

BM200-TR (VR、TC) 系列隔离式安全栅

BM200-TR (VR, TC) Series Isolated Safety Barrier

安装使用说明书 V1.3

Installation and Operation Instruction V1.3

安科瑞电气股份有限公司

Acrel Co., Ltd.

申 明

DECLARATION

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We reserve the right to change the specifications of the products described in this manual without prior notice. Before ordering, please consult your local distributor for new specifications of this product.

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1 概述

1 Overview

BM200 系列隔离式安全栅可以将危险区的热电阻、电位计信号隔离转换成对应的线性电压或电流信号输出至安全区，该产品需独立供电，输入/输出/电源三隔离。既可直接与指针表，数显表相接，也可以与自控仪表（如 PLC）、各种 A/D 转换器、以及计算机系统配接。

BM200 series isolated safety barriers can isolate thermal resistance and potentiometer signals from the hazardous area, convert them into corresponding linear voltage or current signals, and transmit them to the safe area. The product requires independent power supply, and the input/output/power supply should be isolated. It can be directly connected to pointer meters and digital display meters, and can also be connected to automatic control instruments (such as PLCs), various A/D converters, and computer systems.

2 执行标准

2 Executive standard

GB/T 3836.1-2021 《爆炸性环境 第 1 部分：设备 通用要求》

GB/T 3836.1-2021 “Explosive atmospheres—Part 1: Equipment—General requirements”

GB/T 3836.4-2021 《爆炸性环境 第 4 部分：由本质安全型 “i” 保护的的设备》

GB/T 3836.4-2021 “Explosive atmospheres—Part 4: Equipment protection by intrinsic safety i”

GB/T 28471.1-2012 《工业过程测量和控制系统用隔离式安全栅 第 1 部分：通用技术条件》

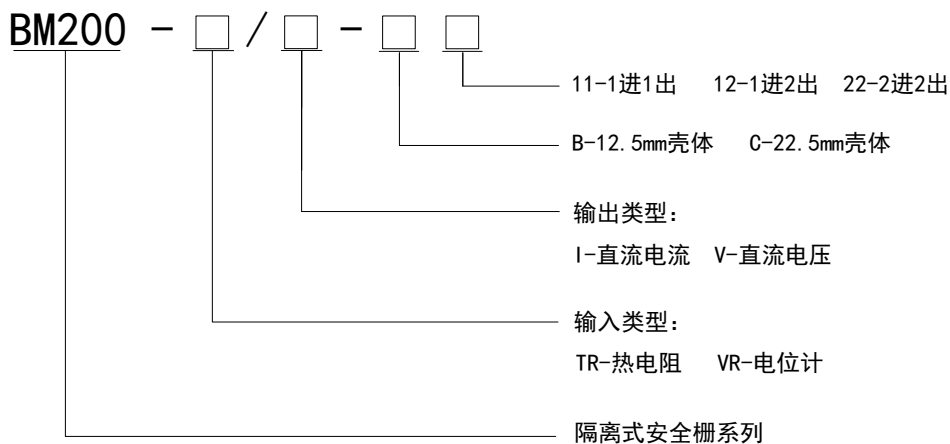
GB/T 28471.1-2012 “Isolated safety barriers for industrial process measurement and control systems—Part 1: General technical specification”

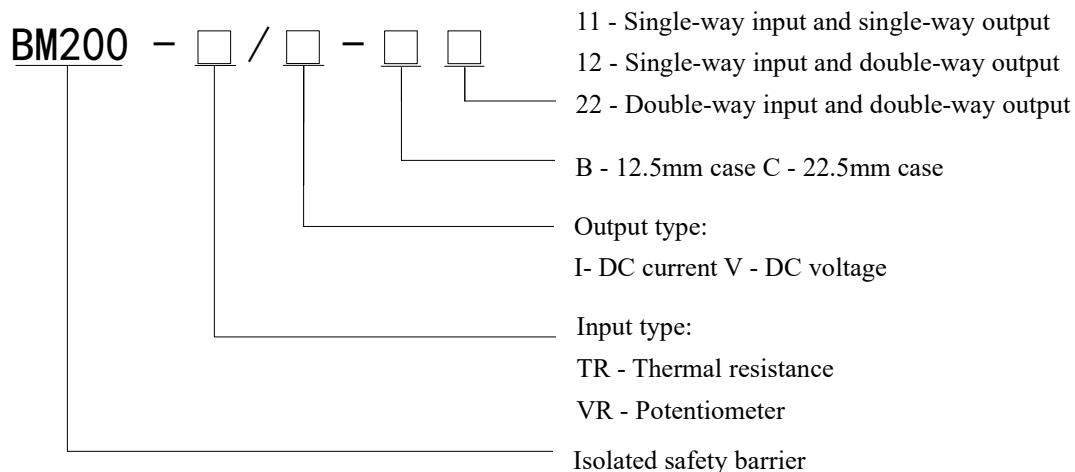
GB/T 28471.2-2012 《工业过程测量和控制系统用隔离式安全栅 第 2 部分：性能评定方法》

GB/T 28471.2-2012 “Isolated safety barriers for industrial process measurement and control systems—Part 2: Performance evaluation method”

3 产品型号

3 Type of products





4 技术参数

4 Technical parameter

型号 Type	BM200-TR/I-B11、BM200-TR/I-C12、BM200-TR/I-C22 BM200-TR/V-B11、BM200-TR/V-C12、BM200-TR/V-C22 BM200-VR/I-B11、BM200-VR/I-C12、BM200-VR/I-C22 BM200-VR/V-B11、BM200-VR/V-C12、BM200-VR/V-C22
通道类型 Channel type	1 进 1 出、1 进 2 出、2 进 2 出 single-way input and single-way output, single-way input and double-way output, double-way input and double-way output
输入类型 Input type	热电阻、电位计 thermal resistance, isolated safety barrier
输入信号 Input signal	Pt100: -200℃~850℃ (最小量程范围 50℃) 0~10KΩ (最小量程范围 1KΩ) Pt100: -200℃~850℃ (minimum range: 50℃) 0~10KΩ (minimum range: 1KΩ)
输出信号 Output signal	0~20mA /4~20mA (安全侧输出); 负载电阻: ≤550Ω 0~5V/0~10V/1~5V/2~10V (安全侧输出); 负载电阻: ≥30KΩ 0~20mA /4~20mA (safe side output); Load resistance: ≤550Ω 0~5V/0~10V/1~5V/2~10V (safe side output); Load resistance: ≥30KΩ
传输精度 Transmission accuracy	0.2%
温度漂移 Temperature drift	50ppm (电压输出为 100ppm) 50ppm (voltage output is 100ppm)
响应时间 Response time	1s 达到最终值的 90% 1s to reach 90% of final value
供电电压 Power supply	20~35V DC
功耗	24V 电源, 20mA 输出时: ≤70mA (一进一出) ≤125mA (一进两出)

Power consumption	$\leq 150\text{mA}$ (两进两出) 24V power supply, 20m output: $\leq 70\text{mA}$ (single-way input and single-way output) $\leq 125\text{mA}$ (single-way input and double-way output) $\leq 150\text{mA}$ (double-way input and double-way output)
使用环境温度 Work temperature	$-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$
储存温度 Storage temperature	$-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$
相对湿度 Relative humidity	$\leq 95\%RH$, 不结露, 无腐蚀性气体场所 $\leq 95\%$ (no condensation, no corrosive gas locations)
海拔 Altitude	$\leq 2500\text{m}$
防护等级 Protection level	IP20
重量 Weight	约 110g (12.5mm 壳体) 约 150g (22.5mm 壳体) about 110g (12.5mm case) about 150g (22.5mm case)
安装方式 Installation	导轨式安装 Din Rail installation
绝缘强度 Insulation strength	本安端与非本安端 $\geq 2500\text{V AC}$; 电源与非本安端 $\geq 500\text{V AC}$ intrinsically safe end and non-intrinsically safe end $\geq 2500\text{V AC}$; power supply and non-intrinsically safe end $\geq 500\text{V AC}$

5 认证参数

5 Certification parameter

证书号 Certificate number	2023322316005037
防爆标志 Explosion proof sign	[Ex ia Ga] II C
端子 Terminal	10、11、12 端子间 $\text{BM200-TR(VR)/I(V)-B11}$ 10, 11, 12 terminals 14、15、16 端子间 $\text{BM200-TR(VR)/I(V)-C12}$ 14, 15, 16 terminals 10、11、12/14、15、16 端子间 $\text{BM200-TR(VR)/I(V)-C22}$ 10, 11, 12/14, 15, 16 terminals
最大允许电压 Maximum allowable voltage	$U_m=250\text{V}$
电压 Voltage	$U_o=5.4\text{V}$
电流 Current	$I_o=20\text{mA}$
功率	$P_o=27\text{mW}$

Power	
电容 Capacitance	II C: Co=65uF II B: Co=1000uF II A: Co=1000uF
电感 Inductance	II C: Lo=80mH II B: Lo=300mH II A: Lo=600mH

6 安装与接线

6 Installation and wiring

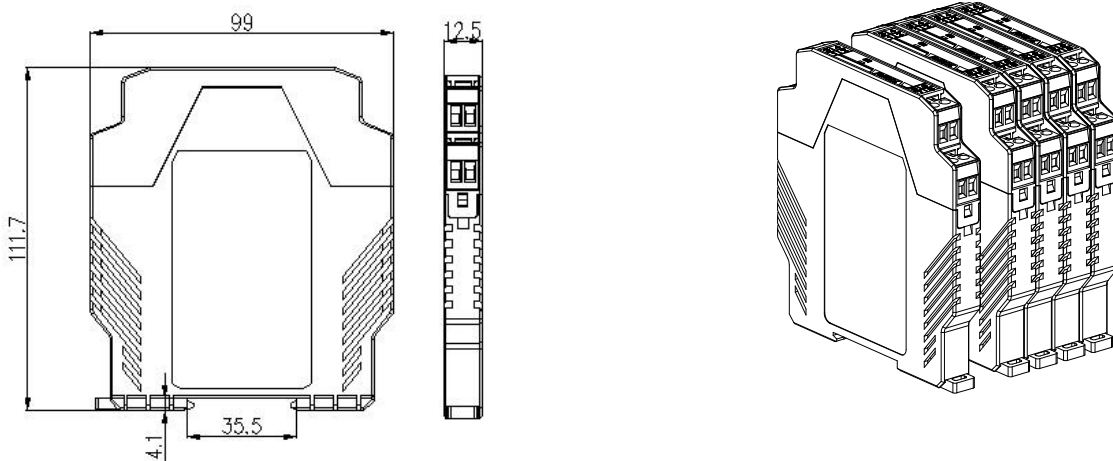
6.1 外形尺寸

6.1 Outline dimension

产品分类 Product	产品型号 Product type	外形尺寸 Outline dimension
BM200	BM200-TR/□-B11、BM200-VR/□-B11	99mm*112mm*12.5mm
	BM200-TR/□-C□2、BM200-VR/□-C□2	99mm*112mm*22.5mm

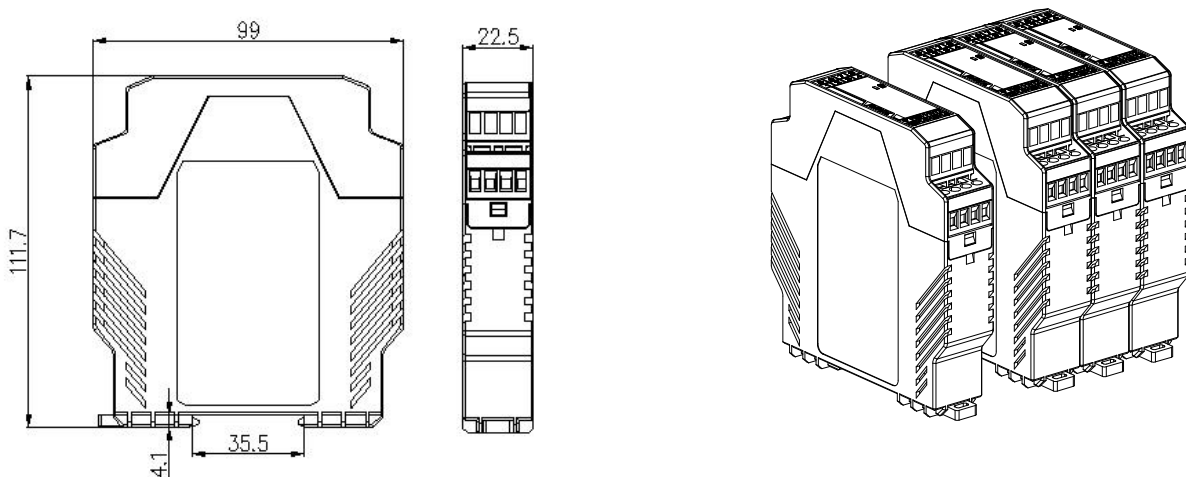
6.1.1 BM200-TR/□-B11、BM200-VR/□-B11 壳体尺寸图:

6.1.1 BM200-TR/□-B11、BM200-VR/□-B11 case dimension diagram:



6.1.2 BM200-TR/□-C□2、BM200-VR/□-C□2 壳体尺寸图:

6.1.2 BM200-TR/□-C□2、BM200-VR/□-C□2 case dimension diagram:



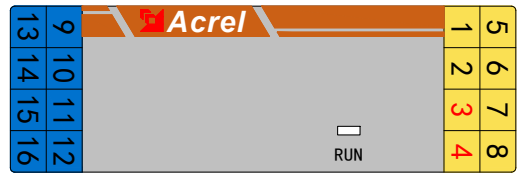
6.1.3 前面板示意图

6.1.3 Front panel diagram



前面板 1: 外形 B, 24V 供电

Front panel 1: appearance B, 24V power supply



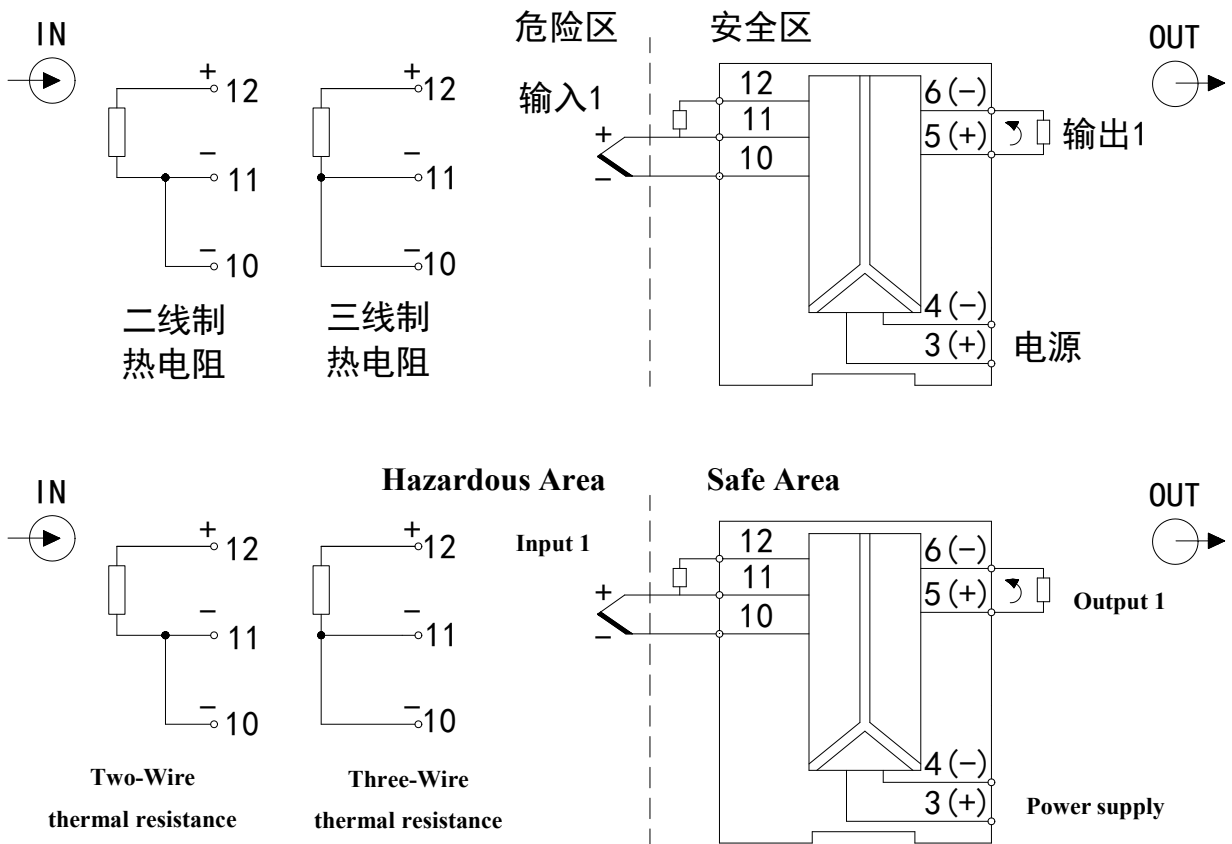
前面板 2: 外形 C, 24V 供电

Front panel 2: appearance C, 24V power supply

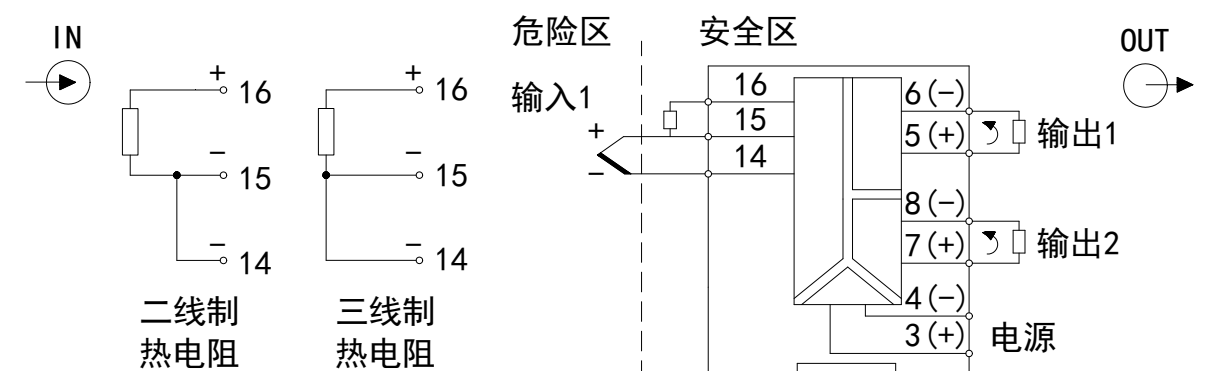
6.2 接线图

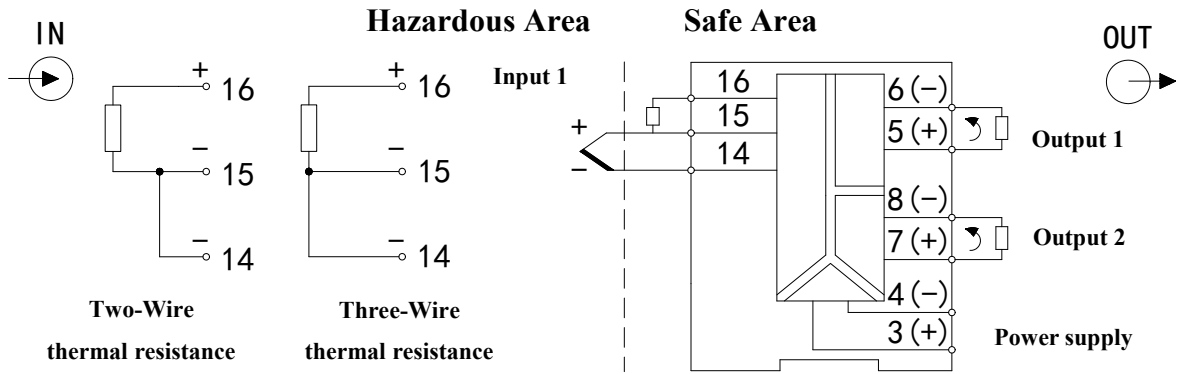
6.2 Wiring

6.2.1 BM200-TR/I-B11、BM200-TR/V-B11:

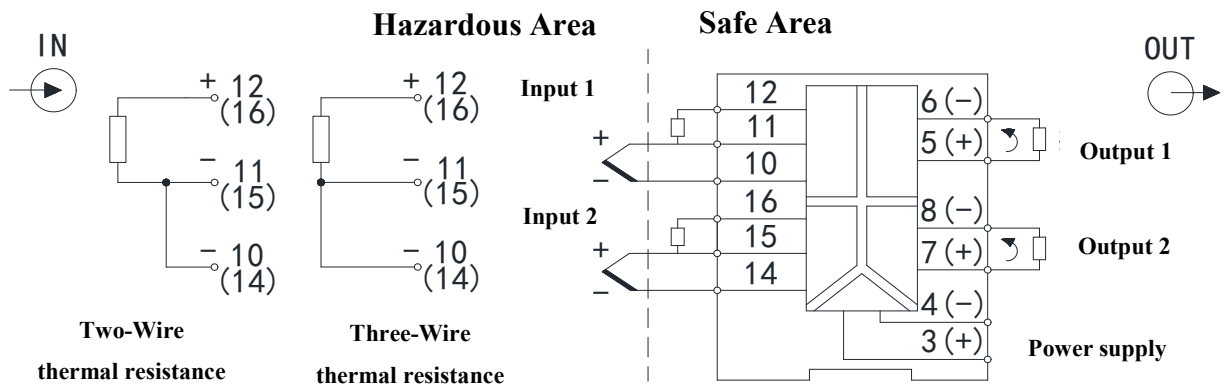
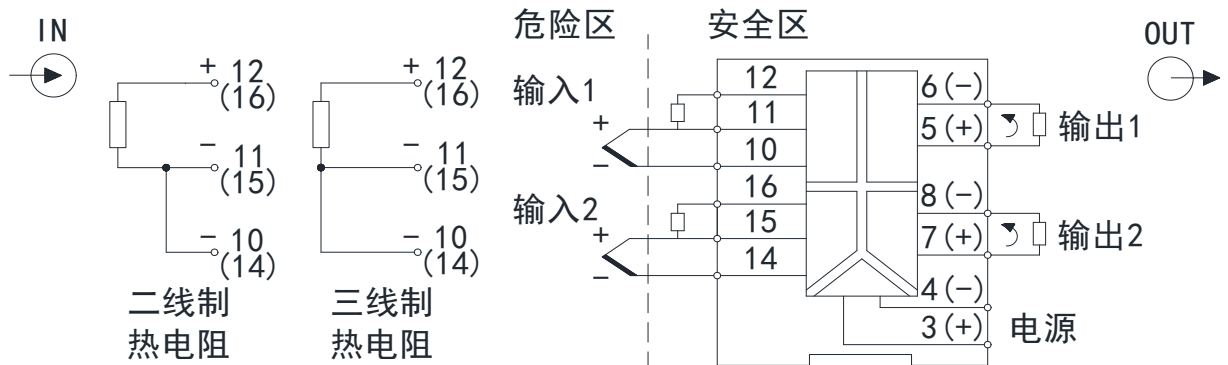


6.2.2 BM200-TR/I-C12、BM200-TR/V-C12:

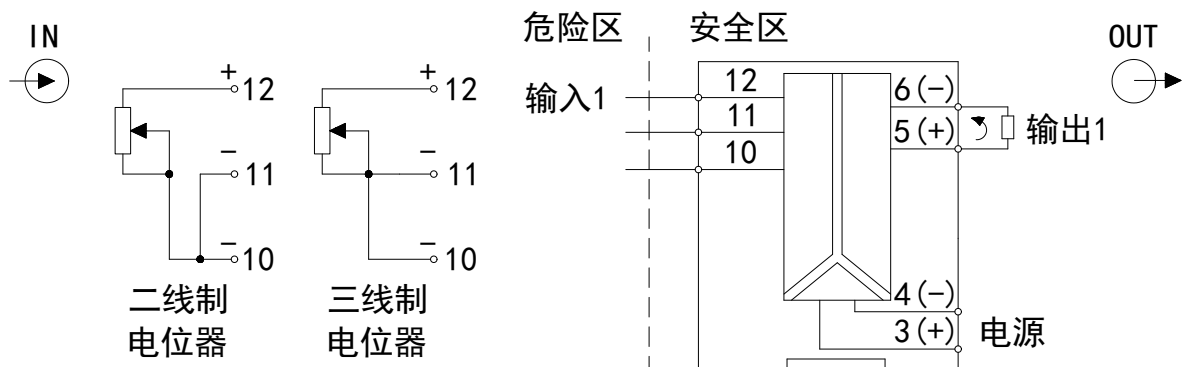


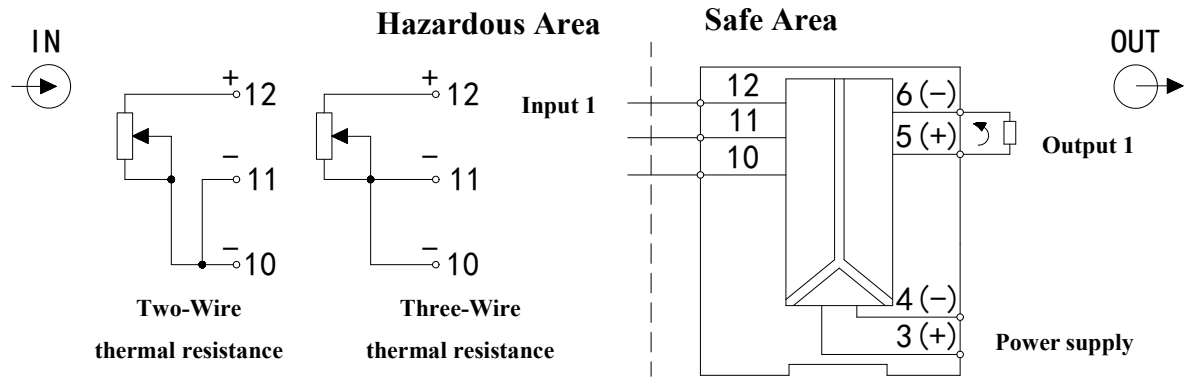


6. 2. 3 BM200-TR/I-C22、BM200-TR/V-C22:

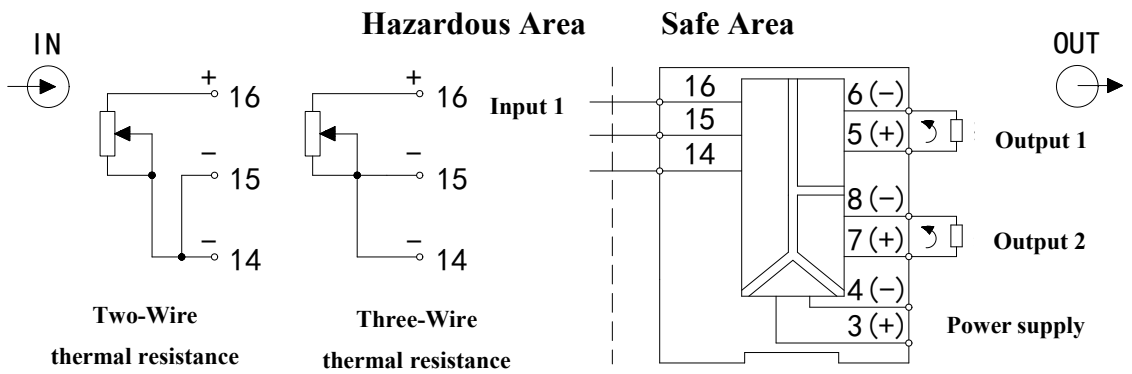
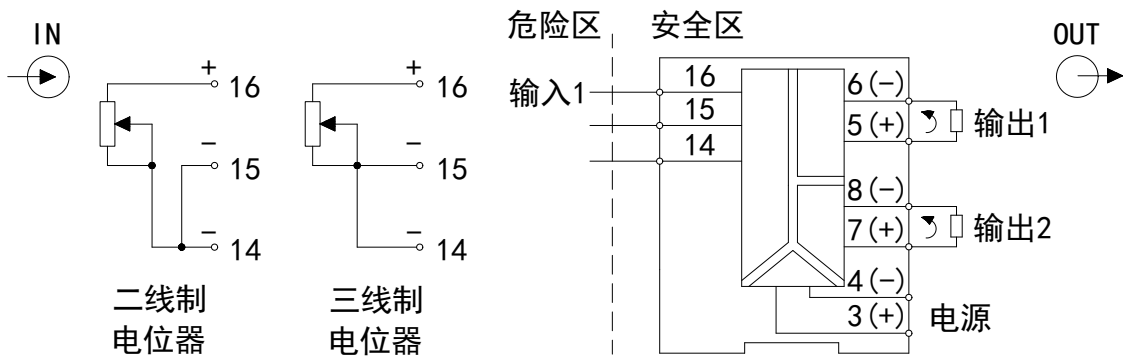


6. 2. 4 BM200-VR/I-B11、BM200-VR/V-B11:



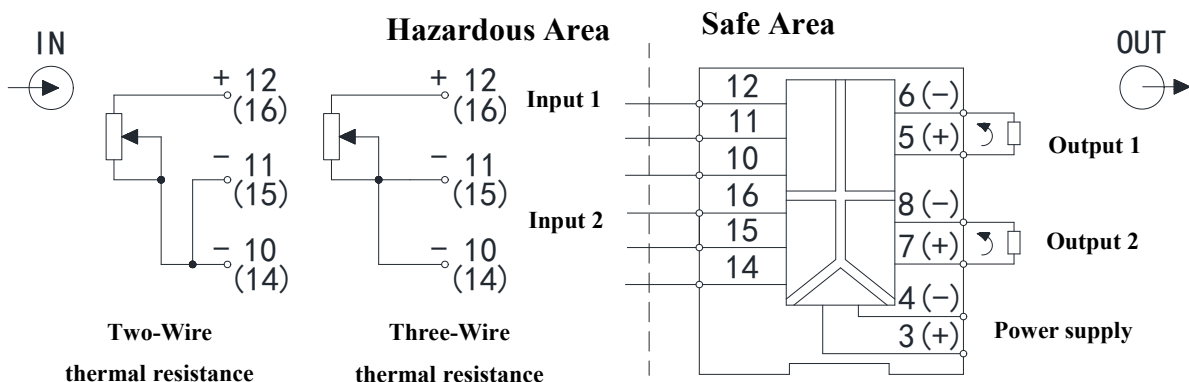


6.2.5 BM200-VR/I-C12、BM200-VR/V-C12:



6.2.6 BM200-VR/I-C22、BM200-VR/V-C22:





7 注意事项

7 Precaution

- 7.1 本产品符合 GB/T 3836.1-2021《爆炸性环境 第1部分：设备 通用要求》和 GB/T 3836.4-2021《爆炸性环境 第4部分：由本质安全型“i”保护的的设备》标准，应在相应标准要求下进行安装、操作、维护。
- 7.1 This product complies with GB/T 3836.1-2021 "Explosive atmospheres—Part 1: Equipment—General requirements" and GB/T 3836.4-2021 "Explosive atmospheres—Part 4: Equipment protection by intrinsic safety i" standards, and installation, operation and maintenance should be carried out under the requirements of corresponding standards.
- 7.2 本产品必须安装在安全区域，周围空气不含对铬、镍、银镀层起腐蚀作用的介质。
- 7.2 This product must be installed in a safe area, and the surrounding air does not contain any medium that is corrosive to chromium, nickel and silver plating.
- 7.3 凡与安全栅连接的仪表，必须是具有防爆合格证的仪表，在安全栅与一次仪表组成本质安全防爆系统时，必须经国家指定的防爆检验认可。
- 7.3 All instruments connected to the safety barrier must be with explosion-proof certificate. When the safety barrier and a primary instrument form an intrinsically safe explosion-proof system, they must be approved by the state-specified explosion-proof inspection.
- 7.4 在未全部断开接线时，严禁用兆欧表直接测试端子之间的绝缘参数，否则会引起内部快速熔断器熔断。
- 7.4 When the wiring is not completely disconnected, it is strictly forbidden to use a megohmmeter to directly test the insulation parameters between the terminals, otherwise the internal fast fuse will be blown.
- 7.5 安全栅本安侧电源等接线不得混接其他非本安侧线路，任何接错线可能会导致危险的发生，本产品本安端和非本安端电路配线，在行线槽中应当分开铺设。
- 7.5 The wiring of the intrinsically safe side power supply of the safety barrier should not be mixed with other non-intrinsically safe side circuits. Any wrong wiring may cause danger. The circuit wiring of the intrinsically safe and non-intrinsically safe of this product should be laid separately in the line groove.
- 7.6 仪表接线采用可拆卸的接线端子，导线采用横截面积大于 0.5mm² 的屏蔽线，本安侧应选用本安电缆。
- 7.6 The meter wiring adopts detachable terminals, and the wires adopt shielded wires with a cross-sectional area of more than 0.5mm², and intrinsically safe cables should be used on the intrinsically safe side.

8 应用实例

8 Application example

举例 1 输入：1 路 PT100，输出：1 路 0-20mA，工作电源：24V DC

E.g.1 Input: single-way PT100, output: single-way 4-20mA, auxiliary power supply: 24V DC

订货型号：BM200-TR/I-B11

Type: BM200-TR/I-B11

举例2 输入：1路 0-10K Ω ，输出：2路 0-5V，工作电源：24V DC

E.g.2 Input: single-way 0-10K Ω , output: double-way 0-5V, auxiliary power supply: 24V DC

订货型号：BM200-VR/V-C12

Type: BM200-VR/V-C12

说明书修订记录

日期	旧版本	新版本	修改内容
2022.12.12	V1.1	V1.2	1. 修改 5 认证参数部分电感参数值
2023.02.15	V1.2	V1.3	1. 增加 5 认证参数部分证书号 2. 删除 6. 1. 1 部分实物图，改为轴视图

Manual change record:

Date	Old version	New version	Change content
2022.12.12	V1.1	V1.2	1. Modify the value of the inductance parameter in 5 Certification parameter section.
2023.02.15	V1.2	V1.3	1. Add the certificate number in 5 Certification parameter section. 2. Delete part of the physical drawing in 6.1.1 and replace it with an axial view.

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