MC 系列储能型电动执行机构

MC series energy storage electric actuator

操作手册 Operation manual

在调试和使用该设备前敬请仔细阅读该手册(A/01)

Please read the manuel carefully before commissioning & using the device.

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本手册适用于 D+R MC 系列储能型电动执行机构的安装、调试、使用和维护指导。

This manual is applicable to the installation, debugging, use, and maintenance guidance of the D+R MC series energy storage electric actuator.

严重警告：禁止在通电情况下打开设备机壳。

Serious warning: It's forbidden to open the device enclosure with power on.

严重警告：调试过程中采用点动进行全开/全关位置设置时，在接近阀门的全开或全关位置时，应该改为手轮操作，以防止使用点动按钮操作造成阀位走过(此时过力矩保护不起作用)，致使阀门或者执行机构损坏，由此种原因造成阀门或执行机构损坏，D+R 概不负责。

Serious warning: In the inching setup of open/closed position during the commissioning, please change to handwheel operation mode when it is near the open or closed position of the valve; otherwise, the inching button will lead to valve position pass-off (at this moment, the over torque protective function does not play any effective role) so that valve or actuator is damaged. D+R will not bear any responsibilities for such damage.

警告： 在安装、调试、使用和维护 D+RMC 系列储能型电动执行机构前，必须仔细阅读本手册，严格按照安全操作规程操作，以防造成设备及人身安全事故。

Warning: Before installing, debugging, using, and maintaining the D+RMC series energy storage electric actuator, it is necessary to carefully read this manual and strictly follow the safety operating procedures to prevent equipment and personal safety accidents.

警告：在操作过程中，必须小心高温、高压、易燃、易爆、有毒及腐蚀性介质、高电压和强大外力等危险情况。

Warning: In the normal operation, please pay special attention to such dangers: high-temperature, high-pressure, combustible, explosive, poisonous and corrosive medium, high voltage and strong external force, etc..

警告：必须严格按照规范、图纸和手册等要求进行正确的安装、接线、调试、使用、储存和维护，否则有可能导致严重伤害及设备损坏。

Warning: Please execute correct installation, wiring, commissioning, usage, storage Andmaintenance in strict accordance with the codes, drawings and operation manual;otherwise, it may lead to serious damage against the equipment or injury to the operator.

注：点动:是指在进行阀门行程设置过程中，不采用手动旋转手轮的方式改变阀门行程，而是通过操作面板的按键改变行程，当手离开按键时，电机就会停止。

Remarks: Inching: In the setup of valve stroke, the operator does not change the valve stroke by manual rotation of the handwheel; instead, operator presses the keys of operation panel to change the valve stroke; the motor will shut down if the operator's hand releases the keys.

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D+R MC 系列电动执行机构可用显示面板上的霍尔磁性按钮或遥控器进行调试、操控、参数设置、修改等。

D+R MC series electric actuator can use the Hall magnetic function button in display panel for commissioning or the remote control, control, operation, parameter setup and revision.

所有执行机构在出厂前，对其功能、参数、保护等进行了完整的确定，无需再进行重复设置，只需在与阀门连接后进行行程限位、信号校准即可。

The functions, parameters and protective functions of all the actuators are set up before they leave the factory; it is only needed to limit the stroke and calibrate the signal upon valve connection.

本手册提供如下指导：

The operation manual provides the following instructions:

- 手动/电动[就地/远程]操作
  Manual/electric [local/remote] operation
- 执行机构的安装
  Installation of actuator
- 执行机构基本设定。
  Basic setup of actuator
- 执行机构组态设定。
  Configuration setup of actuator
- 维护及故障排除。
  Maintenance and fault settlement
- 技术支持。
  Technical support

D+R 推出直流无刷无级调速储能型电动执行机构，在主电源失电时，后备电源自动投入短时供电,自动运行使阀门至指定状态。

D+R introduces a DC brushless stepless speed regulation energy storage electric actuator. When the main power supply loses power, the backup power supply automatically switches on short-term power supply, and automatically operates to bring the valve to the specified state.

本机为非侵入式设计，使用红外遥控器或操作面板上的霍尔磁性按钮，对照本机的《使用说明书》进入执行机构的设定程序，无需打开机盖，即可完成相关设置及参数修改。

The machine is in the non-invasion design mode, operated by infrared remote controller or Hall magnetic function button in the panel; the user enters into the setup procedure of actuator according to the <Operation Manual> and fulfills the setup and parameter revision with no need to open the cover.

诊断功能可对控制系统、执行机构的工作状态进行自诊断，并通过显示屏以中/英形式显示。

The diagnosis function is able to make self-diagnosis to the working status of control system and actuator; display in the screen in Chinese/English (default).

设定、报警及状态菜单的文字说明有英语(默认)和中文。

The written specification of setup, alarm and status menu includes English (default) and Chinese version.

1 安全使用/Usage of safety

本手册是为满足条件的用户在安装、操作、调试 MC 系列执行机构的需要而出版的。

The operation manual is published to meet the user's installation, operation and commissioning demand of MC series actuator.

只有经过培训、有经验的现场仪表工程师才可以对 D+R 执行机构进行安装、操控及维护，并且必须依照本手册中的相关说明为准。用户及其设备操作人员应根据当地相关的安全与健康条例规定来熟悉他们的职责。

Only well-trained and experienced on-site instrument engineer is able to execute installation, operation, control and maintenance of D+R actuator; it must strictly adhere to related specifications herein. The user and its equipment operator shall become familiar with their responsibilities according to local safety and health stipulations.

当 MC 系列执行机构与其它设备共同使用时，应充分考虑有可能发生的情况。如需要 D+R MC 系列执行机构安全使用的更多资料及相关指导，可根据需要提供。

When MC series actuating mechanism is applied together with other equipment, an adequate consideration shall be made to possible conditions; more documents and related instructions are provided if required for safe usage of D+R MC series actuator.

电动执行机构的电气安装、维护及使用应按照本国相关的、适合现场安装条件以及设备安全使用的法律、法规。

The electric installation, maintenance and usage of actuator are in accordance with the national related laws and stipulations applicable to on-site installation conditions and safe usage of the equipment.

机械安装应按照本手册中的概述，并参照 ISO 5210/1 标准。如执行机构铭牌上标称为防爆型，则该执行机构只可安装到分类的 1 区和 21 区、2 区和 22 区(或 1 组、2 组的 1 级或 2 级)。除非铭牌上标称可用于更低的燃点，否则执行机构不能安装到燃点低于 135℃的防爆区域，执行机构只可

安装在与铭牌标称的可燃气体分组相符的防爆区域。

The mechanical installation is in accordance with the overview clearly specified in the operation manual and in reference to ISO 5210/1 standard; if the nominal mode in the nameplate is explosion-proof mode, the actuator is only installed in classified Zone 1 and Zone 21, Zone 2 and Zone 22 (or Level I or Level II of Group 1, Group 2); except that nominal mode in the nameplate is applicable to lower combustion point, it is forbidden to install actuator in the explosion-proof area with a combustion point of lower than 135℃; the actuator is only installed in the explosion-proof area compatible with the combustible gas grouping clearly specified in the nominal mode.

执行机构的电气安装、维护和使用也应依照特殊防爆认证相关的实施规程来进行。

The electric installation, maintenance and usage of actuator are in accordance with the execution modulating types clearly specified in the special explosion-proof accreditation.

如果执行机构符合防爆区域认证的要求,则无需对其进行检查和维修。无论在任何情况下，都不得对执行机构进行任意改造，因为这将使已经获得的防爆认证无效。

If the actuator meets the accreditation requirements of explosion-proof area, it is not needed to make inspection or execute maintenance; under any circumstance, it is forbidden to modify the actuator since it will make obtained explosion-proof accreditation become invalid.

在防爆区域内，禁止用任何带电导体接触执行机构，除非进行经特殊允许的工作，否则应切断电源，将执行机构卸下并移到非防爆区域进行维修或保养。

In the explosion-proof area, it is forbidden to contact the actuator with any charged conductor except for special permission; otherwise, the user shall cut off the power supply, dismantle the actuator and displace to the non-explosion-proof area for maintenance or servicing.

警告: 电机温度在常规操作时，执行机构电机外壳表面温度可能超过 60℃。

如果执行机构设定为电机温度保护旁路，则其防爆认证无效，使用此设定有可能发生电气危险，用户应考虑使用必要的安全措施加以保证。

Warning: In the normal operation, the surface temperature of motor shell of actuator may exceed 60℃; if protective bypass is collocated for the motor temperature, the explosion-proof accreditation is invalid. The setup may lead to electric danger; the user shall consider necessary safety measures.

执行机构外壳为铝合金，紧固件为不锈钢，推力型底座为铸铁或碳钢。

The shell of actuator is made of aluminum alloy; the fastener is made of stainless steel; the thrust foundation is made of cast iron or carbon steel.

用户必须确保操作环境和执行机构的外围材料在安全使用中不受影响，不能仅依赖执行机构本身承担完全保护作用。

The user must avoid negative impact on surrounding materials of operation environment and actuator in the safe usage; it is forbidden to merely depend on the actuator to play the total protective-role.

适当情况下，用户须确保操作环境对执行机构的适当保护。

Under proper conditions, the user must assure proper protection of operation environment to the actuator.

2 存放/Storage

如果执行机构不能立即安装到固定位置，则应将其保存在一个干燥、通风的场所。

If the actuator fails to be immediately installed to the fixed position, it shall be stored in a dry and ventilated area.

警告：禁止露天、潮湿、雨水和淹没的环境中存放，由此造成的后果，D+R 公司将不承担任何责任。

Warning: It is forbidden to store the actuator in open air, humid, rainy and sunken environment; D+R does not bear any responsibilities for such consequences.

如果执行机构已经安装到固定位置，但还没有电气连接，建议您将电缆入口的塑料塞换成缠有聚四氟乙烯带的密封金属塞。

If the actuator is installed into a fixed position without electric connection, it is recommended to replace plastic plug at the cable inlet into sealed metal plug enwrapped with teflon tape.

在使用过程中，执行机构主体部分需与腐蚀性介质、高压电缆、高强度磁场等有影响的环境隔离。

In the normal usage, the main part of actuator must be isolated from the influential environment such as corrosive medium, high-voltage cable and high-strength magnetic field.

如无意外，D+R 执行机构的密封结构将会很好地保护内部的电气部件。

The sealing structure of D+R actuator is able to protect the internal electric components except for accidental conditions.

调试 MC 系列执行机构时仅仅只需打开接线端子仓盖即可。

In the commissioning of MC series actuator, the user only needs to open the cover of wiring terminal.

如果由于用户曾经打开过除接线端子仓盖之外的任何腔体而使执行机构受到损坏，D+R 公司将不承担任何责任。

If the user once opened any cavity beyond the cover of wiring terminal and thus damaged the actuator, D+R does not bear any responsibilities.

每一台执行机构在出厂前均已经过全面检测，如果正确安装、调试、

使用，则可提供多年的无故障运行。

Each actuator has received integrated inspection before leaving the factory; correct installation, commissioning and usage will assure non-fault operation for years.

警告：由于执行机构外壳为铝制品结构，禁止外力冲击以免变形造成外部结构损伤等相关联事件发生。

Warning: Since the shell of actuator is made of aluminum structure, it is forbidden to impact by strong external force; otherwise, the shell is deformed and outer structure is damaged.

3 执行机构控制方式 /Actuator control mode

在电动操作之前，请检查供电电源，确定与执行机构铭牌上的电压要求相符。

Before electric operation, please inspect and confirm the voltage of the power supply correspond with voltage requirements clearly specified in the nameplate of actuator.

警告：设备的安装和连接只能由具备相应资质的受过专业培训的仪表工程师或有授权的人员完成，并严格按照本手册进行操作。

Warning: The qualified and well-trained instrument engineer or authorized personnel are designated for the equipment installation and connection in strict accordance with the operation manual.

警告：关于电动执行机构的操作，任何情况下不允许用扳手之类的附加工具旋转手轮来打开或关闭阀门，这样可能会导致阀门或者电动执行机构损坏。

Warning: Under any circumstance, it is forbidden to rotate the handwheel by other additional tools to open or close the valve, such as the wrench; otherwise, the valve or electric actuator may be damaged.

警告：如果没有进行初步检查，不要进行电动操作。

Warning: It is forbidden to electric operation with no preliminary inspection.

警告：电气连接一定保证在断电状态下进行，连接之前一定要检查电源形式（电压和频率等）和电机参数是否与要求一致。

Warning: The electric connection must be executed in the power-off state; before connection the user must check the consistency of power form (voltage and frequency, etc.) with motor parameters.

3.1 手轮的操作/Handwheel Operation

手轮在电动状态下与执行机构主传动处于分离状态，如需手轮操作时，必须在执行机构处于停机状态下，将手轮向(PUSH)方向推动，使之处于啮合状态(此状态下电动操作失效)，手动过程完毕后，需将手轮向外拉出，使之置于分离状态。(图 3-1)

Under electric conditions, the handwheel and actuator’s main drive are in separation status. When the handwheel operation is needed, the actuator must be shutdown, then push the handwheel to “PUSH” direction, and make it in meshing state (in this state, electric operation is invalid); after the manual process finished, it needs to pull out the handwheel, making it in separation conditions.(Drawing 3-1)

此系列下的其他机型采用行星齿轮结构，无离合装置，无论处于就地/远程，手动/电动状态下皆可转动手轮，不会造成事故。（图 3-2）

The other models in this series use planetary gear structure, no clutch device, no matter the local / remote, manual / electric state can turn the hand wheel, no accident. (Drawing 3-2).

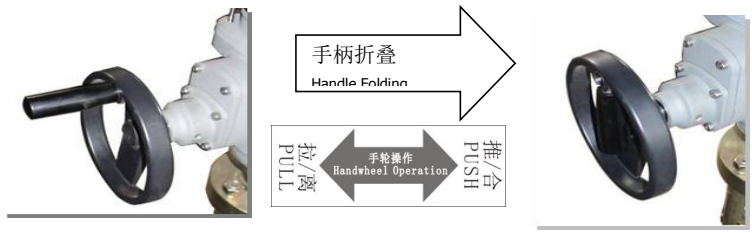


图 3-1 手轮折叠和推/拉操作

Drawing3-1 Hand wheel folding and push/pull operation

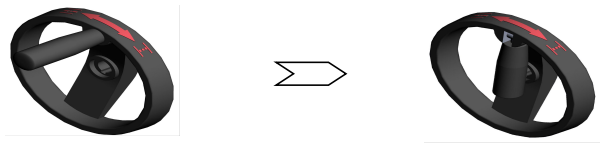


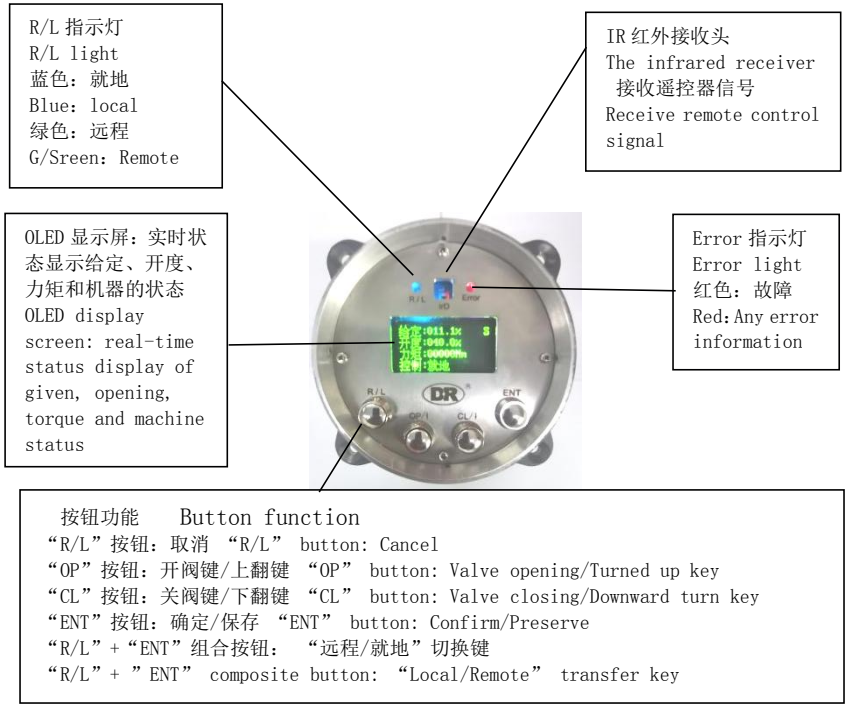
图 3-2 手柄的折叠

Grawing 3-2 Handle Folding

3.2 操作面板控制/ The operation panel control

操作面板包括 R/L 指示灯、Error 指示灯、IR 红外接收头、OLED 液晶显示屏和霍尔磁性功能按钮。

The operation panel includes the R/L light, the Error light, the infrared receiver , OLED and the Hall Magnetic function button.



注： Notes:

调试时：须切换到“就地”状态； When setting: Must switch to "Local"

远程自动时：须切换到“远程”状态 ； When Remote automatic: Must switch to " Remote"

3.2.1 R/L 指示灯/R/L light

R/L 指示灯 R/L light	
蓝色 Blue	绿色 Green
就地 Local	远程 Remote

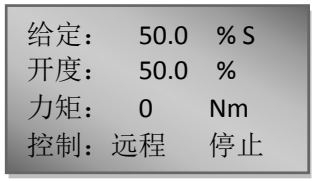
3.2.2 Error 指示灯/Error light

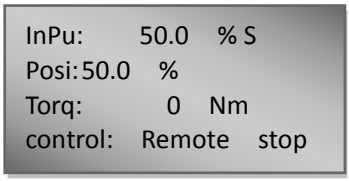
Error 指示灯 Error light	
不亮 Lights off	红色 Red
无故障 No faults	有故障 Faults

3.2.3 实时状态显示/Display of real-time status

OLED 液晶显示屏为 4 行 16 字符的点阵液晶显示屏，可显示中文，中文显示则是 4 行 8 字，所显示信息为字符和形符。

OLED is four lines with 16 characters of the lattice OLED screen, which can show Chinese, and Chinese display is four lines and 8 words, the display information is character and form character.





MC 系列执行机构支持实时状态显示：

MC series actuator supports the display function of real-time status:

第一行：给定信号显示；

The first line: Display set signal.

第二行：阀位状态显示；

The second line: Display valve position and status.

第三行：实时力矩值显示。

The third line: Display real time torque value;

第四行：电动执器的运转状态，例如“就地”停的状态就会显示“就地”。

The fourth line: the operation status of the electric actuator, for example, the status of "local" stop will display "local"。.

3.2.4 霍尔磁性按钮功能/Hall magnetic function button

“R/L”按钮：在设置过程中为“取消”键

“R/L” button: “Cancel” key in the setup

“OP↑”按钮：开阀键/上翻键

“OP↑” button: Valve opening/Turned up key

“CL↓”按钮：关阀键/下翻键

“CL↓” button: Valve closing/Downward turn key

“ENT”按钮：在设置过程中为“确定”键

“ENT” button: “Confirm” key in the setup

“R/L”+“ENT”组合按钮： “远程/就地”切换键

“R/L”+“ENT” composite button:“Local/remote” transfer key.

3.2.5 就地/远程操作/Local/remote operation

通过面板按钮可对执行机构进行“就地/远程”切换操作。面板操作的组合键为“R/L”+“ENT”键，或在基本设置-远程手动设置中进行切换。

The panel button allows for "local/remote" switching operation of the actuator. The combination keys for panel operation are "R/L"+"ENT" keys, or

switch between Basic Settings - Remote Manual Settings.

警告：设置、修改、调试时，执行机构必须处于“就地”状态。

Warning: In the setup, revision and commissioning, the actuator must be in the “local” status.

3.3 遥控器控制/ The remote control

使用遥控器时建议在安装调试时使用，其他工作条件下慎用。

It is recommended to use it during installation and commissioning when using the remote control, and use it with caution under other working conditions.

按“R/L”+“ENT”键，将执行器切换到“就地”状态（蓝色灯亮）。

with “R/L”+“ENT”， the actuator is switched to the "Local" state（Blue lamp）

将遥控器红外发射端朝向执行器面板。

Make remote infrared emission end toward the actuator panel.

遥控器按键说明：

The remote control button description:

“Remote/Local 远程/就地”：远程就地切换；

“Remote/Local 远程/就地”：Switch between Remote and Local；

“Open/↑”：开阀，增加；

“Open/↑”：Open valve, increase；

“Close/↓”：关阀，减小；

“Close/↓”：Close valve, reduce；

“Set/设置”：进入设置；

“Set/设置”：Enter setup；

“Enter/确认”：确认，保存；

“Enter”：Confirm, save；

“Cancel/取消”：取消，停止；

简易通用遥控器

Simple universal remote control

“Cancel”：Cancel, stop；

3.4 4-20mA 控制/ The 4-20mA control

根据现场实际情况，将4-20mA信号线正确接入执行机构。4mA信号对应全关位置，20mA信号对应全开位置。根据给定的4-20mA信号，控制执行机构来改变阀门的开度。同时，执行机构还会把阀门的开度转换为4-20mA的信号反馈给控制中心，让阀门的开度稳定在指定位置。

According to the actual situation of the scene, the 4-20mA signal line is correctly connected to the actuator. 4mA signal corresponds to the fully closed position, 20mA signal corresponds to fully open position. According to the given 4-20mA signal, control the actuator to change the valve opening. At the same time, the actuator will also switch the valve opening to 4-20mA signal feedback to the control center, so that the valve opening stability in the specified location.

3.5 开关量控制/The switch control

根据现场实际情况，将开关量信号线正确接入执行机构。

According to the actual situation of the scene, the switch signal line is correctly connected to the implementing agencies.

控制信号为保持型时，信号长度不小于 100 毫秒。控制信号为点动型时，高电平为有效信号。

When the control signal is held, the signal length is not less than 100 milliseconds. When the control signal is a jog type, high level is a valid signal. 此项已经根据要求设定完成。若需求有变动，请联系 D+R 相关人员。

This item has been set up as required. If there is any change in demand, please contact D + R.

4 调试/Commissioning

4.1 概述/Overview

D+R MC 系列电动执行机构采用非侵入式设计(无需打开端盖即可进行调试)。

D+R MC series electric actuator is in the non-invasive design mode(Commissioning can be executed without opening the end closure).

所有设定功能存储在执行机构内部的非易失性存储器内，由液晶显示屏查看所有设定功能，每个功能的设定值均可查看或更改。

All the set functions are saved in NVM of the actuator; the user will search for all the set functions by OLED, and each set function's set value can be searched or changed.

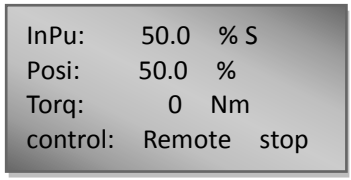
警告：在调试之前，推荐将控制系统的给定信号调至中间位置，应该将给定调至 50%。

Warning: Before debugging, it is recommended to adjust the given signal of the control system to the intermediate position, and the given signal should be adjusted to 50%

4.2 进入执行机构的主菜单/Access parameter setup of actuator

通电开机后，电动执行机构具有自动诊断功能，保证执行机构开机时正常运行时，屏幕显示如下：

After powering on and starting, the electric actuator has an automatic diagnostic function, ensuring that the actuator operates normally when turned on. The screen displays as follows：



4.3 菜单/The menu

4.3.1 主菜单/Main Menu

主菜单包括参数设置、报警查询、历史事件、极值记录和版本信息。参数设置主要是对执行机构各个参数的设置，报警事件查询可查看执行器异常时所报警的事件，历史事件主要是查看执行器之前所有的报警和设置的记录，极值记录主要是查看执行器之前所有最大值的记录，版本信息主要查看软件版本号等内容。

The main menu includes parameter setting, alarm query, historical events, extreme value record and version information. Parameter setting is mainly used to set the parameters of the actuator. Alarm event query can view the alarm events when the actuator is abnormal. The historical event mainly refers to the record of all alarms and settings before the actuator. The extreme value record mainly refers to the record of all the maximum values before the actuator. The version information mainly refers to the software version number.

4.3.2 参数设置/Parameter setting

参数设置分为基本设置、报警设置、高级设置和恢复出厂。

Parameter setting includes basic setting, alarm setting, advanced setting and factory restoring.

4.3.3 基本设置/Basic settings

基本设置包括语言设置、就地/远程设置、行程限位、输入输出校准、速度设置、死区范围设置、信号类型、故障位置、关阀方向、设备地址、自检设置和时钟设置。

The basic settings include language setting, local / remote setting, travel limit, I / O calibration, speed setting, dead zone setting, signal type, fault position, valve closing direction, equipment address, self check setting and

clock setting.

4.3.4 报警设置/Alarm settings

报警设置包括报警关闭、全开、全关、给定信号故障、开过力矩、关过力矩、指定位置、综合报警、远程、就地、主电源故障、开关过力矩。

Alarm settings include alarm off, full open, full close, given signal failure, over torque on/off, specified position, comprehensive alarm, remote, local, main power failure, switch over torque.

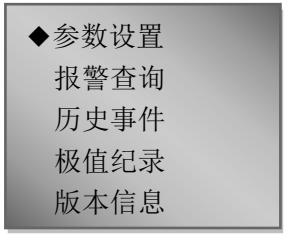
4.3.5 高级设置/advanced setting

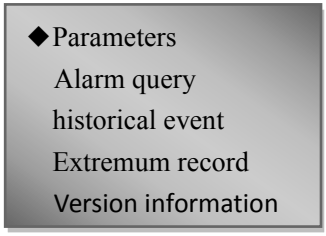
高级设置包括保护设置、传动比设置、电机关阀方向、力矩校准、力矩单位、电机控制参数、产品编号、密码设置、公司信息、Modbus 调试、保存出厂设置。

Advanced settings include protection settings, transmission ratio settings, motor valve closing direction, torque calibration, torque unit, motor control parameters, product number, password settings, company information, Modbus debugging, and saving factory settings.

进入主菜单后，屏幕显示如下：

After entering the main menu, the screen displays as follows:





“◆”表示当前选择的菜单项。按“OP↑”或“CL↓”按钮进行上下菜单项的切换，按“ENT”进入子菜单。

"◆" indicates the currently selected item. Press "OP ↑" or "CL ↓" button

to switch up and down the item. Press "ENT" to enter the submenu.

警告：出厂时，执行机构功能均已按出厂标准设定完成，除非在订货时有特殊要求，可按要求设定；在调试期间如果遇到问题，可恢复到默认设定状态，返回执行机构出厂的设定，然后开始现场调试。

Warning: Before leaving the factory, the functions of actuator are set up according to the factory standard; special requirements raised in the ordering are strictly adhered; in case of any problem in the commissioning, it is resumed to the default setup status and factory setup of actuator, and then on-site commissioning is started.

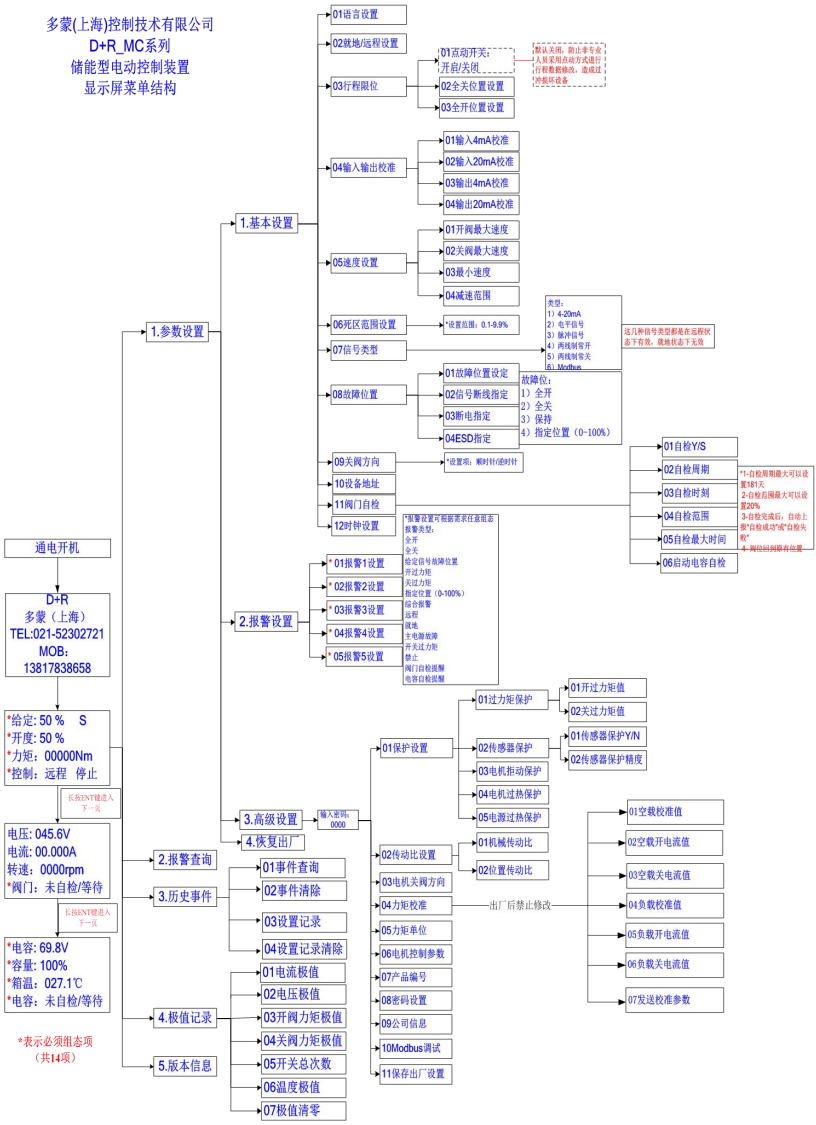
警告：默认各个设定根据需要谨慎使用，因为执行机构出厂后，在现场所设置数据对阀门或者使用厂家来说十分重要。

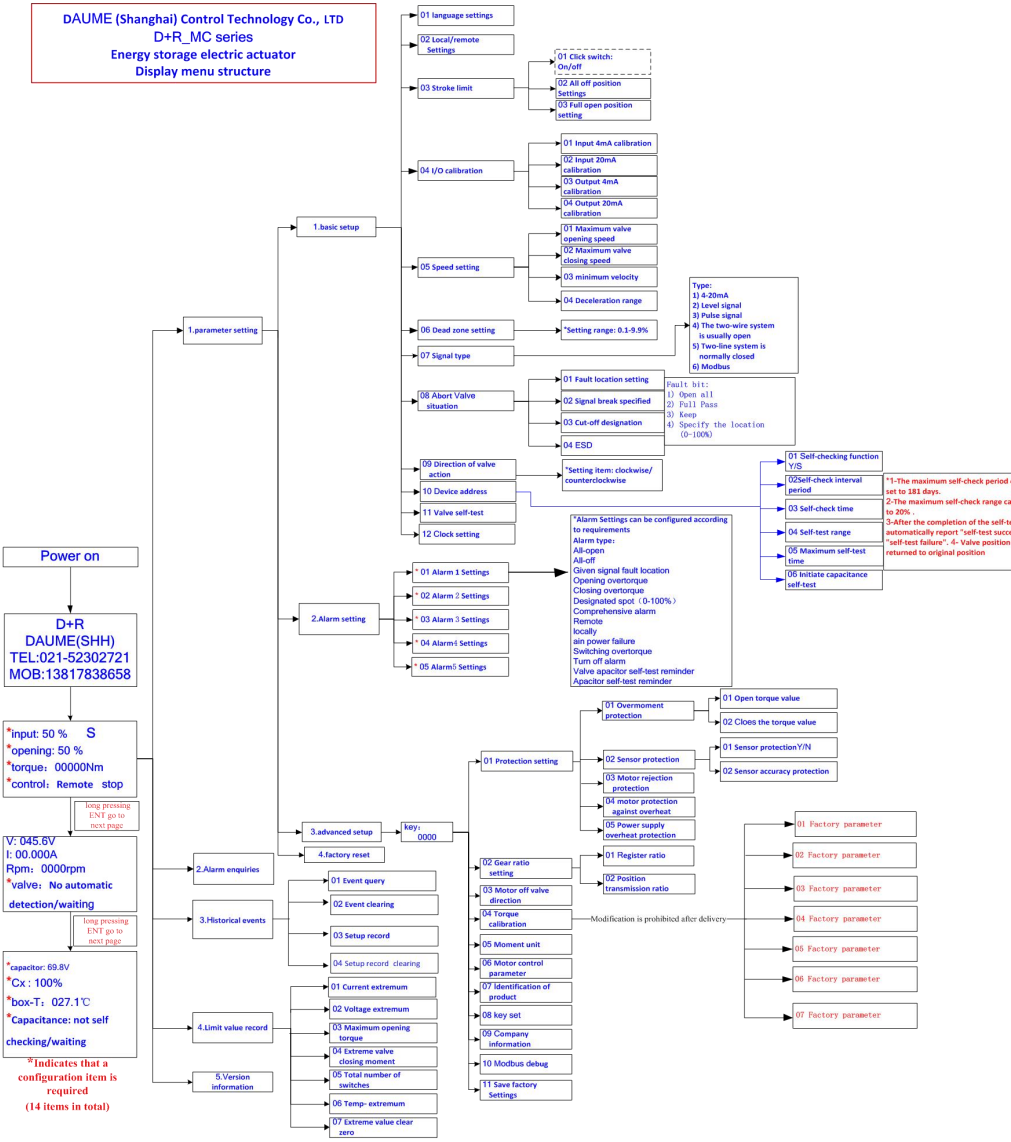
Warning: The default setup must be seriously used according to the actual demands; after leaving the factory, the on-site data setup of actuator is of vital importance to the valve or users.

警告：必须先进行基本设置。出厂设置在执行机构出厂后，一般不需要改动。

Warning: The basic setup must be finished in advance. After the actuator leaves the factory, the factory setup hardly needs to change.

4.4 菜单结构图(The menu structure)



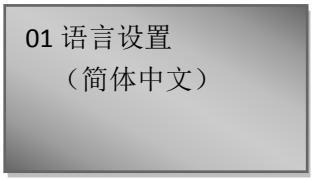

DAUME (Shanghai) Control Technology Co., LTD
D+R_MC series
Energy storage electric actuator
Display menu structure
Power on
D+R
DAUME(SHH)
TEL:021-52302721
MOB:13817838658
*input: 50 % S
*opening: 50 %
*torque：00000Nm
*control：Remote stop
long pressing ENT go to next page
V: 045.6V
I: 00.000A
Rpm：0000rpm
*valve：No automatic detection/waiting
long pressing ENT go to next page
*capacitor: 69.8V
*Cx : 100%
*box-T：027.1℃
*Capacitance: not self checking/waiting
*Indicates that a configuration item is required
(14 items in total)
1.parameter setting
2.Alarm setting
3.advanced setup
4.factory reset
2.Alarm enquiries
3.Historical events
4.Limit value record
5.Version information
1.basic setup
01 language settings
02 Local/remote Settings
03 Stroke limit
01 Click switch: On/off
02 All off position Settings
03 Full open position setting
04 I/O calibration
01 Input 4mA calibration
02 Input 20mA calibration
03 Output 4mA calibration
04 Output 20mA calibration
05 Speed setting
01 Maximum valve opening speed
02 Maximum valve closing speed
03 minimum velocity
04 Deceleration range
06 Dead zone setting
*Setting range: 0.1-9.9%
07 Signal type
Type:
1) 4-20mA
2) Level signal
3) Pulse signal
4) The two-wire system is usually open
5) Two-line system is normally closed
6) Modbus
08 Abort Valve situation
01 Fault location setting
02 Signal break specified
03 Cut-off designation
04 ESD
Fault bit:
1) Open all
2) Full Pass
3) Keep
4) Specify the location (0-100%)
09 Direction of valve action
*Setting item: clockwise/counterclockwise
10 Device address
11 Valve self-test
12 Clock setting
01 Self-checking function Y/S
02Self-check interval period
03 Self-check time
04 Self-test range
05 Maximum self-test time
06 Initiate capacitance self-test
*1-The maximum self-check period can be set to 181 days.
2-The maximum self-check range can be set to 20%.
3-After the completion of the self-test, it will automatically report "self-test success" or "self-test failure". 4- Valve position will be returned to original position
*Alarm Settings can be configured according to requirements
Alarm type:
All-open
All-off
Given signal fault location
Opening overtorque
Closing overtorque
Designated spot（0-100%）
Comprehensive alarm
Remote
locally
ain power failure
Switching overtorque
Turn off alarm
Valve apacitor self-test reminder
Apacitor self-test reminder
* 01 Alarm 1 Settings
* 02 Alarm 2 Settings
* 03 Alarm 3 Settings
* 04 Alarm4 Settings
* 05 Alarm5 Settings
key：0000
01 Protection setting
01 Overmoment protection
02 Open torque value
02 Cloes the torque value
02 Sensor protection
01 Sensor protectionY/N
02 Sensor accuracy protection
03 Motor rejection protection
04 motor protection against overheat
05 Power supply overheat protection
02 Gear ratio setting
01 Register ratio
02 Position transmission ratio
03 Motor off valve direction
04 Torque calibration
Modification is prohibited after delivery
05 Moment unit
06 Motor control parameter
07 Identification of product
08 key set
09 Company information
10 Modbus debug
11 Save factory Settings
01 Factory parameter
02 Factory parameter
03 Factory parameter
04 Factory parameter
05 Factory parameter
06 Factory parameter
07 Factory parameter
01 Event query
02 Event clearing
03 Setup record
04 Setup record clearing
01 Current extremum
02 Voltage extremum
03 Maximum opening torque
04 Extreme valve closing moment
05 Total number of switches
06 Temp- extremum
07 Extreme value clear zero

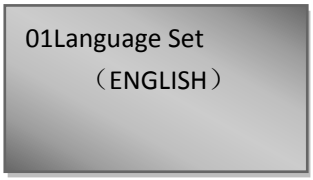
2014.07.03

4.5 菜单项介绍/Menu item introduction

4.5.1 语言设置/Language setting

进入语言设置菜单后，屏幕显示如下：





The screen is displayed as follows in the language setting menu:

语言选择项值：简体中文和 English，默认为英文。

Item values of language option: Chinese and English(default) .

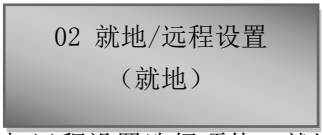
按“ENT”按钮后，进入设置状态，此时项值闪烁。按“OP↑”或“CL↓”按钮进行上下切换。选中后，按“ENT”按钮保存，并提示设置成功。

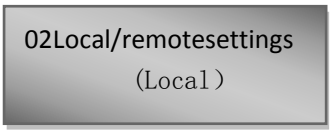
Press the "ENT" button to enter the setting state, then the value of the item flashes. Press “OP ↑ ” or “CL ↓ ” button to switch up and down. After the selection, press the "ENT" button to save, and prompt the setting is successful.

4.5.2 就地/远程设置/Local / remote settings

进入该项设置菜单时，屏幕显示：

The screen is displayed as follows upon access into the “12Rem&Local Set” menu:





就地/远程设置选择项值：就地和远程，默认为就地。

Local / remote setting option value: local and remote, the default is local .

此时项值闪烁。按“OP↑”或“CL↓”按钮进行上下切换。选中后，按“ENT”按钮保存，并提示设置成功。

The item value flashes. Press the "op ↑" or "Cl ↓" button to switch up and down. After selection, press the "ent" button to save and prompt that the setting is successful.

4.5.3 行程限位 Travel limit

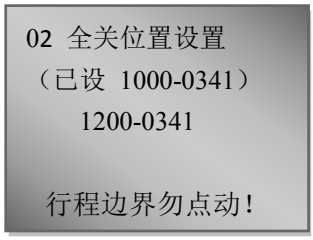
01 点动开关 /inching switch

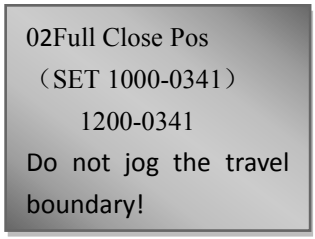
如有需要联系厂家指导/If necessary, contact the manufacturer for guidance

02 全关位置设置/Full close position setting

“02 全关位置设置”对应阀门最小开度位置。顺时针摇动手轮使阀门到达全关位置，进入此设置项。屏幕显示：

02 Closed position setting" corresponds to the minimum closed position of the valve. Rotate the handwheel clockwise to bring the valve to the fully open position and enter this setting. The screen is displayed as follows:





第二行显示“1000-0341”表示全关位置已设位置值。

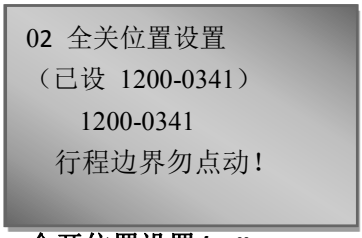
The second line shows "1000-0341" indicating that the fully closed position has been set.

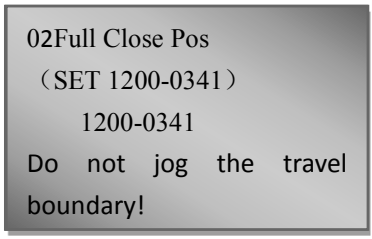
第三行显示“1200-0341”表示编码器当前的位置值。

The third line shows "1200-0341" indicating the encoder's current position value.

按“ENT”按钮将当前位置保存到全开位置。设置成功后，显示如下：

Press the "ENT" button to save the current position to the fully closed position. After the setting is successful, the display is as follows:

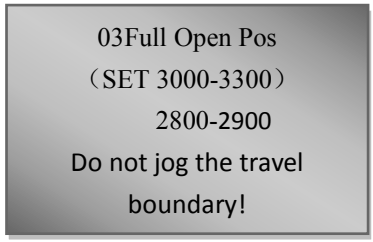




03 全开位置设置/Full open position setting

全开位置设置”对应阀门最大开度位置。逆时针摇动手轮使阀门到达全开位置，进入此设置项。屏幕显示：

Closed position setting" corresponds to the minimum opening position of the valve. Rotate the handwheel clockwise to bring the valve to the fully open position and enter this setting. The screen is displayed as follows:



第二行显示“3000-3300”表示全开位置已设位置值。

The second line shows "3000-3300" indicating that the fully open position has been set.

第三行显示“2800-2900”表示编码器当前的位置值。

The third line shows "2800-2900" indicating the encoder's current position value.

按“ENT”按钮将当前位置保存到全开位置。设置成功后，显示如下：

Press the "ENT" button to save the current position to the fully open position. After the setting is successful, the display is as follows:

4.5.4 速度设置

01.最大开阀速度/Max Op Speed

进入该项设置菜单时，屏幕显示：

The screen is displayed as follows upon access into the setting menu:

第二行显示“2800r/min”表示已设最大开阀速度。最大开阀速度的设置范围：500-2800r/min。

The second line shows "2800r/min" to indicate that the maximum valve opening speed has been set. The setting range of the maximum valve opening speed is 500-2800r/min.

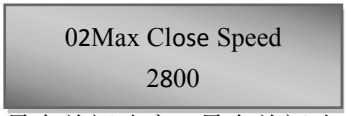
按“ENT”按钮可进入设置状态，修改此参数。

Press "ENT" button to enter the setting state and modify this parameter.

02.最大关阀速度/Max Cl Speed

进入该项设置菜单时，屏幕显示：

The screen is displayed as follows upon access into the setting menu:



第二行显示“2800r/min”表示已设最大关阀速度。最大关阀速度的设置范围：500-2800r/min。

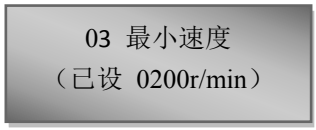
The second line shows "2800r/min" to indicate that the maximum valve closing speed has been set. The setting range of the maximum closing valve speed is 500-2800r/min.

按“ENT”按钮可进入设置状态，修改此参数。Press "ENT" button to enter the setting state and modify this parameter.

03.最小速度/Min speed

进入该项设置菜单时，屏幕显示：

The screen is displayed as follows upon access into the setting menu:



第二行显示“0200r/min”表示已设最小值。最小速度不小于 200r/min。

The second line shows "0200r/min" indicating that the minimum value has been set. The minimum speed is not less than 200r/min.

按“ENT”按钮可进入设置状态，修改此参数。

Press "ENT" button to enter the setting state and modify this parameter

04.减速范围/Deceleration range

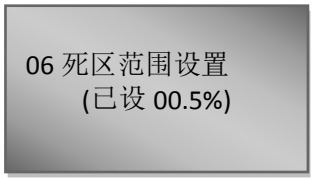
减速范围是执行器开始降速到停止的范围。该项设置值根据实际情况进行调节，可调范围为 0.1%~10%。进入该设置屏幕显示：

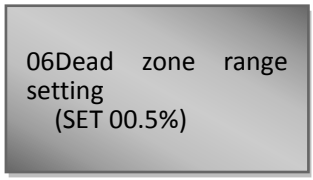
The deceleration range is the range in which the actuator starts to decelerate to the stop. The setting value is adjusted according to the actual situation. adjustable range is 0.1% to 10%. The screen is displayed as follows upon access into the setting menu:

4.5.5 死区范围设置/Dead zone range setting

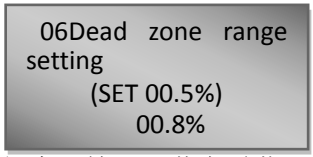
死区范围设置又称灵敏度调整，设置范围为 0.1~9.0，推荐值为 0.3~0.8。进入该项设置，屏幕显示：

Dead zone range setting is also called Flexibility adjustment; the setup scope is between 0.1~9.0 and recommended scope is between 0.1~0.8. The screen is displayed as follows upon access into the setup item:



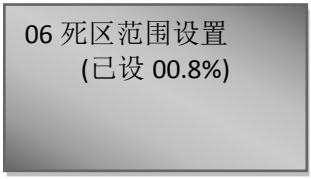


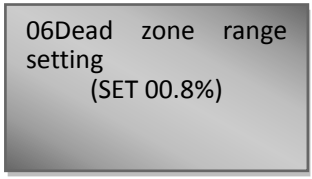
第二行显示“00.5”表示死区已设值。
The second line shows "00.5" indicating that the deadband has been set.
按“ENT”按钮进入设置状态，显示如下：
Press "ENT" button to enter the setting state. the display is as follows:



第三行显示“00.8%”表示当前可修改值。根据实际情况，若有震荡现象，或死区过小时，可调大此值。调整后，按“ENT”按钮进行保存，保存后显示如下：

The third line shows "00.8%" indicating the current modifiable value. According to the actual situation, if the oscillating phenomenon or the dead zone is too small, this value can be increased. After adjustment, press the "ENT" button to save. After saving, the display is as follows:

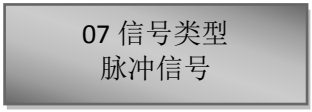


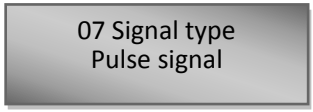


4.5.6 信号类型/Signal type

上（OP）下(CL)翻到信号类型点击按键 ENT 确认进到如屏幕显示界面

Turn up (OP) and down (CL) to the signal type and click ent to enter the screen display interface





如显示脉冲信号在闪烁可以上（OP）下(CL)翻到需要的信号类型点击按键 ENT 确认

If the pulse signal is flashing, you can turn up (OP) and down (CL) to the required signal type, and click ent to confirm

电平信号：是点动模式（在远程使用），给一下高电平时执行器动作一下，在行程范围内一直给高电平执行器就会一直动作，给低电平则停止动作。

Level signal: It is in jog mode (for remote use). If a high-level actuator is activated, it will continue to operate within the travel range. If a low-level actuator is activated, it will stop operating

脉冲信号：是保持型（在远程使用），给一个开阀或关阀高电平信号后，中间没有低电平信号输入时执行器会开到位或关到位，如果运行过程有低电平信号输入时，执行器将会立刻停止开阀或关阀

Pulse signal:It is a holding type (for remote use). After giving a high level signal to open or close the valve, the actuator will open or close in place when there is no low level signal input in the middle. If there is a low level signal input during operation, the actuator will immediately stop opening or closing the valve

两线制常开：是在远程状态下往开阀的方向动作至止开到位（中间没有停止高电平信号输入时）

Two wire system normally open: It is operated in the direction of opening the valve in remote mode until the stop is in place (when there is no stop of high-level signal input in the middle)

两线制常闭：是在远程状态下往关阀的方向动作至止关到位（中间没有停止高电平信号输入时）

Two wire system normally closed: it moves to close the valve in the remote state until the valve stops in place (when there is no stop of high-level signal input in the middle)

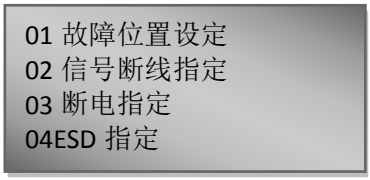
ModbuS:是在远程状态下,使用上位机控制

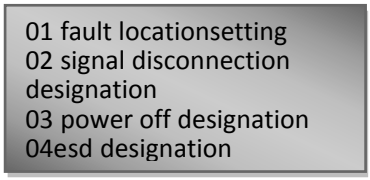
Modbus: it is controlled by upper computer in remote state

4.5.7 故障位置/Fault location

上（OP）下(CL)翻到故障位置点击按键 ENT 确认进到如屏幕显示界面

Turn up (OP) and down (CL) to the signal type and click ent to enter the screen display interface





“故障位置”功能定义为：当执行机构出现故障位置设定、断电指定、ESD 指定，执行机构所采取的动作。

The function of "fault location" is defined as the action taken by the actuator in case of fault location setting, power-off designation and ESD designation.

项值解释：

Interpretation of item value:

1. 故障位置设定：当发生故障时，执行机构运行至设定好的位置；

Fault position setting: when the fault occurs, the actuator will run to the set position;

2. **信号断线指定**：当发生模拟量信号故障时时，执行机构运行至设定好的位置

Signal disconnection designation: When an analog signal fault occurs, the actuator operates to the set position

3. 断电指定：当断电时，执行机构会运行至预设位置；

Power off specification: when the power is off, the actuator will run to the preset position;

4. ESD 指定：当 ESD 动作时，执行机构运行到预设的位置。

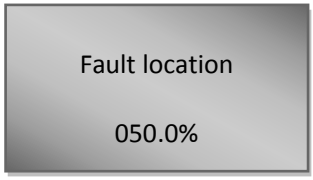
ESD designation: when ESD acts, the actuator will run to the preset position.

进入该项设置菜单时，屏幕显示：

The screen is displayed as follows upon access into the setup menu:

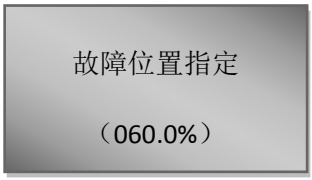
当选择“指定位置（050.0%）”时，显示如下：

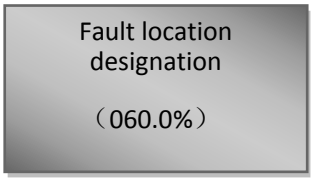
When "Specify position (050.0%)" is selected, the display is as follows:



第二行显示“050.0%”表示当前指定的位置，此值可修改。例如修改成 060.0%后，按“ENT”按钮进行保存，保存后显示如下：

The third line shows "050.0%" indicating the currently specified position. This value can be modified. For example, after changing to 060.0%, press the "ENT" button to save. After saving, the display is as follows:





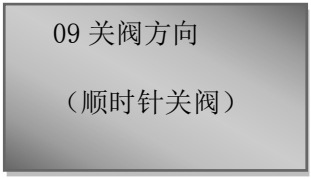
警告：该项设置的出厂默认值为“保持”，根据实际工艺所需要的阀位由用户自行设定或告知调试服务人员进行现场设置。

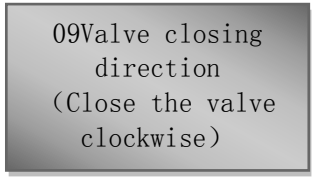
Warning: The factory default value of the item is “Current1(Maintenance)”; according to the process demand, the user sets up the valve position by itself or notifies the commissioning personnel for on-site setup.

4.5.8 关阀方向/Valve closing

进入该项设置菜单时，屏幕显示：

When entering the setting menu, the screen will display;





如果有需要联系厂家指导

If necessary, contact the manufacturer for guidance

4.5.9 设备地址 Device address

上（OP）下(CL)翻到设备地址点击按键 ENT 确认进到如屏幕显示界面

Scroll up (OP) and down (CL) to the device address, click on the ENT button to confirm and enter the screen display interface

显示数字在闪烁，上（OP）下(CL)键可更改设备地址数字身份，点击 ENT 确认键是可以向后移位更改完成后点击确认会显示设置成功

The display number is flashing. The up (OP) and down (CL) keys can change the digital identity of the device address. Click ent to move backward. After the change is completed, click confirm to display the successful setting

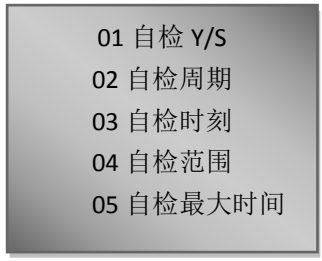
用于 Modbus 通讯是使用，用来识别执行器身份的识别数字

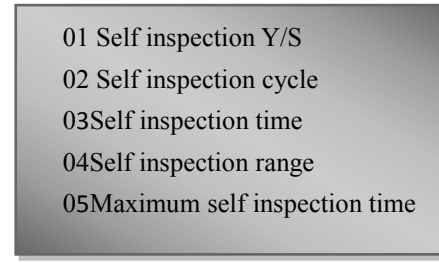
Modbus communication is used to identify the identity of the actuator

4.5.10 自检设置/Self test setting

进入该项设置菜单时，屏幕显示（自检 Y/S、自检周期、自检时刻、自检范围）；

When entering the setting menu, the screen will display;（ self check Y / s, self check cycle, self check time and self check range）



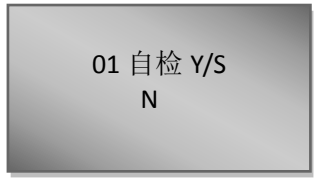


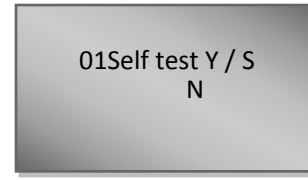
当主电源有电情况下，此功能打开有效。这个主要是预防阀门长期不动作导致阀门锈死，而设计此功能（也可以不使用，具体情况根据现场而定）。如果此功能打开以后会在一定的周期内执行器会自动动作所设定的角度，然后再返回原来的位置。

his function is effective when the main power supply is powered. This function is mainly designed to prevent the valve from rusting due to long-term inaction of the valve (it can also not be used, and the specific situation depends on the site). If this function is turned on, the actuator will automatically operate the set angle within a certain period, and then return to the original position。

01 进入该项设置菜单时，屏幕显示：

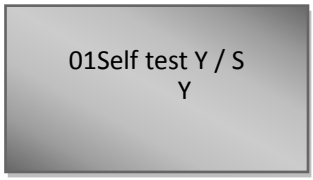
The screen is displayed as follows upon access into the setting menu:





要设置自检打开或关闭，点击 ENT 进去后 N 在闪烁可以通过 OP/CL 上下调整为 Y，然后点击 ENT.设置成功

To set the self-test on or off, click ent. After entering, n will flash, which can be adjusted to y by op / CL, and then click ent



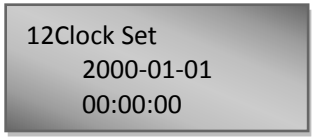
自检周期（最大可以设置 180 天）、自检时刻、自检范围（最大可以设 20%开度）。其它设置选项同上

Self inspection cycle (up to 180 days can be set), self inspection time, and self inspection range (up to 20% opening can be set). Other setting options are the same as above

4.5.11 时钟设置/Clock setting

进入该项设置菜单时，屏幕显示：

The screen is displayed as follows upon access into the setting menu:



按“Ent”按钮进入设置状态，此时设置项闪烁，从左到右，依次按位设置。

Press the "Ent" button to enter the setting state. At this time, the setting item flashes and is set in bits from left to right.

按“OP↑”或“CL↓”按钮进行数字加和减。R/L 键为往前移位键，ENT 为往后移位键。按“ENT”按钮保存，并提示设置成功。

Press the "OP ↑" or "CL ↓" button to add and subtract numbers. R/L is the forward shift key, and ENT is the backward shift key. Press the "ENT" button to save and prompt that the setting is successful.

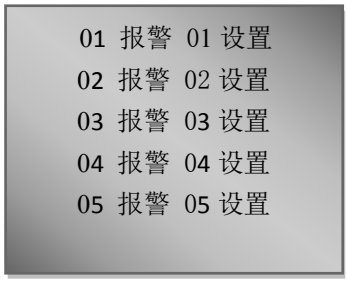
4.5.12 报警功能/Alarm function

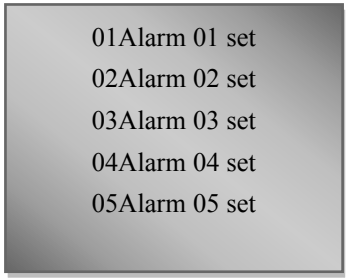
接线端子最多 5 个报警端口，每个端口的报警设置可以通过“报警功能”进行设定。可以对每个端口的报警分别设置。

There are up to 5 alarm ports on the terminal block, and the alarm settings for each port can be set by the “alarm function”. Alarms can be set separately for each port.

进入报警设置，屏幕显示：

The screen is displayed as follows upon access into "Alarm Set" setup:



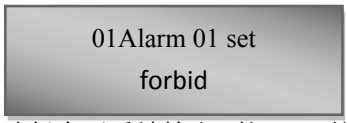


报警功能项值：全开位报警、全关位报警、给定信号故障、关过力矩、开过力矩、指定位置（050.0%）、综合报警、远方、就地、阀门自检提醒、电容自检提醒和报警关闭。

Alarm function item values: full open alarm, full close alarm, given signal fault, closing torque, opening torque, specified position (050.0%), comprehensive alarm, remote, local, valve self check reminder, capacitor self check reminder, and alarm shutdown

当报警设置编程时，屏幕会显示当前所设置的报警功能项值在闪烁：

When the alarm setting is selected "Specified position",The screen is displayed as follows upon access into the setup menu :



按“OP↑”或“CL↓”按钮进行上下翻页，选择全开反馈输出，按“ENT”按钮保存，并提示设置成功。

Press "OP ↑" or "CL ↓" button to turn pages up and down, select full open feedback output, press "ENT" button to save, and prompt that the setting is successful

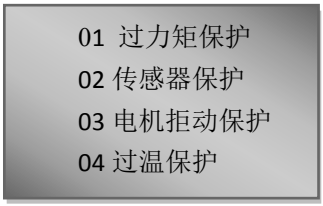
报警 2 设置到报警 5 设置跟报警 1 设置一样

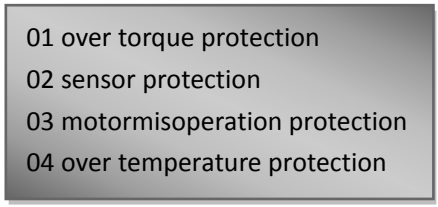
The setting of alarm 2 to alarm 6 is the same as that of alarm 1

4.5.13 保护设置 Protection settings include

进入保护设置，屏幕显示：

Enter the protection setting, and the screen displays:



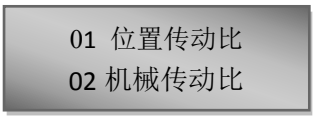


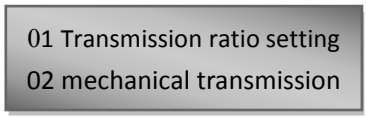
出厂前已设置好无需编程。需要编程联系厂家指导调试

It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.14 传动比设置/Transmission ratio setting

进入传动比设置，屏幕显示：/Enter the transmission ratio setting, and the screen displays





出厂前已设置好无需编程。需要编程联系厂家指导调试

It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.15 电机关阀方向 Motor valve closing direction

进入电机关阀方向，屏幕显示：

Enter the motor valve closing direction, and the screen displays:

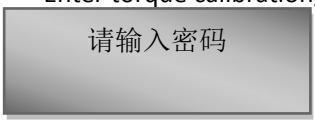
出厂前已设置好无需编程。需要编程联系厂家指导调试

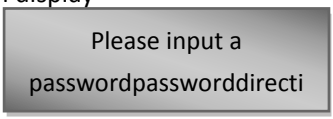
It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.16 力矩校准 torque calibration

进入力矩校准，屏幕显示

Enter torque calibration, screen display





出厂前已设置好无需编程。需要编程联系厂家指导调试

It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.17 力矩单位 Unit of moment

进入力矩单位，屏幕显示/Enter the moment unit, and the screen will display

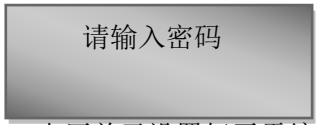
出厂前已设置好无需编程。需要编程联系厂家指导调试

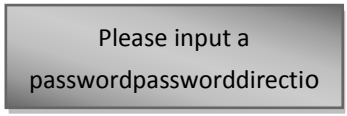
It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.18 电机控制参数 Motor control parameters

进入电机控制参数，屏幕显示

Enter the motor control parameters, and the screen displays



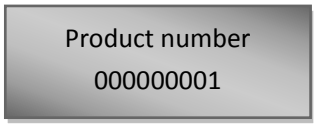


出厂前已设置好无需编程。需要编程联系厂家指导调试

It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.19 产品编号 Product number

进入产品编号，屏幕显示/Enter the product number and the screen will display



出厂前已设置好无需编程。需要编程联系厂家指导调试

It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

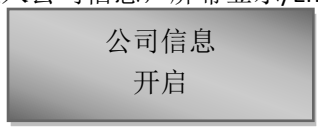
4.5.20 密码设置 password setting

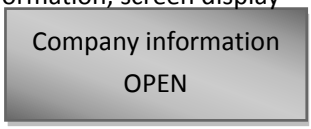
出厂前已设置好无需编程。需要编程联系厂家指导调试

It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.21 公司信息 company information

进入公司信息，屏幕显示/Enter company information, screen display





出厂前已设置好无需编程。需要编程联系厂家指导调试

It has been set in the factory without programming. Programming is required to contact the manufacturer to guide debugging

4.5.22 MODBUS 调试/MODBUS debugging

在使用 modbus 时没有校验码时可以打开，就不对指令校验就可以回复信息。出厂时默认关闭。

When using modbus, if there is no Check digit, it can be opened, and information can be replied without instruction check. Default Off at Factory.

4.5.23 保存出厂设置/Voltage extreme reset

出厂设置主要设置执行器配置相关的参数，此参数已在出厂时已设定完成。若要进入出厂设置，需向 D+R 相关人员索取密码。

The factory setting is to set the parameters related to the actuator configuration. This parameter has been set at the factory. To enter the factory settings, need to D + R related personnel to obtain a password.

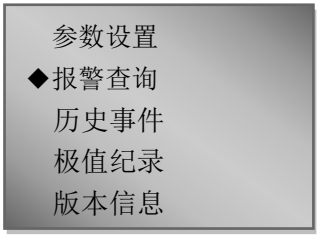
4.5.24 恢复出厂/Return to factory

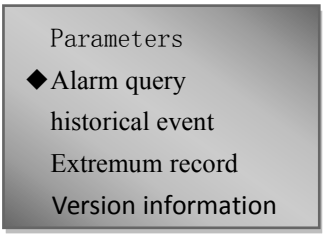
出厂时所设置的参数已经备份，若有需要可恢复出厂时的参数。

The parameters set at the factory have been backed up and the factory parameters can be restored if necessary.

4.5.25 报警查询/ Alarm inquiry

如下屏幕显示/The following screen displays



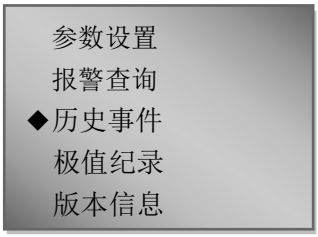


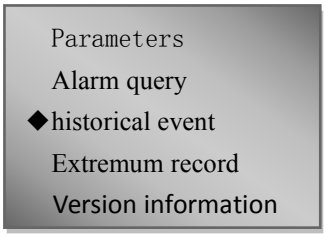
往下翻到屏幕显示的位置上点击 ENT 进去后查看当前报警/Scroll down to the position displayed on the screen and click ent to view the current alarm

报警事件/Alarm event	故障分析/Failure analysis	解决办法/Solution
编码器故障 encoder failed	编码器的接线和位置问题 The connection and position of encoder	检查编码器的接线 Check the encoder wiring
霍尔故障 Hall Failure	电机霍尔接线问题 Motor hall wiring problem	检查电机霍尔接线 Check the motor Hall wiring
其他报警信息 Other alarm information		请联系维修人员 Please contact the service personnel

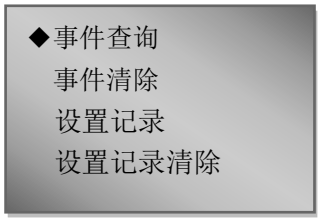
4.5.25 历史事件/Historical events

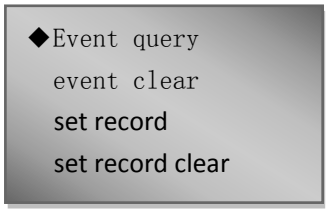
如下屏幕显示/The following screen displays





往下翻到屏幕显示的位置上点击 ENT 进去后里面包含（事件查询、事件清除、设置记录和设置记录清除）如下屏幕显示/Scroll down to the position displayed on the screen and click ent. After entering, it contains the following screen display (event query, event clearing, setting record setting and record clearing)





以事件查询为例点击 ENT 后进行历史报警的查询。

Take the event query as an example, click ent to query the historical alarm.

事件清除和设置记录清除需要联系厂家咨询后获取密码进行清除。

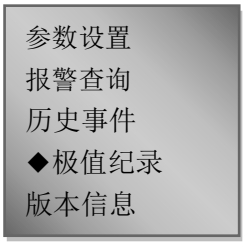
Event clearing and setting record clearing need to contact the manufacturer to obtain password for clearing.

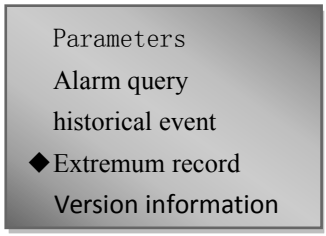
4.5.26 极值记录/Extreme value record

包含电流极值、电压极值、开阀力矩极值、关阀力矩极值、开关总次数、温度极值和极值清零

including current extremum, voltage extremum, valve opening torque extremum, closing torque extremum, total switching times, temperature extremum and extremum clearing

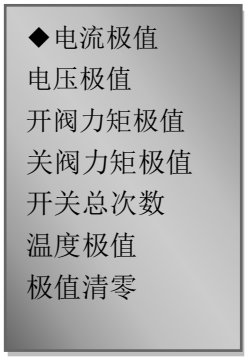
如显示屏幕 If the screen is displayed

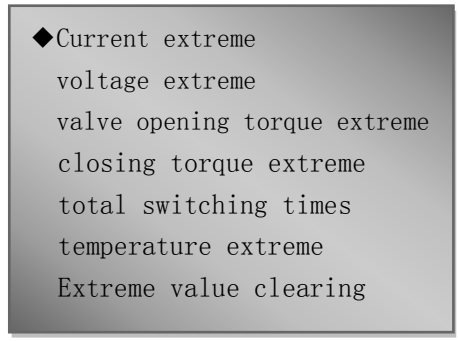




点击 ENT 进入显示页面

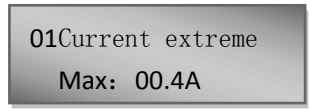
Click ent to enter the display page





以电流极值为例点击 ENT 后进去查看电流极值

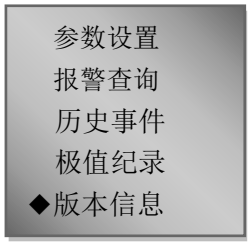
Take the current extreme value as an example, click ent to view the current extreme value

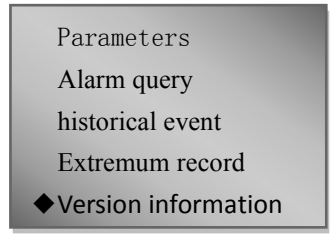


4.5.27 版本信息/Version information

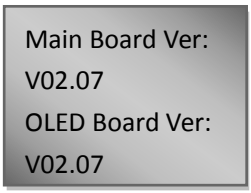
如显示屏幕

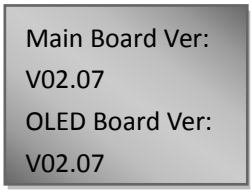
If the screen is displayed





点击版本信息/Click version information





第一行代表主板程序的版本号

The first line represents the version number of the main board program

第二行代表显示屏程序的版本号

The second line represents the version number of the display program

4.6 开关型执行器调试方法/Adjustable actuator debugging method

4.6.1 确认接线无误/Confirm that the wiring is correct

检查电源线、开关量输入和继电器反馈输出线否正确接入。

Check that the power line, digital input, and relay feedback output line are properly connected.

1、屏幕正常显示，说明电源线连接正常。

The screen is displayed normally, indicating that the power cord is connected properly.

2、开关量输入接线，分为干接点和湿接点两大类。湿接点输入信号：带 24VDC 电的输入控制信号。如果输入控制信号为干接点时，需要将执行器本身提供的 24VDC 串入回路中。具体的接线，请参照详细接线图。

Switching input wiring is divided into two categories: dry contact and wet contact. There are two types of wet contact input signals: an input control signal with 24 VDC and an input control signal with 230 VAC. If the input control signal is a dry contact, the 24VDC provided by the actuator itself needs to be serialized into the loop. For detailed wiring, please refer to the detailed wiring diagram.

3、继电器反馈输出是否正确。

The relay feedback output is correct.

4.6.2 全开全关位置设定//Full open and Close position setting

1、全开位置设置：将阀门开到全开位置，再进入“参数设置-->基本设置-->03 行程限位-->03 全开位置设置”，并保存全开位置值。

Full open position setting: open the valve to the full open position, then enter "parameter setting > basic setting > 03 travel limit -- > 03 full open position setting", and save the full open position value.

2、全关位置设置：将阀门关到全关位置，再进入“参数设置-->基本设置-->03 行程限位-->02 全关位置设置”，并保存全关位置值。

Full close position setting: close the valve to the fully closed position, and then enter "parameter setting > basic setting > 03 travel limit -- > 02 fully closed position setting", and save the full closing position value.

4.6.3 就地试运行/Local operation

1、确认工作在就地状态，显示板上“R/L 灯”为蓝色。如果为绿色，同时按下“R/L”和“ENT”键，切换到就地状态。

Confirm that the work is in the local state, and the “R/L lamp” on the display panel is blue. If it is green, press the "R/L" and "ENT" keys at the same time to switch to the local state.

2、按“OP↑”键进行开阀，按“CL/↓”键进行关阀，并观察继电器反馈输出是正常。如果反馈有问题，请重新继电器反馈输出接线和菜单设置项中报警输出功能的配置是否正确。

Press the “OP↑” button to open the valve, press the “CL/↓” button to close the valve, and observe that the relay feedback output is normal. If there is a problem with the feedback, please re-relay the feedback output wiring and the configuration of the alarm output function in the menu setting item is correct.

4.6.4 远程试运行/Remote operation

1、同时按下“R/L”和“ENT”键，切换到远程状态，显示板上“R/L灯”为绿色表示切换成功。

Press the“R/L”and“ENT”keys at the same time to switch to the remote state. Th “ R/L light ” on the display panel is green to indicate successful switching.

2、远程给定控制信号，观察执行器动作是否满足要求。满足要求，则调试结束。如果执行器不动作，请确认当远程给信号时屏幕上给定值是否有相应的变化。如果给定值无相应的变化，请检查接线方式是否正确；否则，请查看出厂设置中信号类型的选择是否匹配。

The control signal is given remotely to see if the actuator action meets the requirements. If the requirements are met, the commissioning ends. If the actuator does not operate, please confirm whether there is a corresponding change in the value given on the screen when the signal is given remotely. If there is no corresponding change in the given value, please check if the wiring is correct; otherwise, check if the signal type selection in the factory setting matches.

5 执行机构与阀门连接/Connection between actuator and valve

执行机构安装前应确保阀门稳固，否则有可能头重脚轻而不稳固。

Ensure the steady of valve before actuator installation, thus to avoid the instability caused by top-heavy.

任何时候都应由经过培训和有经验的人员来进行，确保吊装的安全，尤其是安装执行机构时。

Under any circumstance, the well-trained and experienced personnel are designated to execute operation to ensure the lifting safety, especially in installation of actuator.

警告：执行机构应该被完全支撑起来，直到与阀轴完全啮合，且执行机构落实在阀门的连接法兰上。

Warning: The actuator shall be fully supported, until it is totally meshed with the valve shaft and falls firmly on the connecting flange of valve.

适配法兰符合国际标准 ISO 5210 或美国标准 MSS SP101，必须与阀门相匹配。

The connecting flange is in accordance with ISO 5210 standard or MSS SP101 standard, which must be matched with the valve.

执行机构与阀门连接支架的材料规格应符合 ISO 8.8 级，抗屈强度 628N/sq mm。

The materials specification of the connecting support between the actuator and valve are in accordance with Level 8.8 of the ISO; the yield strength is 28N/sq mm.

警告：对已连接好的执行机构和阀门，不能吊装执行机构，应通过阀门起吊。

Warning: For the well-connected actuator and valve, it is forbidden to lift the actuator directly, but lifting through the valve.

每个组装好的整体必须放在一个独立的基座上估重，以便安全吊装。

Each assembled entirety must be placed on a separate base to estimate weight for lifting safety.

5.1 直行程联接/Linear Connection

线性推力装置

Linear thrust device

将回转输出转换为线性运动的最简单的推力装置

It is the simplest thrust device to transfer the rotary output to the linear motion.

推力装置采用滑动螺旋副，螺母为主动端，标准行程数据参见 MC1/G1/S1 系列样本资料，不得超限使用。螺母材质为耐磨锡青铜。额定载荷下，使用寿命全行程不低于 80000 次，并能很好的保证滑动螺旋副的

传动精度。此线性装置在传动精度失效后可维修或更换。

The thrust device adopts sliding helical pair with nut as the drive end; the standard stroke data is referred in MC1/G1/S1-series sample materials, and overrun is forbidden. Nut is made of wear-resistant tin bronze. Under the rated load, the service life is not less than 80000 times in full stroke, and transmission accuracy of the sliding screw pair can be well ensured. In case of failure of transmission precision, the linear device can be repaired or replaced.

滑动螺旋副通过高粘度特种润滑脂润滑，无需另外补充润滑剂。

The sliding helical pair is lubricated by high viscosity of special lubricant. It doesn't need to supplement lubricant in the normal usage.

线性推力装置安装时，应特别注意保证丝杠与阀杆的同轴度，以免造成阀门寿命的减少。

In the installation of the linear thrust device, the co-axiality between screw stem and valve stem is particularly assured to avoid the decrease of the valve life.

警告：当确认执行机构与阀门连接无误后，在调试前一定阅读本说明书的"调试部分"，特别注意全开位置和全关位置的设置方法，先点动后手轮操作。

Warning: In confirmation of correct connection between actuator and valve, reading the "commissioning part" in the operation manual before commissioning; pay special attention to setup method of open and closed position, operating by inching first and then by handwheel.

5.2 角行程联接/Part-turn Connection

D+R 执行机构输出为多回转型式

D+R actuator is in multi-turn mode.

根据扭矩不同和旋转角度不同（90~360*n°），输出范围为：

According to different torque and rotary angle(90~360*n°), the output scope is as follows:

100~2000Nm，100Nm 以内勿需增加任何减速机构；100~2000Nm 是单级或多级行星减速箱。

100~1200Nm: It needs not to add any reducer within 100Nm;100~2000Nm: It is the single-stage or multistage planetary gearbox.

角行程动力输出端口尺寸遵照 ISO5200 标准（尺寸详见 MC1/G1/S1 系列样本）。

The dimension of part-turn PTO (power take-off) port is in accordance with the ISO5200 standard (The detailed dimension is referred in MC1/G1/S1-series samples).

在未提前说明的情况下，1200Nm 以下只提供“◇”连接端口。请根据标准规定的端口方向正确连接，确保执行机构的安装方向整齐美观（执行机构垂直或平行于管道）。

Without prior instructions, it only provides “◇” connecting port below 1200Nm. Please connect correctly according to the port direction clearly specified in the standard and assure the tidiness and beauty of installation direction of actuator (The actuator is parallel to or vertical to the pipe).

警告：当发生阀杆外四方与执行机构输出端的内四方方向不一致时，需另加工一个双头连接件（一端外方另一端内方，分别与执行机构和阀杆相连），双头连接件与阀门和执行机构连接后，应保证传动角度爬行不超过 0.2°。

Warning: When the outer square direction of valve stem differs from the actuator’s inner square direction, it needs to process another double-end connecting piece (one end is square internally and the other end is square externally, respectively connected with the actuator and valve stem); ensure the crawling transmission angle does not exceed 0.2 degrees, when the double-end connecting piece is connected with valve and actuator.

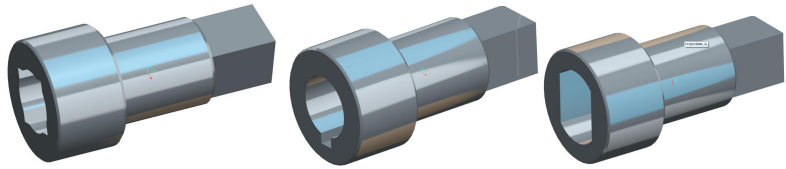


图 3-1 双头连接件

Drawing 3-1 Double-end connecting piece

当阀门与执行机构确保连接无误，松开两个 90 度行程限位螺栓后，

方可进行先点动后手动的方式调试，在未提前说明时，执行机构设置输出角度为 92°。在调试完毕后，拧紧限位螺栓，并锁紧防松螺母。

In confirmation of correct connection between valve and actuator, loose two bolts of 90 degrees stroke limitation; inching first, and then commissioning manually can be operated. Without prior instructions, output angle of actuator is 92 degrees. After the completion of commissioning, tighten the limit bolt and lock-nut.

对不按规定操作或无机械基础者操作，造成的损失 D+R 概不负责。

In case of any damages are in violation of stipulations or by unskillful operators, D+R does not bear any responsibility.

6 电气联接/Electric connection

警告：执行机构在接通电源前，请确认接地线是否已可靠接地。

Warning: Before connection of actuator with the power supply, please confirm the reliable grounding of grounding wire.

警告：电气连接必须在断电状态下进行，连接之前一定要检查电源形式(电压和频率等)和电机参数是否与本机要求一致。

Warning: The electric connection must be made under power off status; before connection, please inspect the power mode (voltage and frequency) and motor parameters for conformity with the requirements.

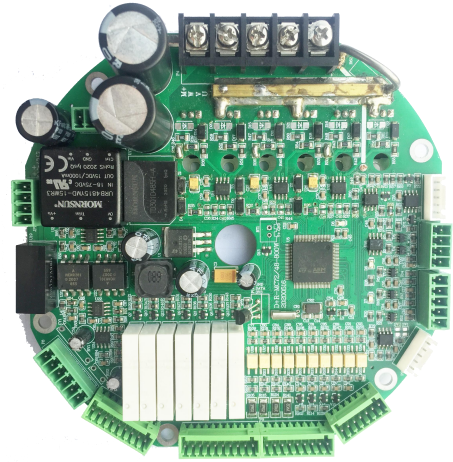
警告：电气设备的安装和连接只能由具备相应资质的受过专业培训的电气技术人员完成，严格按照相应规范进行操作。

Warning: The qualified and well-trained electric personnel are designated for the installation and connection of electric equipment in strict accordance with the codes.

6.1 高度集成 CPU 控制模块/High-integrated CPU control module

D+R MC 系列控制模块采用 ARM 32 位集成芯片，其特点：功能强大、计算速度快、控制精度更高。

D+R MC series control module adopts ARM 32-digit integrated chip, featuring powerful function, Powerful function, fast computing speed and higher control precision.



6.2 接线端子排/Wiring terminal block

1．D+R MC 系列执行器接线端子仓有四个 M20×1.5 进线入口，可根据进线位置自由选择，未使用端口需保留原堵塞不得松动。

D + R MC series actuator terminals have four M20 * 1.5 inlet lines, which can be freely selected according to the line of entry, and the original blockage must be retained without using the port.

2．请按照序号对应内容，分别接入电缆（表 6 - 3 - 1）。

强烈建议信号线采用屏蔽电缆，电源线和信号线分孔进入，以免造成干扰。

Please connect the cable according to the serial number(Table 6 - 3 - 1)。

It is strongly recommended that the signal line be separated by shielding cable, power cable and signal cable to avoid interference.

3．电缆接头防水处理。

Waterproofing of cable joints。

6.3 接线端子定义/Definition of wiring terminal

表 6 - 3-1　外置接线端子定义/Terminal Definition

1	24VDC 输出 +	1	24VDC output +
2	24VDC 输出 -	2	24VDC output -
3	开关量-关 (24VDC+)	3	CLOSE（24VDC+）
4	开关量-开(24VDC+)	4	OPEN（24VDC+）
5	开关量-停 (24VDC+)	5	STOP（24VDC+）
6	开关量-ESD (24VDC+)	6	ESD（24VDC+）
7	开关量-公共端(24VDC-)	7	COM (24VDC-)
8	继电器输出 K1-NO	8	Relay K1-NO
9	继电器输出 K1-COM	9	Relay K1-COM
10	继电器输出 K2-NO	10	Relay K2-NO
11	继电器输出 K2-COM	11	Relay K2-COM
12	继电器输出 K3-NO	12	Relay K3-NO
13	继电器输出 K3-COM	13	Relay K3-COM
14	继电器输出 K4-NO	14	Relay K4-NO
15	继电器输出 K4-COM	15	Relay K4-COM
16	继电器输出 K5-NO	16	Relay K5-NO
17	继电器输出 K5-COM	17	Relay K5-COM
18	Mod Bus A	20	Mod Bus A
19	Mod Bus B	21	Mod Bus B
20	Mod Bus GND	22	Mod Bus GND
25	PE	25	PE
26		26	
27	L	27	L
28	N	28	N

警告：未接线时，请勿松动接线端子仓堵塞，以防进水，湿气等，非专业人员不得进行从事本接线工作，否则由此造成的后果 D+R 不予保修。

Warning: Please fasten the plug of wiring terminal before wiring to prevent water and humidity; it is forbidden for irrelevant personnel to execute the wiring; otherwise D+R does not bear maintenance and servicing responsibilities.

表 6 - 3-2　内置接线端子定义/Terminal Definition

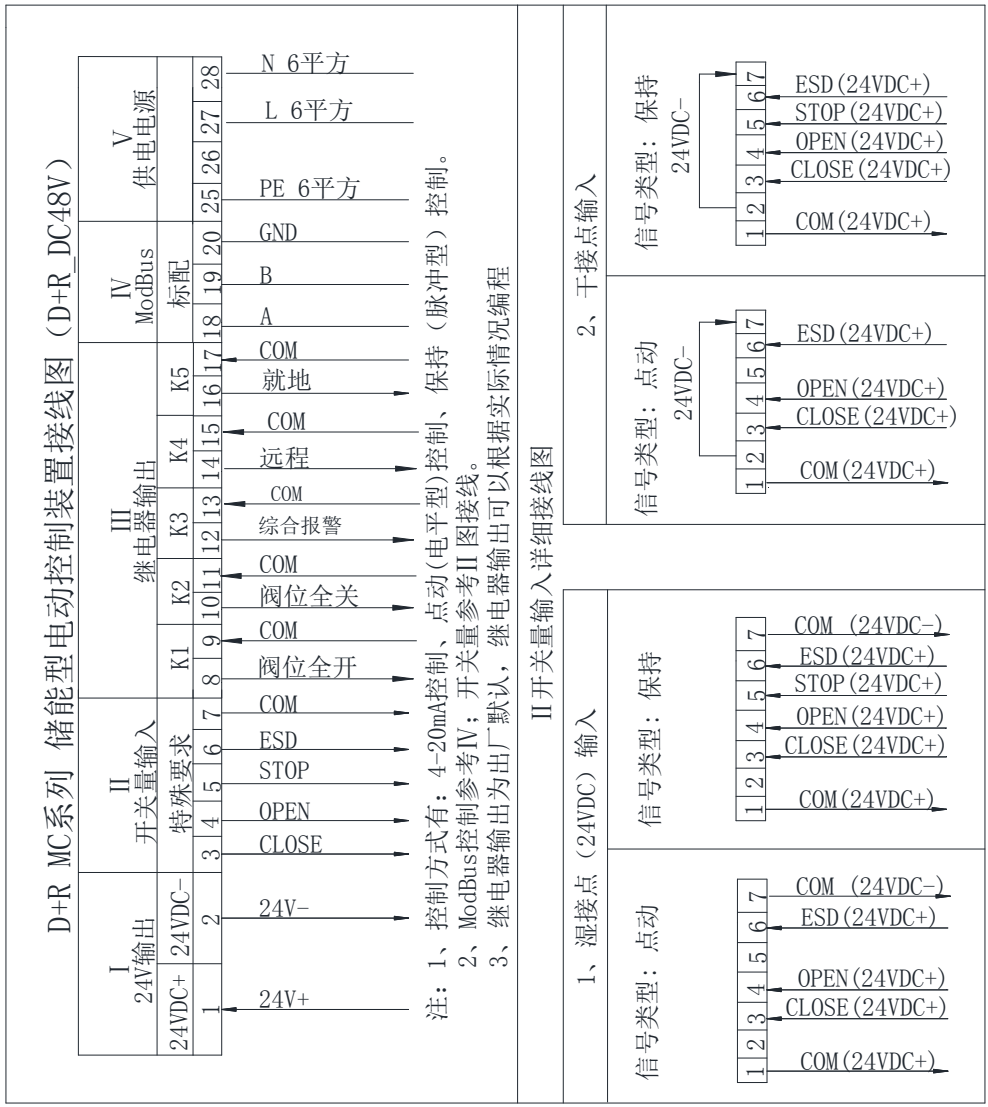
1	24VDC 输出 +	1	24VDC output +
2	24VDC 输出 -	2	24VDC output -
3	开关量-关 (24VDC+)	3	CLOSE（24VDC+）
4	开关量-开(24VDC+)	4	OPEN（24VDC+）
5	开关量-停 (24VDC+)	5	STOP（24VDC+）
6	开关量-ESD (24VDC+)	6	ESD（24VDC+）
7	开关量-公共端(24VDC-)	7	COM (24VDC-)
8	继电器输出 K1-NO	8	Relay K1-NO
9	继电器输出 K1-COM	9	Relay K1-COM
10	继电器输出 K2-NO	10	Relay K2-NO
11	继电器输出 K2-COM	11	Relay K2-COM
12	继电器输出 K3-NO	12	Relay K3-NO
13	继电器输出 K3-COM	13	Relay K3-COM
14	继电器输出 K4-NO	14	Relay K4-NO
15	继电器输出 K4-COM	15	Relay K4-COM
16	继电器输出 K5-NO	16	Relay K5-NO
17	继电器输出 K5-COM	17	Relay K5-COM
18	Mod Bus A	20	Mod Bus A
19	Mod Bus B	21	Mod Bus B
20	Mod Bus GND	22	Mod Bus GND
25	PE	25	PE
26		26	
27	L	27	L
28	N	28	N

警告：未接线时，请勿松动接线端子仓堵塞，以防进水，湿气等，非专业人员不得进行从事本接线工作，否则由此造成的后果 D+R 不予保修。

Warning: Please fasten the plug of wiring terminal before wiring to prevent water and humidity; it is forbidden for irrelevant personnel to execute the wiring; otherwise D+R does not bear maintenance and servicing responsibilities.

6.4 接线示意图/ Complete wiring diagram

表 6 - 4-1　外置接线示意图



Outside 6-4-1 External Wiring Diagram

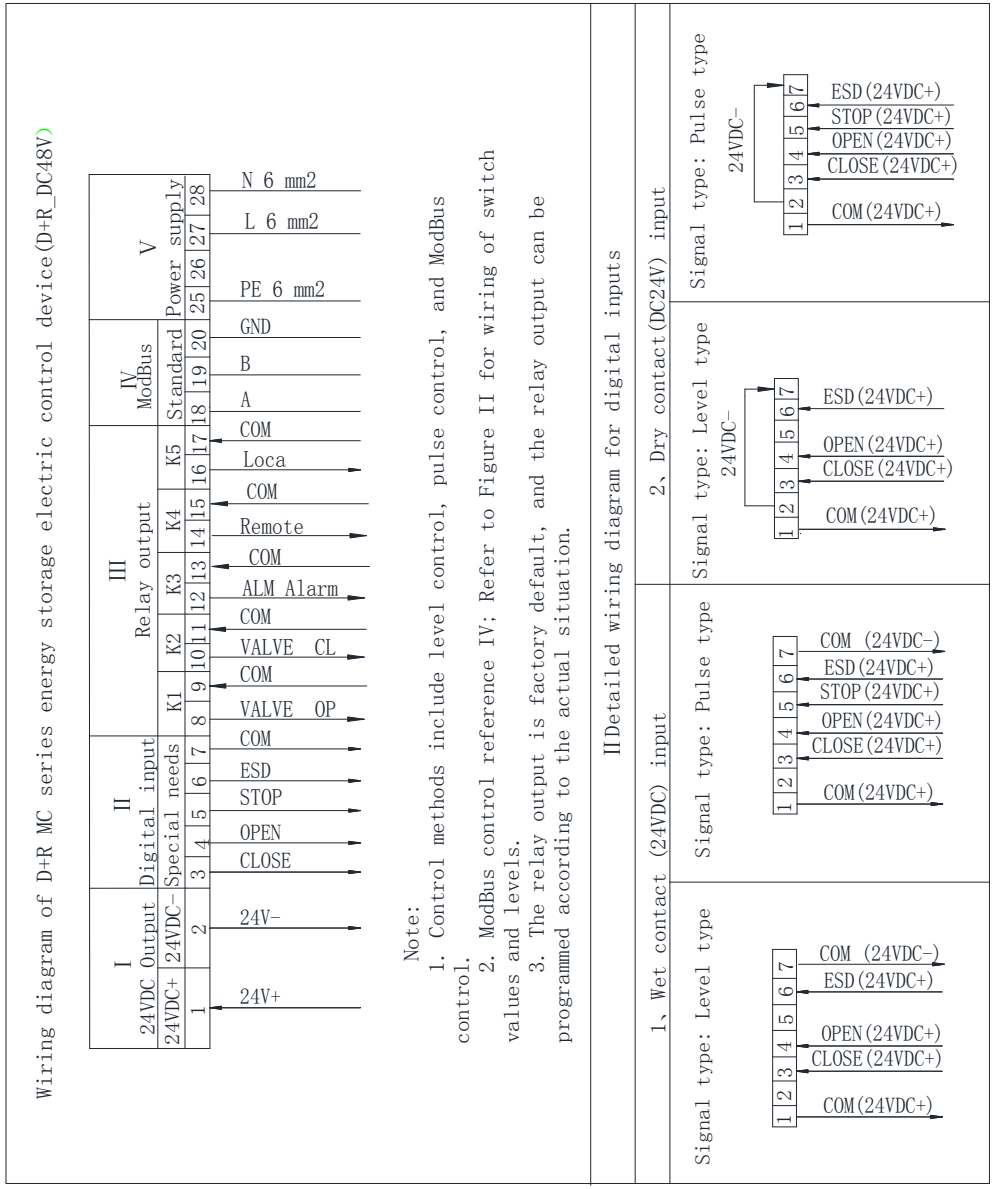
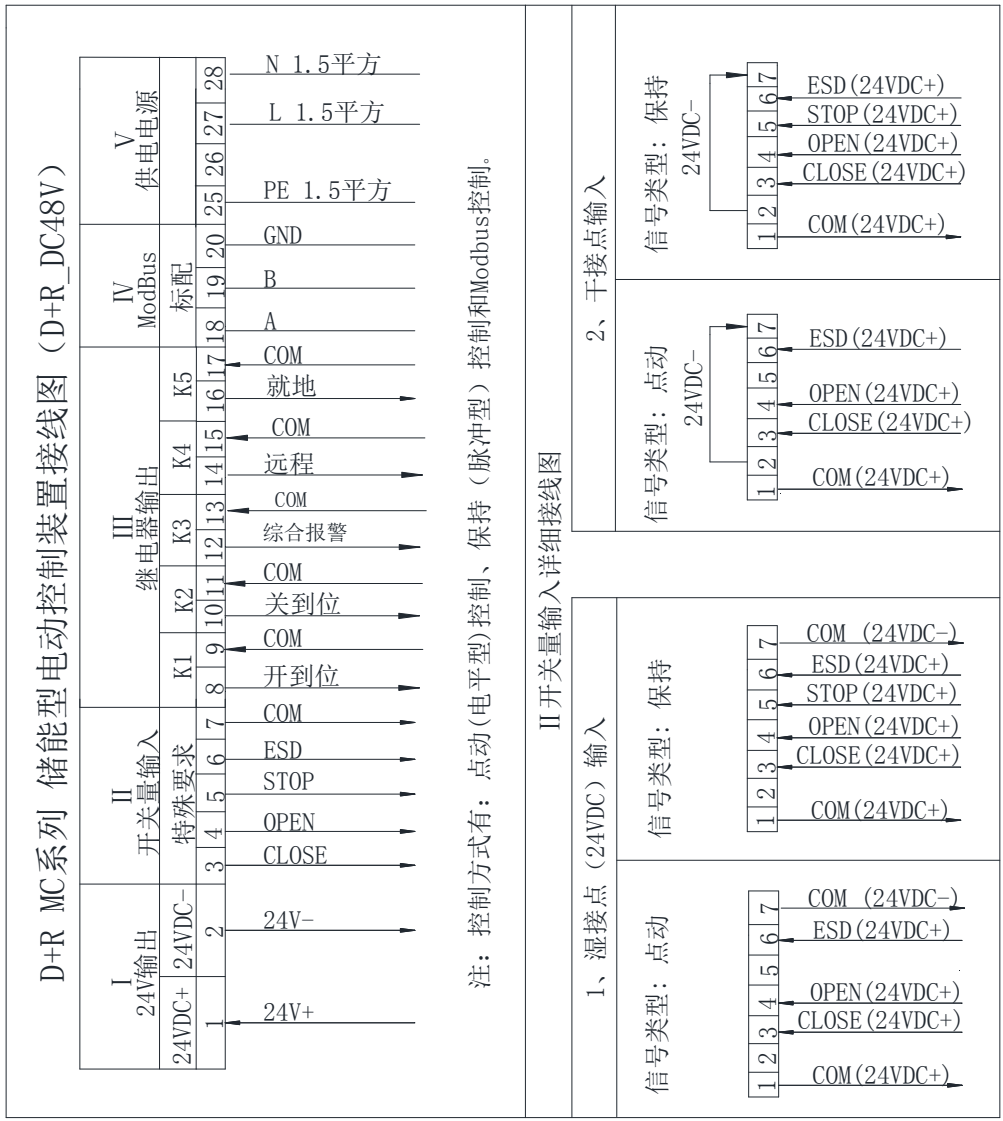
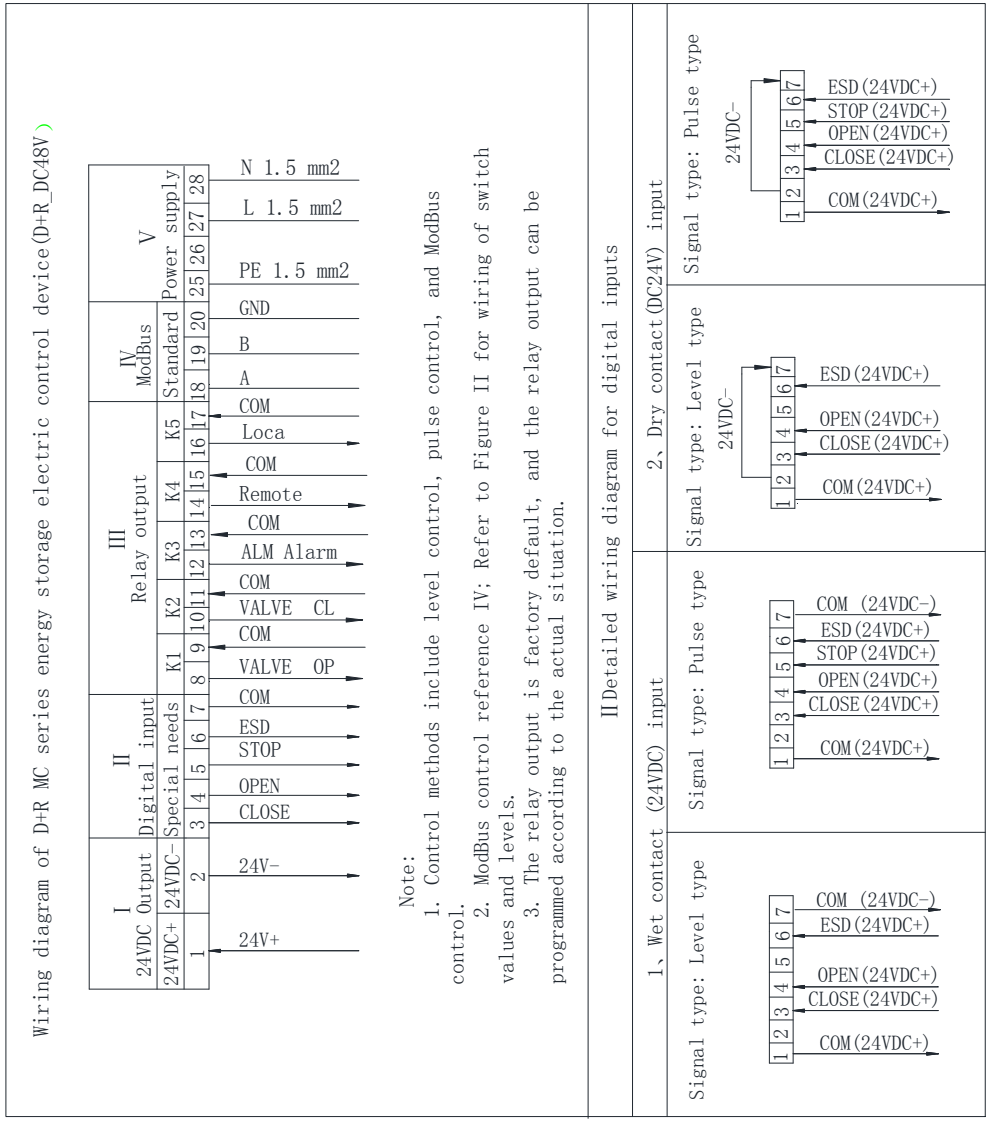


表 6-4-2　内置接线示意图



Outside 6-4-2 External Wiring Diagram



7 设备维护和保养/Maintenance and Servicing of Equipment

7.1 设备维护周期/Equipment Maintenance Cycle

在正常使用情况下，D+R MC 系列电动执行机构是免维护的，但是少量的日常维护是必须的。

Under normal usage, D+R MC series electric actuator is free from maintenance; however, a small amount of daily maintenance is necessary.

产品在长期存放中，会在电动执行机构的法兰面和密封面上渗有少量的润滑油脂，这不会影响产品的寿命和使用，但为了确保设备的正常可靠运行，请定期做一次运行测试。

In the long-term storage, a small amount lubricant oil may be leaked on the flange and sealed surface of electric actuator, which will not influence the life time and normal usage of products. However, in order to ensure the normal and reliable operation of equipment, please make regular operating test.

当您使用的 D+R 产品出现您解决不了的故障，请您立即与我们办事处、代理商联系，我们将在最短的时间内给您圆满解决问题。

Please contact our office or agency whenever you encounter any unmanageable fault, and we promise to settle the problem within the shortest time.

7.2 润滑/Lubrication

D+R MC 系列电动执行机构在正常使用条件下，整个寿命周期内无须额外的润滑。所使用的润滑油脂为添加二硫化钼的多用途高级润滑油。如需购买请及时与 D+R 中国办事处或各级代理商联系。

Under normal usage, D+R MC series electric actuator does not require for additional lubrication within the whole use life. The lubricant refers to multi-purpose senior lubricant containing molybdenum disulfide. Please contact with D+R Chinese office or agent at various levels for procurement.

8 故障信息及处理一览表/List of Fault Information and Settlement

故障情况 Faults	可能故障原因 Possible Reasons	故障处理 Solutions
不能开机（指示灯或 OLED 不显示） It can not be started (indicating light or OLED does not display).	无供电电源或电源不符合要求 There is no power supply or the power fails to meet the requirements.	检查电源和接线端子接线的正确性和可靠性。 Inspect the power supply and wiring terminal for correct and reliable wiring.
	控制电路保险丝熔断或回路开路 Fuse of control circuit is fused or loop is open.	检查电路或更换保险 Inspect the circuit or replace the fuse.
开机后，给定指令，执行机构不动作 Upon start and issuing command, the actuator has no operation.	“全开位置”和“全关位置”数据相等 “Open_Pos/Open position” and “Close_Pos”/Closed position” are equivalent.	进入设置菜单检查数据，并修改。 Enter into the setting menu, inspect and revise the related data.
	电机绕组烧毁 The motor winding is burnt out.	更换电机或维修 Replace or repair the motor.
	电机超温保护 The motor suffers from over temperature protection.	电机降温 Cool down the motor.
	开限位、关限位 Limit switches in open/close direction.	反向运转后正常 Operate reversely and become normal.
手动操作时执行机构不动作或很难动作 In the manual operation, the	传动轴承卡涩 The transmission shaft is blocked.	维修或更换 Repair or replace
	阀杆和执行机构输出轴不同轴 Valve stem and actuator’s output shaft are not co-axial.	维修或更换 Repair or replace

actuator has no operation or suffers from operation difficulty.	阀门卡涩或损坏 The valve is blocked or damaged.	维修或更换 Repair or replace
	传动齿轮没有润滑 The transmission gear isn't lubricated.	进行加油润滑 Add lubricant
电机工作时，阀门不动作 In the normal operation of motor, the valve has no operation.	传动齿轮脱离或损坏 The transmission gear is stripped or damaged.	维修或更换 Repair or replace
	电机轴承损坏或卡涩 The motor shaft is blocked or damaged.	维修或更换 Repair or replace
	阀门卡涩或损坏 The valve is blocked or damaged.	维修或更换 Repair or replace
	阀门轴、阀杆的驱动螺母损坏 The driving nut of valve shaft and valve stem is damaged.	维修或更换 Repair or replace

9 Modbus 通讯协议

电动执行器与 DCS 控制系统数字通信可使用 MODBUS RTU 协议，物理上可通过 RS485 差分信号传输，波特率 9600。

通信数据帧格式如下：

从设备地址（1 字节）+功能码（1 字节）+数据区长度（1 字节）+数据内容（字节数由数据区长度设定）+CRC16 校验值（2 个字节，MSB）

说明：从地址范围 1~254，可在前面板设置执行器通信地址。

功能码定义表：

功能码	数据长度（字节）	功能描述	解析
01H	2	查询开度值	返回 2 个字节为当前位置千分比，如 01 F4 表示目前处于 50.0%开度。
02H	2	查询给定开度	返回 2 个字节当前控制目标开度值千分比。
03H	1	查询控制源	返回当前设定的控制源类型： 00H:就地控制 01H:4-20mA 控制 02H:点动型开关控制 03H:保持型开关控制 04H:二线制常开开关控制 05H:二进制常闭开关控制 06H:modbus 数字接口控制
04H	1	查询运行状态	电机当前运行状态： 01H:开阀 02H:关阀 03H:停止
05H	1	查询开关到位状态	返回位置到位告警信号： bit0:全开到位

			bit1:全关到位 bit2:指定位置到位
06H	4	查询故障告警状态	返回两个字节故障告警: bit0:开阀堵转 bit1:关阀堵转 bit2:一级开过力矩告警 bit3:一级关过力矩告警 bit4:二级开过力矩告警 bit5:二级关过力矩告警 bit6:开阀拒动 bit7:关阀拒动 bit8: 预留 bit9: 位置传感器随动异常 bit10:自检失败 bit11-bit15:预留 bit16: 4-20mA 断线 bit17:驱动模块异常 bit18:预留 bit19:交流主电源失电 bit20:电机霍尔异常 bit21:编码器通信异常 bit22:超级电容容量异常 bit23:电机过热 bit24:存储器错误 bit25:电源模块过热 bit26-bit31:预留
07H	3	查询力矩值	返回 2 个字节力矩值+一个字节单位，单位定义： 00H:单位 N

			01H:单位 Nm 02H:单位 KN
08H	2	查询转速	转速单位 rpm
09H	2	查询超级电容电压	超级电容电压单位 0.1V，如 01 CC 表示超级电容电压 46.0V
0AH	2	超级电容容量	返回 2 个字节超级电容容量值千分比。
0BH	2	电机工作电流	单位 mA
0CH	2	箱体温度	单位 0.1℃ 250.0℃以上无效
0DH	2	自检状态查询	第一个字节自检序列定义： 00H:未自检 01H:向自检目标位置运行中 第二个字节自检结果定义： 00H:自检未进行 01H:自检成功完成 02H:自检序列执行失败
21H	1	设定开关停控制（信号类型选择 modbus，并且处于远程时有效）	控制字定义： 01H:全开 02H:全关 03H:停车
22H	2	设定目标开度值（信号类型选择 modbus，并且处于远程时有效）	给定目标开度值千分比数据，如发送数据 03 E8 表示给定电机运行到 100.0%位置
23H	1	复归故障告警（信号类型选择 modbus，并且处于远程时有效）	写此命令执行器对记忆性的故障进行清除，包含以下故障类型： 开阀堵转 关阀堵转 一级开过力矩告警 一级关过力矩告警 二级开过力矩告警 二级关过力矩告警

			开阀拒动 关阀拒动 位置传感器反向运行 位置传感器随动异常 自检失败

D+R 电动执行机构分为 F、G、HW、MT、MC 五个系列，适用于不同的用户。四十年的品质和近乎理想的控制性能与精度，赢得了世界范围广大用户的一致认可和支持。D+R 电动执行机构的生产、销售、服务都严格按照 IS09001 质量体系和 IS05211 标准执行。

D+R electric actuator includes five series: F, G, HW, MT and MC, etc., which are applicable to different users. Forty-year quality and almost ideal control property and precision have won unanimous recognition and support of worldwide users. The production, sales and service of D+R electric actuator are in strict accordance with IS09001 quality system and IS05211 standard.

2005 年 D+R 在全球率先推出直流无刷无级调速电动执行机构(S、G、MC 系列)，各种技术性能指标全面超过采用交流及交流变频调速执行机构。特别适用于要求输出力大、动作频率、调节精度高、反应速度快、快开快关场所。

In 2005, D+R launched DC brushless stepless variable speed electric actuator as first of its kind in the world (S、G 、MC series); various technical properties and indicators have exceeded AC and AC variable frequency & speed actuators. It is particularly applicable to the areas with large output force, high action frequency, high adjustment precision, swift response and fast opening/closing.

D+R 电动执行机构广泛应用于电力/核电、冶金、有色、石油、化工、制药、造纸、市政、轻工、铁路等行业。

D+R electric actuator is widely applied in the power/nuclear power, metallurgical, non-ferrous, petroleum, chemical engineering, pharmaceutical, paper making, municipal, light industry and railway industries.

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The operation instruction manual is extracted and translated by D+R China Office, Daume (Shanghai) Control Technology Co., Ltd., and the final interpretation right belongs to us. Please contact us whenever you encounter any problem; we reserves the right to change the above statement without prior notice!

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