

Special warning

● In order to keep performance of protection class, users must operate in accordance with "instruction manual" and the "special warnings". Users take responsibility for incorrect operation and operation without referring to "instruction manual" and "special warnings" causing protection class failure

● All of the explosion proof parts have been tested strictly by our quality department before delivery. User open the below parts due to adjusting or maintenance.

1. Body cover
2. Electrical cover combination
- 3 line lock, plug

● All related parts with enclosure protection have been through strict tested to guarantee its good sealing before delivery. Users need to ensure following events if open electric actuator for adjustment, maintenance, other conditions:

1. the electric actuator loose intrinsic protection function when adjusted or operated. Users must protect it away from rain, snow, hail, tidal air, dust.
2. Users should ensure there is no negative factor like water, dust, serious tidal air left inside of the opening position, causing protection performance degradation after operation done
3. After operation done, over the cap to make sure all screws tightened. users also need ensure rubber seal rings is perfect as original shape
4. Users should ensure tighten nut to make sure of good sealing after cable's path through electrical connection. Teflon seal is needed between electrical connection and casting thread. Tightened joint wrapped outside should be sealed with cable
5. Users should ensure there is no negative influence of seal when you open and re-install indicator window or local buttons.

Specialized Fluid Control Valve Manufacturer

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COVNA®
— VALVE —

(Read the instruction manual before usage)
SM-2



INSTRUCTION MANUAL
COVNA-QTEEx Electric Actuator For Valves
(Explosion Proof)

1、产品概述 Product overview

“QT”系列电动执行器用于控制 0° ~ 270° 旋转的阀门及其他同类产品，如蝶阀、球阀、风门、挡板阀、旋塞阀、百叶阀等，可以广泛应用于石油、化工、水处理、船舶、造纸、电站、供暖供热、楼宇自控、轻工等各行业。它以 380V/220V/110V 交流电源为驱动电源，以 4–20mA 电流信号或 0–10V DC 电压信号为控制信号，可使阀门运动到所需位置，实现其自动化控制，最大输出扭矩达 2000 N·M。(该产品已获得防爆认证证书，产品质量具有保障)

QT Series Electric Actuator is used to control valves with 0° –270° rotation and other similar products, such as butterfly valves, ball valves, air throttles, baffle valves, plug valves and shutter valves. It can be widely applied in petroleum, chemical engineering, water treatment, shipbuilding, paper, power stations, heat supply, building automation, light industry and other industries. Driven by 380V/220V/110V AC power and controlled with 4–20mA current signals or 0–10V DC voltage signals, it can make the valve move to the required position for automatic control. The maximum output torque is up to 2,000N.M (The product has been certified by explosion–proof certification, with guaranteed quality).

2、性能特点 Performance characteristics

2.1 壳体 Housing

壳体为硬质铝合金，经阳极氧化处理和聚酯粉末涂层，耐腐蚀性强，防护等级为 IP67，NEMA4和 6，并有IP68 和防爆型供选择。

The housing is made of hard aluminum alloy, with anodic oxidation treatment and polyester powder coating, contributing to its strong corrosion resistance. It has a protection class being IP67, NEMA4 and 6; and is also optional for IP68 and the explosion–proof type.

2.2 电机 Motor

全封闭式鼠笼式电机，体积小，扭矩大，惯性力小，绝缘等级为 F 级，内置过热保护开关，可防止过热损坏电机。

The fully enclosed squirrel–cage motor has a small size, a large torque and a small inertia force, with an insulation class F and a built–in thermal protection switch to prevent damages to the motor caused by overheating.

2.3 手动结构 Manual structure

手轮的设计保证安全可靠、省力、体积小。不通电时，扳动离合器手柄可进行手动操作。通电时，离合器自动复位。(注：在电机不通电的状况下，电动执行器将保持永久手动状态)

The handwheel design ensures its safety, reliability, labor saving and small size. When it's not energized, pull the clutch handle for manual operation. When it's energized, the clutch will be reset automatically. (Note: when the motor is not energized, the electric actuator will maintain a permanent manual state)

2.4 指示器 Indicator

指示器安装在中心轴上，可以观察阀门位置。镜面采用凸透镜设计，不积水，观察更方便。

The indicator is mounted on the central shaft and used to observe the valve position. The mirror adopts a convex lens design with no water accumulation, thus easier for observation.

2.5 干燥器 Dryer

用来控制温度，防止由于温度和天气变化导致执行器内部水分凝结，保持内部电气元件的干燥。

It's used for temperature control to prevent water condensation inside the actuator caused by temperature and weather changes, thus keeping internal electrical elements dry.

2.6 限位开关 Limit switch

机械，电子双重限位。机械限位螺钉可调，安全可靠；电子限位开关由凸轮机构来控制，简单的调整机构能精确并方便地设定位置，无需电池支持。(微动开关接点均为银质触点)

Mechanical + electronic limit. The mechanical limit screw is adjustable, being safe and reliable; while the electronic limit switch is controlled by the a cam mechanism, and the position can be set accurately and easily just by means of adjusting the mechanism simply, without battery support (All micro–switch contacts are silver contacts).

2.7 扭矩开关 Torque switch

可提供过载保护 (QT–005/008/010除外)，在阀门卡涩，有异物时，自动断开电机电源，更有效的保护阀门和电动执行器不受损坏。(出厂前已设定好，请用户不要随意更改设置)

It can provide overload protection (except QT–005/008/010), which can automatically disconnect the motor's power in case of valve clogging or any foreign matter, thus more effectively protecting the valve and the electric actuator from being damaged (It's provided with factory settings, so please don't change such settings without authorization).

2.8 自锁 Self–locking

精密的双蜗轮蜗杆机构可高效传输大扭矩，效率高，噪音低 (最大 50 分贝)，寿命长有自锁功能，防止反转，传动部分稳定可靠，出厂已经加满高效润滑脂，使用无需再加油。

The precision double worm gear mechanism can transmit the large torque efficient, featuring high efficiency, low noise (maximum 50 dB), a long life, a self–locking function to prevent reversion, and a transmission part being stable and reliable. It has been filled with high–performance grease before delivery, so the users needn't to do it again.

2.9 防脱螺栓 Anti–off bolt

拆除外壳时，螺栓附在壳体上，不会脱落。外部螺栓均采用不锈钢材质。

When the housing is removed, the bolts are attached to the housing without falling off. All external bolts are made of stainless steel.

2.10 安装 Installation

底部安装尺寸符合 ISO5211 国际标准，驱动轴套可拆下根据需要进行加工，适应性强。可以垂直安装，也可以水平安装。

The bottom installation size is in line with the international standard ISO5211, and the driven shaft sleeve is removable to be processed as required, thus being very adaptable. It can be installed either vertically or horizontally.

2.11 线路 Circuit

控制线路符合单相或三相电源标准，线路布置紧凑合理，接线端子可有效满足各种附加功能的要求。阀开关到位均有无源接点输出 (可根据客户要求另行加工)。

The control circuit is in line with the single–phase or three–phase power supply standards; the circuit layout is compact and reasonable; and the connecting terminals can effectively meet requirements for various additional functions. The valve is opened and closed in place, and all are provided with passive contact outputs (also available for customization as required by customers).

2.12 智能模块 Intelligent module

采用集成度高，功耗很低的单片机与模拟电路混合的控制板，更采用全金属外挂式安装，使执行器电机热源与控制板有效隔离，很大程度地提高了软件及硬件的抗干扰性能及耐高温性。

It adopts a control panel mixing single–chip and analog circuit with a high degree of integration and very low power consumption, and also all–metal external hanging installation so as to effectively isolate the actuator motor heat source and the control panel, thus greatly improving the anti–interference performance and temperature resistance of the software and hardware.

2.13 阀位数字显示 Digital display of valve position

执行器在打开或关闭过程中，阀位的变化在液晶屏上以大数字方式实时显示。

In the opening or closing process of the actuator, the LCD screen provides real-time display of valve position changes in large numbers.

2.14 相序自动调整 Automatic adjustment of phase sequence

智能型执行器自动检测接入的三相电源相序，无需用户考虑三相电源的相序问题。

The intelligent actuator can automatically detect the phase sequence of the connected three-phase power supply, so the users needn't to consider it.

3、主要技术参数，规格 Main technical parameters, specifications

3.1 QT系列电动执行器技术参数 Technical parameters of QT series electric actuator

型号 Model	最大输出扭矩 Max. output torque N·M	90° 动作时间 60/50Hz 90° Action time 60/50Hz S	最大轴径 Max. shaft diameter mm	电机 F级 Motor class F W	额定电流 (A) 60/50HZ Rated current (A) 60/50HZ			手轮转数 Number of handwheel revolutions N	重量 Weight Kg	
					单相 Single-phase	三相 Three-phase				
					110V 220V	380V	440V			
QT-010	100	18/22	φ 20	25	1.10/0.95	0.55/0.54	0.3/0.3	N/A	10	7.5
QT-015	150	21/25	φ 22	40	1.65/1.67	0.88/0.84	0.31/0.31	0.30/0.31	10	8
QT-020	200	21/25	φ 22	40	1.67/1.67	0.89/0.85	0.31/0.31	0.30/0.31	11	17.3
QT-050	500	26/31	φ 35	120	3.60/3.62	1.55/1.58	0.59/0.59	0.58/0.58	13.5	23
QT-100	1000	31/37	φ 45	200	4.10/4.10	2.15/2.20	0.85/0.85	0.79/0.79	16.5	29
QT-200	2000	93/112	φ 65	200	4.10/4.10	2.15/2.20	0.85/0.85	0.79/0.79	49.5	75

3.2 标准规格 Standard specifications

外壳 Housing	防水级别 IP67, NEMA 4 and 6 Waterproof level IP67, NEMA 4 and 6	
电机电源 Motor power supply	标准: 220V AC 单相 可选: 110V AC 单相, 380/440V AC 三相, 50/60Hz, ±10% 24V DC /110V DC /220V DC" Standard: 220V AC single-phase Optional: 110V AC single-phase, 380/440V AC three-phase, 50/60Hz, ±10% 24V DC /110V DC /220V DC"	
电机 Motor	鼠笼式异步电机 Squirrel-cage asynchronous motor	
限位开关 Limit switch	开/关, 各 1 个 SPDT, 250V AC 10A On / off, each of the 1 SPDT, 250V AC 10A	
辅助限位开关 Auxiliary limit switch	开/关, 各 1 个 SPDT, 250V AC 10A On / off, each of the 1 SPDT, 250V AC 10A	
扭矩开关 Torque switch	开/关, 各 1 个 SPDT, 250V AC 10A On / off, each of the 1 SPDT, 250V AC 10A	QT-010 除外 QT-010 Excluded
行程 Travel	90° ±10°	0° ~ 270° 可选 0° ~ 270° Optional
失速防护/操作温度 Stall protection/ operating temperature	内置过热保护, 开 115°C ±5°C /关 97°C ±5°C Built-in overheating protection, open 115°C ±5°C/关 97°C ±5°C	
指示器 Indicator	连续的位置指示刻度 Continuous position indicator scale	

手动操作 Manual operation	机械离合机构, 配手轮操作 Mechanical clutch mechanism, with handwheel operation
自锁装置 Self-locking unit	蜗轮, 蜗杆机构提供自锁 Worm gear, self-locking provided for the worm mechanism
机械限位 Mechanical limit	2 个外部调整螺栓 Two external adjusting bolts
干燥器 Dryer	7-10W (110/220V AC)
接线孔 Wiring hole	M20*1.5 M36*2
环境温度 Ambient temperature	-20°C ~ +70°C
润滑 Lubrication	铝基润滑脂 (EP 型) Aluminium-base grease (EP type)
材料 Material	钢, 铝合金, 铝青铜, 聚碳酸酯 Steel/aluminum alloy/aluminum bronze/polycarbonate
环境湿度 Ambient humidity	最大 90% RH非凝结 Maximum 90% RH non-condensing
抗震性能 Seismic performance	X Y Z 10g, 0.2 ~ 34 Hz, 30 分钟 X Y Z 10g, 0.2 ~ 34 Hz, Minutes
外涂层 Outer coating	干粉, 环氧聚酯, 具有超强防腐功能 Dry powder/epoxy polyester, with a superior anti-corrosion function

3.3、可选规格 Optional specification

编号 No.	可选配置 Optional configuration	备注 Remarks
1	防爆执行器 (Exd II CT4) Explosion-proof actuator (Exd II CT4)	QT 系列 QT series
2	防水执行器 (IP67,10M,250HR) Waterproof actuator (IP67,10M,250HR)	QT 系列 QT series
3	电位计 (1K-10K) Potentiometer (1K-10K)	QT 系列 QT series
4	比例控制单元 (输入, 输出信号4-20mA DC /1-5V /1-10V) Proportional control unit (input/output signal 4-20mA DC /1-5V /1-10V)	QT 系列 QT series
5	现场控制单元 (就地控制 开/停/关选择开关, 就地/远程切换) On-site control unit (local control ON/STOP/OFF selection switch, local/remote switching)	QT 系列 QT series
6	行程90°, 120°, 180°, 270° Travel 90°, 120°, 180°, 270°	QT 系列 QT series
7	直流电机 (24V DC) DC motor (24V DC)	QT 系列 QT series
8	附加扭矩开关 (SPDT X 2 250V AC 10A) Additional torque switch (SPDT X 2 250V AC 10A)	QT-010除外 QT-010 Excluded
9	电流位置传感器 (输出4-20mA DC) Current position sensor (output 4-20mA DC)	QT 系列 QT series

10	断信号后, 电动阀自动开或关控制柜 The electric valve opens or closes the control cabinet automatically after the signal is cut off	QT 系列 QT series
11	耐高温执行器 (-10℃ ~ +100℃) High-temperature-resistant actuator (-10℃ ~ +100℃)	QT 系列 QT series
12	耐低温执行器 (-40℃ ~ +70℃) Low-temperature-resistant actuator (-40℃ ~ +70℃)	QT 系列 QT series
13	低速执行器 Low-speed actuator	QT 系列 QT series

4、结构 Structure

电动执行器主要由以下几部分组成:

- 壳体部分: 包括外壳及底座部分;
- 驱动部分: 以高性能全封闭鼠笼式电机为动力源;
- 传动机构: 双蜗轮与离合器部分;
- 比例控制部分: 与机械部分分离, 提高可靠性;
- 力矩开关与限位开关部分;
- 开度检测与反馈部分。

The electric actuator mainly consists of the following parts:

- Housing part: including housing and base;
- Driving part: powered by a high-performance fully-enclosed squirrel-cage motor;
- Transmission mechanism: double worm gear and clutch;
- Proportional control part: isolated from the mechanical part to improve reliability;
- Torque switch and limit switch part;
- Opening detection and feedback part.

5、外观图 Appearance diagram

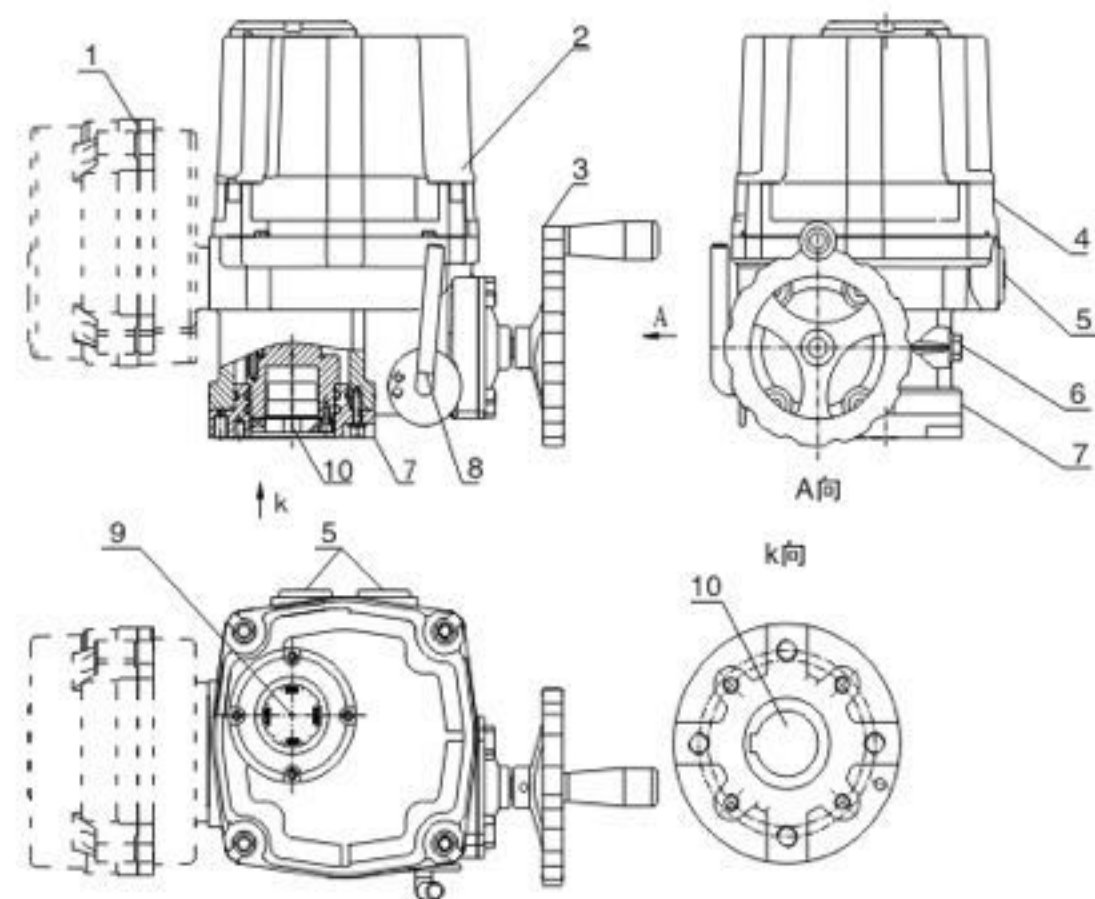


图1 Figure 1

1	控制室 Control room
2	外罩 Enclosure
3	手轮 Handwheel
4	壳体 Housing
5	线缆接入堵头 Cable connection plug
6	机械限位螺钉 Mechanical limit screw
7	连接法兰 Connecting flange
8	离合器手柄 Clutch handle
9	视窗 Window
10	输出轴 Output shaft

5.1 QT-010-015外观及安装尺寸 Appearance and installation dimensions

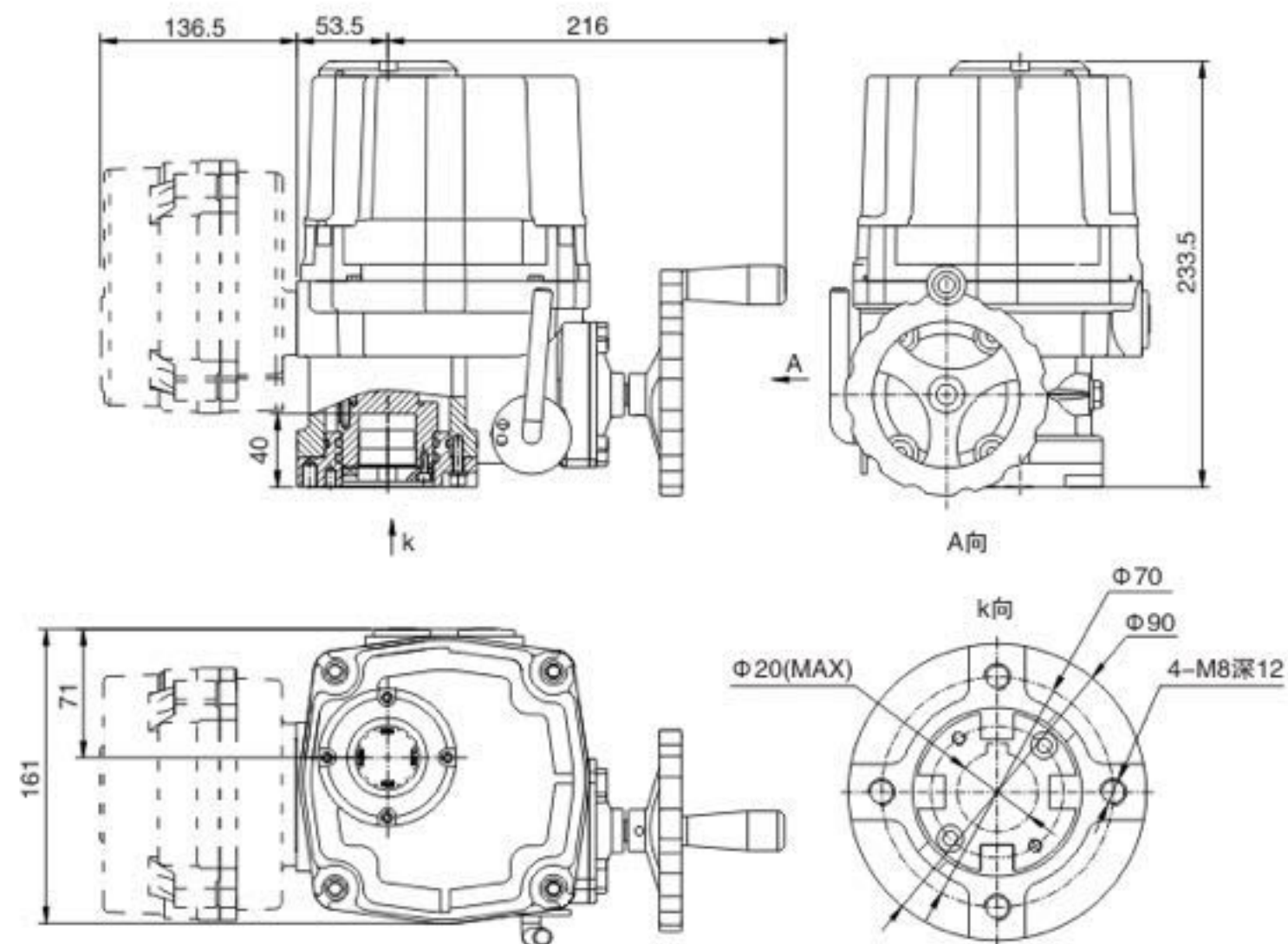


图2 Figure 2

5.2 QT-020外观及安装尺寸 Appearance and installation dimensions

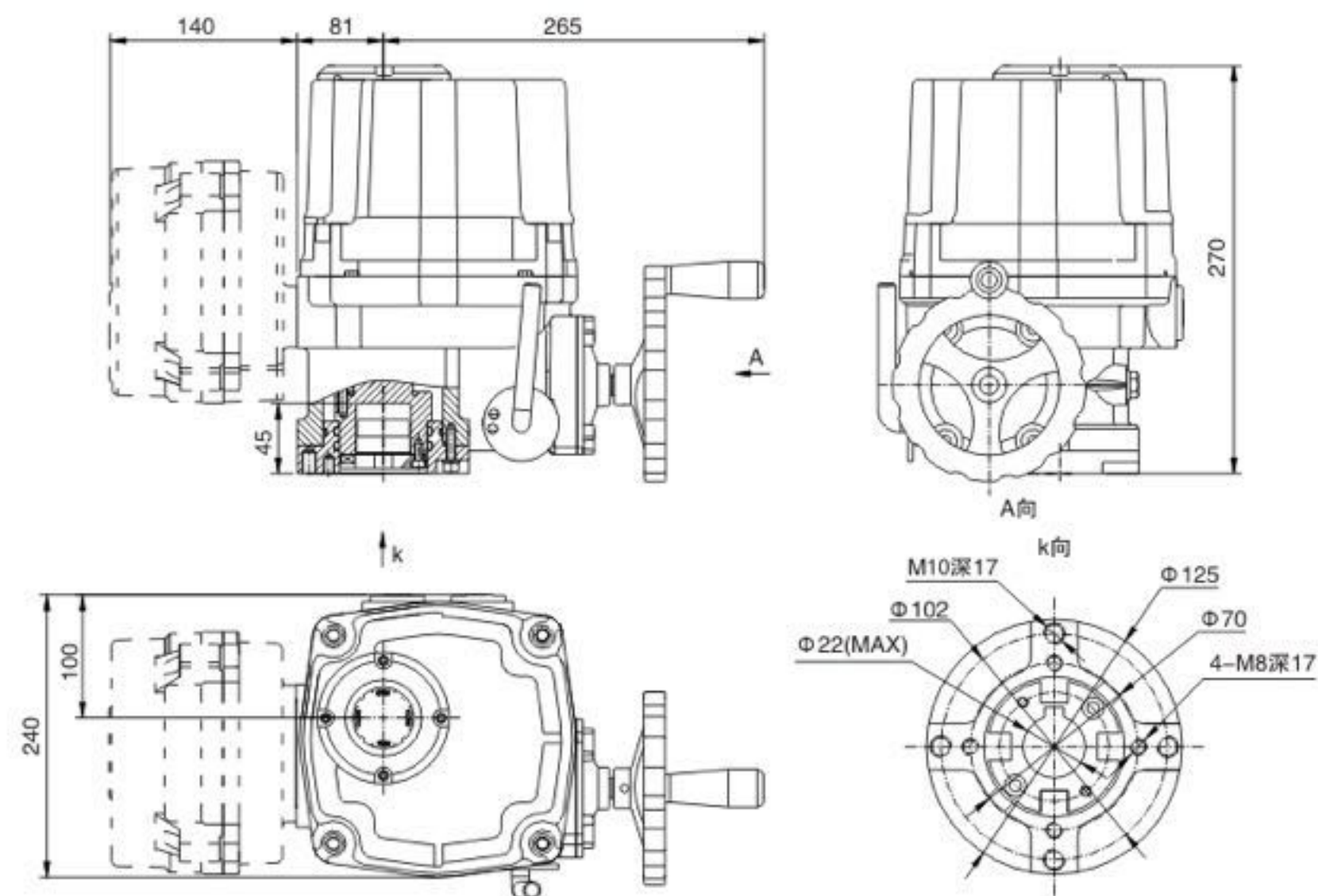


图3 Figure 3

5.3 QT-050外观及安装尺寸 Appearance and installation dimensions

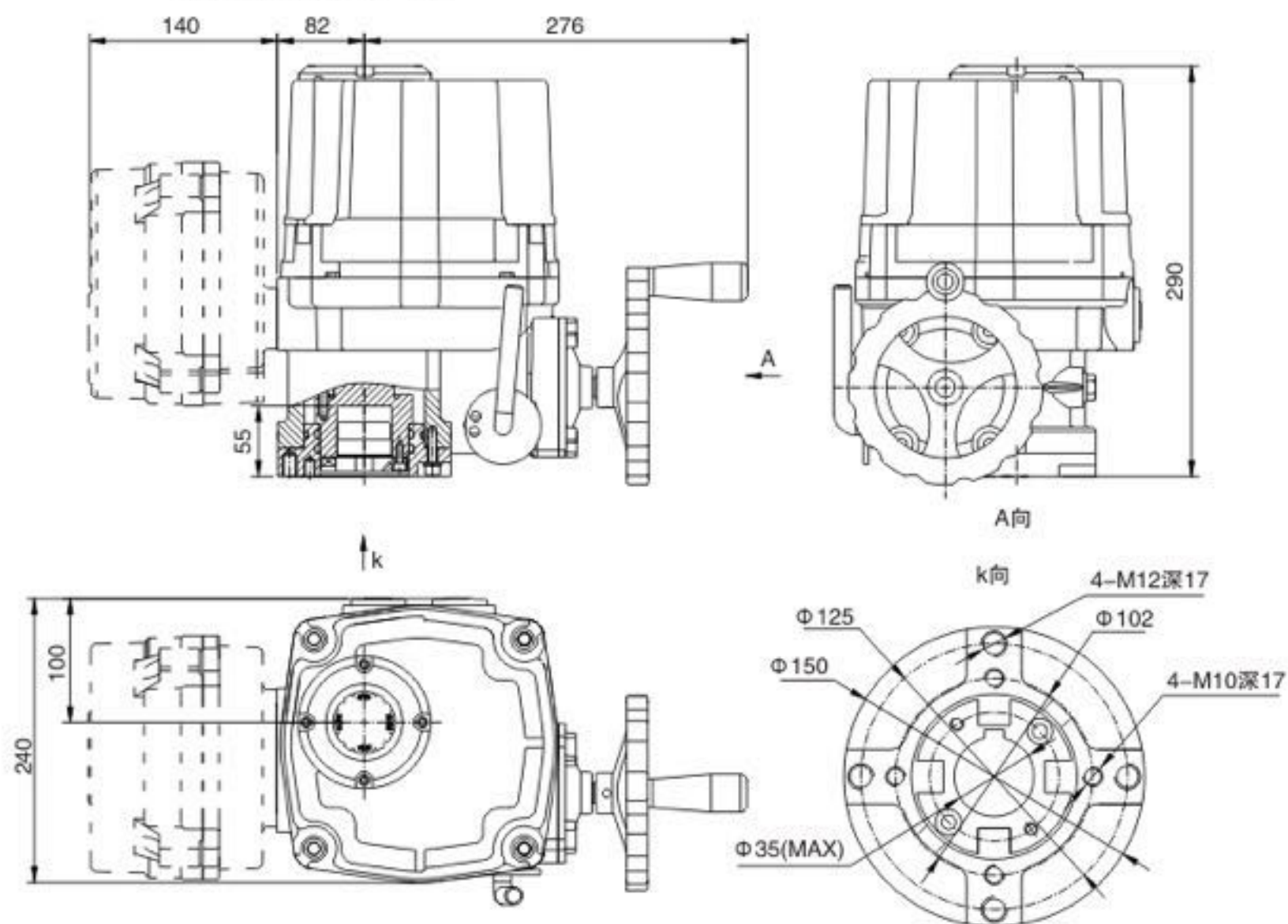


图4 Figure 4

5.4 QT-100外观及安装尺寸 Appearance and installation dimensions

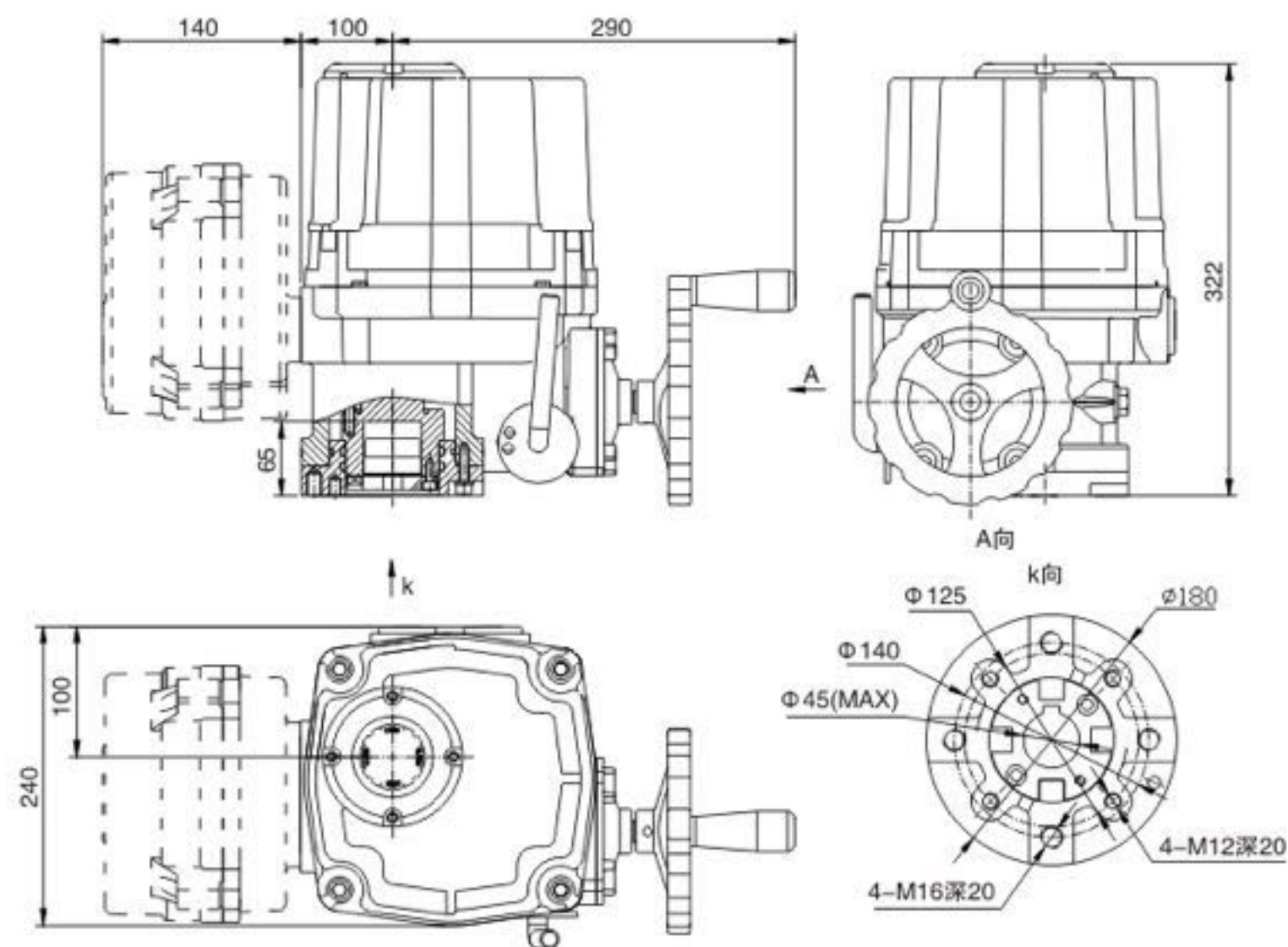


图5 Figure 5

6、执行器安装 Installation of actuator

6.1 安装现场 Installation site

6.1.1 室内安装注意事项 Notes for indoor installation

安装在有爆炸性气体的地方，需订购防爆型执行器；

安装在有水淹没及户外请提前说明；

请预留接线、手动操作维修用空间；

To install it where there is any explosive gas, you need to order an explosion-proof actuator;

To install it where it may be flooded or outdoors, please notify us in advance;

Please reserve maintenance spaces for wiring, manual operation and others;

6.1.2 室外安装的注意事项 Notes for outdoor installation

为了避开雨水、阳光直射等问题，需要安装保护盖；或选用防护等级 IP67 以上；

请预留接线、手动操作等维修用空间；

In order to avoid rain, direct sunlight and other problems, you need to mount a protective cover or select a protection class above IP67;

Please reserve maintenance spaces for wiring, manual operation and others;

6.1.3 环境温度 Ambient temperature

环境温度在 -20°C ~ $+70^{\circ}\text{C}$ 范围内；

环境温度为 0°C 以下时，在机内加装除湿加热器；

The ambient temperature range is from -20°C to $+70^{\circ}\text{C}$;

When the ambient temperature is below 0°C , please mount a dehumidifying heater in the machine;

6.1.4 流体温度条件 与阀门配套使用时，流体的热量会传到机体上，机体温度会升高；流体处于高温状态时，与阀门连接的支架要特别处理。

Fluid temperature conditions: when it works with a valve, the fluid heat may be transmitted to its body whose temperature may rise; when the fluid is in a high-temperature state, special treatment should be provided for the bracket connected to the valve.

标准支架：流体温度 $+65^{\circ}\text{C}$ 以下的支架或免支架；

中温支架：流体温度 $+100^{\circ}\text{C}$ 以上， $+180^{\circ}\text{C}$ 以下的支架；

高温支架：流体温度 $+180^{\circ}\text{C}$ 以上的支架

Standard bracket: bracket for a fluid temperature below $+65^{\circ}\text{C}$ or without bracket;

Medium temperature bracket: bracket for a fluid temperature above $+100^{\circ}\text{C}$ and below $+180^{\circ}\text{C}$;

High temperature bracket: bracket for a fluid temperature above $+180^{\circ}\text{C}$.

6.2 与阀门的连接 Connection to the valve

6.2.1 执行器底部法兰安装孔尺寸符合 ISO5211 标准。如阀门安装尺寸与其不符，则另行设计支架或转接板即可。

The flange mounting hole size at the actuator bottom is in line with the standard ISO5211. If the valve's installing size is not in line with it, please design a bracket or adapter plate separately.

6.2.2 执行器与阀门通过其主轴上可拆卸驱动轴套连接，驱动轴套出厂前为实心件，先用扳手逆时针方向旋出两枚紧固螺钉，然后用两枚顶出螺钉顶出轴套。

The actuator is connected to the valve by a removable drive shaft sleeve on it. The drive shaft sleeve is provided as a solid piece, and you should first screw out two fastening screws counterclockwise with a wrench and then eject the driving shaft sleeve with two ejection screws.

注：用户可根据驱动轴套功能要求另行设计制造，其形状可设计为圆轴、方轴或其它形式的成形轴输出。(加工必须保证孔与外圆的同心)

Note: The drive shaft sleeve can be designed and manufactured separately by users based on its function requirements, and it can be designed into round, square or other shapes for output (The concentricity of hole and outer circle must be ensured in processing).

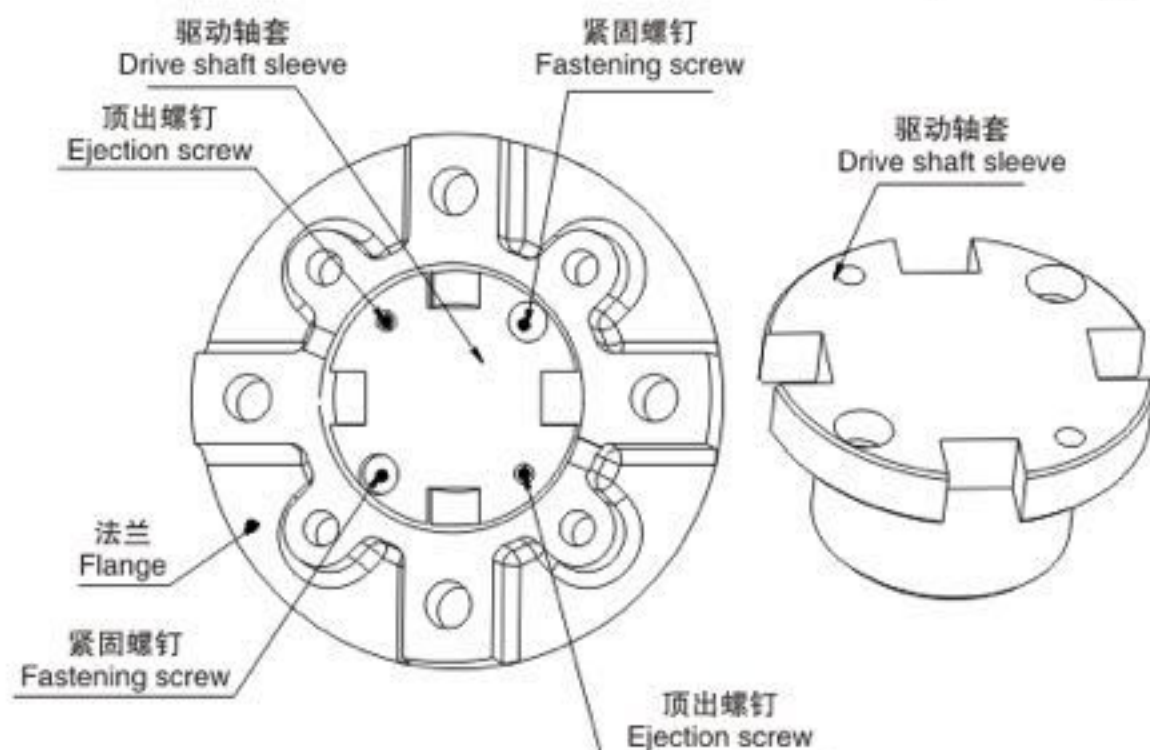


图6 Figure 6

6.2.3 安装前，必须注意执行器的开、关方向应与阀门的开、关方向相对应。

Before installation, it must be noted that the opening/closing direction of the actuator should correspond to that of the valve.

6.2.4 将支架固定在阀门上。

Fix the bracket on the valve.

6.2.5 将电动执行器转到关闭位置，用联轴器螺钉将阀门芯轴和电动执行器输出轴固定。

Turn the electric actuator to the closed position and fix the valve's spindle and the electric actuator's output shaft with couplers and screws.

6.2.6 将电动执行器放在支架上，拧上电动执行器和支架间的螺钉。

Place the electric actuator on the bracket and tighten the screws between the actuator and the bracket.

6.2.7 手动转动阀门，确认无异常情况，并转到全闭位置。

Turn the valve manually to confirm that there is no abnormality and then turn to the fully closed position.

6.2.8 用手轮转动电动执行器时，确认无偏心、弯斜、运动平稳，注意不要超程！

When turning the electric actuator with the handwheel, make sure that there is no eccentricity or bending and that the motion is stable. Note there should be no overtravel!

注意事项：联轴器尽量减小回差。

Note: The coupler should have as few hysteresis errors as possible.

6.3 电源配线 (图7、图8) Power wiring (Figs. 7 and 8)

6.3.1 卸下铝制金属堵头，供外部电缆接入，请使用外螺纹为3/4"的防爆接头或防爆电缆软管。

Remove the aluminum metal plug for external cable connection. Please use an explosion-proof connector with 3/4 " male thread or an explosion-proof cable hose.

6.3.2 如果电缆接头与执行器不符合，可能造成机内密封等级下降而达不到防护要求，或执行器内部进水而损坏机器。

If the cable connector is not in compliance with the actuator, it may result in a decrease in the actuator's internal sealing level so that it cannot meet the requirements for protection or there is water going into the actuator to damage the actuator.

6.3.3 使用电线管时，要充分采取防水措施。

Full waterproof measures should be taken when the wiring tube is used.

6.3.4 拆开机壳外罩。用螺丝刀轻轻按下接线端子上的小孔内金属弹片，同时导线插入侧面插线孔。松开螺丝刀即可。

Remove the housing enclosure. Use a screwdriver to gently press on the metal sheet in the hole on the connecting terminal, and meanwhile insert the lead wire into the side plug hole. Just release the screwdriver.

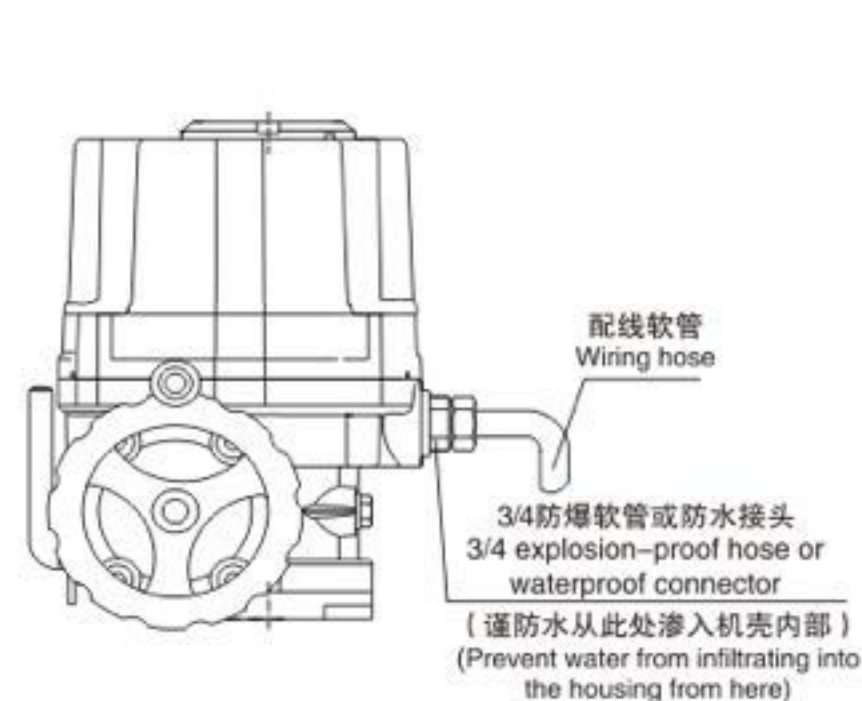


图7 Figure 7

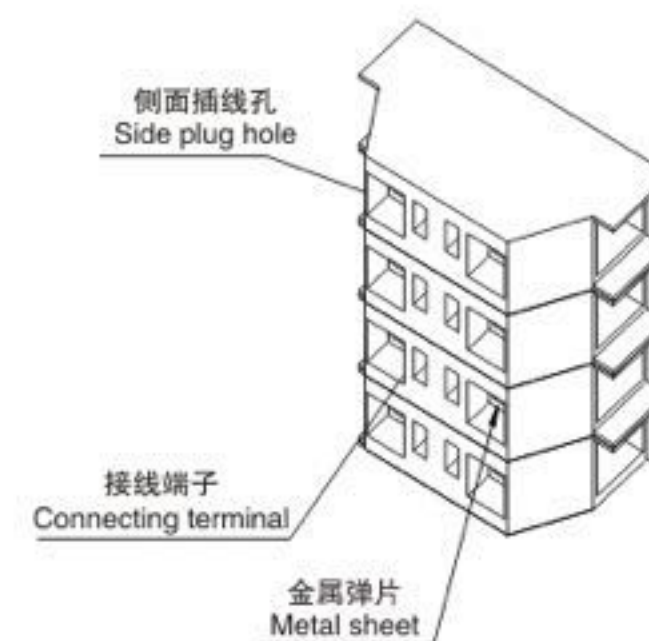


图8 Figure 8

7、调试说明 Commissioning instructions

7.1 机械限位调整 (图9、图10) Adjustment of mechanical limit (Figs. 9 and 10)

松开机械限位螺钉及锁紧螺母，边转动手轮旋转一圈，边向左扳动一下离合器手柄，使离合器啮合后，继续旋转手轮，然后手动使执行器运动到全关的位置，旋转限位螺母，当其碰到里面的扇形齿轮后停止转动，再旋出两圈，最后上紧锁紧螺母。这样就设定好了执行器全关时的机械限位的位置。全开时的位置可同样设定。如图9、图10所示：

Loosen the mechanical limit screw and the lock nut; rotate the handwheel for one turn while turning the clutch handle to the left to engage the clutch; after that, continue to rotate the handwheel; then move the actuator manually to the fully-closed position; rotate the limit nut until the nut touches the fan-shaped gear inside, screw out the nut for two turns, and finally tighten the locknut. By doing so, the mechanical limit position can be set when the actuator is fully closed. The position for the fully-open case can also be set. As shown in Figs. 9 and 10:

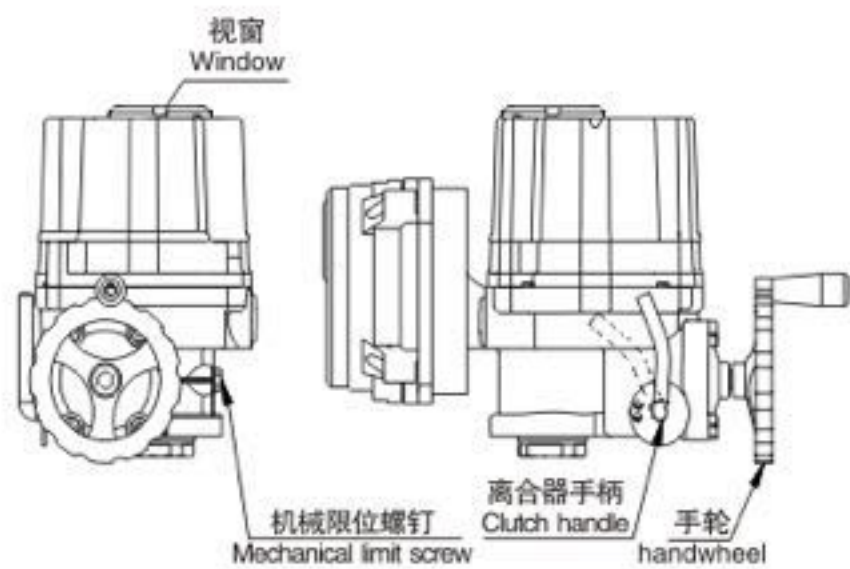


图9 Figure 9

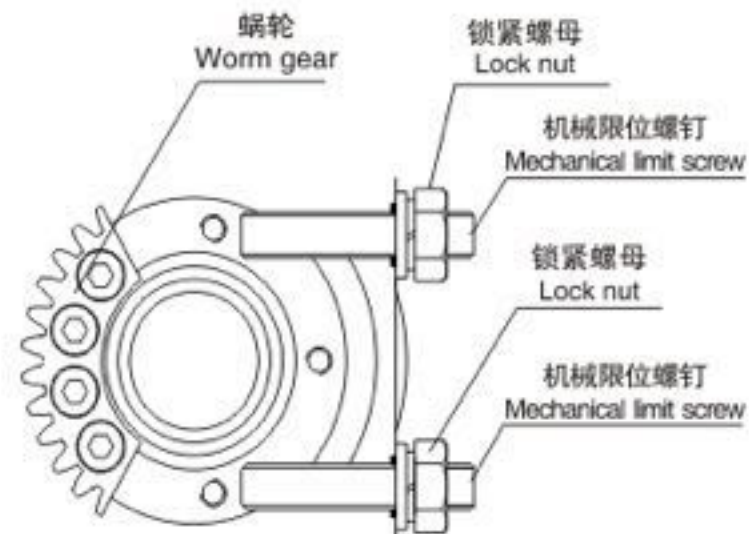


图10 Figure 10

7.2 行程限位调整 (图11) Adjustment of Travel limit (Fig. 11)

手动使阀关到位松开关方向限位凸轮，将其调整到恰好压下下限位开关的位置，再将限位凸轮固紧。这样就设定好了执行器全关时电器限位的位置。全开时的位置同样可设定。

Manually close the valve in place; release the opening/closing direction limit cam to adjust it to a position to just press down the closing limit switch; and then tighten the limit cam. By doing so, the electric limit position can be set when the actuator is fully closed. The position for the fully-open case can also be set.

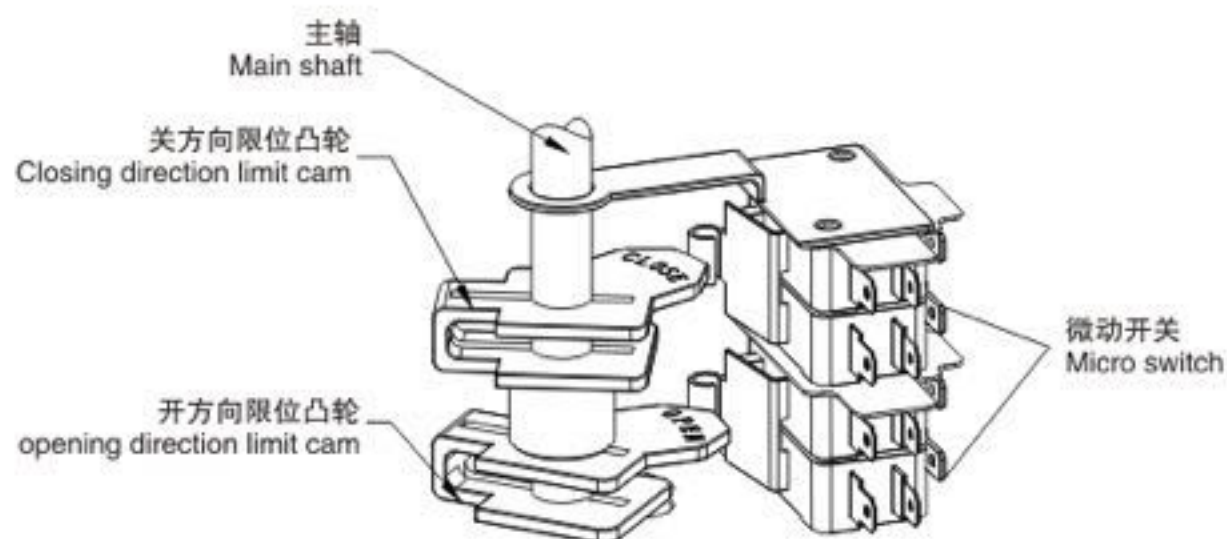


图11 Figure 11

7.3 电位器调整 (图12) Adjustment of potentiometer (Fig. 12)

电位器在执行器中作为一种反馈信号输出，有三个输出端子，其中②脚接电位器的滑臂（参照图12）。①脚接执行器开动作时，与滑臂之间的电阻不断减小一端，③脚则接执行器关闭动作时与滑臂之间的电阻不断减小一端（注意：电位器不应出现阻值过零，跳变现象）。用手轮转动阀门到全开位置，以开到限位开关动作为准用万用表测量，将接线端子上②脚①脚电阻调整到35-60之间。若不正确可通过转动电位器传动齿轮调整。

As a feedback signal output in the actuator, the potentiometer has three output terminals, of which: Terminal ② is connected to the potentiometer's sliding arm (see Fig. 12), Terminal ① to the end where the resistance to the sliding arm will decrease continually when the actuator opens, and Terminal ③ to the end where the resistance to the sliding arm will decrease continually when the actuator closes (Note: the potentiometer should have no zero resistance or

jumping). Turn the valve to the fully-open position with the handwheel until the limit switch acts; and then use a multimeter to measure and adjust the resistance of Terminals ② and ① between 35 and 60. If not correct, adjust by means of rotating the potentiometer's transmission gear.

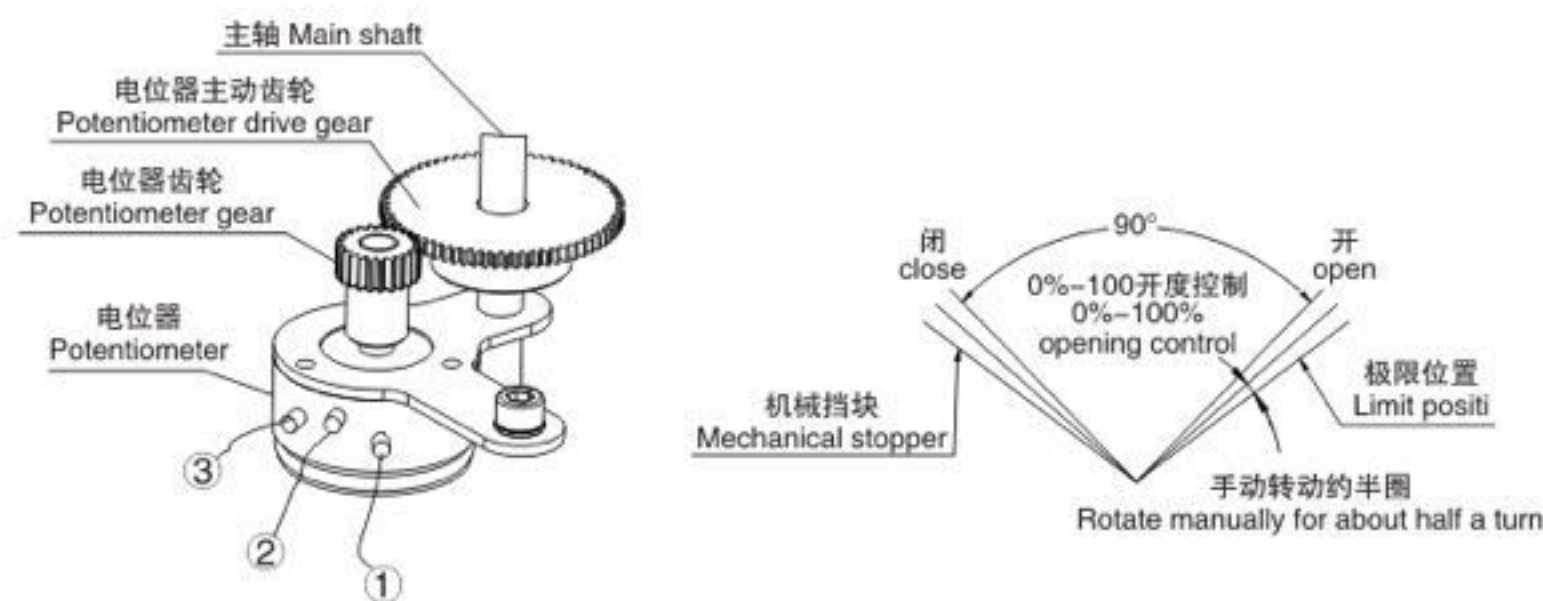


图12 Figure 12

7.4 过载保护装置调整 (图13) Adjustment of overload protector (Fig. 13)

阀门在正常工作压力条件下，调整开关撞板使之与相对应过载开关滚轮刚好接触为好。当开启或关闭阀门所需扭矩大于额定扭矩时，凸轮轴会顺时针或逆时针旋转，带动其上的过载撞块驱使过载开关动作。

注：过载保护装置出厂已调好，原则上是无需再调整；如需调整，阀门需在正常工作压力条件下进行调试。

In the normal working pressure conditions of the valve, adjust the switch stopper to make it just contact its corresponding overload switch roller. When the torque required to open or close the valve is larger than the rated torque, the camshaft will rotate clockwise or counterclockwise to drive the overload stopper on it to drive the overload switch to act.

Note: The factory settings have been provided for the overload protector, which needn't to be readjusted in principle; and such readjustment is required, the valve should be commissioned in its normal working pressure conditions.

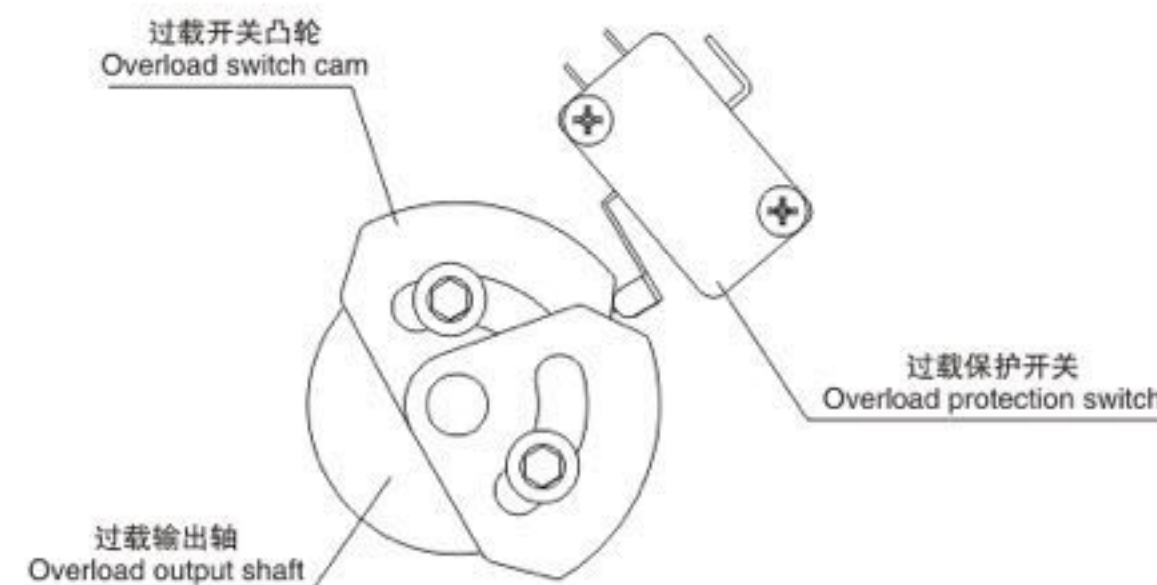


图13 Figure 13

8、试运转 Commissioning

8.1 手动操作 Manual operation

进行手动操作时，必须先把电源切断；边转动手轮旋转一圈，边向左扳动一下离合器手柄，使之离合器啮合后，继续旋转手轮使开度减少（可通过视窗观察）

注意：开度计到全开、全闭位置时极限开关产生动作再转动半圈，会碰到机械挡块上，过分转动，会导致其它零件的损坏，因此要避免用力过大。

Before manual operation, power must be cut off; rotate the handwheel for one turn while turning the clutch handle to the left to engage the clutch; after that, continue to turn the handwheel to decrease the opening degree (observe through the window).

Note: When the opening meter is on the fully-open or fully-closed position, the limit switch will act; with half a turn further, the handwheel will touch the mechanical stopper, and excessive turning may result in damages to other parts, so please avoid an excessive force.

8.2 电动操作 Electric operation

- 电动操作之前，先用手动操作的方法，检查开度计和阀门角度（全开、全闭）是否一致；
- 检查接线是否正确，同时必需先用外部切换开关，确认开闭动作；
- 确认以上状态之后，开始电动操作。
- Before electric operation, first check the opening meter and the valve angles (fully-open/fully-closed) with the manual operation method;
- Check the wiring is correct, and also it's necessary to confirm the on-off action with an external change-over switch;
- After confirming the above states, start the electric operation.

◆ 注意 Note:

- ① 检查接线图，电源，输入/输出信号是否正确。

Check the wiring diagram, power supply and input/output signals are correct.

- ② 尽量不要改变内部接线。

Try not to change the internal wiring.

AC380V开关型需注意 For the AC380V switch type, the following should be noted

- 手动使执行器处于半开/关位，通电并输入开信号。
- 如果执行器向开位运行，则说明接线正确。
- 如果运动方向相反，则必须交换3根电源线中的两根。

注：其他不详或特殊规格，请与本公司技术部联系。

• Manually move the actuator to the semi-open/semi-closed position, energize it and input the opening signal.

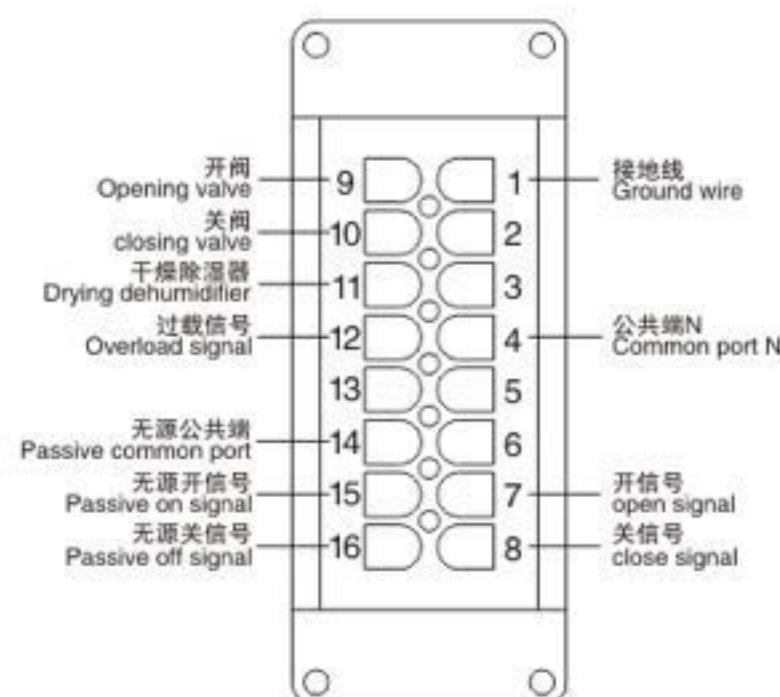
• If the actuator moves to the open position, it indicates that the wiring is correct.

• If the movement direction is opposite, two of the three power cords must be swapped. Note: Please contact our technical department for other unknown or special specifications.

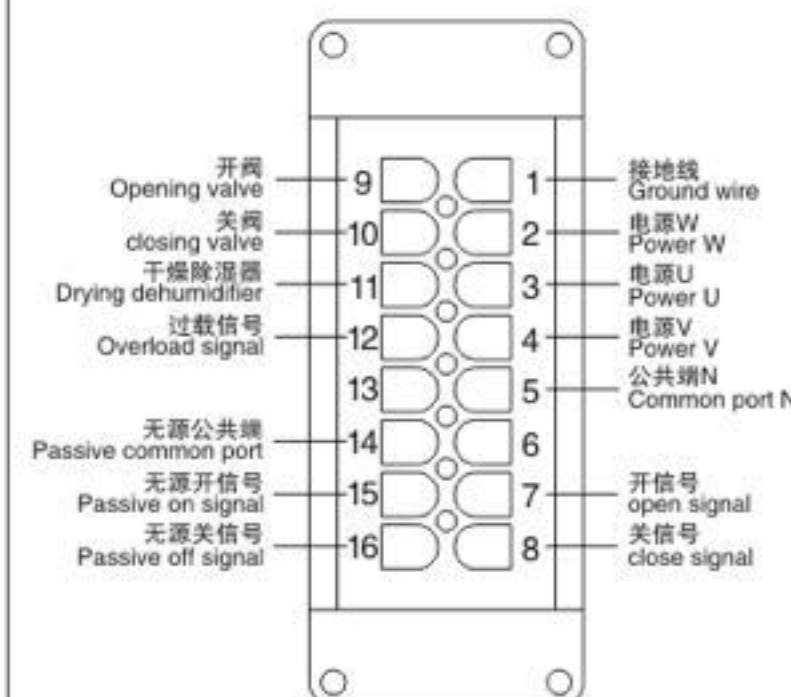
Note: Please contact our technical department for other unknown or special specifications.

9、接线图 Wiring diagram

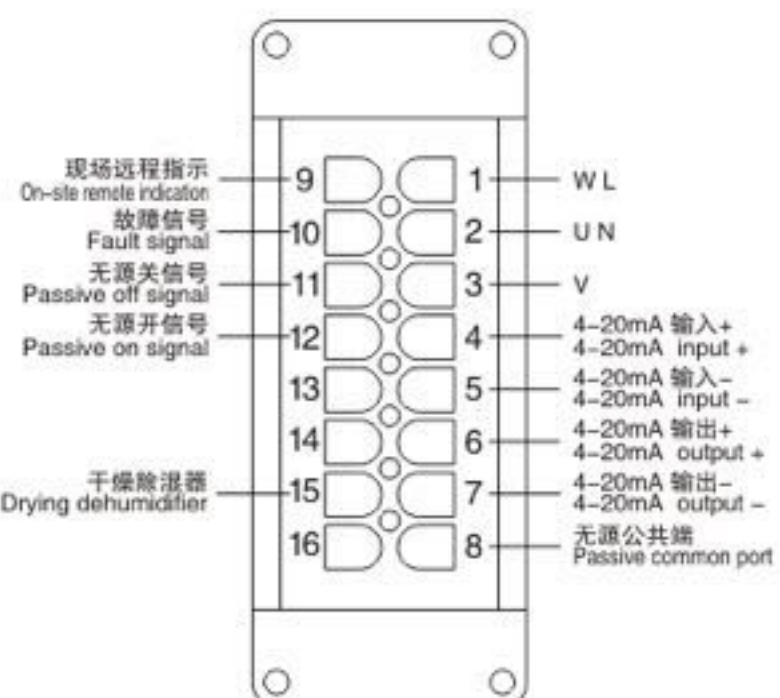
220V开关型接线图
220V Wiring diagram of switch type



380V开关型接线图
380V Wiring diagram of switch type



智能调节型接线图
Wiring diagram of intelligent adjustable type



智能开关型接线图
Wiring diagram of intelligent switch type

