoid short circuit, reduce injurles please use face or breaking switch. The capacity of fuse and breaking switch refer to the follow form..

电压 Voltage　熔断器 Fuse　机型 Mode	AC380V	AC220V	AC110V	AC24V	DC24V
KST-05	2A	2A	3A	5A	5A
KST-10	2A	3A	5A	7A	7A
KST-20/40/60	3A/5A	5A/7A	7A/10A	10A/11A	15A
KST-100/200	5A	7A	10A	20A	

不能将二台或数台电动装置的动线并联；不能用同一接点去控制数台电动装置，否则会造成失控和电机过热。

Can't connect the power lines of two or several electronic devices in parallel;
Can't control several electronic devices with the same joint, Other wise will cause out of control and over heatedly with the electrical machinery.

安装 Installation
室内安装注意事项
Noted items of indoor installation

◆ 属非防爆产品，不要安装在有爆炸性气体的室内；
◆ 安装在有水和原料飞溅的地方时，请加装遮盖整机的防护罩，以策万全；
◆ 请预留进线、手动时所需的空间。
◆ The common product can, t be installed in the room full of explosive air unless explosion-proof product;
◆ If installed at certain place having water or splashed material, operator is supposed to install the protection cover additionally forcovering complete-machine safely;
◆ Operator should save necessary space needed by manual wire-in operation in advance.

室外安装注意事项
Noted items of out door installation

◆ 请加装遮盖整机的防护罩，避开雨水的阳光直射；

◆ 请预留进线、手动时所需的空间。

注：室外阳光直射会造成高温，加热元器件的老化，甚至失效；雨水会加速胶垫的老化，并在万一防水操作不当时，瞬间损坏产品。

◆ Please installing protection cover above complete-machine additionally in order to avoid rain or sunshine;

◆ Please save necessary space needed by manual wire-in operation in advance.

Notes: The shining of sunshine outdoor would lead to high-temperature which accelerates ageing of components, even losing effectiveness; The rain would accelerate aging of rubber-pad, moreover, the product will be damaged if failing in water proof conduction.

环境温度、流体温度条件
Surrounding temperature、fluid temperature condition

◆ 环境温度应在-30℃～+60℃范围内。

注：在零度以下或温差比较大的环境使用时，应使用带有防止结露的除湿加热器的机型。

◆ 当流体温度较高时，应使用高温型的连接架和接头将驱动装置安装在阀门上。

◆ Surrounding temperature should range from -30℃ to +60℃.

Note: when using Below 0, or in the environment of biggish difference in temperature, operator should use certain heating-dehumidification device with performance of anti-dewing.

◆ When the fluid, temperature is high, operator should use high-temperature type connection frame and connector to install driving appliance onto valve.

配线电缆配线连接
Wirng cable and wiring connection

◆ KST-05进线线锁PG11，请用c8的电缆线。

◆ KST-10进线线锁PG11，请用c8的电缆线。

◆ KST-20/40/60/100/200进线线锁PG11,请用c8的电缆线。

◆ 根据进线线锁的尺寸，请使用c8的电缆线，以确保连线的安全可靠；

◆ 将电缆穿过线锁，将线头紧固在端子台上；

◆ 旋紧线锁的外套以锁紧线缆。

◆ KST-05, PG11 wire-in line lock, Please use c8 cable according to dimension of wire-in line lock so as to guarantee safety and reliability of wire.

◆ KST-10, PG11 wire-in line lock, Please use c8 cable according to dimension of wire-in line lock so as to guarantee safety and reliability of wire.

◆ KST-20/40/60/100/200, PG11 wire-in line lock, Please use c8 cable according to dimension of wire-in line lock so as to guarantee safety and reliability of wire.

◆ Please use c8 cable according to dimension of wire-in line lock so as to guarantee safety and reliability of wiring;

◆ Passing cable through line-lock, and fasten thread-end onto terminal stand;

◆ Tightening outer shell of wire-lock for fastening cable.

配线线管
Wiring line-pipe

◆ 使用线管时，要充分采取防水对策。

◆ 如（图1）所示，应保证本阀门电动装置高于电线管，以防止水珠沿电线流入电动装置，造成机器损坏。

◆ When using line-pipe, operator should adopt waterproof measure;

◆ As drawing 1, operator should make sure that the electric appliance of this valve is higher than line pipe, in order to prevent water from inflowing electric appliance along line which leads to damaging of machine.

要谨防水从此浸入
Prevent water from inflowing through here

塑料管
Plastic pipe
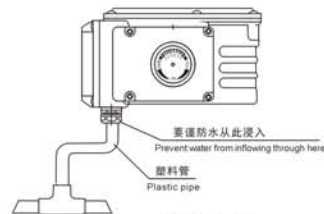
（图1drawing1）

Model selection
选型配制表

产品型号 Model	输出力矩 Output torque	动作时间time (0~90°)	电源 Power supply	硬密封蝶阀 Hard-sealing butterfly valve	软密封蝶阀 Flexible bomier butterfly valve	球阀 Ball valve	通风蝶阀 Ventalaing butterfly valve
				≤PN1.6MPa	≤PN1.6MPa		≤PN1.0MPa
KST-02	6N.M	7S	AC110、AC220V、50/60HZ、DC24V		DN25	≤DN20	
KST-05	15N.M	10S			≤DN65	≤DN40	DN50～DN80
	30N.M	20S					
	50N.M	30S					
KST-10	50N.M	13S		DN40～DN65	DN80～DN125	DN40～DN50	DN100～DN200
		15S					
	60N.M	20S					
	100N.M	30S					
KST-20	80N.M	9S	AC110V、AC220V、AC380V、50/60HZ、DC24V	DN80～DN125	DN150～DN200	DN65～DN80	DN250～DN300
	100N.M	15S					
	150N.M	20S					
	200N.M	30S					
		60S					
KST-40/60	150N.M	9S		DN150～DN200	DN250	DN100～DN125	DN350～DN500
	250N.M	15S					
	400N.M	20S					
	600N.M	30S					
		60S					
KST-100	800N.M	30S		DN250	DN300～DN350	DN150～DN200	DN600～DN800
	1000N.M	50S					
KST-200	2000N.M	100S		DN300～DN400	DN400～DN500	DN250～DN300	DN800～DN1000
KST-400	4000N.M	100S		DN400～DN500	DN500～DN600	DN300～DN400	DN1000～DN1200
KST-600	6000N.M	150S		DN500～DN600	DN800～DN600	DN400～DN500	DN1400～DN1600

因阀门种类繁多，同种规格型号的阀门，不同的生产厂家，不同的使用环境，阀门实际工作扭矩也各不相同。因此，建议在选择电动执行器型号时，应当以执行器额定输出力矩的60%～80%为阀门的工作扭矩。

As various valves, even the same size, different manufacturers, different working environment, the valve with different working torques.

Accordingly, we suggest when you choose the module of electric actuator, you shall be rated output torque of 60%~80% for valve operation torque.

开关型的调整
The regulation of switch type product
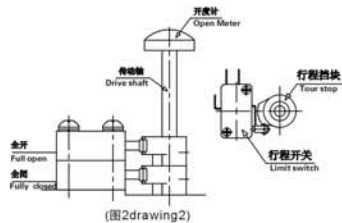
(图2 drawing2)

极限位置开关的调整(图2)
Adjust the limit position switch(drawing2)

◆ 将阀门手动至全闭位置。
◆ 松开行程挡块固定螺钉，转动下面行程挡块，使下面行程开关动作，行程开关动作时会发出"咔哒"声响，然后固定螺钉。全开位置调整方法同上。

◆ the valve manually to the fully closed position.
◆ stroke stop screw loose, turn the block below, so that the following action limit switch, micro switch Action will be issued when the "click" sound, and thenscrew. Full open position adjustment method as above.
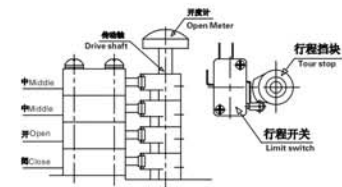
(图3 drawing 3)

中间位置开关的调整(图3)
Intermediate position adjustment switch(drawing 3)

◆ 用手柄驱动阀门至所需位置。
◆ 松开行程挡块固定螺钉，转动行程挡块，使相对应的行程开关动作，然后固定螺钉。
◆ 两个中间位置开关动作位置可根据使用需要进行调整。

◆ valve driven by the handle to the desired location.
◆ stroke block release screws, rotating block schedule, so that the corresponding micro switch operation, and then Screws.
◆ switching the two middle position can be adjusted in accordance with needs.

机械限位的调整（图4）
Regulation of mechanical position-limiting (drawing 4)

◆ 用手柄转动至全开位置。
◆ 松开锁紧螺母，旋转调整螺钉，使之与机械挡块接触，然后，反方向旋转螺钉半圈，锁紧螺母。
◆ 同样方法，可进行全闭位置的机械挡块的调整。

◆ Rotate it to the wholly-open position with handle.
◆ Loosen tighten-nut and rotate regulation screw in order to touch the mechanical link-stopper, then, rotate screw or semi-circle in anticlockwise direction for tightening nut.
◆ Using same method, operator could regulate mechanical link-stopper at wholly-closed position.

*注：机械限位必须滞后于电气限位，否则易造成电机发热。
* Notes: the mechanical position-limiting should lag behind the electric limiting , or else, it would lead to heating of electric machine.
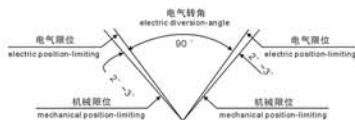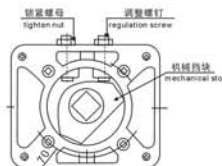
(图4 drawing 4)

电位器的调整[开度型（R）、调节型（A）]（图5）
Potentiometer, regulation (opening type R、regulate type A) (drawing 5)

◆ 电位器的电阻值为：1KΩ、5KΩ；
◆ 用手柄 转动阀门到全闭位置；
◆ 松开开度齿轮的螺钉，转动开度齿轮，调整电位器。
用万用表测量4-5接线端子间的电阻值，使4-5端子间的电阻值到大约为10Ω，紧固开度齿轮固定螺钉（如果是调节型的七线接插件连接时请测量对应RV和RS两插孔的电阻值）。

◆ The resistance valve of potentiometer is 1KΩ、5KΩ；
◆ Using handle to rotate valve to wholly-closed position;
◆ Loosen screw of opening-gear and rotate opening gear for regulating potentiometer.
Using universal-meter to measure resistance valve between 4 and 5 wiring terminals, and make the resistance valve achieve 10Ω, tighten opening gear, fixing screw.(if the seven-line connector of regulate type are connected, please measure the resistance between RV and RS jacks.)

*注：亦可直接松开电位器调整，但固定时，请注意电位器齿轮与开度齿轮的啮合，间隙不能过大或过紧，否则直接影响执行器的整机精度。

*Notes: operator also could loosen potentiometer for regulation, however, in case of being fixed, operator should take notice of the stitch closure between gears of potentiometer and opening, which can't be too large or small, or else, it would directly affect the complete-set precision of execution device.
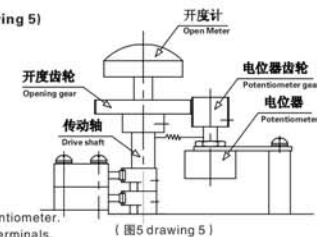
(图5 drawing 5)

调节型的调整
The regulation of adjusting type product

执行机构的调整 Regulation of execution machinery

◆ 在调整智能定位器之前，应清楚开关角度的调整方法，根据阀门的全闭、全开调整执行机构的电气限位、电位器和机械限位。

◆ Before regulating intelligent localizer, operator should understand the regulation method and regulate electric position-limiting、potentiometer and mechanical limiting of execution structure in the light of wholly-open、wholly-closed of valve.

ZXQ2004

ZXQ2004c

Ksaite

定位器面板 Localizer panel

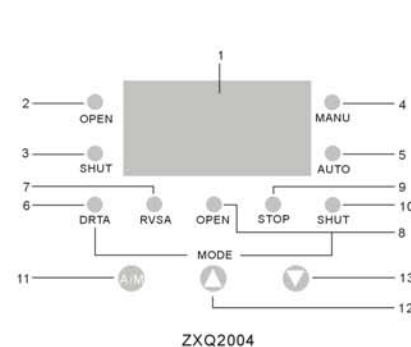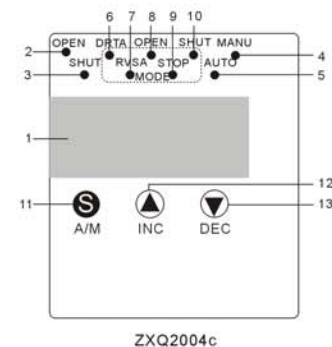| 参数显示 Data display	1	LED视窗 LED form	通过按键切换显示阀门实际开度值、阀门设定开度值、定位器壳内温度和设定参数 Show actual opening valve、setting opening valve of valve、temperature inside localizer, cover and its setting data by means of pressing key for changing
状态指示 State indication	2	OPEN	输出控制"开"继电器闭合Output control "open" relay shutting
	3	SHUT	输出控制"闭"继电器闭合Output control "closed" relay shutting
	4	MANU	手动状态Manual state
	5	AUTO	自动状态Automation state
模式指示（MODE）Mode indication	6	DRTA	正动作模式，输入信号对应输出如下：Obverse-action mode, input signal, corresponding output stated as following: 4mA-满位（一般标定为全开）；20mA-零位（一般标定为全闭）4mA-full(whollyopened normally); 20mA-zwro(wholly-closed normally)
	7	RVSA	反动作模式，输入信号对应输出如下：Reverse-action mode, input signal, corresponding output stated as following: 4mA 零位（一般标定为全闭）；20mA 满位 4mA-zero(whollyclosed normally); 20mA-full(wholly-opened normally)
	8	OPEN	输入信号中断时为"开"，使执行器开至最大开度限位处 Input signal, suspending state being "open", operator open the execution device to the greatest opening, limit
	9	STOP	输入信号中断时为"停"，使执行器停在当前位置 Input signal, suspending state being "stop", operator should stop execution device, operation under present state.
	10	SHUT	输入信号中断时为"闭"，使执行器开至最小开度限位处 Input signal, suspending state being "shut", operator open the execution device to the smallest opening, limit
按键 Key	11	A/M	手动/自动切换键，参数的进入修改和切换键 Manual/auto switching key, input revisal and switching key for data
	12	▲	数值增加键，自动状态下还用于切换显示阀位设定开度值，手动状态下为"开" Numerical increaaing key. This key can be used for converted-showing valve, s setting opening valve under auto state too, it is at "on" state under manual state
	13	▼	数值减少键，自动状态下还用于切换显示定位器壳内温度，手动状态下为"闭" Numerical reducing key. This key can be used for converted-showing internal temperature of localizer under auto state too, it is at "off" state under manual state

接线说明 Wiring introduction

ZXQ2004智能定位器与电动执行器通过一个七线接插件连接。

定位器上有一个六线弹性压力锁紧的接线排（如图6），其中、N、L接220VAC单相电的中线和相线，2个4～20mA(或者1～5V等)IN端子接控制电流（电压），2个4～20mA端子为反馈电流信号输出，可以连接电流表用于指示实际的阀门开度，也可以是空白不接。连接线可用线芯为Φ1～2mm（如图7）的单芯或多芯红外绝缘线，去除7mm绝缘层，如采用多芯线最好能扭紧并上锡，这样连接会容易很多，接线时可以将单芯或多芯线插入孔内，感到阻力后，再继续插入4～5mm，即可，如果线丝较软，则将线放入孔内，感到阻力后，一字弄螺丝刀压下上边上的弹性锁紧开关，再将线插入4～5mm，然后松开弹性锁紧开关，则线被锁紧，一般情况下不能拉出来。需要拉出来时，要用一字型螺丝刀压下对应孔上的弹性锁紧开关。然后才可将线拉出。

ZXQ2004 intelligent localizer can be connected with electric execution device through one seven-line connector:

There is one wiring row tightened by six-line flexible pressure on localizer(as drawing6), of which the N、L lines connected with mid-line and phase-line of 220VAC single-phase circuit, two 4～20mA(or 1～5V) IN terminals connected with control current(voltage), two 4～20mA terminals outputting feedback current signal can be connected with ammeter so as to display actual valve, s opening, while, it also can be not connected. The connection line could take Φ1～2mm single-core、many-core or insulated line (shell insulation-skin) as line-core, operator is suggested to twist tightly and plate tin onto line-core in case of using many-core line, which would simplify connection. During wiring, operator could insert single-core line or many-core line (after tin plating) into hole, and supposed to continue to insert for 4～5mm fur-the after touching flexible

弹性锁紧开关 flexible tighten-switch

接线孔 Wiring hole

（图6 drawing6）

Φ1～2mm

7mm

（图7 drawing7）

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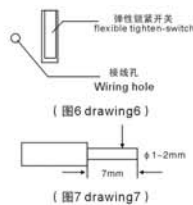
resistance. Provided the line soft, operator can put the line into hole and use "—" shape screw driver to press the flexible locking switch on corresponding hole after touching resistance, then inserting line in wards for 4～5mm and loosen flexible tighten switch. After the line is tightened, it is difficult to be drawn out under normal case. However, provided user wants to draw out line, he should press down flexible tighten switch on corresponding hole by "—" shape screw driver.

智能定位器的设定操作方法 The setting operation method of intelligent localizer

按接线图连接好给定信号源、输出信号测量仪表（可以不接）及电源之间的连线；

◆上电，此时显示阀位实际开度值，定位器处于自动测控状态；

◆按A/M键切换为手动状态，分别按 ▲和 ▼键，执行器对应为手动"开"和"闭"的动作。

◆自动状态下，按 ▲查看阀门设定开度值，此时可查看输入信号的变化趋势和稳定性；

◆自动状态下，按 ▼可观察定位器壳内温度，当温度超过70时，定位器停止对执行器的开、闭控制；

◆自动状态下，按下A/M键4S，可以进入下列表的设定参数，参数值可以通过 ▲和 ▼键修改，详见操作流程图。

Connecting the lines between given signal source、output signal measure meter(no-connected is allowed) and power supply according to wiring drawing.
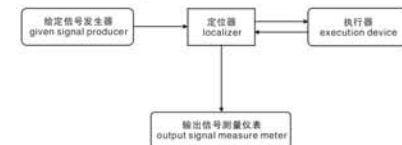
◆When electrifying, the actual opening valve of valve would be displayed, and the localizer is at auto-test state at this time.

◆Pressing A/M key for converting to manual state, separately pressing ▲and keys is corresponding to manually "open" and "shut" operation of execution device.

◆Under auto state, pressing ▲can look into valve, s setting opening valve, and the varying trend and stability of input signal could be displayed at this time.

◆Under auto state, pressing ▼can look into internal temperature of localizer,s casing, the localizer would stop open-shut controlling to execution device if temperature exceeds 70;

◆Under auto state, pressing A/M key and lasting for 4S, it would enter the setting data of following form, the data valve could berevised by means of pressing▲and ▼keys, the specific stating please refer to operation process drawing.

给定信号发生器 given signal producer → 定位器 localizer → 执行器 execution device

定位器 localizer → 输出信号测量仪表 output signal measure meter

智能定位器的设定操作办法 Setting operation method of intelligent localizer

参数列表 Data form

参数 data	显示值 showed valve	含义Meaning	出厂值 ex-factory vive
U0	00x.0	X=1允许电子制动，x=0不允许电子制动 X=1the electronic driving is allowed, x=0 the electronic driving is not allowed	1
	000.x	1、x=0不允许改变定位精度，但允许改变重调时间 X=0 changing location precision is not allowed, while, changing readjusting time is allowed 2、x=1、2、3不改变重调时间，但允许改变定位精度 X=1、2、3 changing readjusting time is not allowed, and the location precision can be changed	0
U1	00x.0	设定正反作用，x=0为正，x=1为反 Setting positive and negative action, x=0 is positive, x=1 is negative.	1
	000.x	中断信号模式，x=0(忽略) x=1(开) x=2（停） x=3(闭) Suspend-signal mode, x=0(neglection) x=1(open) x=2(stop) x=3(shut)	2
U2	xxx.x	控制输出下限限制值0≤U2＜100，手动和标定零点、满位过程中不受此参数限制 The control output lower-limit limiting valve is 0≤U2＜100, during process of manual operation and calibrating zero, full position, it is not limited by this data.	0.0
U3	xxx.x	控制输出上限限制值0＜U2＜U3≤100，手动和标定零点、满位过程中不受此参数限制 The control output upper-limit limiting valve is 0＜U2＜U3≤100, during process of manual operation and calibrating zero, full position, it is not limited by this data.	100.0
U4	00x.x	精度可调，等于x.x/100 The precision is adjustable, equals x、x/100	0.4
U5	xxx.x	操作密码，（U5=003.1为进入执行器开度标定） Operation cipher,(U5=003.1 is opening calibrating of entering execution device)	
U6	xxx.x	执行器零位确认，操作▲▼键，当到达指定满位时，按A/M键，零点确认，然后进入U7 Execution device, zero confirmation, please pressing ▲▼key, when touching given zero position, please press A/M key for zero-position confirmation, then enter U7	
U7	xxx.x	执行器满位确认，操作▲▼键，当到达指定满位时，按A/M键，满点确认 Execution device, zero confirmation, please pressing ▲▼key, when touching given full-position, then pressing A/M key for full-position confirmation	

注：其它参数工厂保留使用，如有需要，可参考附录。
Notes: other data are reserved by manufacturer, if customers need, please refer to appendix.

※执行器标定出厂前已标定完毕,用户只需连接好电源、信号源和输出信号测量仪表（可以不接），可直接使用,无需重新标定。如果确要重新标定,可按以下步骤操作。

◆标定执行器的零位和满位。此标定对定位器的输入、输出信号无影响,执行器重新调整后,必须进行器转角的标定,此后定位器才能正常工作,标定有以下两种方法:

※The execution device is calibrating before ex-factory, user just needs to connect power supply、signal powal and output signal measure meter (no-connection is allowed), then coule be put into work without re-calibrating again.

◆Calibrating position-position and full-position of execution device, this calibrating has mo influence on inputting、out-putting signal for localizer, after the execution device is readjusted again, operator must conduct calibrating for rotation angle o f execution device, then the localizer can work normally. Calibrating has two methods as followings:

方法一（手动标定）（参照操作流程）:
◆进入到U5,修改U5=003.1,然后再按一下A/M键,进到U6参数（标定零位）,按▲或▼,执行器相应朝"开"或"闭"方向运作,同时显示的阀位实际开度值也相应逐渐变大或变小,当到达期望零位时（一般设在全闭位置）,按A/M键,零位确认,进入U7参数。
◆进入U7参数（标定满位）,同理按▲或▼到期望满位（一般设在全开位置）,按A/M键满位确认,执行器自动回到90%位置返回U5。
◆修改U5=000.5,返回测控状态。

方法二（自动标定）:
◆进入到U5,修改U5=003.1,然后按住A/M键的同时按下▼键然后都放开,即启动自动标定,此时定位器先标定零位,后标定满位,标定完后定位器处于手动状态,★重新进入参数U5,修改U5=000.5(默认值)后按A/M键,标定结果才被存储。

The lst method (manually calibrating) (according to the operating process):
◆Enter into U5 equal 003. 1, the pressing A/M key again and enter into U6 data (calibrating zero-position), press▲and▼key, correspondingly, the execution device will operate in "open" and "close" direction, and the actual opening valve of valve displayed will increase and decrease in responses. When touch the expected zero-position (commonly at wholly-close position), please press down A/M key for zero-position confirmation and enter into U7 data.
◆Enter into U7data (calibrating full-position),like the operation above, pressing ▲ and▼key until expected full-position(commonly at wholly-open position),and press A/M key For full position conformation, A the actuator will return the site of 90% automatically, then return to U5.
◆Revising U5 and revise U5 to be oo5. 1
the 2nd method (auto calibrating)
◆Revising U5 and revise U5 to be oo3. 1, then pressing▼key at the sane time of pressing A/M key ,then releasing all the keys that is start auto calibrating, this time, localizer would calibrate zero-position firstly and full-position secondly, the localizer would be at manual state after being calibrated. ★ Enter into data U5 again and revise U5 to be 000.5 (defaulting), then press A/M key and the ca-librating result would bestored.

◆在定位器测控过程中,可能由于输入信号质量、外界电磁干扰等,执行器会出现振荡而导致发热,为了避免执行器持续振荡,可以修改U0（000.X）:
1、设置x=0,则在执行器出现振荡过程中定位精度保持为设定精度,但执行器的重调时间会不断增大至7秒,从而达到精确定位和执行器间断工作的要求;
2、X=1,2,3 则在执行器出现振荡过程中重调时间保持不变（大约2秒）,但执行器的精度会不断减小,从而达到最适宜精度下工作的要求。
※参数修改过程中如出现10S空闲,会自动回到测控状态。

◆Euring test process of localizer, the execution device would oscillate and produce heat because of input-signal quality or ext-ernal electromagnetic interruption etc, for preventing execution device from oscillating continuously, operator could Change U0(000.X);
1、Setting x=0,the location precision would retain setting precision during oscillating process of execution device, however, int-errupting work of execution device;
2、X=1,2,3 the readjusting time would keep invariant (about 2 seconds)during oscillating process of execution device, but the precision of execution device would decrease, thus achieve the work demand under the most proper precision.
※if the is 10S leisure in process of revising data, it would return to test state automatically.

操作流程 Operation process
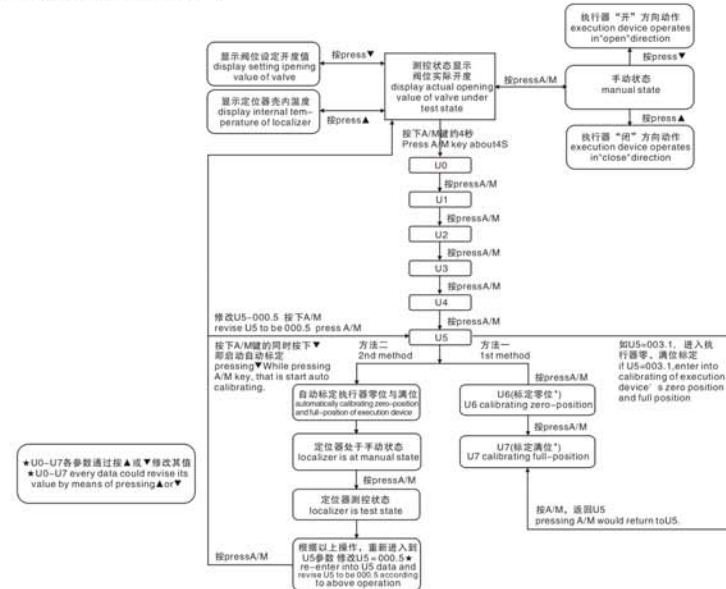
智能定位器的设定操作方法 Setting operation method of intelligent localizer
错误代码列表 Wrong code list

错误代码 wrong code	含义 Meanings
E-01	控制信号中断或者低于0.3mA The controlling signal disrupt or below 0.3mA
E-03	定位器和执行器间的信号反馈线或开-闭线接反 The signal feed back line or open-close line between localizer and execution device are connected contrarily
E-05	执行器振荡大,可能由于输入信号或反馈信号不稳定、精度太高等 Execution device produces obvious oscillation, maybe because the input signal or feedback signal are unstable. precision being too high etc
E-06	执行器往闭方向时堵转 Blocking phenomenon occurred during execution device, operation in "open"direction
E-07	执行器往开方向时堵转 Blocking phenomenon occurred during execution device, operation in "open" direction
E-08	定位器壳内温度超过70℃ The temperature inside localizer, s casing exceeds 70℃

附：其它标定-输入信号、输出信号等标定方法见下图
Appendix: other calibrating operation–calibrating method of inputting signal、outputting signal etc refer to following drawing

测控状态显示阀位
实际开度
display act ual opening
value of valve under test state

按下A/M键约4秒
press down A/M key for 4S

U0

按press A/M

U4

按press A/M

U5=000.5
按A/M，返回测控状态
press A/M key and return to test state

U5

如U5=001.1
For example U5=001.1

按press A/M

U6

按press A/M

U7

按press A/M

U8

按press A/M

U9

按press A/M

Ua

输出电流标定
calibrating for output-current

按press A/M

Ub

按A/M，返回U5
press A/M key and return to U5

按press A/M

Uc

如U5=011.1 按A/M
For example U5=011.1
Press A/M

U8

按press A/M

U9

按A/M，返回U5
press A/M key and return to U5

输入电流标定
calibrating for input-current

ZXQ2004模块升级版说明 The introduction of up grading edition for ZXQ2004 model

1、增加了简单自动标定方法，即在自动状态下按住A/M键的同时按▼键后，同时松开，即启动了自动标定（和方法二自动标定相同功能）。

Adding to simple automatically calibrating method. Under automatic state, pressing A/M key and▼key ,then disentangling them at the same time, starting the automatic calibrating.

2、根据说明书标定方法，标定满位（U7）后，按确认键（A/M），这时不会马上回到U5，电动阀会走到标定后量程的10%位置，然后才返回U5。

According to the calibrating method from the introduction book, after calibrating the full position(U7), pressing confirm key (A/M), it will not return U5immediately, however, the electric valve will go to 10% position of calibrating measurement, then return U5.

3、模块增设防堵转功能，当电动阀门发生堵转时（全量程时间的10%），模块停止控制输出，一分钟后模块再次检测堵转，如故障未消除，则一分钟再次检测，共计三次。显示屏显示故障代码与阀位值交替闪烁。故障仍未消除时，模块停止检测，显示故障代码，模块停止工作。

The model adds to the function which can make the valve work all the time. When the electric valve does not work (in 10% of the measurement), the model will stop controlling output, then it will check the valve again in one minute. If the malfunction does not eliminate, it will check the valve again, three times in total. If the malfunction does not eliminate again, the model will stop checking, indicate the malfunction code, as far as the model stops working.

可以通过点动面板按键或重新上电使模块恢复正常。

You can make the model get right by pressing panel key or electrifying again.

⚠ **（出厂后一般不需此项操作，如需请在工程师指导下使用)**

（This operation is not required after ex-factory aenerally, if required, please use it under engineer's instruction）

输入信号标定

◆在定位器的正常测控状态下，按下A/M键约4秒钟，将进入设定参数状态；显示"U0"参数值。通过按A/M键，选择"U5"参数。按▲，▼键可以修改"U5"的数值，使之为011.1。（数值含义参照下表）

◆进入"U8"参数值为校准输入电流零点：标定时，通过外部仪表输入零点信号（一般为4mA），按A/M键确认，然后进入"U9"参数。

◆Under normal test state of localizer, pressing A/M key for 4S would enter into setting data state; the "U0" data value will be displayed, operator also could select "U5" data by A/M, Pressing ▲,▼key could change numerical value of "U5" to be 011.1. (Numerical meaning refers to following form)

◆Entering into 'U8' data for calibrating zero position of inputting current; when calibrating, the signal of inputting zero position through external instrument (is 4mA commonly), then pressing A/M key for confirmation, and enter into" U9" data.

参数 Data	显示值 Display		含义Meanings	
U5	0xx.x	进入标定密码，U5=001.1,进入输入电流标定，U5=011.1进入输出电流标定等， Enter into cipher calibrating. U5=011.1, enter into input-current calibrating；U5=001.1, enter into output-current calibrating; U5=003.1进入执行器零、满位标定 U5=003.1 ,enter into zero、 full position calibrating of execution device		
U6	xxx.x	执行器零位确认参数		Execution device, zero–position confirmation data
U7	xxx.x	执行器满位确认参数		Execution device, full-position confirmation data
U8	xxx.x	校准输入电流零点参数		Input-current zero-position confirmation data
U9	xxx.x	校准输入电流满量程参数		Input-current full-position confirmation data
Ua	xxx.x	标定输出电流零位参数		Calibrating output-current zero-position data
Ub	xxx.x	标定输出电流满量程参数		Calibrating output-current full-position data
Uc	xxx.x	修正机壳内温度		Revise temperature inside casing

◆"U9"参数为校准输入电流满量程：标定时，通过外部仪表输入满量程信号（一般为20mA），按A/M键确认，然后进入"U5"参数；修改U5=000.5按A/W键确认退出，标定完成

输出信号标定

◆以上操作保障输入信号的洁净和稳定。

◆进入U5参数，修改U5=001.1，按A/M键进入U6参数；

◆跳过参数U5、U6、U7、U8进入Ua；

◆"Ua"为标定输出电流零点：标定时，操作▲、▼键，使标定输出为4mA或其它数值，对应执行器零位输出信号值，按A/M键确认，然后进入"Ub"参数；

◆"Ub"参数为标定输出电流量程：操作▲、▼键，使标定输出为20mA或其它数值，对应执行器满位输出信号值，按A/M键确认，然后进入"Uc"参数；

◆"Uc"参数为修正机壳内温度，操作▲、▼键，可以调整；

◆按A/M键确认，然后返回"U5"参数。修改"U5"数值，使U5=000.5。按A/M键确认，返回测控状态。

◆ "U9" data is calibrating input–current full measuring range: when calibrating, please input full measuring range signal (is 20mA generally) throwgh external instrumentand press A/M key for confirmation, then enter into "U5" data revise U5 to be 000.5,then press A/M key to exit,the calibration is completed;
  ◆ The signal must be inputted stably in above operation.
  ◆ Enter into U5 and revise U5 to be 001.1, then press A/M key for entering into U6data;
  ◆ Skip data U5, U6, U7, U8 for entering into Ua;
  ◆ "Ua" is calibrating output–current zero position: when calibrating, pressing ▲、▼key so as to set the calibrated output to be 4mA pr other numerical value, which is corresponding to the zero–position outputting signal value of execution device, then pressing A/M key for confirming and enter into "Ub" data;
  ◆ "Ub" is calibrating output–current full measure range: pressing ▲、▼key so as to set calibrated output to be 20mA or othernume rical value, which is corresponding to the full position outputting–signal value of execution device, then press A/M key for confirmation and enter into "Uc" data;
  ◆ "Uc" data is calibrating temperature inside casing, pressing ▲、▼key for regulation;
  ◆Pressing A/M key for confirmation, then return to "5" numerical value to set U5 to be 000.5. then pressing A/M key for confirm- ation and return to test state.

LSDTK使用说明LSDTK INSTRUCTIONS

一、概述Brief Introduction
LSDTK是一调节型电动执行器控制部件。电路采用单片机控制。提供了多种故障诊断与保护功能。设置采用按键操作，简单易行。电子行程检测与限位，无需加装限位开关。可靠的固态继电器故障保护电路，在固态继电器损坏时，能保电机不会误动。LSDTK具有就地操作与远方操作切换功能。全部设置和操作仅通过就地操作面板即可完成，实现了"非侵入"式操作。LSDTK可选用红外线遥控。

LSDTK is the control part of regulated electric actuator.. Circuit adopts single–chip microcomputer control。It Offers a variety of fault diagnosis and protection function, and easily operated by key–press. LSDTK uses electric travel to detect and limit, without fixing limit switches. Reliable solid–state relay fault protection circuit can ensure the motor will not malfunction while the solid–state relay is damaged. LSDTK's local and remote operation also have a switching function. All settings and operations can only be completed through the local control panel to achieve a "non-invasive" type of operation. LSDTK also can be used in infrared remote control.

二、主要功能Main Function
1、给定信号失效判断保护功能
给定信号引线开路、短路、超出正常范围时，发出报警，并能根据用户选定的信号失效处理方式（全开、全关、保持）自动控制阀门的位置。

1, protection function of given the signal failure (input signal)
When a given signal leads open circuit, short circuit, and outside the normal range, the alarm will shout, and according to user's selected signal failure handling way(Full-open, Full-closed, Maintain)to automatic control the valve position.

2、位置发送器信号失效判断保护功能
位置传感器引线故障、本身损坏，可立即自动切断电机电源（远程模式），发出报警。

2, protection function of the position transmitter signal failure (feedback signal failure/output signal)
Position sensor lead failure and self damage can be immediately and automatically cut off electrical power (remote control mode),then issue a warning.

3、过力矩保护功能
出现过力矩，控制器会控制电机向相反方向转动一小步，然后再按原方向运转。如果过力矩消失，转入正常运行。如果继续过力矩，再重复后退、前进一次。三次进退过力矩不消失则关断电机电源，发出报警。

3, protection function of there have been over torque
The controller will control motor to turn a small step in the opposite direction when it comes out over torque, then turn back to the orig inal direction. If the over torque has disappeared, then turns into normal operation. If continue, then repeat back, forward again. Advancing and retreating over three times the torque can not be cut off and then lose power, issue a warning.

4、行程限位功能
到达全开位置，自动关断电机，不能再开。
到达全关位置，自动关断电机，不能再关。

4,stroke limit function
To reach the fully open position automatically shut off the motor, it can not be opened again.
To reach the fully closed position, automatically shut off the motor, it can not be shut again.

5、瞬间防反转功能
确保在电机停下来后才可启动反转。

5, instant anti–reversed function
To ensure that only after the motor stops can starts reversing

6、精确的定位功能
采用独特的自适应算法确定提前发出电机停止信号的时间，大大地提高了定位精度。对于执行器的负载力矩变化，自适应定位软件均可保证精确定位，大大降低了基本误差。

6,the precise positioning function
Using adaptive algorithm to make sure the time of advanced issuing motor stopped signal, greatly enhance the positioning accuracy. With regard to the load torque changes of actuator, adaptive positioning software can ensure the precise positioning and greatly reduce the fundamental error.

7、就地手动操作与远方自动操作功能
可通过就地操作面板切换就地手动操作模式和远方自动运行模式。在就地模式下，可通过就地操作面板的按钮控制执行器的开、关动作。在远程模式下，执行器的开度自动跟随给定开度信号变化。

7, local manual operation and automatic operation function
Through the local operation panel to switch off local manual operation mode and remote automatic operation mode. In the local mode, through the buttons of the local operation panel to control the opening and closing movements of actuator. In remote mode, the opening of the actuator automatically follows the given signal changes.

三、主要技术指标the major technical indicators
1、调节（给定）输入信号：4～20mA；输入电阻120Ω。
2、位反信号输出：4～20mA；输出负载电阻≤750Ω。
3、灵敏度：0.025%（1 / 4096）。
4、死区值：自动调整。
5、定位误差：≤±1‰。
6、阻尼特性：无振荡。
7、迟滞：不大于0.2S。
8、电源电压：80～265VAC、DC（交直流均可）。
9工作环境温度： －25～80℃。
10、境湿度： ≤95%RH。

1, adjust (given) the input signal: 4～20mA; input resistance 120□
2, bit anti–signal output: 4～20mA; output load resistance ? 750□
3, sensitivity: 0.025% (1 / 4096).
4, the dead zone values: automatic adjustment.
5, the positioning error: = □ %.
6, the damping characteristics: no oscillation.
7, Delaying: less than 0.2S.
8, the power supply voltage: 80～265VAC, DC (AC–DC is available).
9, Operating temperature: –25～80 ?.
10, Environmental humidity: ≤ 95% RH.

四、接线Wiring
见附录in Appendix

五、使用Using

LSDTK型的就地操作操作面板如下图所示。
local operation panel of LSDTK type as shown below.
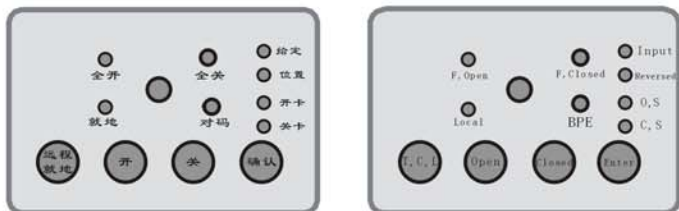
LSDTK控制电路提供两种运行模式：即就地手动模式和远方自动模式。就地模式下可通过操作面板的开、关键直接控制执行器的开、关；远方自动模式接受给定的4～20mA控制信号，执行器的开度跟随给定信号变化。
上电后控制电路自动进入远方运行模式。

LSDTK control circuit provides two operating modes: the local manual mode and remote automatic mode. The opening and closing presses of local mode operation panel can directly control the actuator opening and closing; remote automatic mode accepts a given 4 ~ 20mA control signal, the opening of the actuator automatically follows the given signal changes.
After turn on the power, it can control circuit to automatically enter remote operation mode.

1、从远方自动模式切换到就地模式
同时按下"远程/就地"键和"确认"键保持5秒钟以上，"就地"指示灯亮，表示进入了就地手动模式，同时松开按键，即可进行就地手动操作。

1, from remote automatic mode switch to the local mode
press the "remote / local" button and "OK" button for 5 seconds,if the"local" indicator light turns on, it means that has entered the local manual mode, and release buttons, the local manual operation has began.

2、从就地模式返回远程模式
只需按下"远程/就地"键，当就地指示灯熄灭，松开按键，即返回了远程模式。

2, return from the local mode to remote mode
Simply press the "remote / local" button, when the local light is off, then release the button, which returns the remote mode.

3、就地手动操作
就地手动操作为点动模式。及按下"开"键，执行器向开方向运行。松开按键或运行到全开位置，执行器停止运行。在全开位置，按"开"键无效。按下"关"键，执行器向关方向运行。松开按键或运行到全关位置，执行器停止运行。在全关位置，按"关"键无效。

3, local manual operation
Take local manual operation as the jog mode. Press the "open" button, the actuator operate to the open direction. Release the button or run to the fully open position, the actuator stops. In the fully open position, press "open" button is invalid. Press the "off" button, the actuator operate to the off direction. Release the button or run to the fully closed position, the actuator stops. In the fully closed position, press the "off" button is invalid.

4、远方自动运行
在远方模式下，执行器的开度跟随给定信号变化。

4,remote automatic mode
In remote mode, the opening of the actuator automatically follows the given signal changes.

六、设置Setting

执行器在投入使用前或改变接线后必须要进行设置。设置前应在位反电流输出端接一20mA的电流表。
Actuator must be set before it is put into use or after changing the connection wiring. Before setting it should connect a current ammeter of 20mA in place

1、进入设置
进入设置前必须将运行模式切换到就地状态。在就地模式下按下"确认"键不放，保持约5秒钟，就地指示灯开始闪烁，表示已进入设置状态。松开按键，"全关"灯亮，即进入了全关标定状态。

1, enter into setting
before entering the setting mode should switch operating state to the local state. In the local mode, press the "ENTER" button for about 5 seconds, then the local light starts flashing, that means it has entered the setting state. Release the button, "Full closed" light turns on, that is into the fully closed demarcated state.

2、全关标定
就地灯闪动，"全关"灯亮，表示已进入全关标定状态。此时应用"开"键和"关"键启动电机转动（松开按键即停），将执行器调至全关位置。再按下"确认"键不放，保持约3秒，"全关"灯熄灭，表示全关标定完成。松开"确认"键，"全开"灯亮，即进入下一步全开标定。

2, "Full closed" demarcation
The local light flashes, " Full closed ' light turns on, that means it have been demarcated into the fully closed state. At this time use "OPEN" button and "CLOSED" button to start the motor rotation (release the button to stop), make the actuator transfer to fully closed position. Then press "ENTER" button for about 3 seconds, " Full closed " light is off, it means the fully closed demarcation completed. Release the "ENTER" button, "full open" light is on, that is, into the next full open demarcation.

3、全开标定
就地灯闪动，"全开"灯亮，表示进入了全开标定状态。用"开"键和"关"键启动电机转动，将执行器调至全开位置。按下"确认"键不放，保持约5秒钟，"全开"灯熄灭，表示全开标定完成。松开"确认"键，即进入下一步给定信号失效处理选择。

3," Full open" demarcation
The local light flashes, " Full–open" light turns on, that means it have been demarcated into the fully open state .Use "OPEN" button and "CLOSED" button to start the motor rotation, make the actuator transfer to fully open position. Then press "ENTER" button for about 5 seconds, "Full open" light is off, the open demarcation completed. Release the "ok" button, that is enter next step–––a given signal failurehandling options.(input signal failure handling options)

4、给定信号失效处理选择
给定信号失效，可选择使阀门开度为全开、全关、保持三者之一。进入给定信号失效处理选择，就地指示灯等闪动，"给定"、"全开"、"全关"灯可能是其中一个亮或全亮。"全开"亮，表示失效后阀门将运行到全开位置；"全关"亮，表示失效后阀门将运行至全关位置；两个灯同时亮，表示失效时阀门位置保持不变。按动"开"键，可改变以上状态，循环出现"全开"亮，"全关"亮，"全开""全关"同时亮。当前状态为需要的状态时，按下"确认"键不放保持约5秒钟，就地指示灯等停止闪动，表示设置全部结束，退回到就地操作模式。

4,given signal failure handling options(input signal failure handling options)
Given signal failure, you can choose one of the valve opening, such as fully open, fully closed, and maintain. enter Into the failure of a given signal processing options, the indicator light is flashing, "Input", "F, open", "F, Closed" lights, it may be one of them lights or full light. "F, Open" lights, it means after failure the valve will run to the fully open position; "Full closed" lights, it means after failure the valve will run to the fully closed position; two lights at the same time, that means valve position remains there. Press "open" button, can change over the state, circulating comes out a "F, open" light, "Full closed" light, "open" "full off" lights at the same time. When the the current state is needed, press the "ENTER" button for about 5 seconds, the local light stop flashing, that is to say, setting is all finished, it will been back to the local operating mode.

七、误差校正The Error Correction

LSDTK电路板在出厂前已校正过，一般无需用户进行此操作。
如果出现给定开度与阀门实际开度不符，应重新标定满量程给定信号；如果出现阀门在全关位置，位反电流不等于4mA,或阀门开度在全开位置，位反电流不等于20mA,应校正位反输出电流。

LSDTK circuit wafer has been regulated before it has been finished product, the user need not to do this.
If the given opening isn't match to the actual valve opening, it should be re-demarcated full scale for a given signal; If the valve in the fully closed position, the bit counter-current is not equal to 4mA, or the valve opening in the fully open position, the bit current is not equal to anti-20mA, should be corrected bit counter output current.

1、给定信号满量程标定
在给定信号输入端加入准确的20.00mA电流。然后在就地模式下先按下"确认"键不放，再秒钟内按下"开"键，保持约1秒钟等"给定"指示灯亮后同时松开两只键，即进入给定信号满量程标定。在确认加入了20.00mA给定电流后，按下"确认"键保持约5秒钟，当"关卡"指示灯亮后再熄灭，松开按键，标定完成。LSDTK退出标定进入就地操作模式。

1,given signal full demarcation
Add 20,00mA in the given signal input termination, and in the local mode, first press "ENTER" button within two seconds and press "OPEN" button together for about 1 second, after "INPUT" indicator light is on at the same time release the two buttons that access to given signal full-scale demarcation. press the "ENTER" button for about 5 seconds after confirming that 20mA given current have added, when the "C,S" indicator light is on and then off, release the button, the demarcation completed. LSDTK exits demarcation and enter into local operation mode

2、位反输出电流校正
在就地模式下先按下"确认"键不放，两秒钟内按下"关"键，保持约1秒钟，等"位置"指示灯亮后同时松开两只键，即进入了位反输出电流校正。进入位反输出电流校正后首先是4.00mA校正。观察电流表，此时的输出电流应为4.00mA±0.2%。有偏差时按动"开"键输出电流增加，按动"关"键输出电流下降，将电流调至准确的4.00mA，按下"确认"键保持约5秒钟，当"关卡"指示灯亮后再熄灭时松开按键。此时进入20mA校正。观察位反输出电流表，通过"开"键、"关"键，将电流调至20.00mA。再按下"确认"键保持约5秒钟，"关卡"指示灯亮后再熄灭，松开按键，误差校正完成，进入了就地操作模式。

2, bit counter output current correction
in the local mode, first press the "ENTER" button, after two seconds press the "Closed" button, for about 1 second ,when "Reverse" indicator light is on at the same time release the two button, that is, into the bit counter output current correction. The first correction is 4mA after into the bit counter output current. Observing current ammeter, this time the output current should be 4.00mA ± 0.2%. If there is deviation, press "Open" button to increase the output current, press the "CLOSED" button down the output current , adjust the correct current 4.00mA, press the "ENTER" button for about 5 seconds, when the "C,S" indicator light is on and then is off, release the buttons. This time it has been into the 20mA demarcation. Observe the bit counter output current ammeter, through the "OPEN" button, CLOSED" button, the current is transferred to 20.00mA. Then press "ENTER" button for about 5 seconds, C,S" indicator light is on and then off, release the button, error correction completed, enter into the local operation mode

八、故障判断与保护Fault Diagnosis and Protection

1、给定信号开路、短路、超出正常范围，"给定"故障报警灯亮。LSDTK将按照预先设定的给定信号失效处理选择，使阀门定位于选定位置，关断电机。信号恢复正常，控制电路自动解除报警。

1,given signal open circuit, short circuit, outside the normal range, "input" fault warning light turns on. LSDTK will be in accordance with pre-set given signal failure handling options, so that the valve will be located in the selected location, and cut off the motor. Signal is back to be normal, the control circuit automatically relieves the alarm.

2、位置检测电路故障（电位器引线开路、短路、位置检测电路其它器件故障），"位置"报警灯亮。在远程状态下，切断电机电源；在就地状态下，仍可手动"开"、"关"键操作电机。这时需观察阀门开度的机械指示。位置检测电路恢复正常，自动解除报警。

2, the position detects circuit fault (potentiometer leads open, short, position detection circuit for failure of other devices), "Reverse" warning light turns on. In the remote state, cut off electrical power; in local state, can still press manually "open" and "off" button operation of the motor. Now should observe mechanical direction of valve opening. Position detection circuit is back to be normal, automatically relieve the alarm.

3、出现开向卡涩，"开卡"指示灯亮。切断电机开向电源。该功能只在远程模式下有效。

3, appears opening jam, "O,S" indicator light is on. Cut off the motor on the power supply. This feature is only effective in remote mode.
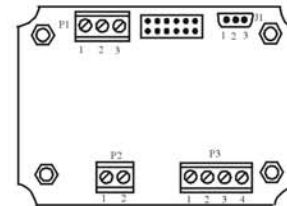
4、出现关向卡涩，"关卡"指示灯亮。切断电机关向电源。该功能只在远程模式下有效。

4, appears closed jam, "C,S" indicator light turns on.Cut off the power supply. This feature is only effective in remote mode.
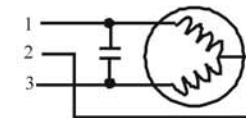
附录：接线图Appendix: Wiring Diagram
电路板通过接线端子与插座与外部链接。如下图所示。
Circuit board links external part through connection terminal and outlet. As shown below.

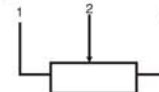P1：电机接线端子。端子定义如下图所示。
P1: electrical motor connection terminal. Terminal definition as shown below.

J1：电位器插座。接线方法如下图。
J1: Regulation resistance. Connection way as shown below.

P2：电源接入插座
接入AC220V
P2: AC220V power supply into a outlet
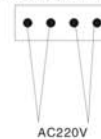P3：输入、输出信号插座。接线定义如下：
P3:Input,output signal outlet. Connection definition as follow:

编号	1	2	3	4
定义 (Definition)	阀位电流 +(Valve Current+)	阀位电流 -(Valve Current-)	给定电流 +(Given Current+)	给定电流 -(Given Current-)

电源插座的引线1、2两根线作一根线用；3、4两根线做一根用。如下图所示：
Power outlet leads 1&2 two lines as one line;3&4 as one. As shown below:

AC220V

LSTDP型电动执行器控制部件使用说明LSTDP INSTRUCTIONS

一、概述Brief Introduction

LSTDP型电动执行器控制部件是一种紧凑型，智能化的调节型电动执行器控制部件。LSTDP带有就地显示操作面板，具有就地与远方可切换操作功能。LSTDP提供了完整的中、英文设置菜单及操作指导。设置只需按照菜单提示，通过操作面板的按键操作即可。所有的调整、标定工作均由控制电路自行完成。显示器实时显示运行参数、运行状态、故障原因等，具有更完美、更友好的人机界面。根据用户对防护等级的不同要求，就地操作按键板可使用非通透式磁性按钮、红外遥控或普通按键。

LSTDP is a compact, intelligent regulated electric actuators control unit. LSTDP with local show panel, it can be switched between local and remote operation. LSTDP provides a complete setup menu and operation guidance in Chinese and English. Just follow the menu prompts to set up, and operating by the button on the operation panel easy . All adjustments, demarcation work are completed by the control circuit .The monitor shows operating parameter ,condition ,default cause or something all the time, and it has a more perfect, more friendly human−machine interface. According to the different grade of protection requirements from users, the local operating key board can be used non−transparent magnetic buttons, IR remote control or common key.

二、主要功能Main Function

1、给定信号失效判断与保护功能
给定信号引线开路、短路、超出正常范围时，发出报警，并能根据用户选定的信号失效处理方式（全开、全关、保持）自动控制阀门的位置。

1, given the signal failure and protection function
When a given signal leads open circuit, short circuit, and outside the normal range, the alarm will shout, and according to user's selected signal failure handling way(FULL−open, FULL−closed, maintain)to automatic control the valve position.

2、位置发送器信号失效判断保护功能
位置传感器引线故障、本身损坏，可立即自动切断电机电源，发出报警。

2, the position transmitter signal failure and protection function
Position sensor lead failure and self damage can be immediately and automatically cut off electrical power (remote mode), then issue a warning.

3、阀门卡涩判断与处理功能
出现卡涩，控制电路会控制电机向相反方向转动一小步，然后再按原方向运转。如果卡涩消失，转入正常运行。如果卡涩继续，再重复后退、前进一次。三次进退卡涩消失，按正常情况处理，不能消失则关断电机电源，发出报警。

3, valve jam diagnosis and processing function
jam occurs, the control circuit will control the motor to turn a small step in the opposite direction, then operate in the original direction. If the jam disappears, the motor turns into normal operation. If the jam continues, and then repeat back, forward again. Advancing and retreating over three times the jam disappears, handle it by normal, if not, should cut off motor and lose power, then issue a warning.

4、电子行程限位
电子限位可实现中途、全开、全关限位。开度达到限位位置，20mS内可切断电机电源。

4, electronic lead limit function
Electronic limit can be halfway, FULL−open, FULL−closed limit. If opening is up to limit location, cut off the electrical power within20mS.

5、自动调整电机转动方向功能
自动识别电机转动方向，并自动调整为需要的方向。

5, automatically adjust the motor rotation direction
automatically identify the motor rotation direction and automatically adjust to the desired direction.

6、瞬间防反转功能
确保在电机停下来后才可启动反转。

6, instant anti−reversed function
To ensure that only after the motor stops can starts reversing.

7、电子制动与精确的定位功能
采用独特的自适应算法确定提前发出电机停止信号的时间，配合电子无摩擦制动功能，大大地提高了定位精度。

7,electronic motor and the precise positioning function
Using adaptive algorithm to make sure the time of advanced issuing motor stopped signal, with electronic motor without friction which greatly enhance the positioning accuracy.

8、行程方向自适应功能
可根据用户定义，自动确定开／关阀门的运行方向。

8,adaptive function of travel direction
According to the users' definition, Automatically determine the operation direction of on / off valve.

9、给定信号作用方向可选择
用户可选给定信号正作用（4～20mA对应执行器开度0～100%），或反作用（4～20mA对应执行器开度100%～0）。

9, can choose the direction of the given signal
User can select direct action of the given signal (4 ~ 20mA corresponds to the actuator opening 0 to 100%), or reverse action (4 ~ 20mA corresponds to the actuator opening 100% ~ 0).(REMARK:GIVEN SIGNAL MEANS INPUT SIGNAL .)

10、就地手动操作与远方自动操作可切换
提供就地手动与远程自动两种运行模式。通过就地操作面板，可实现两种运行模式的切换。

10, switch between local manual operation and remote automatic operation
Provide two operation modes, local manual and remote automatic operation. Through the local operation panel to switch off these two modes.

11、位置检测电位器安装指导功能。

11,the installation guidance function of position detection potentiometer.

三、主要技术指标the major technical indicators

1、调节（给定）输入信号：　4～20mA，输入电阻150Ω。
2、位反信号输出：4～20mA，输出负载电阻≤750Ω。
3、灵敏度：0.05%。
4、死区值：0～4%。
5、定位误差：≤±0.5%（与机械机构有关）。
6、阻尼特性：死区值大于0.5%，无振荡。
7、迟滞：不大于0.2S。
8、工作电源：AC220V±10%。
9、电机驱动电流：长期工作不大于1.5A。
10、电气限位范围：关限位：0～100%；开限位0～100%
11、显示精度：　0.5级。
12、工作环境温度：　−25～70℃。
13、环境湿度：　≤95%RH。

1, adjust (given) the input signal: 4 ~ 20mA; input resistance 150Ω.
2, bit anti−signal output: 4 ~ 20mA; output load resistance ≤ 750Ω.
3, sensitivity: 0.05%.
4, the dead zone values:0~4%
5, the positioning error: ≤ ± 0.5%(related to Machinery sector).
6, the damping characteristics: dead zone values>0.5%, no oscillation.
7, Hysteresis: less than 0.2S.
8, Power supply: AC220V ± 10%.
9, Motor drive current: long−term work≤1.5A.
10,Electrical limit range: Off Limit: 0 ~ 100%; open limit 0 to 100%.
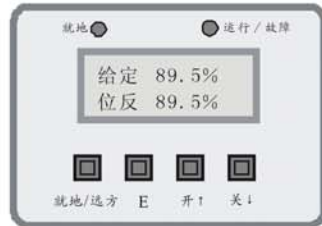11, Display accuracy:0.5 degree
12, Operating temperature: −25 ~ 70 ℃.

四、接线Wiring
见附录
in Appendix

五、使用Using
LSTDP型控制电路的操作面板如下图所示。
local operation panel of LSTDP type as shown below.

LSTDP型控制电路提供两种运行模式：即就地手动模式和远方自动模式。就地模式下可通过操作面板的开、关键直接操作执行器的开、关；远方自动模式接受给定的4～20mA控制信号，执行器的开度跟随给定信号变化。
如果以手动调节的4～20mA信号取代控制系统（调节器）送出的给定信号，也可实现远方手动操作。
上电后控制电路自动进入远方运行模式。

LSTDP control circuit provides two operating modes: the local manual mode and remote automatic mode.The opening and closing presses of local mode operation panel can directly control the actuator opening and closing; remote automatic mode accepts a given 4～20mA control signal, the opening of the actuator automatically follows the given signal changes.
If the 4～20mA signal from the manual adjustment replaces the given signal sent from control system (controller), remote manual operation also can be achieved.
After turn on the power, it can control circuit to automatically enter remote operation mode.

1、从远方自动模式切换到就地模式
同时按下"就地／远方"键和"E"键保持5秒钟以上，"就地"指示灯亮，表示进入了就地手动模式，同时松开按键，即可进行就地手动操作。

1, from remote automatic mode switch to the local mode
press the " local / remote " button and "E" button for 5 seconds, if the "local" indicator light turns on, it means that has entered the local manual mode, and release buttons, the local manual operation has began.

2、从就地模式返回远方模式
只需按下"就地／远方"键，当就地指示灯熄灭，松开按键，即返回了远方模式。

2,return from the local mode to remote mode
simply press the " local / remote " button, when the local light is off, release the button, which returns the remote mode.

3、就地手动操作
就地手动操作作为点动模式。及按下"开"键，执行器向开方向运行。松开按键或运行到全开位置，执行器停止运行。在全开位置，按"开"键无效。按下"关"键，执行器向关方向运行。松开按键或运行到全关位置，执行器停止运行。在全关位置，按"关"键无效。就地手动模式下不作卡涩判断。中途限位在就地模式下不起作用。

3, local manual operation
Take local manual operation as the jog mode. Press the "open" button, the actuator operate to the open direction. Release the button or run to the fully open position, the actuator stops. In the fully open position, press "open" button is invalid. Press the "closed" button, the actuator operate to the closed direction. Release the button or run to the fully closed position, the actuator stops. In the fully closed position, press the "closed" button is invalid.
Local manual mode does not make jam judgments. Halfway limit does not work in the local mode.

六、设置Setting
执行器在投入使用前或改变接线后必须进行设置。
Actuator must be set before it is put into use or after changing the connection.

1、进入设置enter into setting
1）上电启动时，当显示器显示：
1) power on, when the display shows:

按一下"E"键，启动自检完后直接进入设置状态。
Click the "E" key to start the self-test then directly enter into the setting state.

2）正常运行时，在就地模式下，按下"E"键保持约4秒以上，显示器显示如下：
2) normal operates in the local mode, press the "E" button for about 4 seconds, the monitor shows the following:

表示已进入设置状态。松开按键，即进入设置过程。
That means it has entered the setting state. Release the button, enter the setup process.

2、设置过程setting process

1）语言选择language selection
用户可选择中文/ENGL.（英文）显示。进入此设置，液晶显示如下：
user can select Chinese / ENGL. (English) display. Into this setting, the LCD shows the following

按动"开↑"键，第一行右侧的显示在"中文"与"ENGL."间交替出现。当显示是您需要的语言，按下"E"键确认。语言选择完成，自动进入下一步全关标定。

Pressing the "open ↑" key, the right of the first line displays between the "Chinese" and "ENGL." When the display is the language you want, press the "E" key to confirm. Language selection completes, automatically turn to the next step "off" demarcation.
2）全关标定"FULL-CLOSED" demarcation
进入全关标定，液晶显示如下：
Into the fully closed demarcation, liquid crystal display as follows:

进入全关标定，显示器第一行右侧显示的百分数为当前电位器开度，用于指导电位器的安装位置确定。如果是厂方新装电位器或用户更换电位器，需确定电位器的安装位置。此时可用手动操作键将执行器的开度调至50%（此时开、关键对应的电机方向不确定），调整电位器的安装位置，使显示的电位器开度也为50%±2%，然后固定好电位器。电位器安装完成。如果已经确定过电位器的安装位置，可直接进入下面的全关标定。
按动操作面板上的"开"、"关"键（此时开、关方向不确定，应根据实际转动方向选择按键），将执行器调至全关位置。此时电位器的开度显示应大于5%或小于95%。否则应调整电位器安装位置。确认无误后按下"E"键保持约5秒钟以上，等显示器出现"OK"时松开按键，全关标定完毕。进入下一步全开标定。

Into the fully closed calibration, the percentage of the first line of the right showed in the monitor is the current potentiometer opening, and it's used to guide the installation location of the potentiometer. If it is the factory newly installed potentiometer or user replaced potentiometer, the potentiometer must be determined the installation location. At this point, you can adjust the actuator opening to 50% by manual operated key(now the open and close keys corresponding to the motor direction are uncertained), adjust the potentio meter installation location, make the opening show of the potentiometer 50% ± 2%, and then fix the potentiometer. Potentiometer has installed. If you have identified the potentiometer position, can directly enter into the following closed calibration.
press the "open" and "closed" button (at this time, the direction of " on ", "closed" is uncertained, should be based on the actual direction of rotation to select buttons), adjust the actuator to closed position. At this point, potentiometer opening show should be more than 5% or less than 95%. Otherwise, potentiometer installation position should be adjusted. After confirmed, press the "E" button for about 5 seconds and more, when the display appears "OK", then release the button, closed calibration is completed. Enter the next step of open calibration.

3）全开标定"FULL-open"demarcation
进入全开标定，液晶显示如下：
Into the fully open demarcation, liquid crystal display as follows:

调至全开 XX.X%	To FO XX.X%
取消E+↑ 确认E	Can.E+↑ E Enter

与全关标定的方法相似。将执行器调至全开位置，电位器开度显示应大于5%或小于95%。按下"E"键，等显示器出现"OK"时松开。进入下一步关限位设置。
The open calibration method is similar to the closed calibration. Adjusted the actuator to open position, the potentiometer should shows opening more than 5% or less than 95%. Press the "E" key, when the display appears "OK", then release the button. Enter the next step of off-limit setting.

4）中途关限位设置half-way off limit setting
进入中途关限位设置，液晶显示如下：
Into the halfway off limit set, the LCD displays the following:

关限位 XX.X%	C Li. XX.X%
加↑减↓ 确认E	↑↓ E Enter

按动"开↑"键或"关↓"键可增大、减小关限位值。用户根据需要调整到所需的关限位值，按一下确认键"E"。关限位设置完成，进入下一步中途开限位设置。
Pressing the "open ↑" key or "closed ↓" can increase, decrease off limit values. Users adjust the off limit value according to their needs, click the button "E". Off limit setting is completed, then enter the next step of halfway on limit setting.

5）中途开限位设置halfway on limit setting
进入中途开限位设置，液晶显示如下：
Into the halfway on limit set, the LCD displays the following:

开限位 XX.X%	O Li XX.X%
加↑减↓ 确认E	↑↓ E Enter

与关限位设置方法相同。开限位设置完成后即进入下一步"死区值"设置。
The method is equal to the off limit setting. After on limit setting is completed, enter the next step of "dead zone value" settings.

6）死区值设置"dead zone value" setting
进入死区设置。液晶显示如下：
Into the dead zone setting. LCD shows is as follows:

死区值 XX.X%	DeadBa. X.X%
加↑减↓ 确认E	↑↓ E Enter

设置方法同前。按"E"键确认。进入下一步给定信号作用方向选择。
Setting method is just like the former. Press "E" key to confirm. Enter the next step of choosing the direction of the given signal.

7、给定信号作用方向选择液晶显示如下：
choosing thedirection of the given signal LCD display is as follows:

输入 XXX	Input XXXXX
↑改变 确认E	↑AlterE Enter

输入信号正作用(Rising Slope)，即输入信号为4～20mA，自动运行对应的阀门开度为0～100%；输入信号反作用（Falling Slope），即即输入信号为4～20mA，对应的阀门开度为100%～0。
按动"开↑"键，第一行右侧的显示交替出现"正作用（Rising）"和"反作用（Falling）"。当显示为需要的选择时，按一下"E"键设置完成。进入下一步失效处理选择。

Direct action of Input signal(Rising Slope), the input signal is 4～20mA, automatically operates the corresponding valve opening of 0 to 100%;reverse action of input signal(Falling Slope), which the input signal is 4～20mA, corresponding valve opening is 100%～0. Pressing the "open ↑" key, the first line of the right of the display alternated shows "direct action (Rising)" and "reverse action (Falling)". When what the monitor shows is needed, click the "E" key then the setting completes. Enter the next step of Failure treatment options.

8）失效处理选择the failure treatment option

失效处理选择用于选择当给定信号失效（故障）时需要阀门停止的位置。用户可根据自己的需要，选择"全开"、"全关"、"保持"。进入失效处理选择，液晶显示如下：
failure treatment option is used to select the position the valve should stop when the given signal failure (fault).Users can according to their needs, choose "full-open", "full-closed", "maintain" Into the failure treatment options, LCD display as follows:

给定失效XX	In Fail. XXXX
↑改变 确认E	↑Alter E Enter

逐次按动"开↑"键，显示在"保持"、"全开"、"全关"间变化。出现用户需要的显示，按"E"键确认。全部设置完成，自动进入就地运行状态。
Press the "open ↑" key in turn, display changes among the "maintain", "full-open", "full-closed". The display users need appears, press the "E" key to confirm. All sets have completed, then it automatically enter local operated state.

注：
进入设置状态，控制电路中仍保留着原来的设置值。如限位值、死区值等。在进入设置时显示器上显示的就是原设置值。除全开、全关标定外，任一步设置，如不需改动原值可直接按"E"键进入下一步设置。如不需要重新标定全开、全关位，可直接按"就地／远方"切换键进入下一步。所以在任意时刻，如想浏览或修改原设置参数，即可进入设置状态，通过按动"就地／远方"键、"E"键，就可浏览、修改全部原设置参数。

Note:
Enter setting state, the control circuit still retains the original settings. Such as the limit value, the dead zone value, before enter the settings shown on the display is the original setting. In addition to fully open, fully closed calibration, any step setting can press "E" key to enter the next setting eg: need not change the original value. like open and closed calibration does not need to re-demarcate, can directly press the "Local / Remote" switch key to enter the next step. So at any time, If you want to view or modify the original setting parameters, you can enter the setting state, by pressing the "Local / Remote" key, "E" button, you can scan, modify all of the original setting parameters.

七、误差校正 The Error Correction

产品在出厂前已校正过，一般无需用户操作。如果发现输入的给定电流或输出的位反馈电流与液晶显示的阀门开度（百分数）不对应时，应做以下操作。

进入校正：在设置状态下，当失效处理选择出现需要的显示时，如果按下"E"键，则设置完成，进入运行状态；如果不按"E"键而改按"关"，将进入误差校正状态。校正过程如下：

products has been regulated before it has been finished product, the user need not to do this.If you find that input given current or output counter current does not correspond to the valve opening (percentage) on liquid crystal display, you should do the following.
Enter the correction: In the setting state, when the failure treatment option appears needed display, if press the "E" key, the setup completes, enter the running state; if you do not press the "E" button instead press the "off ↓",it will be into the error correction state.
Correction process is as follows:

1、输入满量程标定

进入误差校正状态首先是输入满量程标定。液晶显示如下：

1, input full-scale calibration
First of entering the error correction state is inputing full scale calibration. LCD display is as follows:

```
┌──────────┐   ┌──────────┐
│ 输入标定 │   │Input Calib.│
│取消E+↑ 确认E│   │Can. E+↑ E Enter│
└──────────┘   └──────────┘
```

在给定电流输入端加入精确的20.00mA直流电流，按下"E"键保持，显示"OK"时标定完成。进入下一步—输出校正。如无需重新标定，也可按一下"↑"键，取消本次操作。

Adding accurate 20.00mA DC current at given current input, press the "E" button for showing "OK",the calibration completes. Enter next step---output correction. If there is no need to re-calibrate, can click "↑" key, to cancel this operation.

2、输出电流校正

输出电流校正是用于校正位置反馈电流的4mA和20mA。
进入输出校正，液晶显示如下：

2, the output current correction
output current correction is used to correct the position feedback current about 4mA and 20mA. Into the output correction, LCD shows as follows:

```
┌──────────┐   ┌──────────┐
│ 4mA校正 │   │4mACorrect│
│加↑减↓ 确认E│   │↑↓ E Enter│
└──────────┘   └──────────┘
```

观察位反电流显示。如果此时显示电流不是4mA，可通过按动"↑"或"↓"键增大或减小电流值，使位反电流表显示为4.00mA。按下"E"键保持，显示器显示"OK"时松开按键，4mA校正完成，并自动进入20mA校正状态。

Observe the display of reversed position current. If the current displayed is not 4mA,by pressing the "↑" or "↓" key to increase or decrease the current value, make the reversed position current meter display 4.00mA. Press the "E" button for the display shows "OK" then you release the button, 4mA correction is completed, and automatically enter the correct state of 20mA.
Into the 20mA correction, the display shows the following:

```
┌──────────┐   ┌──────────┐
│ 20mA校正 │   │20mACorrect│
│加↑减↓ 确认E│   │↑↓ E Ent er│
└──────────┘   └──────────┘
```

观察位反电流表显示。如果此时显示电流不是20mA，可通过按动"↑"或"↓"键增大或减小电流值，使位反电流表显示为20.00mA。按下"E"键保持，显示器显示"OK"时松开按键，20mA校正完成，并自动进入运行状态（就地模式）。

Observe the display of reversed position current. If the current displayed is not 20mA, by pressing the "↑" or "↓" key to increase or decrease the current value, make the reversed position current meter display 20.00mA. Press the "E" button for the display shows "OK" then you release the button, 20mA correction is completed, and automatically enter the operating state(local mode).

八、设置中的故障处理与检查 Fault Treatment and Inspection in the Setting Process

在"全关标定"、"全开标定"电机转动时，如果显示的电位器开度不变或变化量不大于50%，或显示值出现非数字符号，则说明电位器或引线有故障。必须先排除故障后在向下进行。
如果标定完全开后又返回到全关标定，说明从全关到全开电位器的开度变化不足30%，控制电路拒绝这种设置。应解决后重新标定。
只有正常完成设置才能保证执行器可靠工作。为确保设置正确，在完成设置后系统自动进入手动运行状态时按操作执行器开、关，电机转动方向必须与操作方向一致，显示的位反开度变化趋势正常。改变给定电流，显示的给定开度能作相应的变化。以上检查全部正确，再切换到自动运行状态。

When the motor rotates in the "full-closed calibration", "full-open calibration" states, if the display of the potentiometer opening is the same or less than 50% of the variation, or it comes out non-numeric symbols, that means the potentiometer or lead wire has something wrong.The fault must be shooting then do next step.
If the calibration is fully open then returns to fully closed calibration, shows that the opening variation from fully closed to fully open is less than 30%, the control circuit rejects this kind of setting.It should be solved and re-calibrated.
Only complete the setting can ensure normal and reliable actuator work. In order to ensure the settings are correct, after the completion of setting the system automatically enter manual operation state, press buttons to operate the actuator on or closed, the motor rotation direction must be consistent with the operating direction, the variation trend of reversed position opening showed is normal. Change the given current, the given opening can be corresponding the related changes. Check all of the above is correct, then switch to automatic operation.

九、故障处理 Fault Treatment

执行机构发生故障，控制电路会立即发出报警，切断电机电源，液晶显示器同时显示故障信息。故障信息显示及处理见下表。
Actuator occurs fault, control circuit will immediately send out an alarm, cut off the electrical power, while LCD displays the fault information. Fault information display and treatment table as below.

故障信息一览表

| 序号 item	故障信息 Fault information	故障原因 reason	故障处理 treatment	备注 remarks
1	失效A invalidation A	控制信号引线开路、短路、控制信号本身错误。 The control signal leads, open circuit, short circuit and control signal error.itself	恢复控制信号 Revert control signal	信号正常后自动恢复 Automatic recovery after normal signal
2	失效P invalidation P	位置传感器引线开路、短路、故障。 Position sensor fuses, open circuit, short circuit and fault.	检查引线，更换坏的器件。 Check lead, replace the bad spare parts	信号正常后自动恢复 Automatic recovery after normal signal
3	卡涩 jam	阀门卡涩；执行机构机械故障。 The valve jamming, Actuator meet mechanical trouble	排除故障 Trouble-shooting	重新上电或回退解除 power on again or relief rollback

附录：LSTDP电路板接线图
Appendix: LSDTP circuit wiring diagram

主电路板对外连接插座、接线端子位置如下图所示：
The circuit board external connection socket, terminal blocks ,position see below:
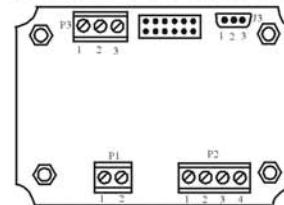
J3、电位器插座。Potentiometer socket


```
1    2    3
```
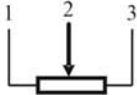
P1：电源接入端子Power access terminals
接入AC220V insert AC220V
P2：与控制系统连接端子Terminals connect with control system
1--位反输出reverse output +   2--位反输出reverse output –
3--给定输入set input +   4--给定输入set input –
P3：电机接线端子motor wiring terminals


```
1
2
3
```
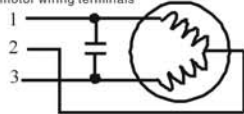
使用与维护

⚠ 通电时禁止手动操作

本产品出厂前已经通过全面调试、质检人员检验，产品与阀门安装、连接时，可能因阀门联轴器等原因，导致阀门不能全闭、全开、需要重新调整，调整时应遵循以下步骤：

◆将执行机构与阀门正确安装、连接；
◆手动试运行
卸下电气盖，摘下手柄轴橡胶塞，将附带六角手柄插入六角孔，顺时针方向转动，阀门开度减少；
阀门在全闭位置时，观察关闭方向极限行程开关是否动作（开关动作时会发出"咔嚓"声响）再转动手柄约半圈，检查机械挡块是否碰到调整螺钉；
逆时针方向转动手柄，阀门开度应增大，同样方法，检查开启方向极限行程开关和机械挡块，手动运行完毕后，装上气盖，塞好橡胶塞。
◆电动试运行
卸下接线盖，按盖上电路图正确接线；
通电试运行，注意观察执行机构和阀门工作是否正常。
◆维护
针对本产品的结构紧密特性，特别使用了寿命长、耐压性好的钼基润滑脂，实现免加油；
电动阀门长时间不动作或者动作稀少时，请定期检查驱动执行机构有无异常。

LSDTK and LSDTP Use and maintenance

The manual operation is banned during electrification

This product has pass completely–test and checkout conducted by quality–test workers before ex–factory. In the process of installation、connection between product and valve, the valve maybe can't be wholly opened and closed because of valve's coupling problem etc, in this case, the readjusting is required , its process stated specifically as followings:

◆Firstly, installing and connecting correctly the execution device and valve;
◆Manually test–run
Unload electric cover and handle–axle rubber stopper, then inserting enclosed hexagonal handle into hexagonal hould and rotating it in clockwise direction,the valve's opening valve would be reduced;
When valve at wholly–closed position, please observe whether the limit stroke switch in "close" direction works or not (it will produce crack sound when working), then rotate handle for semi–circle so as to check whether the mechanical stop touches regulation screw or not;
Rotating handle in anticlodkwise direction and the valve s opening value would increase, then like the operation above stated, operator should check the limit stroke switch and mechanical stop. After manually test–run, operator should install the electric cover and rubber stopper.
◆Electric test–run
Unload wiring cover and doing wiring correctly according to circuit drawing on cover;
Electrifying for test–rim, operator should tale notice of working circumstance of execution device and valve.

故障与对策 Failure and countermeasure

故障状态Failure state	原因Cause	对策Countermeasure
电机不转 Electric-machine doesn't rotate	供给电源电压低或者电源没有 The power-supply，voltage is low or no power-supply	电源电压的检查 Checking of power-supply volt age
	输入信号断或值不够 Input signal breaks off or the value is not enough	输入信号的检查 Checking of input signal
	断线或与端子台分离 Line-breakage or departing from terminal-stand	接好电线、更换端子台 Connecting wire well、change terminal stand for new one
	温度保护器动作 Temperature protector works	降低周围环境温度 Reduce surrounding temperature
		降低使用频率 Reduce use frequency
		负荷过重 Load is too heavy
	极限开关在中间开度时已经动作 Limit switch has worked at the Time of middle-opening	调整行程挡块 Regulating tour stop
	电机进相用电容损坏 The electric capacity used for electric machine, s enter-phase is damaged	更换电容 Change electric-capacity
	电机断线 Electric-machine、line-breakage	更换马达 Change motor
	控制盒不良 Control box damaged	更换控制盒 Change control box
开度不停地来回变化 The opening is changed without stop	信号源里有干扰信号 There is interruption signal in signal source	检查输入信号 Check input signal
	从分压器里产生干扰 The interruption is produced from divisor	更换电位器 Change potentiometer
	分压器齿轮或开度齿轮松动 The gear of divisor or opening are loosened	检查紧固齿轮的螺钉 Check screw of tightening gear
输入信号与开度不符 The input signal doesn't conform with opening	输入信号不对 Input signal is wrong	检查输入信号 Check input signal
	调零、倍率的调整不良 The regulation of zeroing、 multiplying-power has problem	重调倍率零点 Readjust multiplying-power zero position
	电位器齿轮的位置变化 Position-changing of potentiometer, s gear	电位器齿轮的再调整 Readjusting of potentiometer, s gear
开度信号没有 No opening signal	开度信号线断开或接触不良 Opening signal line is broken or connection has problem	检查配线 Check wiring