

使用说明书

Instruction Manual



DZW 多回转系列
DZW Multi-turn Series

请在使用本公司产品前仔细阅读本说明书

Please read this Manual carefully before using our products

- 1) 正确的使用本公司产品，不必要的损失和事故将得到避免！您应遵守本说明书的规定，因为意外的损失和事故的发生，往往是一些人的粗心，疏忽和大意引起的！
 - 1) Using our products correctly can avoid unnecessary losses and accidents! You should abide by the provisions of this Manual, because unexpected losses and accidents are often caused by carelessness and negligence!
- 2) 开度视窗不得与硬物碰撞。
 - 2) The opening windows shall not collide with hard objects.
- 3) 与阀门连接所用螺栓强度不得低于 8.8 级。
 - 3) The strength of bolts used for valve connection shall not be less than Grade 8.8.
- 4) 不得在阴雨天户外打开电气箱盖、电机等密封部位。
 - 4) Do not open the electrical box cover, motor and other sealing parts outdoors on rainy days.
- 5) 安装或重装后，首次电动操作，必须使阀门处于中间位置检查开、关方向，必须按调试要求进行逐项调试，检查各部件正常后，才能投入使用。
 - 5) The valve must make in the middle position to check the opening and closing direction during the first electric operation after installation or reinstallation. Besides, commissioning shall be carried out for each item as required to ensure that all parts are normal, and then it can be put into operation.
- 6) 安装拆卸调试时不可损伤密封面，密封件和隔爆型阀门电动装置的隔爆面，重装时盖严紧固并必须确保电气箱盖和电缆进出口处密封良好，以防雨水，潮气进入，造成电器元件失效及零件锈蚀。
 - 6) Sealing surface, sealing elements and flameproof surface of explosion-proof electric valve actuator shall be free from damaged during installation, disassembly and commissioning. When reinstalling, the cover shall be tightly closed and it shall be ensured that the electrical box cover and cable inlet and outlet are well sealed to avoid rainwater and moisture. Otherwise, the electrical components may be failed and parts may be rusted.
- 7) 手动操作时应将手-电动切换手柄按箭头方向推动（或拉），若推不到位时应边转动手轮边推动手柄，切换到位后即可手动操作，手轮旋向与输出轴旋向一致，正常顺时针为关阀，逆时针为开阀；电动时切换手柄将自动复位，切不可将手柄强行扳回，否则损坏阀门电动装置。
 - 7) In case of manual operation, push (or pull) the manual-electric switching handle in arrow direction. If it cannot be pushed to designated position, the handle can be pushed while rotating the hand wheel, then manual operation can be carried out after switching in position. The rotation direction of hand wheel and output shaft is the same, normally, the valve can be closed by rotating it clockwise and opened by rotating it anticlockwise. Under electric mode, the switch handle will automatically reset. At this time, it shall not be forcibly pulled back, or the electric valve actuator will be damaged.

- 8) 不得在爆炸环境下拆去与电气有关的箱盖带电调试阀门电动装置，打开电气箱盖时，必须先切断电源。

8) It is not allowed to remove the electric-related box cover in the explosion environment during commissioning for electric valve actuator with electricity. Instead, the power supply must be cut off first before opening the electric box cover.

- 9) 阀门电动装置上的阀杆保护套或闷盖应旋紧，取下修理或保养时，用遮盖装置顶部，以防止灰尘、砂石及其它外来物进入内腔，造成阀杆或阀杆螺母的损坏

9) The valve rod protective sleeve or cover on the electric valve actuator shall be firmly rotated. When it is removed for repair or maintenance, the top of the device shall be covered to prevent dusts, sands and other foreign matters from entering the inner chamber, which may damage the valve rod or valve rod nuts.

- 10) 阀门电动装置采用阀门专用电动机，为短时工作制，持续工作时间不得超过铭牌标定时间。

10) The electric valve actuator shall be a special motor for the valve, and the working time shall be short and shall not exceed the time specified on the nameplate.

- 11) 当阀门不经常工作时，应定期检查保养并进行操作，建议 1 月/次，时间不超过 10 分钟。

11) The valve, when it does not work frequently, shall be regularly checked, maintained and operated, which is recommended to be once a month (no more than 10min each time).

- 12) 对于阀门电动装置在工况环境、规格、性能参数、连接尺寸、电路等方面有特殊要求时，本公司可按特殊要求供货。

12) The Company can supply as required if there are special requirements for working conditions, specifications, performance parameters, connection size, circuit and other aspects of the valve actuator.

- ! 本产品请务必存放于清洁干燥的室内，如果存放于室外，应与地面保持一定的高度，并应做好防雨、防潮保护措施，以防止冷凝水对设备造成的不必要损坏

! This product must be stored in clean and dry rooms. If stored outdoors, it shall be kept at a certain height from the ground with rain and moisture protection measures adopted to prevent unnecessary damage caused by the condensate water to the device.

前言

Preface

感谢使用 Z 系列阀门电动装置，在安装调试之前请仔细阅读本说明书。
Thank you for using the Z series electric valve actuator. Please read this Manual carefully before installation and commissioning.

关于本说明使用说明书

About the Operating Manual

本说明书应交付给最终用户使用，敬请爱惜和妥善保存；
This Manual shall be handed over to end users. Please keep it properly.

在开始操作前务请仔细阅读本使用说明书以充分理解操作该产品的使用方法和调试方法；
Please read this Manual carefully before operation to fully understand the operation and commissioning methods of the product.

本使用说明书的内容如有变动恕不另行通知；
The Manual is subject to change without prior notice.

在编写本说明书时已尽力确保其正确性，如用户发现有任何错误或遗漏，请与我公司市场部联系。
We have tried our best to ensure the correctness of this Manual. In cases of any mistake or omission, please contact our Marketing Department.

安全使用注意事项

Safety Precautions for Use

为了保护并确保本产品以及由本产品所控制的系统安全，在产品的使用过程中必须严格按本使用说明书中与安全有关的说明和注意事项操作，否则一切后果自负，我厂概不负责。

In order to protect and ensure the safety of the product and the system controlled by the product, it is necessary to strictly follow the safety-related instructions and precautions in this Manual during the use of the product, otherwise we will bear no responsibility for consequences arising therefrom.

请务必对本产品进行改动或将电路改装于本产品之内。
Do not modify this product or its circuit inside the product.

当您更换产品的零部件或消耗品时，请采用我厂的原装配件。
Please replace parts or consumables of products, if needed, with original accessories manufactured by our company.

特别警示

Special Warning

电缆线必须穿过备件中提供的出线套，并且旋紧。并用绝缘胶布将其缠绕密封
The cable must pass through the outlet sleeve provided in the spare part and be firmly rotated, and then wrapped and sealed by insulating tapes.

强烈建议使用屏蔽电缆线连接。

We strongly recommend using shielded cable for connections.

因未按本产品安装要求所造成的损失，本公司概不承担保修责任。

The Company does not assume any warranty responsibility for the loss caused by failure to comply with the installation requirements of the product.

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1.1 产品概述

1.1 Product Overview

多回转阀门电动装置,简称 Z 型或 Z 型电动装置电动。是阀门实现开启、关闭或调节控制的驱动设备。适用于闸阀、截止阀、隔膜阀、柱塞阀、节流阀、水闸门、插板阀等。

The multi-turn electric valve actuator, also known as Z type or Z-type electric actuator for short, is a kind of actuator device of valve achieving opening, closing, regulating or control. It is applicable to gate valve, stop valve, diaphragm valve, plunger valve, throttle valve, sluice gate, plug valve and so on.

本系列电动装置具有功能全、性能可靠、控制系统先进、体积小、重量轻、使用维护方便等特点。可对阀门实行现场、远控和自动控制。

With characteristics including complete functions, reliable performance, advanced control system, small volume, light weight and convenient use and maintenance, the electric actuator can realize field, remote and automatic control of valves.

本产品的性能符合 JB/T8528-1997《阀门电动装置技术条件》的规定。隔爆型的性能符合 GB3836.1-2000《爆炸性气体环境用电气设备第 1 部分:通用要求》, GB3836.2-2000《爆炸性气体环境用电气设备第 2 部分:隔爆型“d”》及 JB/T8529-1997《隔爆型阀门电动装置技术条件》的规定。

The product has performances complying with *Technical Specifications of Electric Valve Actuators* (JB/T8528-1997). Its explosion-proof performances comply with *Electrical Equipment Used in Explosive Gas Atmosphere Part 1: General Requirement* (GB3836.1-2000), *Electrical Apparatus for Explosive Gas Atmospheres - Part 2: Flameproof Enclosures 'd'* (GB3836.2-2000) and *Technical Specifications of Explosion-Proof Version Electric Valve Actuators* (JB/T8529-1997).

Z 型多回转系列按防护类型分:户外型和隔爆型。

By protection types, the Z multi-turn electric actuator is divided into outdoor type and explosion-proof type.

Z 型多回转系列按控制方式分:基本型、隔爆型、整体型(开关型/调节型)、整体隔爆型、总线控制型。

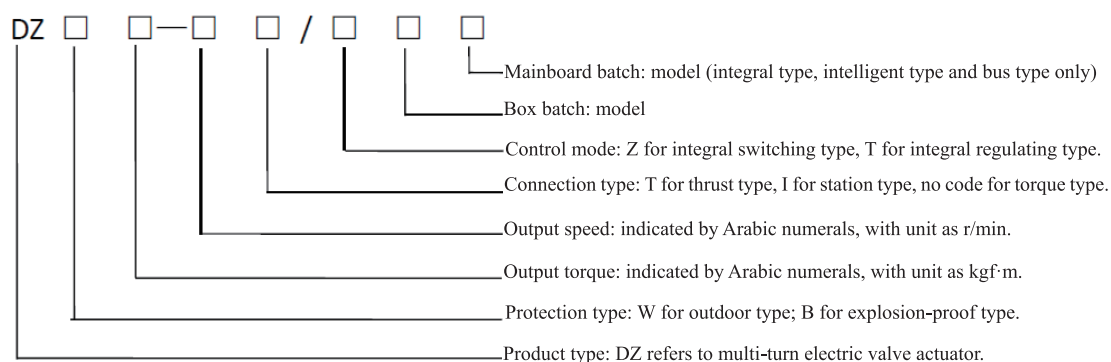
The Z multi-turn electric actuator is subdivided into basic type, explosion-proof type, integral type (switching/regulating type), integral explosion-proof type and bus control type according to control modes.

Z 型多回转系列按连接型式分:有转矩型、电站型和推力型。

By connection modes, it can be divided into torque type, station type and thrust type.

1.2 型号表示方法

1.2 Model Indication Method



型号示例:

Model example:

Z30-24/W-XX: 多回转阀门电动装置、常规户外型、300N.m(30kgf.m)、转矩型接口、输出转速: 24r/min。

Z30-24/W-XX: multi-turn electric valve actuator, conventional outdoor type, 300N.m(30kgf.m), torque type interface, output speed: 24r/min.

ZB120T-36/W-XX: 多回转阀门电动装置、隔爆型、1200N.m(30kgf.m)、推力型接口、输出转速: 36r/min。

ZB120T-36/W-XX: multi-turn electric valve actuator, explosion-proof type, 1200N.m(30kgf.m), thrust type interface, output speed: 36r/min.

Z30-24/Z-XX/XX: 多回转阀门电动装置、常规户外型、300N.m(30kgf.m)、输出转速: 24r/min、整体开关型。

Z30-24/Z-XX/XX: multi-turn electric valve actuator, conventional outdoor type, 300N.m(30kgf.m), output speed: 24r/min, integral switching type.

1.3 工作环境和主要技术参数

1.3 Working Environment and Main Technical Parameters

供电电源: (常规三相) 380V、50HZ, (单相电源) 220V、110V, (特殊电源) 400V、415V、440V、660V

Power supply: (conventional three-phase) 380V, 50HZ, (single-phase power supply) 220V, 110V, (special power supply) 400V, 415V, 440V, 660V

环境温度: -20~+60°C (特殊要求可达到-20~+80°C)

Ambient temperature: -20~+60°C (-20~+80°C in case of special requirements)

相对湿度: ≤95% (+25°C)

Relative humidity: ≤95% (+25°C)

防护等级: (常规) IP65 (特殊订做) IP67, IP68

IP grade: (conventional) IP65 (special order) IP67, IP68

防护类型: 户外型用于无易燃、易爆和无腐蚀性介质的场所。隔爆型产品有 dI 和 dIICT4 两种, dI 适用于煤矿非采掘工作面; dIIC T4 用于工厂, 适用于环境为 IIA、IIC 级 T1~T4 组的爆炸性气体混合物。

Protection type: outdoor electric actuator is used in environment without inflammable, explosive and corrosive media. Explosion-proof electric actuator is divided into dI type and dIICT4 type. dI type is used for non-excavation face of coal mines while dIICT4

type is used in IIA and IIC environment with T1~T4 explosive gas mixture in factories.

防爆标志: ExdIICT4

Explosive-proof sign: ExdIICT4

电机工作制式: 额定运行时间为 10 分钟 (特殊订货 15-30 分钟)

Motor working system: rated operation time is 10min (15-30min in case of special requirements)

2.1 型号规格和主要性能参数表

2.1 Model, Specifications and Main Performance Parameters

型号 规格 Model & Spec.	公称转 矩 (N.M) Nominal torque (N.M)	公称推 力(KN) Nominal thrust (KN)	最大阀杆 直径(mm) Max. valve rod diameter (mm)	最大转圈 数(圈) Max. turns (turn)	手动速 比 Manual speed ratio	输出转 速 r/min Output speed (r/min)	电机功 率 (KW) Motor rating (kW)	参考重量 (Kg) Reference weight (kg)
Z-05	50	20	28	50	1:1	12	0.12	28
Z-10	100	40	40	50	1:1	24/36	0.25/0.55	45
Z-15	150					24/36	0.37/0.75	46
Z-20	200	100	42	50	1:1	24/36	0.55/1.1	56
Z-30	300					24/36	0.75/1.5	58
Z-45	450	150	48	120	1:1	24/36	1.1/2.2	120
Z-60	600					24/36	1.5/3	125
Z-90	900	200	60	120	1:1/25:1	24/36	2.2/4	140
Z-120	1200					24/36	3/4	145
Z-180	1800	325	70	150	22.5:1	18/24	4/5.5	250
Z-250	2500					18/24	5.5/7.5	255
Z-350	3500	700	80	150	20:1	18	7.5	330
Z-500	5000					18	7.5	350

注: 1) 可按用户要求提供其它转速: 12/18/24/36/48/60(r/min)

Note: 1) Other speeds such as 12/18/24/36/48/60(r/min) can be provided according to customers' requirements.

2) 当产品提供四层计数器时, 最大转圈数为表 1 转圈数 X10

2) If the product is provided with a quaternary counter, the maximum turns can be the turns in Table 1 multiplies by 10.

2.2 电机技术参数见下表

2.2 Technical Parameters of Motor

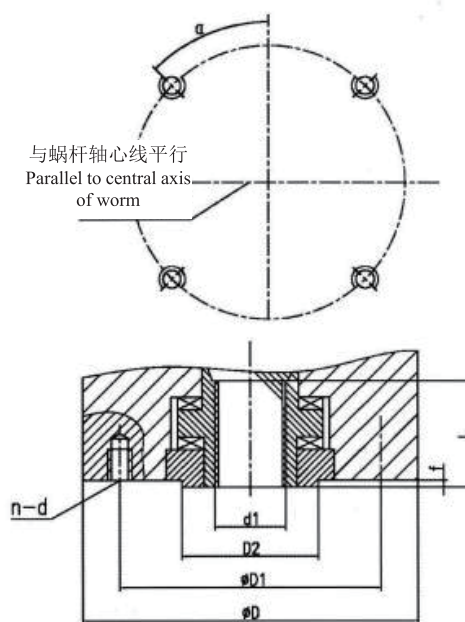
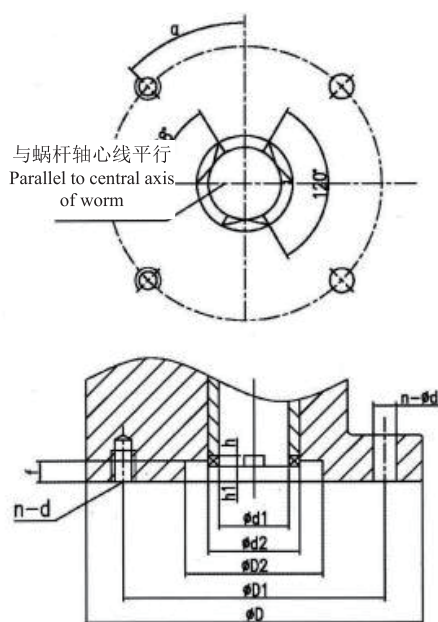
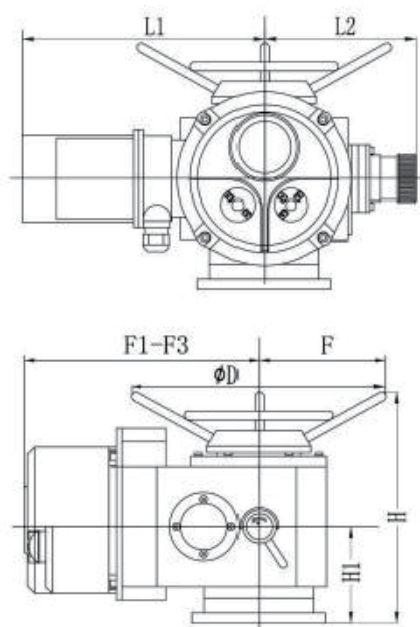
功率 KW Power (kW)	0.12	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3	4	5.5	7.5	10	15
电流 A Current (A)	0.57	1.03	1.38	2.2	2.62	4	4.12	5.25	7.9	8.87	12.05	15.6	20.5	26.6

2.3 安装外形尺寸

2.3 Boundary Dimensions and Installation Dimensions

型号 Model	H	H1	L1	L2	F	F1	F2	F3	ΦD
Z-5	270	100	250	160	110	220	230	310	320
Z-10 Z-15	290	120	300	180	120	220	230	310	340
Z-20 Z-30	300	125	320	180	120	220	230	310	340
Z-45 Z-60	370	200	400	270	250	250	260	380	440
Z-90 Z-120	430	200	480	270	260	300	310	430	455
Z-180 Z-250	510	250	540	310	300	380	390	480	520
Z-350 Z-500	720	280	1080	400	430	410	440	540	560

F1 为基本型；F2 为隔爆型；F3 为整体型
F1 refers to basic type; F2 refers to explosion-proof type; F3 refers to integral type



转矩型连接尺寸

Connection Dimensions of Torque Type Actuator

型号 Model	转矩型 JB2920 Torque JB2920											
	法兰号 Flange No.	D	DI	D2(H9)	h1	f	h	d1	d2	d	n	a
Z5/10/15	2	145	120	90	2	4	8	30	45	M10	4	45°
	21	115	95	75			6	26	39	M8		
Z20/30	3	185	160	125			10	42	58	M12		
	31	145	120	90			8	30	45	M10		
Z45/60	4	225	195	150		5	12	50	72	M18		

Z90/120	5	275	235	180			14	62	82	M22		
	5I	230	195	150			12	50	72	M18		
Z180/250	7	330	285	220	3	6	16	72	98	M26	8	22.5°
Z350/500	8	380	340	280			20	83	118	M22		

推力型连接尺寸

Connection Dimensions of Thrust Type Actuator

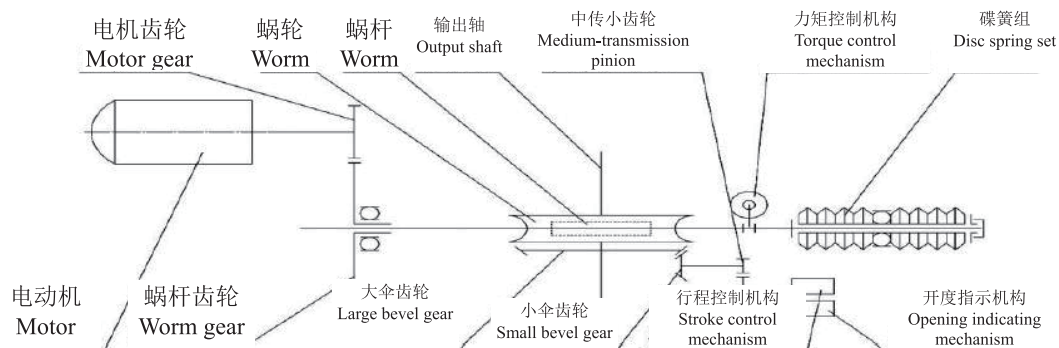
型号 Model	推力型 GB12222 Thrust GB12222									
	法兰号 Flange No.	D	DI	D2(f8)	f	d1 (max)	d	L	n	a
Z5/10/15	F10	125	102	70	3	T28	M10	40	4	45°
Z20/30	F14	175	140	100	4	T36	M16	55		
Z45/60	F16	210	165	130	5	T44	M20	70	8	22.5°
Z90/120	F25	300	254	200		T60	M16	90		
Z180/250	F30	350	298	230		T70	M20	110		
Z350/500	F35	415	356	260		T80	M30	150		

3.1 总体结构及其工作原理

3.1 Overall Structure and Working Principles

多回转阀门电动装置由电动机、减速机构、力矩控制机构、行程控制机构、开度指示机构、手-电动切换机构、手轮及电气组部分组成。其传动原理如下图所示：

The multi-turn electric valve actuator consists of motor, reducing mechanism, torque control mechanism, stroke control mechanism, opening indicating mechanism, manual-electric switching mechanism, hand wheel and electrical part. Its transmission principles are shown below:



电动机：户外型电机采用 YDF 型，隔爆型采用 YBDF 型阀门专用三相异步电动机

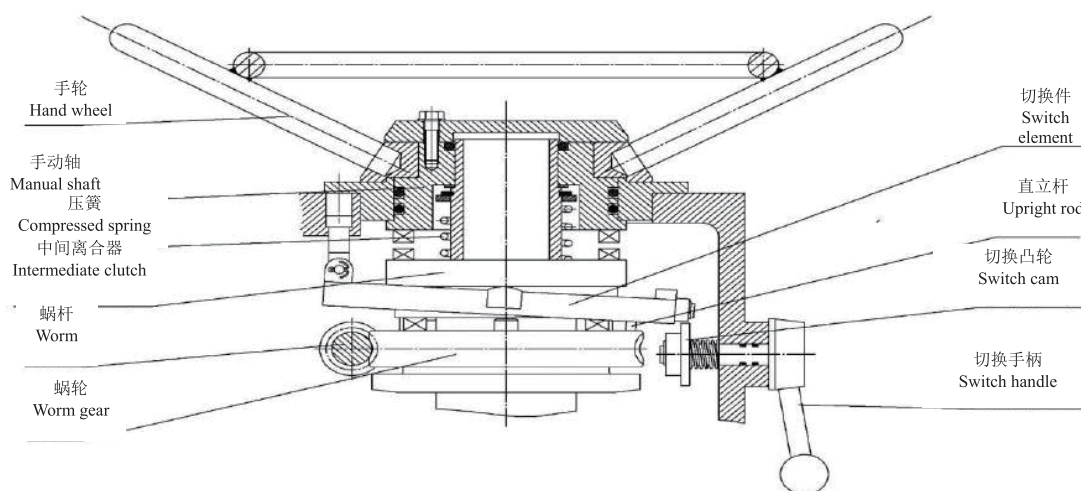
Motor: The outdoor motor adopts YDF motor. Explosion-proof actuator adopts YBDF special three-phase asynchronous motor for valve.

3.2 减速机构：由一对直齿轮和蜗轮副两级传动组成。电动机的动力经减速机构传递输出轴。

3.2 Reducing mechanism: It consists of double-stage driving, i.e. one pair of spur gear and worm gear. The power from the motor is transmitted to the output shaft through reducing mechanism.

3.3 手-电动切换机构：为半自动切换，手动时需扳动手柄切换，手动状态转变为电动时则自动运行。其结构如下图所示，它由手柄、切换件、直立杆、离合器、压簧等组成。需手轮操作时，将手柄向手动方向推动，切换件使离合器抬高，并压迫压簧。当手柄推到一定位置时，离合器即脱离蜗轮而与手轮咬合，同时直立杆在扭簧作用下直立于蜗轮端面，支撑住离合器不致下落，切换完成即可放开手柄，使用手轮进行操作。而需电动操作时，电动机将带动蜗轮传动，支承于蜗轮端面的直立杆即倒下，在压簧作用下离合器迅速向蜗轮方向移动，并与蜗轮咬合，同时与手轮脱开，自动实现手动到电动状态的转换。

3.3 Manual-electric switching mechanism: It is in semi-automatic switching status. To switch to manual mode, the handle shall be operated. To switch to electric status from manual status, it is switched automatically. The structure is shown below. It is composed of handle, switch element, upright rod, clutch, pressure spring and so on. When the operation by hand wheel is needed, the handle is pushed to the manual position, and the switch lifts the clutch and makes the pressure spring compressed. When the handle is pushed to a certain position, the clutch is detached from the worm wheel and meshes with the hand wheel. At the same time, the upright rod stands upright at the end of the worm wheel under the action of the torsion spring, and supports the clutch not to drop down. The hand wheel can be released after switch is completed and the hand wheel is then used for operation. When electric operation is needed, the motor drives the worm wheel, and the upright rod on the end of the worm wheel falls down. Under the action of the pressure spring, the clutch moves rapidly to the direction of the worm wheel and meshes with the worm wheel. At the same time, the clutch is detached from the hand wheel, to automatically realize the shift of the manual mode to the electric mode.



注意事项：1、电机在运行时切勿扳动切换手柄

Note: 1. Do not pull the switch handle when the motor is running.

2、切换时按箭头方向推（或拉）动手柄，若推不到位时应边转动手轮边推动手柄

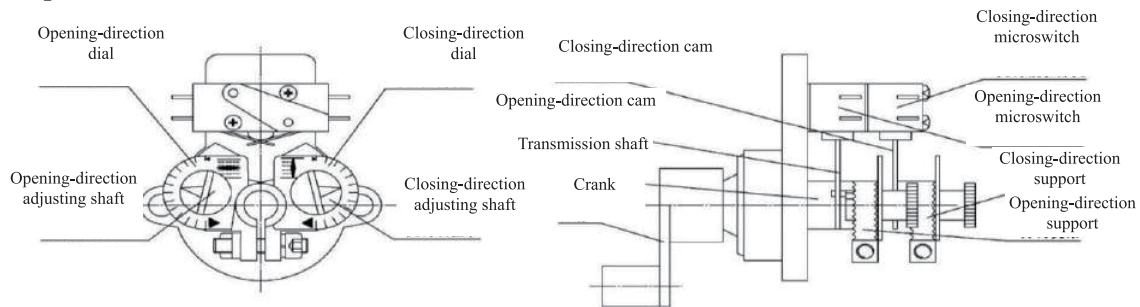
2. Push (or pull) the handle according to the arrow direction when switching. If it cannot be pushed to the place, rotate the hand wheel and push the handle at the same time.

3.4 力矩控制机构

3.4 Torque control mechanism

当输出轴上受到一定转矩后，蜗杆除旋转外还产生轴向位移，带动力矩下端的曲拐，曲拐直接（或通过撞块）带动支架产生角位移，当输出轴上的转矩增大到整定转矩时，则支架产生的位移量使微动开关动作，从而切断电机电源，电动机停转。以此实现对电动装置输出转矩的控制，达到保护电动阀门的目的。

After a specified torque is posed to the output shaft, the worm will rotate and cause axial displacement to drive the crank below the moment and the crank will directly (or through the block) drive the support to produce angular displacement. When the torque on the output shaft increases to the setting torque, the displacement generated by the support makes the microswitch move, thus cutting off the power supply of the motor and stopping the motor. In this way, the output torque of electric device is controlled to protect the electric valve.

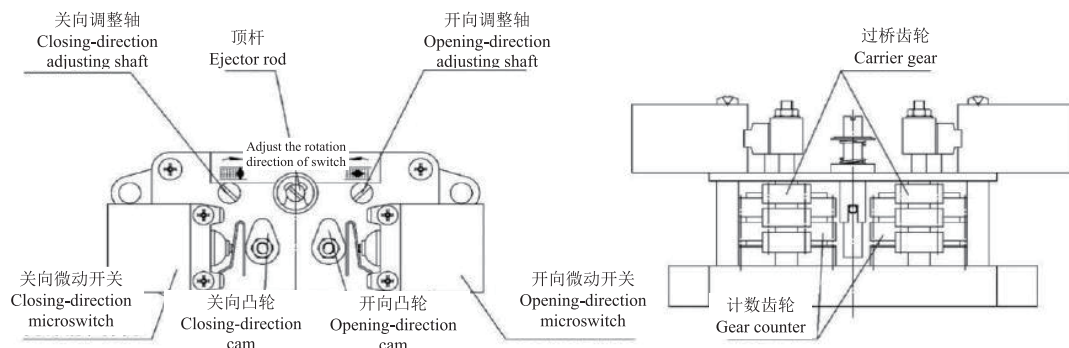


3.5 行程控制机构

3.5 Stroke Control Mechanism

采用十进制计数器原理，又称为计数器，控制精度高，其工作原理为：由电动装置内的一对大小伞齿轮带动中传小齿轮，再带动行程控制机构工作。如果行程控制器按阀门开、关的位置调整好，当控制器随输出轴转动到预先调整好的位置（圈数）时，则凸轮将转动 90 度，迫使微动开关动作，切断电动机电源，电动机停转，从而实现对电动装置行程（转圈数）的控制。

It adopts the decimal counter, with high control accuracy. The working principle is that a pair of large and small bevel gear in the electric actuator drives the medium-transmission pinion and then drives the stroke control mechanism to work. If the stroke controller has been adjusted according to the opening and closing position of the valve, when the controller rotates to the preset adjusted position (turns) with the output shaft, the cam will rotate for 90° to make the microswitch act. And then, the power for motor will be cut off and the motor will stop operating, so that the stroke (turns) of the electric actuator is controlled.

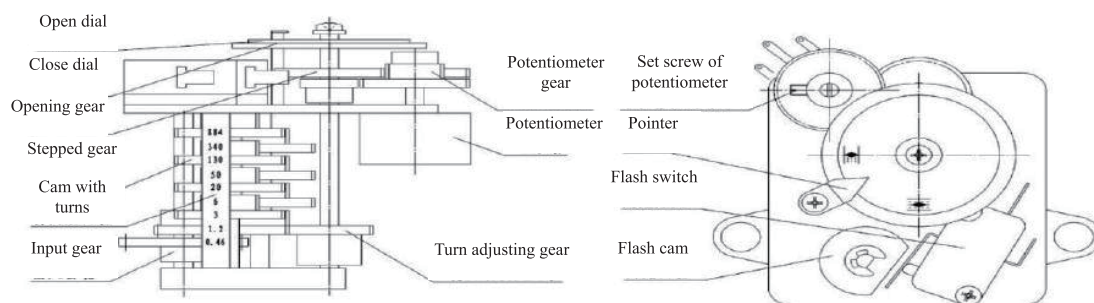


3.6 开度指示机构

3.6 Opening Indicating Mechanism

输入齿轮由计数器个位齿轮带动，经减速后，指示盘随阀门的开关过程同时转动，以指示阀门的开关量，电位器轴和指示盘同步转动，供远传开度指示用。移动转圈数调整齿轮可以改变转圈数。开度指示机构内设一微动开关和凸轮，当电动装置运转时，旋转凸轮周期性的使微动开关动作，其频率为输出轴转动一圈动作一次或二次，可供闪光信号等使用。

The input gear is driven by the gear counter. After speed reduction, the indicator dial rotates with the opening and closing of the valve to show the opening quantity of the valve. The potentiometer shaft rotates with the indicator dial for remote opening indicating. Shifting the turns adjusting gear can change the number of turns. A microswitch and a cam are set inside the opening indicating mechanism. When the electric actuator operates, the cam makes the microswitch act periodically and its frequency is one or two acts per turn of rotation of the output shaft, and it can be used for flash signal.



阀门电动装置与阀门组装后，必须对力矩控制机构、行程控制机构、开度指示机构分别进行调试，方可投入使用。（注：调试主要是对行程控制机构的限位调整）

After the assembly of the electric valve actuator and the valve, commissioning shall be respectively carried out for torque control mechanism, stroke control mechanism and opening indicating mechanism before use. (Note: The commissioning mainly aims to the limit adjustment for stroke control mechanism)

4.1 力矩控制机构的调整

4.1 Adjustment of Torque Control Mechanism

力矩在出厂前已按要求在调试台调整好扭矩值，出厂后不需要再进行调整。如需改变整定扭矩值，可旋转调整轴至相应刻度。先调关向，后调开向。

The torque value has been adjusted on the commissioning table as required before delivery, which is unnecessary to be adjusted again after receiving the product. If it is necessary to change the fixed torque value, rotate the adjusting shaft to the corresponding scale. Adjust the opening direction and then the closing direction.

注意：力矩控制机构的调整轴压下后方可旋转

Note: It can be rotated only when the adjusting shaft of torque control mechanism is pressed down.

4.2 行程控制机构的调整（先调关向，后调开向）

4.2 Adjustment of Stroke Control Mechanism (adjusting closing

direction before opening direction)

全关位置的调整

Adjustment of Full Closing Position

- ① 手动将阀门关严
- ① Manually close the valve tightly;
- ② 用螺丝刀压下顶杆旋转 90 度将顶杆卡住，使中转小齿轮与行程控制机构个位齿轮完全脱开
- ② Use a screwdriver to push down the ejector rod and rotate 90° to lock it, so that the intermediate pinion is completely disengaged with the unit gear of the stroke control mechanism;
- ③ 按行程控制机构上面的关向限位开关所示的箭头旋转方向旋转关向调整轴，直到关向凸轮动作为止
- ③ Rotate the closing adjustment shaft in the rotation direction of the arrow shown by the closing limit switch on the stroke control mechanism until the closing cam moves;
- ④ 旋回顶杆至原来的位置
- ④ Rotate the ejector rod back to the original position.
- ⑤ 注意：旋回顶杆后，应用螺丝刀旋转一下调整轴，以确保中转小齿轮与行程控制机构个位齿轮正确咬合
- ⑤ **Note: After rotating back the ejector rod, use a screwdriver to rotate the adjusting shaft to ensure that the intermediate pinion meshes correctly with the unit gear of the stroke control mechanism.**

全开位置的调整

Adjustment of Full Opening Position

- ① 手动将阀门开到所需的位置
- ① Manually open the valve to the required position;
- ② 用螺丝刀压下顶杆旋转 90 度将顶杆卡住，使中转小齿轮与行程控制机构个位齿轮完全脱开
- ② Use a screwdriver to push down the ejector rod and rotate 90° to lock it, so that the intermediate pinion is completely disengaged with the unit gear of the stroke control mechanism;
- ③ 按行程控制机构上面的开向限位开关所示的箭头旋转方向旋转开向调整轴，直到开向凸轮动作为止
- ③ Rotate the opening adjustment shaft in the rotation direction of the arrow shown by the opening limit switch on the stroke control mechanism until the opening cam moves.
- ④ 旋回顶杆至原来的位置
- ④ Rotate the ejector rod back to the original position.
- ⑤ 注意：旋回顶杆后，应用螺丝刀旋转一下调整轴，以确保中转小齿轮与行程控制机构个位齿轮正确咬合
- ⑤ **Note: After rotating back the ejector rod, use a screwdriver to rotate the adjusting shaft to ensure that the intermediate pinion meshes correctly with the**

unit gear of the stroke control mechanism.

4.3 开度指示机构的调整

4.3 Adjustment of Opening Indicating Mechanism

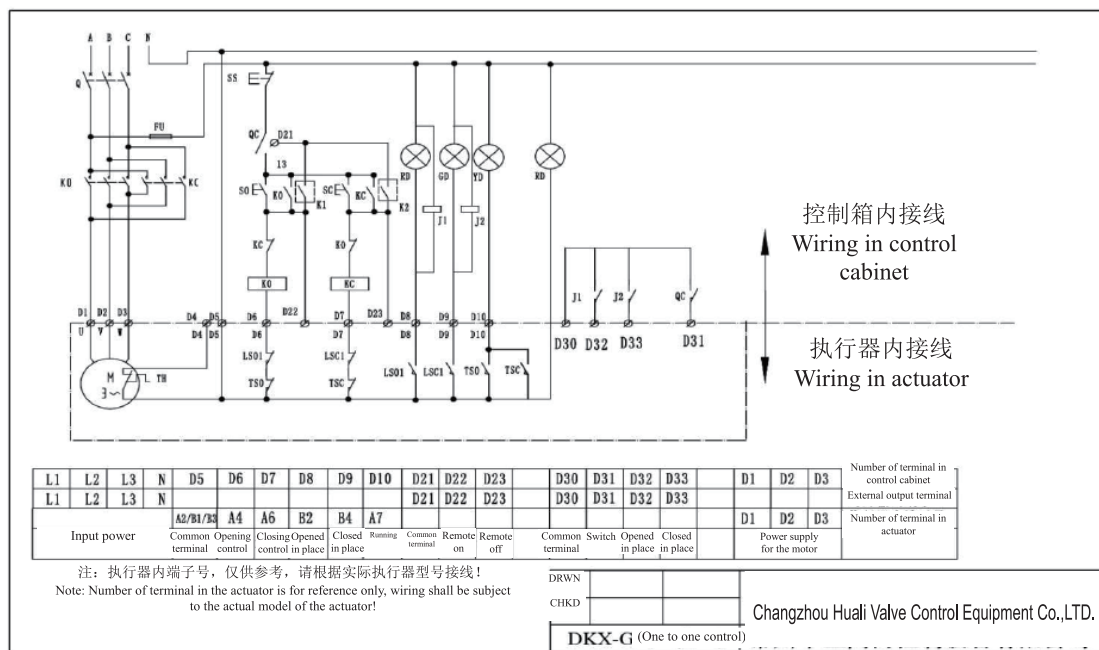
在调整好力矩、行程的基础上调整现场开度指示机构，方法如下：

After adjusting the torque and stroke, the adjust the local opening indicating mechanism by the following method:

- ① 移动转圈数调整齿轮至所需的转圈数位置：
- ① Shift the turns gear to the wanted turns;
- ② 挂上电位器齿轮，拧紧电位器固定螺母并确定电位器齿轮的紧定螺钉是松开的：
- ② Engage the potentiometer gear, tighten its fixing nut, and make sure that the set screw of the potentiometer gear is loose;
- ③ 手动或电动关闭阀门并面对指示盘观察电位器齿轮的旋向：
- ③ Manually or electrically close the valve and observe the direction of the potentiometer gear in the face of the indicator panel;
- ④ 关到位后转动关向指示盘使标志对准指针：
- ④ Turn the closing-position indicator panel when closing to the position, to align the sign at the pointer;
- ⑤ 按所观察电位器齿轮的旋向转动编码器轴至临近终端的位置（死区之外），拧紧紧定螺钉
- ⑤ Rotate the encoder shaft to the position near the terminal (beyond dead zone) according to the rotation direction of the potentiometer gear, and tighten the set screw;
- ⑥ 电动或手动操作阀门至全开位置，保持关向指示盘不动，旋转开向盘使标志对准指针
- ⑥ Rotate the valve to the full open position via electrical or manual operation, keep the closing direction indicator panel still, and rotate the opening direction indicator panel to align the sign at the pointer.

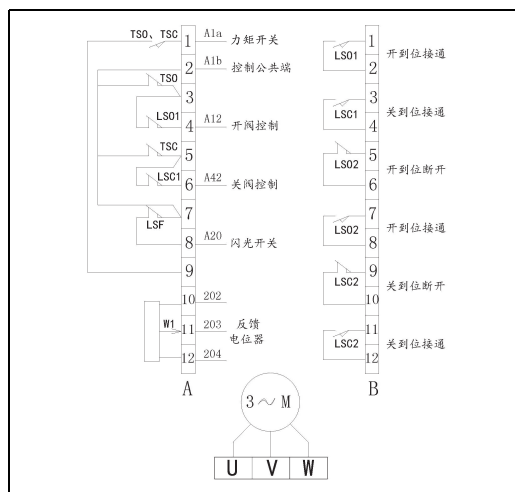
5.1 基本开关型电气控制原理图

5.1 Basic Switching Electrical Control Schematic Diagram



5.2 基本开关型端子接线图

5.2 Basic Switching Terminal Wiring Diagram



A 端子

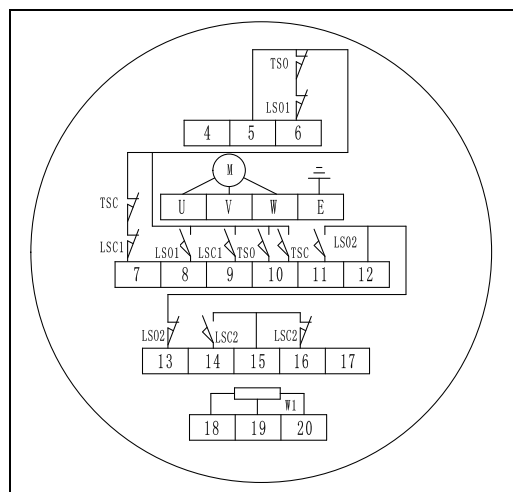
- 1、9: 力矩开关常开点
- 2、公共端
- 3、开力矩常闭点
- 4、开阀
- 5、关力矩常闭点
- 6、关阀
- 8、闪光开关
- 10、11、12: 电位器

B 端子

- 1、2: 开限位常开点
- 3、4: 关限位常开点
- 5、6: 开限位常闭点
- 7、8: 开限位常开点
- 9、10: 关限位常闭点
- 11、12: 关限位常开点
- UVW: 电源线

5.3 基本隔爆型端子接线图

5.3 Terminal Wiring Diagram of Basic Explosion-proof Type Terminal



5: control common point

6: open valve control

7: close valve control

8: open in place limit

9: close in place limit

10: overtorque normally open point

11: open in place normally open point

12: public point

13: open in place normally closed point

14: close in place normally open point

15: public point

16: close in place normally closed point

18, 19, 20: potentiometer

5.4 电气元件表

5.4 List of Electrical Components

代号 Code	名称 Name	数量 Qty.	标配元件 Standard components	可选元件 Optional components	备注 Remark
Q	空气开关 Air switch	1	√		
KO、KC	交流接触器 AC contactor	2	√		
J1、J2	继电器 Relay	2	√		
FU	熔断器 Fuse	1	√		
TH	热敏开关 Thermoswitch	1			加装电装内部 Inside electric fitting
FR	热继电器 Thermorelay	1		※	
LSF	闪光开关 Flash switch	1			加装电装内部 Inside electric fitting
LSO、LSC	行程开关 Travel switch	2			加装电装内部 Inside electric fitting
TSO、TSC	力矩开关 Torque limit switch	2			加装电装内部 Inside electric fitting
SA	钮子开关 Toggle switch	3	√		
SO、SC、SS	按钮 Button	1	√		
QC	现场/远控转换开关 Local/remote control change-over switch	1	√		
CB	开度表 Opening meter	1		※	
W1	电位器 Potentiometer	1			加装电装内部 Inside electric fitting
W2	电位器 Potentiometer	1		※	
RPC	精密电位器 Precision potentiometer	1		※	

RH	加热电阻 Heating resistor	1			加装电装内部 Inside electric fitting
M	电机 Motor	1			加装电装内部 Inside electric fitting
B	变压器 Transformer	1		※	
C	电解电容 Electrolytic capacitor	1		※	
V	整流管 Rectifier tube	1		※	
R	电阻 resistance	1		※	
YD、RD、GD	指示灯 Indicator light	3	√		

注 1：打“√”为控制箱内标配元件；

Note 1: Items with '√' are standard components of control cabinet;

注 2：打“#”为电装内标配元件；

Note 2: Items with '#' are standard inside electric fittings;

注 3：打“※”为控制箱内可选元件

Note 3: Items with '※' are optional components of control cabinet.

6.1 整体型的电气组成部分

6.1 Integral Electrical Components

整体开关型/调节型阀门电动装置元的人机界面包括点阵液晶显示屏、位置选择旋钮和操作旋钮 3 个部件。

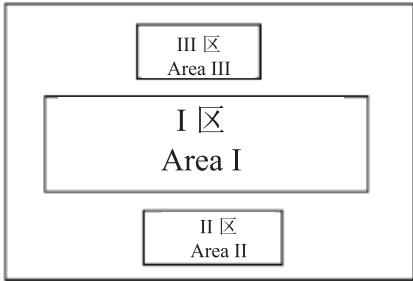
The man-machine interface of the integral switching/regulating electric valve actuator includes three parts, i.e., dot matrix LCD screen, position selection knob and operation knob.

阀门电动装置配有一点阵图行式液晶显示屏；

The electric valve actuator is provided with a dot matrix graphic LCD screen;

显示屏在常规状态下分为 3 个显示区域，如下图所示 I 区、II 区、III 区。

The display screen is divided into three display areas in normal state, as shown in the following figure: area I, area II and area III.



① “I”区为阀位显示区，以阀位开度百分比的形式实时显示当前阀位值；

- ① Area I is the display area for valve position. The valve position is real-time displayed in this area as the percentage of the degree of opening;
- ② “II”区为控制方式显示区；（包括：远方自动、远方手动、现场电动等）
- ② Area II is the display area for control modes, including remote automatic, remote manual, on-site electric mode and so on.
- ③ “III”区为运行状态和报警信息显示区（详见后面的“报警信息”）（当进入工作参数设定的菜单时，液晶显示屏将统一使用 I 区、II 区、III 区。
- ③ Area III is the display area for operation state and alarm information display area (see 'alarm information below for details'). When entering the working parameter setting menu, the LCD screen displays Area I, II and III.

6.2 整体型的菜单界面介绍

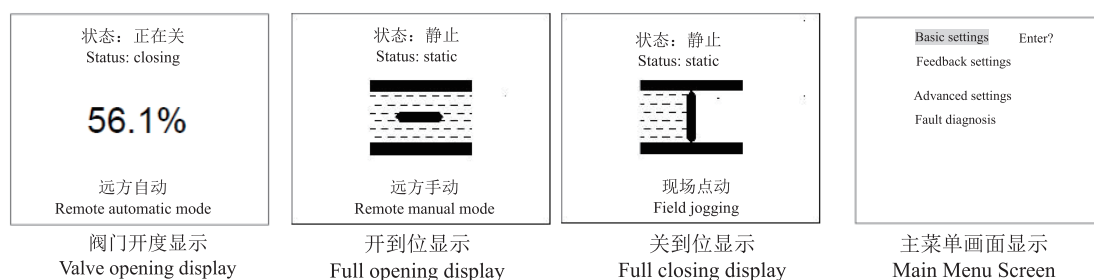
6.2 Introduction to Integral Menu Interface

阀门电动装置通电以后，电装的控制系统首先对指令、程序区、数据区和 A/D 转换功能依次进行自检。如果自检均正常，LCD 液晶显示器的阀位显示区显示当前阀位开度的百分比数，报警区的内容被清除。若自检时某一项不正常，报警区将一直显示该项的不正常代码，控制系统不接受任何操作，等待处理。

After the electric valve actuator is powered on, the control system of electric fittings will conduct self-inspection for the command, program area, data area and A/D switching function orderly. If the self-inspection is normal, the valve position display area of the LCD shows the opening degree of current valve position in percentage, and the contents of the alarm area are cleared. If an item is abnormal during the self-inspection, the alarm area will always display the abnormal code of the item, and the control system will not accept any operation until being processed.

阀门电动装置通电初始化后，整个点阵液晶屏显示画面以大字体显示电动装置开度百分比数。在阀位开或关到位置处时，电动装置开度的显示模拟蝶形图形方式显示（见下图）。

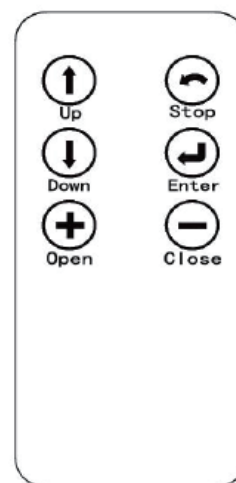
After the electric valve actuator is powered on and initialized, the whole dot matrix LCD screen displays the opening percentage of the electric actuator in large font. When the valve is opened or closed in position, the opening of the electric actuator is displayed in the way of butterfly graph (see the figure below).



（控制单元标配红外遥控器，遥控器能方便进行现场操作或参数设置。红外线遥控器带有 6 个操作按键。功能如下）

(The control unit is equipped with an infrared remote control, which is convenient for field operation or parameter settings. The infrared remote control has 6 operation buttons. Functions are shown below.)

- ① : “UP”键: 上移键;
 ① : UP, move upward;
- ② : “Down”键: 下移键;
 ② : Down, move downward;
- ③ : “Open”键: 加键、开阀键（在现场操作时，可作为打开阀门按钮使用）
 ③ : Open: increasing key, open valve (it can be pressed to open valve during field operations)
- ④ : “Close”键: 减键、关阀键（在现场操作时，可作为关闭阀门按钮使用）
 ④ : decreasing key, close valve (it can be pressed to close valve during field operations)
- ⑤ : “Stop”键: 停止键/返回键（在现场操作时，可作为停止按钮使用，在菜单设置状态下，按一下可返回上一级子菜单，或直接退出设置菜单）
 ⑤ : Stop: stop and return (it can be used as a return key during field operations. Under menu setting state, press it to return to the last submenu or directly exit setting menu)
- ⑥ : “Enter”键: 确认键
 ⑥ : Enter: confirm.



旋钮开关操作说明

Instructions of Knob Switches

方式旋钮开关的操作说明（红色旋钮代表方式旋钮）

Operation instructions of mode knob switches (red knobs refer to mode knobs)

确认操作: 红色旋钮从“停止”状态转到“现场”状态位置，即为按下确认键。

Confirm: rotating the red knob from 'stop' to 'field' can be deemed as pressing 'confirm' button.

返回操作: 红色旋钮从“停止”状态转到“远方”状态位置，即为按下返回键。

Return: rotating the red knob from 'stop' to 'remote' can be deemed as pressing 'return' button.

操作旋钮开关的操作说明（黑色旋钮代表操作旋钮）

Operation instructions of knob switches (black knobs refer to operation knobs)

下移操作: 操作旋钮由“停”中间状态转到“关闭”位置，即为下移选择操作。

Moving down: rotate operating knob from 'stop' intermediate state to 'close' position to move down for item selection.

加减操作: 操作旋钮由“停”中间状态转到“打开”位置，即为加减选择操作。

Increasing & decreasing: rotate operating knob from 'stop' intermediate state to 'open' position to increase or decrease.

整体型的常规操作说明

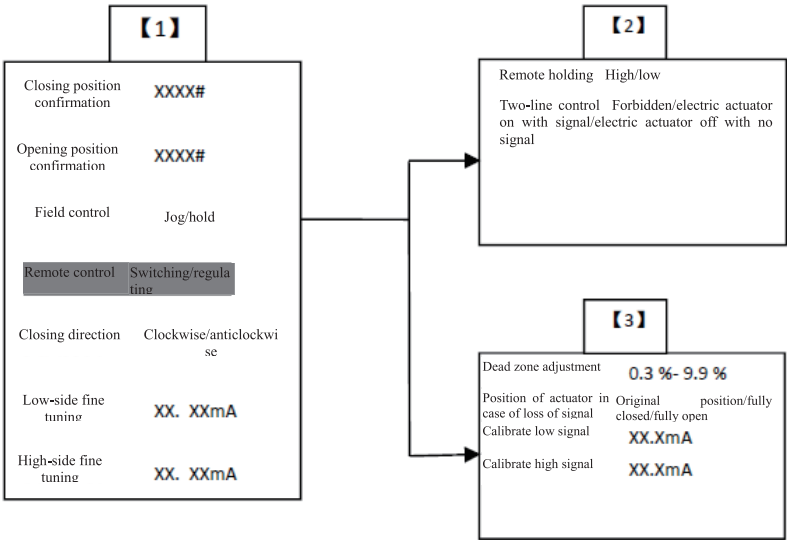
Instructions to Routine Operations of Integral Type

进入菜单：将红色的方式旋钮旋至“现场”位置，按手持式遥控器上的上移键、下移键、停止键、确认键中的任意按键可进入工作设定菜单，或将黑色的方式旋钮打在“停止”位置，黑色的操作旋钮放在“打开”位置并保持 5S 钟以上，控制系统即可进入工作设定菜单主界面。

Entering menu: rotate the red mode knob to 'field' and press any buttons among 'Up, Down, Stop and Enter' on the hand-held remote control to enter working settings menu, or rotate the black mode knob to 'Stop position'. The control system can enter the main interface of working setting menu if the black operation knob is in 'Open' position for above 5s.

注：为了后面叙述和显示的方便，用“【】”括起来表示选中的菜单，在液晶画面的菜单显示中，被选中的项是以反显示方式（即黑底白字）指示光标所在位置；没被选中的项以常规方式（即白底黑字）显示。

Note: for the convenience of the subsequent narration and display, "[]" is used to indicate the selected menu; in the menu display of LCD screen, the selected item indicates the position of cursor in a reverse display manner (i.e., white characters on a black background); the items that are not selected are displayed in a conventional manner (i.e., black characters on a white background).



6.3 整体型的行程位置标定
6.3 Stroke Position Calibration of Integral Type

（手持式遥控器标定方法）
(Hand-held remote control calibration method)

阀门电动装置和阀门连接后，无需开盖即可对阀门行程位置进行标定，具体方法如下：

After connecting electric valve actuator with the valve, the stroke position of valve can be calibrated without opening the cover. The specific method is shown below:

（先标定关向，再标定开向）
(Calibrate closing direction before opening direction)

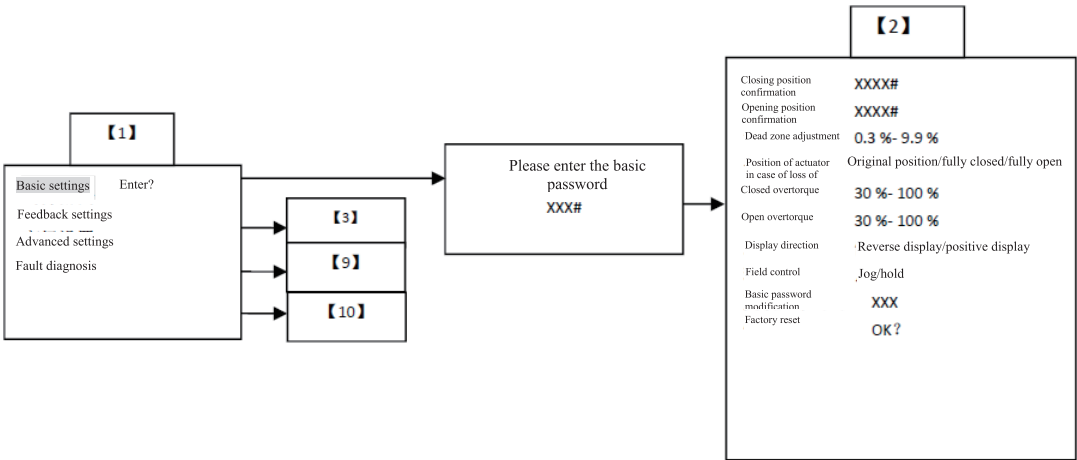
标定全关：通过手动或电动将阀门关严并进入设置界面菜单后（如下图所示），选中“关位确认”选项后，该行的右边将显示绝对编码器输出的当前位置的编码值

(0-65535)，按下遥控器上的确认键，此时液晶屏上方的绿色指示灯会闪动 2 下后再点亮，表示电动装置已经将该位置设定为关阀位置。再按“Stop”返回键直接返回主界面菜单。

Full closing calibration: After fully closing the valve manually or electrically, entering setting interface menu (as shown below), and selecting 'closing position confirmed', the encoding value (0-65535) of the current position output by the absolute encoder will be displayed on the right of the line. Then press 'Enter' on the remote control, the green indicator light on the LCD screen will flash 2 times and then turn on at this time, indicating that the electric actuator has set the position as the valve closing position. Then, press 'Stop' to directly return to main interface menu.

标定全开: 通过手动或电动将阀门打开并进入设置界面菜单后(如图 8 所示), 选中“开位确认”选项后, 该行的右边将显示绝对编码器输出的当前位置的编码值 (0-65535)，按下遥控器上的确认键，此时液晶屏上方的红色指示灯会闪动 2 下后再点亮，表示电动装置已经将该位置设定为开阀位置。再按“Stop”返回键直接返回主界面菜单。

Full opening calibration: After fully opening the valve manually or electrically, entering setting interface menu (as shown in Fig. 8), and selecting 'opening position confirmed', the encoding value (0-65535) of the current position output by the absolute encoder will be displayed on the right of the line. Then press 'Enter' on the remote control, the red indicator light on the LCD screen will flash 2 times and then turn on at this time, indicating that the electric actuator has set the position as the valve opening position. Then, press 'Stop' to directly return to main interface menu.



(旋钮开关标定方法)
(Knob switch calibration method)

标定全关: 通过手动或电动将阀门关严后将红色方式旋钮放在“停止”位置，再将黑色操作旋钮旋至开向位置 5 秒以上进入设置界面菜单后（如图 8 所示），选中“关位确认”选项后，再将红色旋钮旋至现场状态，此时液晶屏上方的红色指示灯会闪动 2 下后再点亮，表示电动装置已经将该位置设定为关阀位置。

Full closing calibration: After fully closing the valve manually or electrically, rotate the red mode knob on 'stop' position and rotate black operation knob to opening position for above 5s, then enter the menu of setting interface (as shown in Fig. 8). After select 'closing position confirmed', rotate the red knob to 'field' state. At this time, the red indicator light on the LCD screen will flash 2 times and then turn on, indicating that the electric actuator has set the position as the valve closing position.

标定全开:通过手动或电动将阀门打开并进入设置界面菜单后(如图 8 所示),选中“开阀确认”选项后,该行的右边将显示绝对编码器输出的当前位置的编码值(0-65535),按下遥控器上的确认键,此时液晶屏上方的绿色指示灯会闪动 2 下后再点亮,表示电动装置已经将该位置设定为开阀位置。再按“Stop”返回键直接返回主界面菜单。

Full opening calibration: After opening the valve manually or electrically and entering setting interface (as shown in Fig. 8), select 'opening position confirmed'. At this time, the encoding value (0-65535) of the current position output by the absolute encoder will be displayed on the right of the line. Then press 'Enter' on the remote control, the green indicator light on the LCD screen will flash 2 times and then turn on at this time, indicating that the electric actuator has set the position as the valve opening position. Then, press 'Stop' to directly return to main interface menu.

注:当阀门没有全关到位的时候,需要对行程调整时,操作步骤如下;

Note: The following steps shall be followed once it is required to adjust stroke when the valve is not fully closed in position;

在进入行程位置标定状态下,即上图所示界面;然后把位置选择旋钮拨到现场位置,不退出设置界面,进入下图提示,此时可以用操作旋钮或遥控器开阀按键和关阀按键任意调整阀门位置,不受原先标定的全开或全关位置限制。位置调整完成后再切换到停止位,可继续完成位置最终的设定。

Under stroke position calibration state, i.e., the interface shown above, pull the position selection knob to 'field' position without exiting the setting interface to pop up the prompt shown below. At this time, the position of valve can be adjusted at will via the operation knob or valve opening/closing keys on remote control without being limited by originally calibrated full opening or full closing position. The position can be finally set by switching to stop position after adjusting the position.

现场控制方式设置: 在“【1】号菜单中,通过遥控器上移、下移按键选定“现场控制”项后,该行的右边将显示以前的设定值(点动或保持)。用“加”“减”键可使设定值在“点动”和“保持”之间切换。用“确认键”保存选定的设定值。

Field control mode settings:

In menu [1], select 'field control' via the Up/Down keys of the remote control, then the previous set value ("jog" or "hold") will be displayed on the right of the line. Switch the set value between "jog" or "hold" with the "increasing" or "decreasing" key. Press the "Confirm" key to save the set value selected.

远程控制方式设置: 在“【1】”号菜单中,用“下移键”选中“远方控制”项后,该行的右边将显示以前的设定的远方控制方式。用“加”“减”键可选择远方控制为开关、调节控制中的一种,按“确认键”则进入相应控制方式的参数菜单内。

Remote control mode settings:

In menu [1], select "remote control" with the "Down" button, then the remote control mode set previously will be displayed on the right of the line. Remote control can be selected as switching or regulating type via 'increasing' or 'decreasing' key. After pressing 'Enter', the device will enter

the parameter menu of corresponding control mode.

6.4 整体型的控制参数设置

6.4 Control Parameter Settings of Integral Type

功能参数方式设置:

Function parameter mode settings:

- **远程 保持控制:** 在【2】号菜单中用“下移键”选中“远方保持”项后, 该行的右边将显示以前设定的远方保持信号电平设置。
● **Remote hold control:** 用“加”“减”键可选择远方保持为高电平、低电平控制中的一种, 用“确认键”保存选定的设定值。
(仅限开关型)
(Only for switching type) In menu [2], select "remote hold" with the "Down" button, then the remote hold signal level set previously will be displayed on the right of the line. Remote hold can be selected as high level or low level via 'increasing' or 'decreasing' key, and the selected set value can be stored by pressing 'Enter'.
- **两线 控制 方式:** 两线控制是指电动装置接受远方两线电动操作时工作方式。
● **Two-line control mode:** Two-line control refers to that an electric actuator accepts the working mode during remote two-line electric operation.

在【2】菜单中, 用“上移键”或“下移键”选定“两线控制”项后, 该行的右边将显示以前设定的两线控制方式。用“加”“减”键可选择两线控制为禁止、有信开、有信关中的一种, 用“确认键”保存选定的设定值。
In menu [2], select "two-line control" with the "Up" or "Down" button, then the two-line control mode set previously will be displayed on the right of the line. Two-line control can be selected as forbidden/electric actuator on with signal/electric actuator off with no signal via 'increasing' or 'decreasing' key, and the selected set value can be stored by pressing 'Enter'.

“禁止”是指两线控制方式无效; “有信开”是中控室与电动装置的连接线上有电压信号时电动装置进行打开操作; 连接线上无电压信号时电动装置进行关闭操作; “有信关”是指中控室与电动装置的连接线上有电压信号时电动装置进行关闭操作; 连线上无电压信号时电动装置进行打开操作。
'Forbidden' indicates that two-line control mode is invalid. 'Electric actuator on with signal' indicates that the electric actuator opens the valve when there are voltage signals from the connecting line between central control room and electric actuator. 'Electric actuator off with no signal'

indicates that the electric actuator closes the valve when there are voltage signals from the connecting line between central control room and electric actuator. When there is no voltage signal, the electric actuator opens the valve.

- 丢信动作设置:
- Settings for actions after signal loss:

(仅限调节型)
(Only for regulating type)

丢信: 当电动装置工作在远方自动控制方式、且控制电流小于低端电流的 1/2 时, 电动装置认为控制信号丢失, 简称丢信。丢信动作定义了在进行丢信时电动装置应运行到的位置。

Signal loss: when an electric actuator works in a remote automatic control manner and the control current is lower than 1/2 of the low-side current, the electric actuator will think the control signal has got lost, called signal loss for short. It defines the positions that an electric actuator shall reach in case of signal loss.

(在【3】号菜单中, 用“上移键”或“下移键”选定“丢信动作”项后, 该行的右边将显示以前的设定值(“保位”或“全关”或“全开”)。用“加”、“减”键选择所需的值, 用“确认键”保存所做的修改。)

(In menu [3], select "actions after signal loss" with the "Up" or "Down" button, then the previous set valve ('original position', 'fully closed' or 'fully opened') will be displayed on the right of the line. Select the required value with the "increasing" or "decreasing" button and press the "Enter" to save the changes made.)

- 调节死区设定:
- Dead zone adjustment settings:

死区的意义: 该功能在远方自动控制方式有效。在这种控制方式下, 执行器根据控制电流计算出用户希望的阀位值, 再将该值与当前的阀位值进行比较, 如果差值的绝对值大于死区值, 执行器才开始动作, 使当前的阀位向目标阀位靠近。如果当前的阀位与用户希望的阀位之差的绝对值在死区范围之内, 则执行器停止动作。设定适当的死区可以防止执行器在给定的阀位附近振荡。

Meaning of a dead zone: the function is effective in the remote automatic control manner. In this control mode, the actuator calculates the valve position value desired by the user according to the control current, and then compares this value with the current valve position value. If the absolute value of the difference is greater than the dead zone value, the actuator starts to operate, making current valve position closing to the target valve position. If the absolute value of the difference between the current valve position and the valve position required by users is within the dead zone range, the actuator stops operating. Setting a proper dead zone can prevent the actuator from oscillating near a given valve position.

(在【3】号菜单中, 用“上移键”或“下移键”选定“调节死区”

项后，该行的右边将显示以前的设定值（**0.3%~9.9%**）。用户可以使用“加”、“减”键来改变死区值。选定所需的死区值后，用“确认键”保存所做的修改。）

(In menu [3], select the **"Adjust the dead zone"** with the "UP/Down" key, then the previous set value (**0.3%~9.9%**) will be displayed on the right side of the line. Users can change the value of the dead zone with the "Plus" or "Minus" button. After selecting the required value of the dead zone, press the "Enter" key to save the changes made.)

- 电流标定设定：
- Current calibration settings:

当用户送给电动装置的 4mA~20mA 电流与执行器以前的标定值有差别时，可用此项功能对用户发出的电流进行重新标定，使电动装置和用户的 4mA~20mA 电流发送设备具有相同的测度标准，以提高执行器控制的准确度。

When a 4mA~20mA current sent by a user to an electric actuator is different from the previous calibration value of the actuator, the function can be used to recalibrate the current sent by the user to ensure that the actuator and the user' 4mA~20mA current transmitter have the same measurable standard, thus to improve the accuracy of actuator control.

为了叙述方便，定义 4mA 为信号低端（简称低信），20mA 为信号高端（简称高信）。

For convenience for description, the 4mA is defined as the low side of signal (hereinafter referred to as low signal) and the 20mA is defined as the high side of signal (hereinafter referred to as high signal).

- 标定低信：
Calibrate low signal:

在【3】号菜单中，用“上移键”或“下移键”选定“**标定低信**”项后，该行的右边将显示执行器采集到的控制电流值（mA）；此时用户可给执行器发送控制电流的低端信号，并且等到电流稳定后按“确认键”保存所采集到的电流值。

In menu [3], select **"Calibrate low signal"** with the "UP/Down" button, and then the control current value (mA) collected by the actuator will be displayed on the right of the line; at this time, the user can send the low signal of control current to the actuator and press the "Enter" key to save the collected current value after the current is stable.

- 标定高信：
Calibrate high signal:

在【3】号菜单中，用“上移键”或“下移键”选定“**标定高信**”项后，该行的右边将显示执行器采集到的控制电流值（mA）；此时用户可给执行器发送控制电流的高端信号，并且等到电流稳定后按“确认键”保存所采集到的电流值。

In menu [3], select **"Calibrate high signal"** with the

"UP/Down" button, and then the control current value (mA) collected by the actuator will be displayed on the right of the line; at this time, the user can send the high signal of control current to the actuator and press the "Enter" key to save the collected current value after the current is stable.

在任何时候用户都可用控制电流标定菜单来查询用户发出的电流值，但在控制电流信号未标定之前，查询到的值是不准确的。

At any time, a user can query the value of current sent by him with the control current calibration menu. However, the value queried is not accurate before the control current signal is not calibrated.

- 关闭方向设定：在【1】号菜单中，用“上移键”或“下移键”选定“关闭方向”项后，该行的右边将显示以前的设定值（“顺时针”或“逆时针”），按一下“返回键”则退回到上一级菜单，不会改变以前的设置。用户可利用该特点来查询以前的设定值（以下类同，不再赘述）。用“加”、“减”键可使设定值在“顺时针”和“逆时针”之间切换。用“确认键”保存选定的设定值。
- Closing direction settings:

In menu [1], select "Closing direction" with the "UP/Down" button, then the previous set valve ("clockwise" or "anticlockwise") will be displayed on the right of the line; press the "Return" button to return to the previous menu, and the previous settings will not be changed. Users can use the characteristic to query the previous set value (the following is the same and it will not be mentioned repeatedly). Switch the set value between "clockwise" or "anticlockwise" with the "Plus" or "Minus" button. Press the "Confirm" key to save the set value selected.

注：在执行器改变关闭方向后必须重新校准行程。

Note: the stroke shall be re-calibrated after the actuator changes the closing direction.

- 低端微调设定：在【1】号菜单中，用“上移键”或“下移键”选定“低端微调”项，执行器将送出 4mA 电流；当用户认为发送的 4mA 电流不准时，用户可用“加”“减”键增加或减小输出电流；用“确认键”保存设定值。
- Low-side fine tuning settings:

In menu [1], select "Low-side find tuning" with the "UP/Down" button, then the actuator will send a 4mA current; if a user thinks such current is not correct, he/she can increase or decrease the output current with the "increasing" or "decreasing" button; save the set value with the "Enter" key.

- 高端微调设定：在【1】号菜单中，用“上移键”或“下移键”选定“高端

- High-side fine tuning: 微调”项, 执行器将送出 20mA 电流; 当用户认为发送的 20mA 电流不准时, 用户可用“加”“减”键增加或减小输出电流; 用“确认键”保存设定值。

In menu [1], select "**High-side fine tuning**" with the "UP/Down" button, then the actuator will send a 20mA current; if a user thinks such current is not correct, he/she can increase or decrease the output current with the "increasing" or "decreasing" button; save the set value with the "Enter" key.

报警信息（整体型的常见问题处理方法）

Alarm information (solutions for common problems of integral type)

报警区显示“关向过矩”时, 表示在关阀过程中, 执行器承受的**转矩值超过额定值**, 此时执行器将停止电机转动, 并建立标志禁止向关方向动作。向开方向动作一小段距离或重新上电均可清除关阀过矩标志;

In case of '**overtorque in closing direction**' in alarm area, it indicates that the torque borne by the actuator is beyond rated value when closing the valve. At the time, the actuator will stop rotating the motor and display a sign to forbid moving to closing direction. The sign can be cleared by moving a short distance to opening direction or power it on again;

报警区显示“开向过矩”时, 表示在开阀过程中, 执行器承受的**转矩值超过额定值**, 此时执行器将停止电机转动, 并建立标志禁止向开方向动作。向关方向动作一小段距离或重新上电均可清除开阀过矩标志;

In case of '**overtorque in opening direction**' in alarm area, it indicates that the torque borne by the actuator is beyond rated value when opening the valve. At the time, the actuator will stop rotating the motor and display a sign to forbid moving to opening direction. The sign can be cleared by moving a short distance to closing direction or power it on again;

报警区显示“电源缺相”时, 表示执行器检测到**电源缺相**, 此时执行器将停止电机转动, 并使报警继电器的“MONI-NC”端与“MONI-COM”端闭合;

In case of '**power supply phase loss**' in alarm area, it indicates that the actuator detects power supply phase loss. At the time, the actuator will stop rotating the motor and close the 'MONI-NC' end and 'MONI-COM' end of the alarm relay;

报警区显示“信号丢失”时, 表示输入执行器的 4mA~20mA 控制**电流信号已丢失**, 执行器将按“工作参数设定”中的第 12 项“丢信动作”设定值进行动作, 并使报警继电器的“MONI-NC”端与“MONI-COM”端闭合;

In case of '**loss of signal**' in alarm area, it indicates that the 4mA~20mA control current signal input to actuator has lost. Then the actuator will work according to the set value of item 12 '**signal loss action**' in "Working Parameter Settings" and close the 'MONI-NC' end and 'MONI-COM' end of the alarm relay;

报警区显示“远开远关同在”时, 表示执行器同时收到**远方关闭和远方打开**两个信号, 执行器将停止电机转动, 并使监视继电器的“MONI-NC”端与“MONI-COM”端闭合;

In case of '**remote opening and closing enabled**' in alarm area, it indicates that the actuator receives both remote closing and remote opening signals at the same time, and

the actuator will stop the motor and close the 'MONI-NC' end and 'MONI-COM' end of the supervisory relay;

报警区显示“转向错误”时，表示执行器转动过程中检测到阀位的变化不正确时（可能是转动方向错误，或阀位编码器有问题），执行器将停止电机转动。

In case of 'rotating direction error' in alarm area, it indicates that the actuator detects incorrect change of valve position (it may be wrong rotating direction or valve position encoder is faulted) during rotation, and the actuator will stop the motor.

报警区显示“阀位出错”时，表示执行器转动过程中检测不到阀位的变化（可能是未挂上电动挡，或反向转动时空程太长，或编码器有问题），执行器将停止电机转动。

In case of 'valve position error' in alarm area, it indicates that the actuator detects no changes of valve position during rotation (it may not be in electric mode, or the idle stroke is too long when rotating reversely or the encoder is faulted), and the actuator will stop the motor.

注：在无报警状态时，报警继电器的“MOM-NO”端与“MONI-COM”端闭合，而“MONI-NC”端与“MOM-COM”端断开。

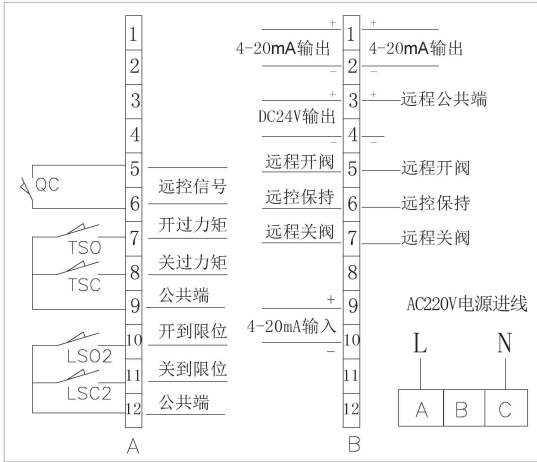
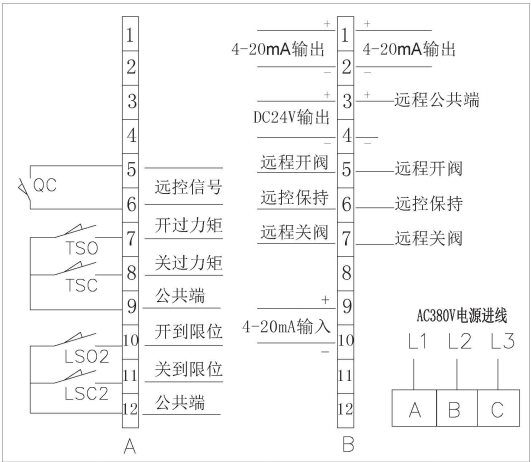
Note: The 'MOM-NO' end and 'MONI-COM' end of alarm relay close when there is no alarm state, while 'MONI-NC' end and 'MOM-COM' end are disconnected.

7.1 整体开关型端子接线图

7.2 整体调节型端子接线图

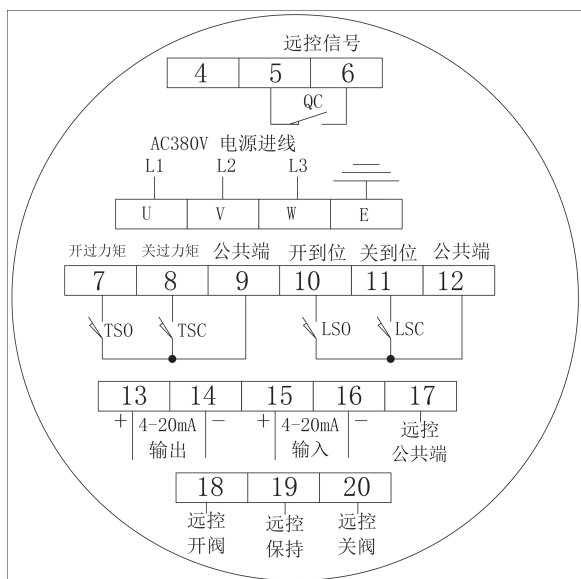
7.1 Integral Switching Terminal Wiring Diagram

7.2 Integral Regulating Terminal Wiring Diagram



7.3 整体隔爆开关型接线端子图

7.3 Integral Explosion-proof Switching Wiring Terminal Diagram



5、6: 远控信号

5, 6: Remote control signal

7: 开力矩常开点

7: Opening torque normally opened point

8: 关力矩常开点

8: Closing torque normally opened point

9: 力矩公共端

9: Torque common terminal

10: 开到位常开点

10: Normally opened point for opening in position

11: 关到位常开点

11: Normally opened point for closing in position

12: 到位信号公共端

12: In-position signal common terminal

13、14: 4-20mA 模拟量输出

13, 14: 4-20mA analog output

15、16: DC24V 输出

15, 16: DC24V output

18: 远程开阀

18: Remote valve opening

19: 远程保持

19: Remote holding

20: 远程关阀

20: Remote valve closing

U、V、W: 电源进线

U, V, W: incoming power line

注:

Note:

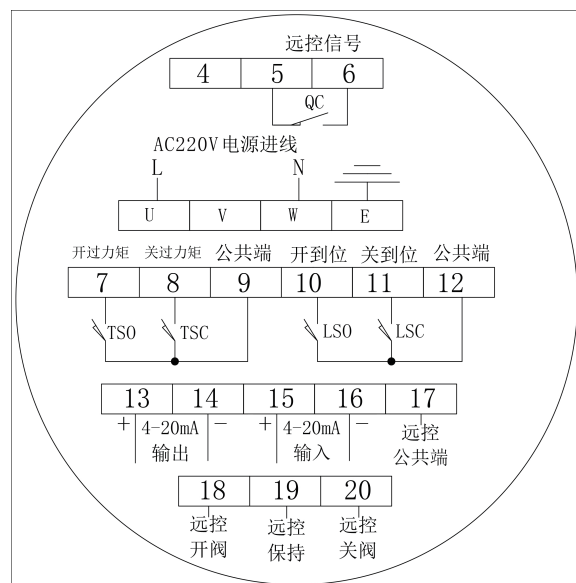
15#端子为远控公共端

15# terminal is the remote

control common terminal

7.4 整体隔爆调节型接线端子图

7.4 Integral Explosion-proof Regulating Terminal Wiring Diagram



5、6: 远控信号

5, 6: Remote control signal

7: 开过力矩常开点

7: Opening overtorque normally opened point

8: 关过力矩常开点

8: Closing overtorque normally opened point

9: 力矩公共端

9: Torque common terminal

10: 开到位常开点

10: Normally opened point for opening in position

11: 关到位常开点

11: Normally opened point for closing in position

12: 到位信号公共端

12: In-position signal common terminal

13、14: 4-20mA 模拟量输出

13, 14: 4-20mA analog output

15、16: 4-20mA 模拟量输入

15, 16: 4-20mA analog input

U、V、W: 电源进线

U, V, W: incoming power line

