产品说明书
Product Manual

VF04E限位开关
VF04E limit switch



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Chongqing Chuanyi Control Valve Co., Ltd.

用户须知

User instructions

- 产品在通电前，外壳须可靠接地。
- The housing must be reliably grounded before the product is powered on.
- 断电源后开盖。
- Open the cover after the power is cut off.
- 引入电缆为橡胶皮护套电缆，拧紧压紧螺母，使密封套内径紧紧抱住电缆护套。密封套、电缆护套老化，需及时更换。
- The lead-in cable is a rubber sheathed cable. Tighten the gland nut so that the sealing sleeve bore holds tightly to the cable sheath. The sealing sleeve and cable sheath shall be replaced in time after aging.
- 安装现场不存在对铝合金有腐蚀作用的有害气体。
- There shall be no harmful gas corrosive to the aluminum alloy at the installation site.
- 用户安装使用和维护防爆限位开关时，必须遵守 GB50058-2014《爆炸危险环境电力装置设计规范》和 GB/T3836.15-2017 防爆标准的规定。
- The user shall install, use and maintain the flameproof limit switch in accordance with the provisions of GB50058-2014 *Code for Design of Electrical Installations in Explosive Atmospheres* and GB/T3836.15-2017 explosion-proof standard.
- 使用屈服应力≥700MPa 的紧固件（A2-70）
- Use the fasteners (A2-70) with the yield stress ≥700MPa
- 螺纹接口为隔爆螺纹，规格 M20×1.5-6H、NPT1/2、NPT3/4 长度 14.2mm，使用时必须配接螺纹规格已取得防爆合格证的隔爆接头。
- The threaded interface is flameproof thread, with the specification of M20×1.5-6H, NPT1/2 and NPT3/4 and the length of 14.2mm, and must be connected with flameproof joint whose thread specification has obtained the conformity certificate of explosion-proof when used.
- 电源线截面积≥1.5mm²、接地线截面积≥4mm²。
- Power cable cross-sectional area ≥1.5mm², ground cable cross-sectional area ≥4mm².
- 静电措施：清洁时，仅使用湿抹布等。
- Electrostatic measures: Use only wet rags for cleaning.

一、 概述

I. Overview

VF04E 限位开关是自控系统中检测阀门状态的一种现场仪表，用以将阀门的开启或关闭位置以开关量的信号输出，被程控器接受或计算机寻访采样，确认后执行下一程序。该产品也可作为自系统中重要阀门联锁保护及远程报警指示之用。

The VF04E limit switch is a field instrument to detect the status of the valve in the automatic control system. It is used to output the opening or closing position of the valve as a switching signal, which is accepted by the program controller or searched and sampled by the computer before the next procedure after confirmation. The product can also be used for important valve interlock protection and remote alarm indication in the automatic control system.

其中，VF04E 限位开关可选用电感式接近开关，具有非接触、无磨损、寿命高、免维护的特点。

Among them, the VF04E limit switch can be non-contact, wear-free and maintenance-free inductance proximity switch with long life.

二、工作原理

II. Working Principle

限位开关检测的阀位转角位移，通过同轴连接件或反馈杆使传动轴产生旋转，让凸轮或感应片接近对齐电感式接近开关，从而使开关组件的触点闭合或断开，通过接线端子向外部传送电流信号，并通过指示器就地显示。

The valve position angle displacement detected by the limit switch rotates the drive shaft through the coaxial connector or the feedback rod, so that the cam or the sensor chip approaches the aligned inductance proximity switch and the contact of the switch assembly is closed or disconnected. The current signal is transmitted externally through the terminal and displayed locally through the indicator.

机械式限位开关检测的阀位转角位移，通过同轴连接件或反馈杆使传动轴产生旋转， 让凸轮触动微型开关，从而使开关组件的触点闭合或断开，通过接线端子向外部传送开关量信号，并通过指示器就地显示。

The valve position angle displacement detected by the mechanical limit switch rotates the drive shaft through the coaxial connector or the feedback rod, so that the cam touches the microswitch and the contact of the switch assembly is closed or disconnected. The switch signal is transmitted externally through the terminal and displayed locally through the indicator.

三、特征

III. Features

1、压铸铝合金壳体，粉末涂层，紧凑设计外型美观；

1. Die-cast aluminum alloy housing and powder coating, with compact design and beautiful appearance;

2、感应式限位开关符合 NAMUR 标准，最大限度的提高互换性；

2. The inductive limit switch meets the NAMUR standard to maximize the interchangeability;

3、防脱螺栓，拆装时螺栓附在上盖上不会脱落；

3. Anti-off bolt, which is attached to the top cover and will not fall off when disassembled;

4、环境温度：-40～+80℃，最低可达-50℃，防护等级：IP67；

4. Ambient temperature: -40～+80℃, lowest up to -50℃, protection grade: IP67;

5、同时具备气体防爆、粉尘防爆功能；

5. With gas explosion-proof and dust explosion-proof function;

6、双接线口，标准接点，接线安全、方便；

6. Double-port and standard contact, achieving safe and convenient connection;

7、“快速位置”凸轮，开关凸轮的位置不用工具即可进行快速调整；

7. “Fast position” cam; the position of the switch cam can be adjusted quickly without tools;

8、多接点端子排，8 个标准接点，最多可接两个电磁阀。

8. Multi-contact terminal block with 8 standard contacts, which can connected to at most two solenoid valves.

四、主要技术指标

IV. Main Technical Indicators

防护等级：IP67

Protection class: IP67

防爆标志：Ex db ⅡB/IIC T4· · · T6 Gb；

Explosion-proof mark: Ex db IIB/IIC T4···T6 Gb;

Ex ia ⅡC T4· · · T6 Gb；

Ex ib ⅢC T135℃ Db；

Ex tb ⅢC T135℃ Db.

环境温度：

Ambient temperature:

防爆标志 Explosion-proof mark	环境温度 Ambient temperature	防爆标志 Explosion-proof mark	最高表面温度 Maximum surface temperature
Ex ia ⅡC T4· · · T6 Gb	T4(-40℃/-50℃～+80℃)	Ex ib ⅢC T135℃ Db	T135℃
	T5：-40℃/-50℃～+60℃		
	T6：-40℃/-50℃～+45℃		
Ex db ⅡB T4 Gb	-40℃～+80℃	Ex tb ⅢC T135℃ Db	T135℃
Ex db ⅡB/ⅡC T4· · · T5 Gb	-40℃～+60℃		
Ex db ⅡB/ⅡC T4· · · T6 Gb	-40℃～+45℃		

开关：

Switch:

NJ2-V3-N×2，电感式，有源 8V ˙ DC，本安参数：Ui：16V Ii：52mA Pi：169mW Ci： 40nF Li:50uH；

NJ2-V3-N×2, inductive, active 8V˙DC, intrinsic safety parameters: Ui: 16V Ii: 52mA Pi: 169mW Ci: 40nF Li:50uH;

SN3,5-SN×2，电感式，有源 8V ˙ DC，本安参数：Ui：16V Ii：52mA Pi：169mW Ci： 40nF Li:50uH；

SN3,5-SN×2, inductive, active 8V˙DC, intrinsic safety parameters: Ui: 16V Ii: 52mA Pi: 169mW Ci: 40nF Li:50uH;

BD2-S0-Q13-0.15M-DT，有源 8V ˙ DC，本安参数：Ui：15V Ii：30mA Pi：100mW Ci： 32nF Li:0.03mH；

BD2-S0-Q13-0.15M-DT, active 8V˙DC, intrinsic safety parameters: Ui: 15V Ii: 30mA Pi: 100mW Ci: 32nF Li:0.03mH;

switch×2， 机械式，0.1A 24V • DC（直流）；5A 220V • AC（交流）。

switch×2, mechanical, 0.1A 24V·DC; 5A 220V·AC.

关联设备：KFD2-SR2-2.W.SM(ia)隔离式安全栅

Associated apparatus: KFD2-SR2-2.W.SM(ia) isolated safety barrier

执行标准：Q/CY 94，GB/T3836.1-2021，GB/T3836.2-2021，GB/T3836.4-2021

Executive standards: Q/CY 94, GB/T3836.1-2021, GB/T3836.2-2021, GB/T3836.4-2021

接线端子数：8P

Number of terminals: 8P

电气接口：2-M20×1.5、2-NPT1/2、2-NPT3/4

Electrical interface: 2-M20×1.5, 2-NPT1/2, 2-NPT3/4

指示位置：开---绿；关---红

Indicating position: on -- green; off -- red

五、外形尺寸图

V. Overall Dimension Drawing

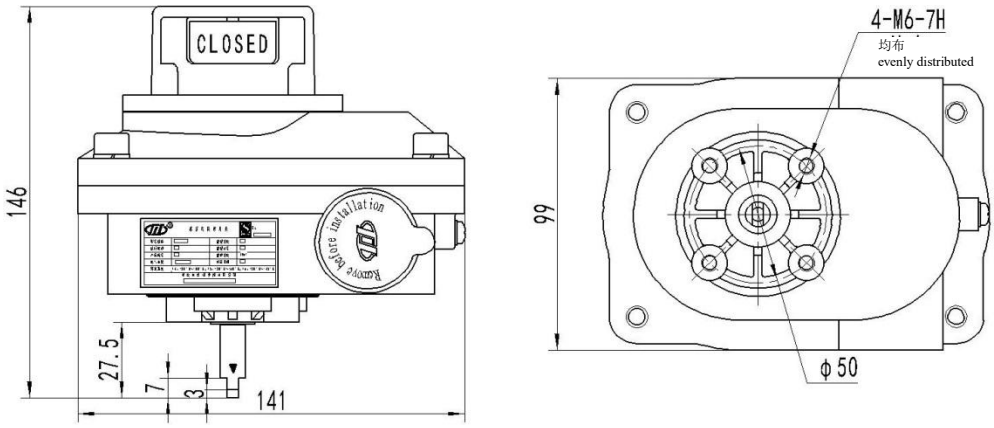


图 1 外形尺寸

Figure 1 Overall dimensions

六、接线示意图

VI. Wiring Diagram

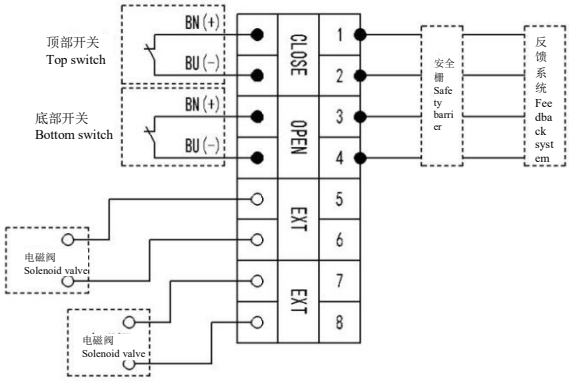


图 2 感应式限位开关接线图

Figure 2 Wiring diagram of inductive limit switch

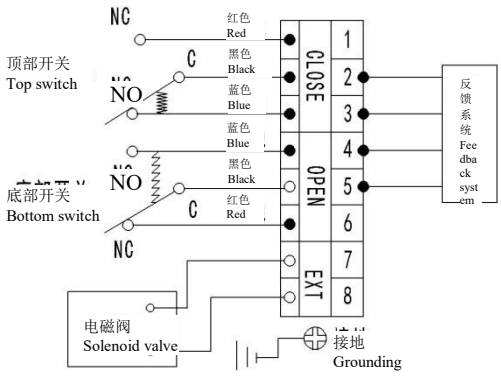


图 3 机械式限位开关接线图

Figure 3 Wiring diagram of mechanical limit switch

七、安装及使用

VII. Installation and Use

1、让阀门走到关的位置，调节红色凸轮，使“关”开关有信号输出；

1. Turn the valve off and adjust the red cam, so that the "off" switch has signal output;

2、让阀门走到开的位置，调节黄色凸轮，使“开”开关有信号输出；

2. Turn the valve on and adjust the yellow cam, so that the "on” switch has signal output;

3、让阀门来回走几次，确定限位开关信号通断可靠。

3. Open and close the valve several times to ensure that the limit switch signal is on/off reliably.

4、根据用户需要，在安全栅可设置输出开或输出关。

4. Output on or output off can be set in the safety grid as required.

八、订货须知

VIII. Ordering Instructions

1、若需其他形式的电缆接口请在其订单上注明；

1. For other forms of cable interfaces, please indicate on the order;

2、用户可根据使用要求订购防爆接头，并在其订单上注明；

2. The user can order the explosion-proof joint according to the requirements of use, and indicate on the order;

3、安装板适应于 30×130、30×80 安装尺寸的标准执行器；

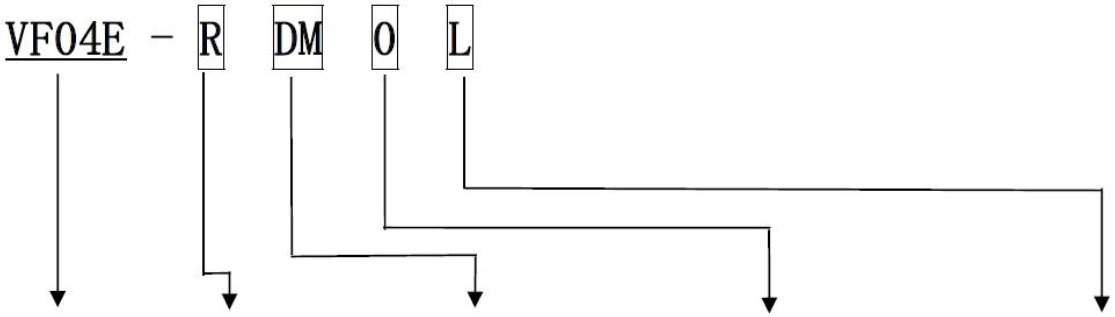
3. The mounting plate is suitable for standard actuators with the mounting dimension of 30×130 and 30×80;

4、 用户特殊要求可协商解决。

4. Special user requirements can be satisfied through negotiation.

九、型号说明

IX. Model Description



产品代码 Product code	行程分类 Travel classification		防爆形式/开关类型 Flameproof type/switch type		电气接口 Electrical interfaces		环境温度 Ambient temperature	
限位开关 Limit switch	R	角行程 Angular travel	DM	隔爆型/机械式 Flameproof/mechanical	0	M20x1.5	0	-40℃～+80℃
			DP	隔爆型/感应式 Flameproof/inductive	1	NPT 1/2	L	-50℃～+80℃
			AP	本安型/感应式 Intrinsically safe/inductive	2	NPT 3/4		
			FP	本安粉尘/感应式 Intrinsically safe dust type/inductive				
			TM	粉尘外壳/机械式 Dust enclosure type/mechanical				
			TP	粉尘外壳/感应式 Dust enclosure type/inductive				

注：1.环境温度 L 仅适用于本安型/本安粉尘型；

Note: 1. Ambient temperature L is only applicable to intrinsically safe/intrinsically safe dust type;

2.电气接口默认选择 NPT 3/4。

2. The default electrical interface is NPT 3/4.

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