



公司公众号



公司官网



常州市环宇电站辅机有限公司

Changzhou Huanyu Power Station Auxiliary Equipment Works Ltd.



# SMT系列 智能型非侵入式电动执行机构 使用说明书

地址：江苏省常州市天宁区郑陆镇梧岗村3号  
电话：0519-85505114  
传真：0519-85500828  
邮编：213028  
邮箱：changzhouhuanyu@163.com

Address: No 3 Wugang Village Zhenglu Town Tianning District  
Changzhou City Jiangsu Province  
Tel : 0519-85505114  
Fax: 0519-85500828  
P.C : 213028  
E-mail: changzhouhuanyu@163.com

本产品如有更改，以实物为准，恕不另行通知 2024年1月

## 产品概述 product description

SMT 系列智能型非侵入式电动执行机构，是常州市环宇电站辅机有限公司通过自己二十多年的阀门电动装置的研发、设计、生产、制造的经验再结合国内外各种产品的优点，自行通过长时间的设计、测试、改进而自主研发出的一种具有先进水平的新一代智能型非侵入式电动执行机构。

SMT-Q 系列和 SMT-DQ 系列为部分回转，适用于对球阀、蝶阀、风门等阀门的自动控制。

SMT series intelligent non-invasive electric actuators, is changzhou huanyu power station auxiliary machinery Co., LTD. Through more than 20 years of valve electric device research and development, design, production and manufacturing experience combined with the advantages and disadvantages of all kinds of products at home and abroad, through long time of design, testing and improvement and independent research and development of a kind of advanced technology of a new generation of intelligent non-invasive electric actuators. SMT-Q series and SMT-DQ series is partial turn type, suitable for automatic control of ball valve, butterfly valve, air valve and other valves.

## 执行机构的特点

- ※ 壳体采用铝合金压铸，并通过高温热处理，且表面采用静电粉末的喷涂工艺，使整机外形美观，并且强度可靠。
- ※ 智能非侵入式设计，所有电器部件都密封在铝合金箱体内，对执行器操作通过旋钮和红外遥控器进行免开盖调试，既方便又可靠。
- ※ 双密封设计大大提高了产品整体的防水、防尘的效果，最高防护等级可达 IP68。
- ※ 人机界面采用军工级别的 OLED 中英文双语言液晶显示，具有传统 LCD 屏所不具备的广视角；反应速度超快；且耐低温，可以在 -40°C 环境下正常显示内容。
- ※ SMT-Q 系列执行器采用最先进的绝对编码器检测行程，测量精确，分辨率高，性能稳定，在失去动力电源的情况下，手动操作执行器也不会丢失阀位，具备断电记忆功能。
- ※ 全面的保护和自诊断功能
  - ① 自动相序纠正功能
  - ② 电源缺相保护功能
  - ③ 电机过热保护功能
  - ④ 瞬时反转保护功能
  - ⑤ 阀门卡塞保护，解卡功能
  - ⑥ 电子制动功能
  - ⑦ 具有变速慢关功能，有效地控制阀门的开关速度，从而保护了阀门和管线的安全
  - ⑧ 运行中故障自诊断和自适应，故障报警功能
  - ⑨ ESD 紧急事件功能，用户可以根据需要选择优先级
  - ⑩ 电机空转超时停机报警功能
- ※ 就地控制采用两个非侵入式的磁控旋钮，黑色旋钮为操作旋钮，有三个位置分别为“开”、“关”、“停”；红色旋钮为选择方式旋钮，有三个位置分别为“现场”、“远控”和“断开”，两种旋钮都采用 120°任意方向自保持转动的设计可以使执行器操作更加方便，减少误操作。

- ※ 远程控制为无源干接点，可以提供开关量控制或模拟量控制，同时可将阀位通过 4-20mA 信号反馈给 DCS 或 PLC，远控接口可以组态多种控制方式，配备 8 组信号输出继电器，可满足系统采集执行器现场状态信号。
- ※ 具有普通产品和防爆产品两大系列。
- ※ 支持 Modbus、Profibus、HART 总线通讯（选配）。

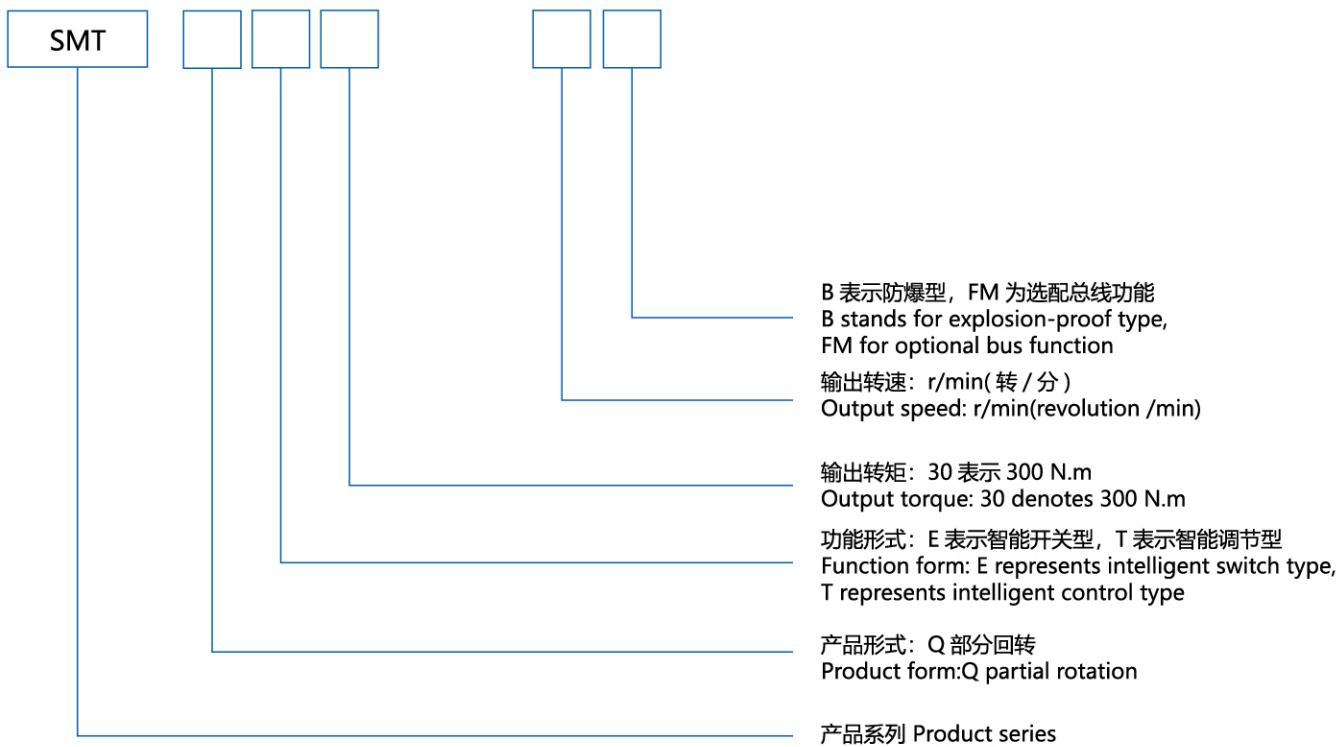
## characteristics of the actuator

- ※ The shell is made of aluminum alloy die-casting, and through high temperature heat treatment, and the surface is sprayed with electrostatic powder, which makes the whole machine beautiful in appearance and reliable in strength.
- ※ intelligent non-invasive design, all electrical components are sealed in the aluminum alloy enclosure, the actuator operation through the knob and the infrared remote control to open free debugging, convenient and reliable.
- ※ double seal design greatly improves the whole products of the effect of waterproof, dustproof, high protection grade of IP68.
- ※ man-machine interface are military level of OLED dual language in both English and Chinese LCD display, a traditional LCD screen that the wide Angle of view; The reaction speed is super fast; And low temperature resistance, can be normally displayed in -40°C environment.
- ※ SMT-Q series actuator adopts the most advanced testing schedule, absolute encoder measuring precision, high resolution, stable performance, in the case of loss of power supply, manual actuators also won't lost valve position, have power off memory function.
- ※ comprehensive protection and self-diagnosis function
  - ① Automatic phase sequence correction function
  - ② Power loss phase protection function
  - ③ motor overheating protection function
  - ④ Instantaneous reversal protection function
  - ⑤ valve plug protection, unjam function
  - ⑥ Electronic braking function
  - ⑦ With speed change and slow closing function, effectively control the opening and closing speed of the valve, so as to protect the safety of the valve and pipeline.
  - ⑧ The operation of fault diagnosis and adaptive, fault alarm function.
  - ⑨ ESD emergency function, users can select priority level as needed
  - ⑩ Attending motor idle overtime stop alarm function
- ※ local control adopts two non-invasive magnetic control knob, black knob knob for this operation, there are three position respectively "on" and "off" and "stop"; The red knob is the selection mode knob, and there are three positions for "field", "remote control" and "disconnect" respectively. The design of 120 ° self-maintaining rotation in any direction of the two kinds of knobs can make the operation of the actuator more convenient and reduce misoperation.
- ※ remote control for passive dry contact, can provide the switch quantity control or analog control, and valve position can be through the 4-20 ma signal feedback to DCS or PLC, remote control interface can be

configured a variety of control mode, equipped with 8 groups of signal output relay, can meet the system status signal acquisition actuator scene.

- ※ with ordinary products and explosion-proof products two big series.
- ※ Supports Modbus, Profibus, HART bus communication (optional).

### 型号表示方法 Model Number Representation



例: SMT-QT30-1, 表示智能调节型, 部分回转, 输出转矩 300N.m, 转速 1r/min。

Example:

SMT-QT30-1, intelligent adjustability, partial rotation, output torque 300N.m, speed 1r/min.

### 主要技术参数 Main technical parameters

- 供电电源: 380VAC±10% ,50/60Hz±1%。  
可选电源: 220-660V ,50/60Hz (订货时需说明)。
- 远控接口:
  - 开关量输入信号: 无源干接点信号, 外部有源信号需设置。  
开关量输出信号: 继电器输出, 触电额定容量: 5A@250VAC、5A@30VDC。
  - 模拟量输入信号: 4-20mA: 输入阻抗≤250Ω。  
模拟量输出信号: 4-20mA: 外接小于 750Ω的负载。

3、工作环境:

- 环境温度: -20--60°C
- 相对湿度: ≤90% (25°C)
- 防护等级: IP68
- 工作制式: S2 短时工作制, 额定运行时间为 10min、15min。
- 电机绝缘等级: B 级、F 级。
- 防爆等级: ExdbIIBT4 和 ExdbIICT4

1. Power supply: 380VAC±10%,50/60Hz±1%.

Optional power supply: 220-660V,50/60Hz (need to be specified when ordering).

2. Remote control interface:

- Input signal of switching quantity: passive dry contact signal, external active signal needs to be set.  
Switching quantity output signal: relay output, electric shock rated capacity: 5A@250VAC, 5A@30VDC.
- the analog input signal: 4-20 ma: input impedance Ω 250 or less.  
4-20 ma analog output signal: external load is less than 750 Ω.

3. Working environment:

- Ambient temperature: -20--60°C
- Relative humidity: ≤90% (25°C)
- Protection grade: IP68
- Working system: S2 short-time working system, rated running time of 10min, 15min.
- Motor insulation grade: B class, F class.
- explosion-proof grade: ExdbIIBT4 和 ExdbIICT4

### 操作说明 Operating Instructions















#### 电动操作 Electric operation



**注意:** 通电前应检查电源电压, 应与执行器铭牌上的标称相符, 如果没有进行初步检查, 则不要进行运行。此外至少要用红外遥控器或旋钮完成阀门参数设置, 方可操作阀门。

Note: The power supply voltage should be checked before power on, which should be consistent with the name on the nameplate of the actuator. If there is no preliminary inspection, do not operate. In addition, at least with the infrared remote control or knob to complete the valve parameter setting, can operate the valve.

## 遥控器功能说明 Function description of remote control

| 遥控器效果图<br>Remote control effect picture   | 遥控器操作<br>Remote control operation   | 旋钮操作<br>Knob operation          | 功能定义<br>Function definition | 备注<br>remarks                           |
|---|---|---------------------------------|-----------------------------|---|
| <br><br><br><br>(选配)<br>(Optional) |       | 远控到断<br>Remote control to break | 返回键<br>Return key           | 返回到上级菜单<br>Go back to the upper menu    |
|   |       | 现场到断<br>Field fault             | 设置键<br>Set key              | 确认<br>confirm                           |
|   |       | 开阀<br>Open valve                | 开阀<br>Open valve            | 开阀<br>Open valve                        |
|   |       | 关阀<br>Turn off valve            | 关阀<br>Turn off valve        | 关阀<br>Turn off valve                    |
|   |       | 开阀到停<br>Open valve to stop      | 加<br>add                    | 功能选择、加<br>Function selection, plus      |
|   |   | 关阀到停<br>Close valve to stop     | 减<br>Reduction of           | 功能选择、减<br>Function selection, reduction |
| 特别提醒：使用时须对准显示窗口，当遥控距离明显缩短时，请更换电池！<br>Special reminder: use must be aligned with the display window, when the remote control distance is significantly shortened, please replace the battery!          |   |                                 |                             |   |

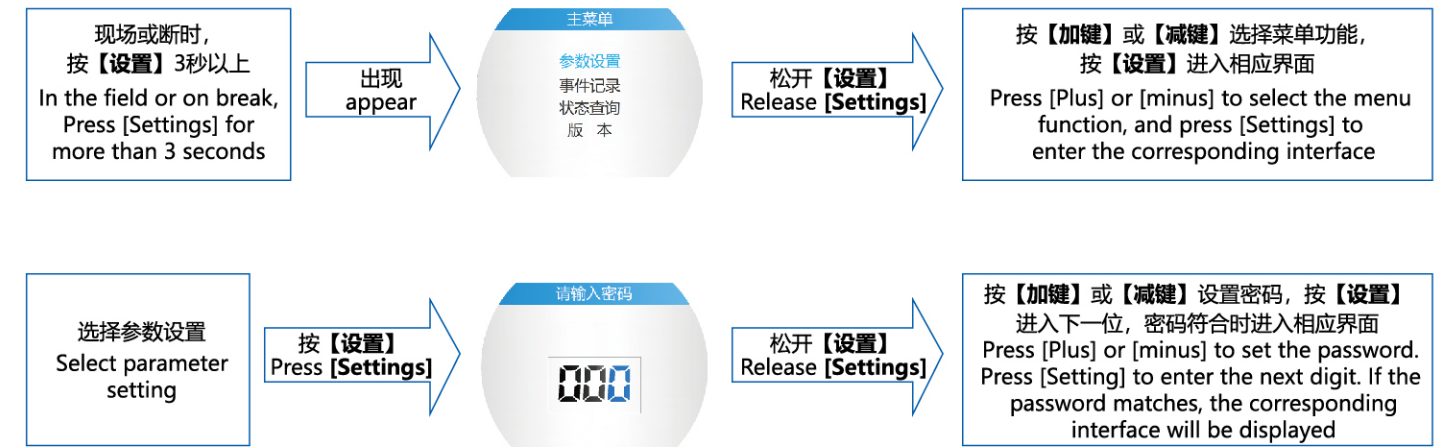
## 操作说明 Operating instruction

- 将红旋钮选择“断”位置 + 黑旋钮选择“关阀”3秒进入主菜单，黑旋钮“开阀”等同遥控【加键】，“关阀”等同遥控【减键】。红旋钮由“断”旋转至“远控”等同遥控【返回键】，由“断”旋转至“现场”等同遥控【确认键】。
- 进行参数或行程设定时有返回操作则返回上级画面。
- 设置界面按【加键】、【减键】进行菜单选择，按【设置】确认进入。
- 黑旋钮在“停”位置，红旋钮在“断”位置，长按遥控【SET】（显示屏出现信号符号有效）进入密码输入界面（以下为遥控器操作流程）。

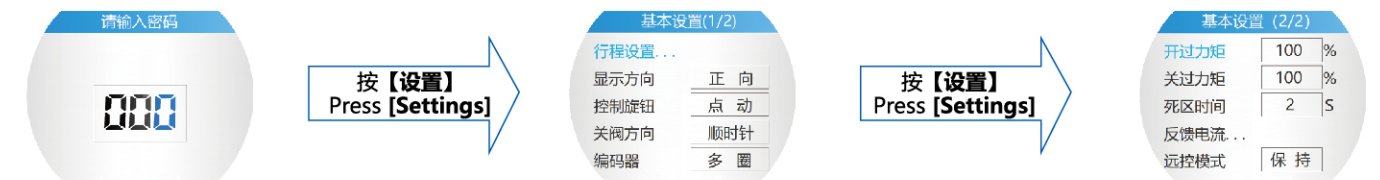
- Select the "off" position of the red knob + select "Off valve" of the black knob for 3 seconds to enter the main menu. The "open valve" of the black knob is equivalent to the remote control [plus key], and the "close valve" is equivalent to the remote control [minus key]. The red knob rotates from "off" to "remote control" as remote control [return key], and rotates from "off" to "scene" as remote control [Confirm key].
- When setting parameters or travel, return to the upper screen.
- On the setting interface, press [Plus] and [Minus] for menu selection, and press [Settings] to confirm entry.



- With the black button in the "Stop" position and the red button in the "off" position, long press the remote control [SET] (the signal symbol on the display screen is valid) to enter the password input interface (the following is the operation process of the remote control).



## 基本参数设置（密码000）Basic Parameter Settings (Password 000)



- 可以在基本设置里进行“行程设置”、“显示方向”、“控制旋钮”，“关阀方向”、“编码器”、“开过力矩”、“关过力矩”、“死区时间”、“反馈电流”、“远控模式”等设置；  
You can set "stroke setting", "Display direction", "Control knob", "direction of closing valve", "encoder", "turn-on moment", "turn-off moment", "dead zone time", "feedback current", "remote control mode" and so on in the basic Settings.

## 行程的设定 Setting of travel



(先确定电动执行器的转向和力矩接线正确)  
(First make sure that the steering and torque wiring of the electric actuator are correct)

### 输出电流微调 Output current fine-tuning

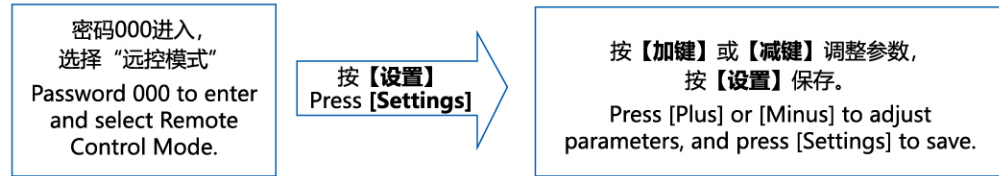


### 输入电流微调 (调节型有此功能) Input current fine-tuning (adjustable type has this function)



同时在此界面可以进行“精度”、“丢信模式”设置, 行程长、惯量小则控制精度可以调高, 反之则应把控制精度调低 (数值变大)。  
At the same time, "precision" and "letter loss mode" can be set on this interface. If the stroke is long and the inertia is small, the control precision can be adjusted higher, and on the contrary, the control precision should be reduced (the value becomes larger).

### 远控信号选择 (开关型可选择4种模式) remote control signal selection (switch mode can choose four kinds of patterns)



### 总线设置 (选配总线型时, 功能) Bus Settings (Bus selection, function)



注: 地址范围1~250, 一共有6种通信格式。  
Note: The address ranges from 1 to 250, and there are 6 communication formats.

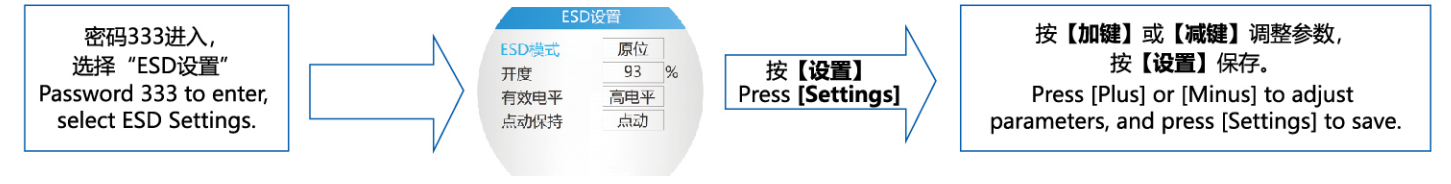
## 高级设置(密码333) Advanced Settings (Password 333)

### 高级设置 Advanced Settings



可以在高级设置里进行“ESD设置”、“继电器组态”、“复位参数”、“语言选择”、“部分行程”等设置, 阀门类型及语言选择可根据需要要进行设置。  
can be "ESD Settings" in the advanced Settings, "relay configuration" and "reset parameters", "language selection", "part of" Settings, such as valve type and language selection according to need to be set up.

### ESD 设置 ESD setup



### 继电器组态设置 Relay configuration Settings



### 复位参数 reset parameters



注: 如复位, 继电器将恢复到默认功能, 故障记录将清除, 其它参数不变。  
Note: If reset, the relay will return to its default function, the fault record will be cleared, and other parameters will remain unchanged.

### 部分行程 Partial stroke

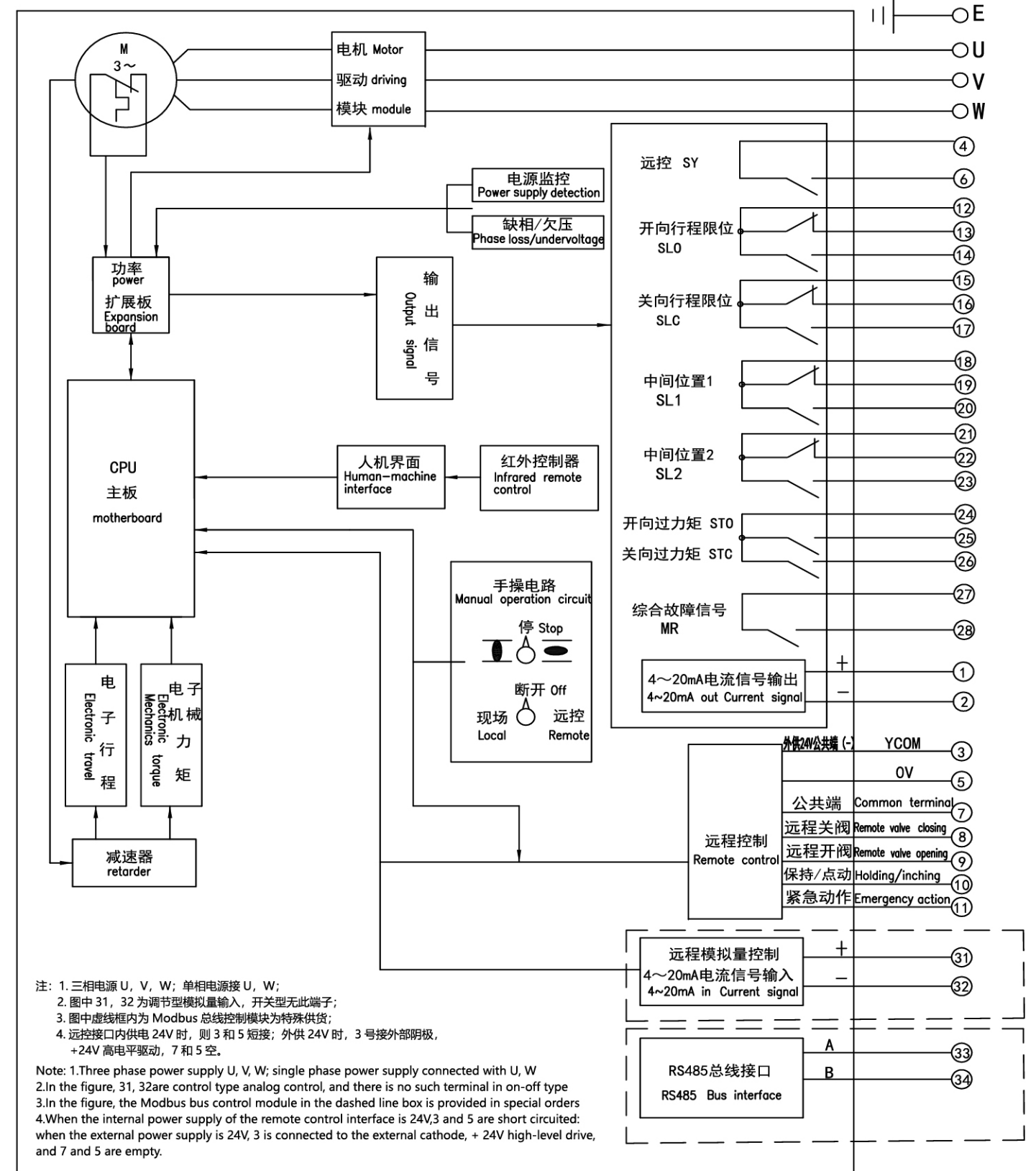


常见问题处理方法 Solutions to common problems

| 故障现象<br>Fault phenomenon  | 处理方法<br>Treatment method  |
|---|---|
| 显示电机失速<br>Show motor stall  | 1. 电机堵转 2. 电机反转 3. 编码器失效<br>1. Motor blockage 2. Motor inversion 3. Encoder failure   |
| 显示相序检测故障<br>Indicates the fault of phase sequence detection                         | 1. 接入电源错误 2. 缺相<br>1. The power supply is incorrectly connected. 2. Lack of phase   |
| 显示指令冲突<br>Display instruction conflict  | 同时又远程开和远程关信号输入<br>At the same time, remote on and remote off signal input   |
| 显示阀位上溢或阀位下溢<br>Show valve position overflow or valve position underflow             | 1. 编码器读取值超出输出轴 2.5 圈 2. 未设置行程<br>1. Encoder read value exceeds 2.5 turns of output shaft 2. Stroke is not set   |
| 通电显示屏和指示灯不显示<br>Power display and indicator are not displayed                       | 1. 电源未接入或电压过低 2. 模块内连接线松动 3. 电路坏<br>1. The power supply is not connected or the voltage is too low. 2. The cable in the module is loose   |
| 通电现场和远控均不动作<br>Power-on site and remote control do not operate                      | 1. 故障保护 2. 电机坏或卡死 3. 电路坏<br>1. Fault protection 2. Motor is broken or stuck 3. Circuit is broken  |
| 现场工作正常远控不动作<br>Field work is normal remote control does not move                    | 1. 远控信号给定异常 2. 未在远程 3. 电路坏<br>1. The remote control signal is abnormal 2. Not in the remote 3. The circuit is broken  |
| 现场不动作但远控工作正常<br>No action on site but the remote control works normally             | 1. 不在现场 2. 操作按钮未按到位 3. 电路坏<br>1. Not on site 2. The operation button is not pressed in place 3. The circuit is broken   |
| 能开不能关或能关不能开<br>It can be on or off or off or off                                    | 1. 力矩线接错或开路 2. 电机坏或堵转或接线错 3. 电路坏<br>1. The torque line is connected incorrectly or the circuit is open. 2. The motor is broken or blocked, or the cable is connected incorrectly 3. The circuit is broken     |
| 无控制信号通电即动作<br>No control signal power up action                                     | 1. 控制信号实际有或丢失动作 2. 设为两线控制 3. 电路坏<br>1. The control signal actually has or loses the message action 2. Set the two-wire control 3. The circuit is broken   |
| 中间位置能动作到限位不动<br>The middle position can be moved to the limit                       | 1. 力矩开关接线反 2. 电机坏或接线开路 3. 电路坏<br>The torque switch is incorrectly connected. 2. The motor is faulty or the connection is open. 3. The circuit is broken   |
| 动作方向反<br>Reverse action direction   | 1. 电机接线反 2. 阀位标定反 3. 正反作用设反 4. 信号反<br>1 motor wiring reverse 2 valve position calibration reverse 3 positive and negative action set reverse 4 signal reverse   |
| 无输出电流或时有时无<br>None Output current or sometimes none                                 | 1. 接线错或接触不良 2. 电位器或编码器故障 3. 电路坏<br>1. Incorrect connection or poor contact 2. Potentiometer or encoder fault 3. The circuit is broken   |
| 反馈电流偏大偏小或不变<br>The feedback current is larger or smaller or unchanged               | 1. 编码器故障或与传动齿轮啮合不好 2. 标定错 3. 电路坏<br>1. Encoder fault or bad meshing with transmission gear 2. Wrong calibration 3. Bad circuit  |
| 遥控器无反应<br>Remote control does not respond.  | 1. 电池电压低或装错 2. 遥控未对准显示窗口 3. 遥控器坏<br>1. The battery power is low or installed incorrectly 2. The remote control is not aligned with the display window 3. The remote control is broken                         |
| 显示故障且“输入缺相”闪<br>A fault is displayed and Input phase is missing blinks              | 1. 输入电源缺相或端子未拧紧 2. 电路板坏<br>1. The input power is out of phase or the terminals are not tightly tightened. 2. The circuit board is broken  |
| 显示“故障”且“缺相”闪<br>"Fault" is displayed and "Missing phase" blinks                     | 1. 输出缺相 2. 电机坏 3. 电机线未接好 4. 电路板坏<br>1 output phase is missing 2 motor is bad 3 motor line is not connected 4 circuit board is bad   |
| 显示“故障”且“过热”闪<br>The system displays Fault and Overheat blinking                     | 1. 电机过热或堵转或坏 2. 电机温度传感器坏 3. 电路坏<br>1 motor overheating or blocked or bad 2 motor temperature sensor is bad 3 circuit is bad   |
| 显示“故障”且“开过载”或“关过载”闪<br>"Fault" is displayed, and On Overload or Off Overload blinks | 1. 执行器选小, 启动力矩不足 2. 力矩线未接好 3. 行程设定不正确 4. 堵转或电机坏 5. 电路坏<br>1. The actuator selection is small and the starting torque is insufficient 2. The torque line is not connected properly 3. 5. The circuit is broken |
| 动作正常但阀位显示不变<br>Normal operation but unchanged valve position display                | 1. 电位器或编码器坏 2. 电位器或编码器线松动 3. 电路坏<br>1. Potentiometer or encoder is broken 2. Potentiometer or encoder cable is loose 3. The circuit is broken   |
| 阀到位后电机不停<br>The electric motor stops after the valve is in place                    | 1. 行程设定错误 2. 电位器或编码器异常 3. 电路坏<br>1 stroke setting error 2 potentiometer or encoder abnormal 3 circuit bad   |
| 显示丢信<br>Display lost message  | 1. 4~20mA 信号源异常 2. 接线错误或松动 3. 电路坏<br>The 1.4 to 20mA signal source is abnormal 2. The cable connection is incorrect or loose 3. The circuit is broken   |

电气原理和接线图 Electrical principle and wiring diagram

SMT电气原理图 SMT electrical schematic diagram



## SMT智能型电动执行机构远控接口说明 SMT Intelligent Electric Actuator Remote Control Interface Description

电动执行机构控制方式有现场控制、远程控制两种形式。

现场控制：当红色旋钮处于现场位置时，就可通过黑色旋钮实现电动执行机构的打开、关闭和停止功能。

远程控制：当红色旋钮处于远控位置时，就可通过接线端子（或总线）实现电动执行机构的打开、关闭和停止功能。

通过设定功能可设定以下远控方式：

There are two forms of electric actuator control: field control and remote control.

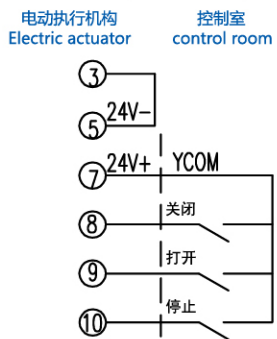
Field control: when the red knob is in the field position, the black knob can be used to open, close and stop the electric actuator.

Remote control: when the red knob is in the remote control position, the electric actuator can be opened, closed and stopped through the wiring terminal (or bus).

The following remote control mode can be set by setting function:

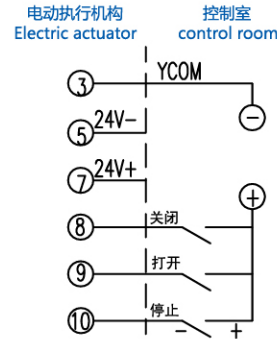
(1) 自保持：打开、停止、关闭控制，信号应持续 500ms 以上。内供 24V，停止信号 NO，闭合有效（SND 方式）

(1) Self-maintaining: open, stop, close the control, the signal should last more than 500ms. Internal supply 24V, stop signal NO, closed effective (SND mode)



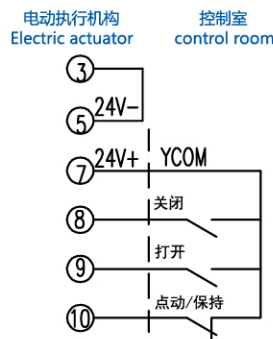
(2) 自保持：打开、停止、关闭控制，信号应持续 500ms 以上。外供 12~48VDC，共阴，阳极驱动

(2) Self-maintaining: open, stop and close the control, the signal should last more than 500ms. External 12~48VDC, common cathode, anode drive



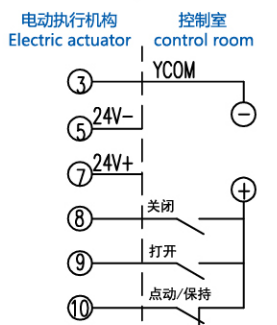
(3) 点动 / 保持：点动打开、关闭控制，信号应持续到开关到位。或则通过 7-10 闭合切换到保持模式（同 ROTORK，出厂默认。）

(3) Inching/holding: Inching opens and closes the control, and the signal should continue until the switch is in place. Or switch to hold mode via 7-10 close (same as Rotork, factory default)



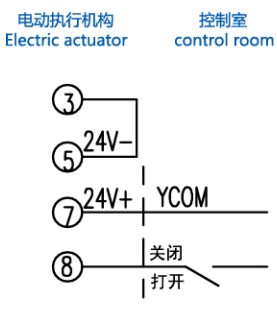
(4) 点动 / 保持：打开、停止、关闭控制，信号应持续 500ms 以上。外供 12~48VDC，共阴，阳极驱动

(4) Inching/holding: open, stop and close the control, the signal should last more than 500ms. External 12~48VDC, common cathode, anode drive



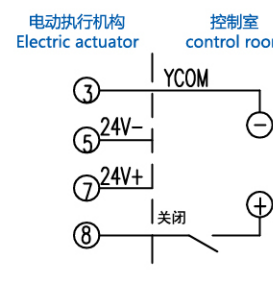
(5) 双线关：两根线单个干接点控制，接点断开时打开，操作闭合时关闭。

(5) double wire close: two lines single dry contact control, open when the contact is disconnected, closed when the operation is closed.



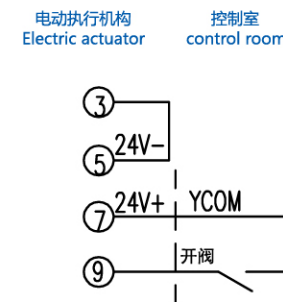
(6) 双线关：两根线单个干接点控制，接点断开时打开，闭合时关闭。外供 12~48VDC，共阴，阳极驱动

(6) double wire close: two wire single dry contact control, open when the contact is disconnected, close when it is closed. External 12~48VDC, common cathode, anode drive



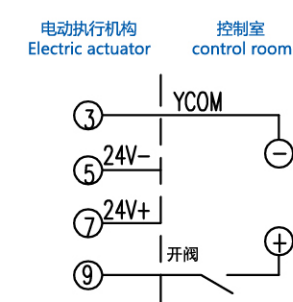
(7) 双线开：两根线单个干接点控制，接点断开时关闭，操作闭合时打开。

(7) double wire opening: two lines single dry contact control, contact is closed when disconnected, open when the operator is closed.



(8) 双线开：两根线单个干接点控制，接点断开时关闭，闭合时打开。外供 12~48VDC，共阴，阳极驱动

(8) double wire opening: two wire single dry contact control, contact is closed when disconnected, open when closed. External 12~48VDC, common cathode, anode drive

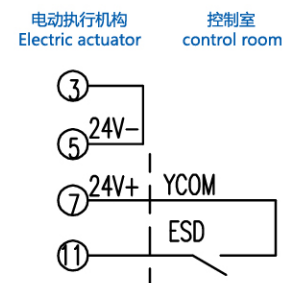


(9) 紧急功能：可组态，按照设定的优先级，模式运行

紧急功能，此信号应一直维持到组态的阀门运行状态的结束。内供 24VDC，ESD 闭合 (NO) 有效

(9) Emergency function: can be configured, according to the set priority, mode operation

Emergency function, this signal should be maintained until the end of the configured valve operating state. Internal supply of 24VDC, valid ESD closure (NO)

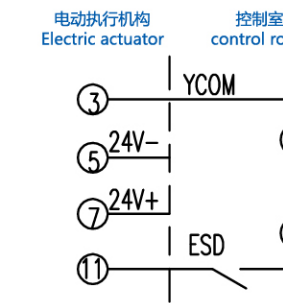


(10) 紧急功能：可组态，按照设定的优先级，模式运行

紧急功能，此信号应一直维持到组态的阀门运行状态的结束。外供 12~48VDC，ESD 闭合 (NO) 有效

(10) Emergency function: can be configured, according to the set priority, mode operation

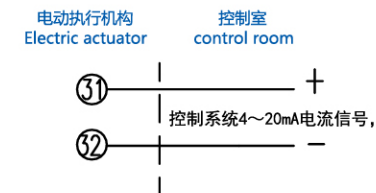
Emergency function, this signal should be maintained until the end of the configured valve operating state. External supply of 12~48VDC, ESD closure (NO) is effective



(11) 模拟量：接收 4 ~ 20mA 电流信号，并根据电流值来确定阀位。

无电流信号输入，自动切换到远控开关量模式

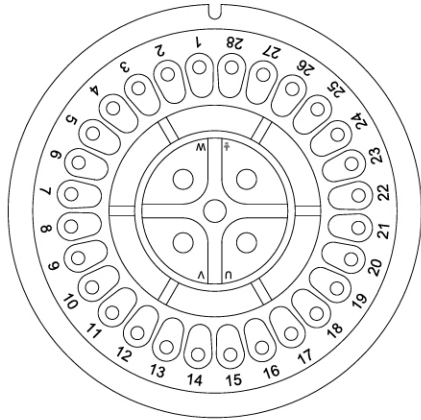
(11) Analog quantity: receive 4 ~ 20mA current signal, and determine the valve position according to the current value. No current signal input, automatic switch to remote control switch mode



## 接线端子图 Terminal diagram

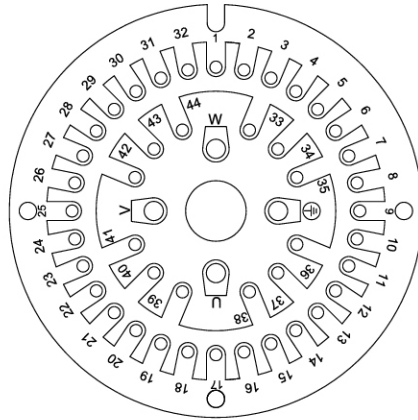
### ■ SMT系列智能开关型端子图

SMT series intelligent switch terminal diagram



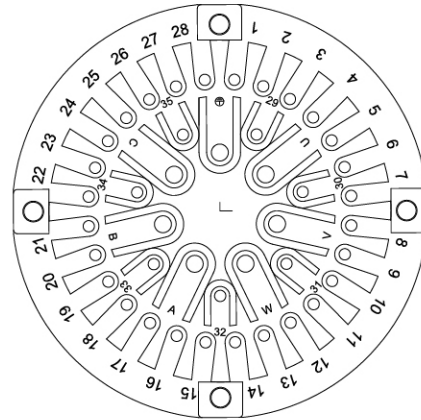
### ■ SMT系列智能调节型(总线型)端子图

SMT series intelligent regulating (bus) terminal diagram



### ■ SMT系列防爆型端子图

SMT series explosion-proof terminal diagram



## 接线端子示意图 Diagram of terminal

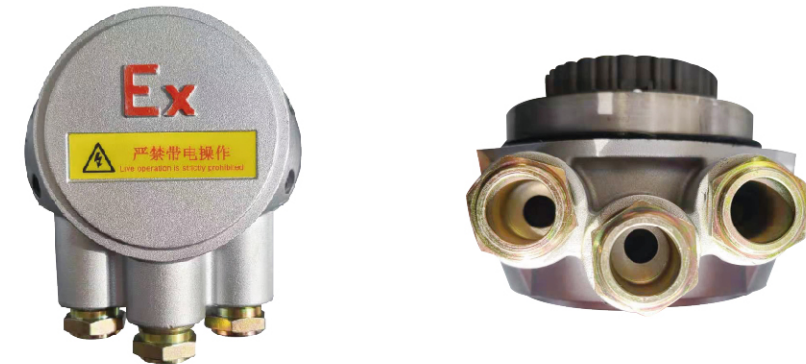
| 端子号 No. | 功能 function   | 说明 instructions   |
|---------|---|---|
| E       | 接大地 Grounding   | ≡   |
| U       | 三相电源<br>Three-phase power supply  | 单项接L Single pick up L   |
| V       |   | 单项空 Single empty  |
| W       |   | 单项接N Single pick N  |
| 1       | 阀位反馈信号 (+) Valve position feedback signal (+)   | 4-20mA输出 4-20mA signal output   |
| 2       | 阀位反馈信号 (-) Valve position feedback signal (-)   |   |
| 3       | 远控接口内/外供电(出厂短接默认内供24V, 外部无源干接点控制)<br>Remote control interface internal/external power supply (factory short connection default internal supply 24V, External passive dry contact control) | 需外供24V时, 断开3、5短接线, 3号为远程公共端, 接外供低电压阴极。<br>When the external supply is 24V, disconnect the 3 and 5 short wiring, No. 3 is the remote common terminal, connected to the external low voltage cathode. |
| 4       | 就地/远控<br>Local/remote control   | 断开为就地 Disconnect to in place  |
| 6       |   | 闭合为远控 Closed for remote control   |
| 7       | 远程控制<br>The remote control  | 公共端(无源干接点) Remote control common (no-power)   |
| 8       |   | 远程关阀 Remote valve closing   |
| 9       |   | 远程开阀 Remote valve opening   |
| 10      |   | 保持/点动 Holding/inching   |
| 11      |   | 紧急动作 (ESD) Emergency action   |
| 12      | 全开限位<br>Full open limit   | 公共端 Travel fully open limit common  |
| 13      |   | 常闭端 Normally closed point   |
| 14      |   | 常开端 Normally open point   |
| 15      | 全关限位<br>Seated limit  | 公共端 Travel full close limit common  |
| 16      |   | 常闭端 Normally closed point   |
| 17      |   | 常开端 Normally open point   |

| 端子号 No. | 功能 function                         | 说明 instructions                                    |
|---------|-------------------------------------|--|
| 18      | 可组态触点1<br>Configurable contact 1    | 公共端 Configurable common                            |
| 19      |                                     | 默认全开常闭触点 Default full open normally closed contact |
| 20      |                                     | 默认全开常开触点 Default full open normally open contact   |
| 21      | 可组态触点2<br>Configurable contacts 2   | 公共端 Configurable common                            |
| 22      |                                     | 默认全关常闭触点 Default full closed normally contact      |
| 23      |                                     | 默认全关常开触点 Default full closed normally open contact |
| 24      | 过力矩信号<br>Overmoment signal          | 公共端 Configurable common                            |
| 25      |                                     | 开过力矩常开触点 Drive past torque normally open contacts  |
| 26      |                                     | 关过力矩常开触点 Close over torque normally open contact   |
| 27      | 综合故障信号<br>Integrated fault signal   | 发生故障触点闭合<br>Failure of contact closure             |
| 28      |                                     |  |
| 31      | 远程模拟量输入 (+) Remote analog input (+) | 4-20mA输入<br>4-20mA signal input                    |
| 32      | 远程模拟量输入 (-) Remote analog input (-) |  |
| 33      | RS485总线接口<br>RS485 bus interface    | A  |
| 34      |                                     | B  |

注: 31-32为智能调节型配有, 33-34为总线型配有。Note: 31-32 is equipped with intelligent adjustment type, 33-34 is equipped with bus type.

## 电气接口 Electrical interface

■ SMT系列提供3个M30×1.5的电气接口 The SMT series offers 3 M30 x 1.5 electrical interfaces



## 执行机构的日常保养和维护 Daily maintenance and maintenance of actuators

每台执行机构出厂前都经过全面测试, 按照说明书进行安装调试, 可实现无故障运行。如有疑问可直接联系厂家。执行机构是非侵入式设计的, 常规调试检查不应打开执行机构的控制器箱盖, 因为控制系统是在干燥清洁的环境里封装的, 出厂后一般不需要调整其内部的部件。

常规维护应注意以下内容:

- ※ 检查执行机构与阀门之间的固定螺栓是否紧固。
- ※ 确保阀杆与驱动轴套的清洁和润滑。
- ※ 检查并立即更换外部损坏零件, 玻璃窗口如果有破损, 应更换整个外盖。
- ※ 由于磕碰表面掉漆或长时间在化学腐蚀和盐雾环境的工况下, 油漆表面受腐蚀氧化的, 应及时除锈后重新油漆。
- ※ 如电动阀门很少运行, 应定时让执行机构通电检测测试运行。

Each actuator has been fully tested before leaving the factory, and can be installed and debugged according to the instructions to achieve trouble-free operation. If you have any questions, please contact the manufacturer directly.

The actuator is of non-invasive design, and the controller box cover of the actuator should not be opened for routine debugging inspection, because the control system is packaged in a dry and clean environment, and there is generally no need to adjust its internal components after delivery.

Routine maintenance should pay attention to the following:

- Check whether the fixing bolt between the actuator and the valve is tight.
- Ensure the valve stem and drive shaft sleeve clean and lubricated.
- Check and replace the external damaged parts immediately. If the glass window is damaged, the entire outer cover should be replaced.
- Due to knock off the surface paint or long time in chemical corrosion and salt spray environment working conditions, paint surface corrosion and oxidation, should be timely after rust repaint.
- If the electric valve rarely runs, it should be regularly energized to test and run the actuator.

### 性能参数表 Performance parameter table

#### SMT-Q 系列技术参数 Technical parameters of SMT-Q series

| 型号规格<br>Type | 输出转矩<br>Output torque<br>N/m | 输出转速<br>Output speed<br>r/min | 最大阀杆直径<br>Maximum stem diameter<br>mm | 手动速比<br>Manual speed ratio | 电机功率<br>Motor power<br>W | 额定电流<br>Rated current<br>A | 参考重量<br>Reference weight<br>Kg |
|--------------|------------------------------|-------------------------------|---------------------------------------|----------------------------|--------------------------|----------------------------|--------------------------------|
| SMT-Q10      | 100                          | 1                             | 28                                    | 90                         | 60                       | 0.48                       | 12                             |
| SMT-Q20      | 200                          | 1                             | 28                                    | 90                         | 90                       | 0.65                       | 12.7                           |
| SMT-Q30      | 300                          | 1                             | 28                                    | 90                         | 120                      | 0.75                       | 12.7                           |
| SMT-Q40      | 400                          | 1                             | 28                                    | 90                         | 150                      | 0.85                       | 13                             |
| SMT-Q60      | 600                          | 1                             | 38                                    | 87                         | 180                      | 0.95                       | 21                             |
| SMT-Q90      | 900                          | 1                             | 38                                    | 87                         | 250                      | 1.2                        | 21                             |
| SMT-Q120     | 1200                         | 1                             | 38                                    | 87                         | 370                      | 1.7                        | 21                             |
| SMT-Q200     | 2000                         | 1                             | 38                                    | 87                         | 550                      | 2.4                        | 23                             |

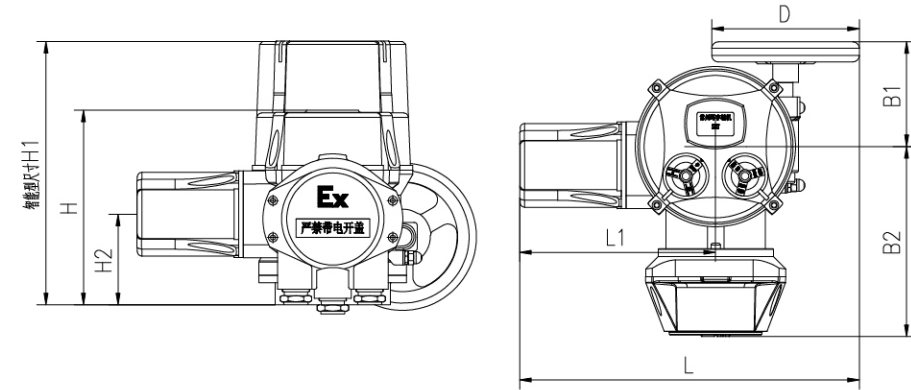
注：1. 电机的起动电流约为表格所示参考值的 7 倍，运行过程中电流偏大是正常现象。

2. 输出转矩 200N.m 以上，用户可以根据需要选择 SMT-DQ 叠加蜗轮箱的 SMT 系列叠加形式。

Note: 1. The starting current of the motor is about 7 times the reference value shown in the table, and it is normal that the current is too large during operation.

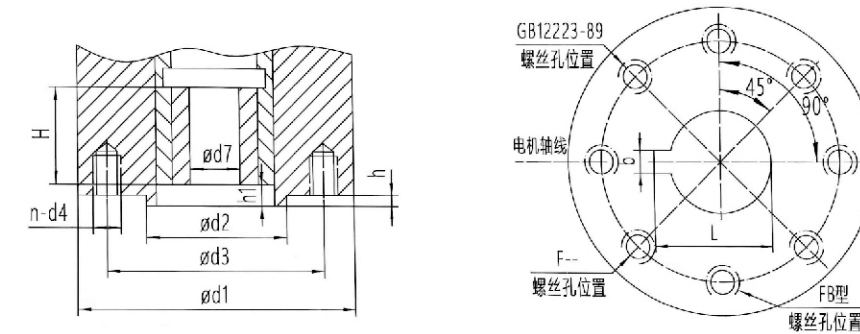
2. The output torque is above 200N.m, and the user can choose the SMT series superposition form of SMT-DQ superposition worm gear box according to the need.

#### SMT-Q外形尺寸图 Outline dimensions of SMT-Q



| 型号Model     | B1  | B2  | H   | H1  | H2  | L   | L1  | D   |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|
| SMT-Q10-40  | 114 | 206 | 211 | 286 | 98  | 269 | 211 | 160 |
| SMT-Q60-200 | 159 | 222 | 310 | 235 | 134 | 426 | 237 | 200 |

#### SMT-Q连接尺寸 SMT-Q connection size



| 型号<br>Model | 法兰型式<br>Flange type | d1  | d2  | d3    | n-d4  | D7   |      | H  | h | h1 |
|-------------|---------------------|-----|-----|-------|-------|------|------|----|---|----|
|             |                     |     |     |       |       | 预留   | 最大   |    |   |    |
| SMT-Q10-40  | FB2                 | 92  |     | 70    | 4-M8  | 19   | 19   | 42 |   |    |
|             | F07                 | 90  | 55  | 70    | 4-M8  | 12   | 28   | 42 | 3 | 2  |
|             | FB3                 | 115 |     | 89    | 4-M12 | 22.2 | 22.2 | 42 |   |    |
|             | F10                 | 125 | 70  | 102   | 4-M10 | 12   | 28   | 42 | 3 | 2  |
| SMT-Q60-200 | FB3                 | 115 |     | 89    | 4-M12 | 28.6 | 28.6 | 50 |   |    |
|             | F10                 | 125 | 70  | 102   | 4-M10 | 15   | 38   | 50 | 3 | 2  |
|             | FB4                 | 140 |     | 108   | 4-M12 | 31.7 | 31.7 | 50 |   |    |
|             | F12                 | 150 | 85  | 125   | 4-M12 | 15   | 38   | 50 | 3 | 2  |
|             | FB5                 | 197 |     | 159   | 4-M16 | 33.3 | 33.3 | 60 |   |    |
| F14         | 175                 | 100 | 140 | 4-M16 | 20    | 38   | 60   | 3  | 3 |    |

注：以上参数为常规供货，如有特殊需要可在订货时说明。

Note: The above parameters are general supply, if there is special need can be explained when ordering.

以下总线和云端技术已成功应用到系列智能管网控制项目中

The following bus and cloud technologies have been successfully applied to a series of intelligent pipe network control projects

|   |  |   |   |
|---|--|---|---|
| <br>RS485 Modbus | <br>PROFIBUS DP/NET | <br>HART    | <br>LoRa |
| <br>CAN Open     | <br>4G/5G           | <br>蓝牙      | <br>以太网  |
| <br>M-bus        | <br>手机 App          | <br>云平台管理系统 | <br>风光互补 |

云电装、总线型电装功能特点

Cloud electric outfit, bus electric outfit function characteristics

- ※ 无需土建施工：只需要一根总线或云端无线链接
  - ※ 无高低压串扰、无线路长导致信号衰减，可实现阀控的级联
  - ※ 电源供应：可市电供应，也可风光互补新能源供应
  - ※ 管道闭环控制：现场数据采集直接入电装，传感器信号可多重选择，软件 PID 模糊算法，实现管道压力和流量的闭环均衡控制
  - ※ 采用风光互补供电可节省整个管网运营产生的电费，更加清洁和安全
  - ※ 管网升级和改建更加便捷，无需增添中控硬件资源
- No civil construction: only a bus or cloud wireless link is needed
  - no high and low voltage crosstalk, no line length leading to signal attenuation, can achieve valve controlled cascade
  - power supply: mains supply, but also wind complementary new energy supply
  - pipeline closed-loop control: field data acquisition directly into the electrical installation, sensor signal can be multiple selection, software PID fuzzy algorithm, to achieve closed-loop balanced control of pipeline pressure and flow
  - The use of wind-solar complementary power supply can save the electricity cost generated by the operation of the whole pipe network, making it cleaner and safer
  - Pipe network upgrading and reconstruction are more convenient, without adding central control hardware resources

云电装控制拓扑图  
Cloud installation control topology

