

## Two Wire Resistance Signal Isolation Conditioner

Two-wire Wheatstone bridge/potentiometer signal to voltage/current signal isolation conditioner: ISO EM R-P-O series

### Feature:

- Two-wire potentiometer, resistance signal input
- Accuracy grade: 0.1, 0.2
- Built-in precision constant-current source excitation circuit
- Three port isolation between auxiliary power, input and output: 3KVDC
- Auxiliary power: 5V, 12V, 15V or 24VDC
- Input resistance signal: 0-1KΩ/0-2KΩ/0-5KΩ/0-10KΩ /etc.
- Output standard voltage signal: 0-5V/0-10V/1-5V/etc.
- Output standard current signal: 0-10mA/0-20mA/4-20mA/etc.
- Industrial grade temperature range: - 25~ + 70 °C

### Typical application:

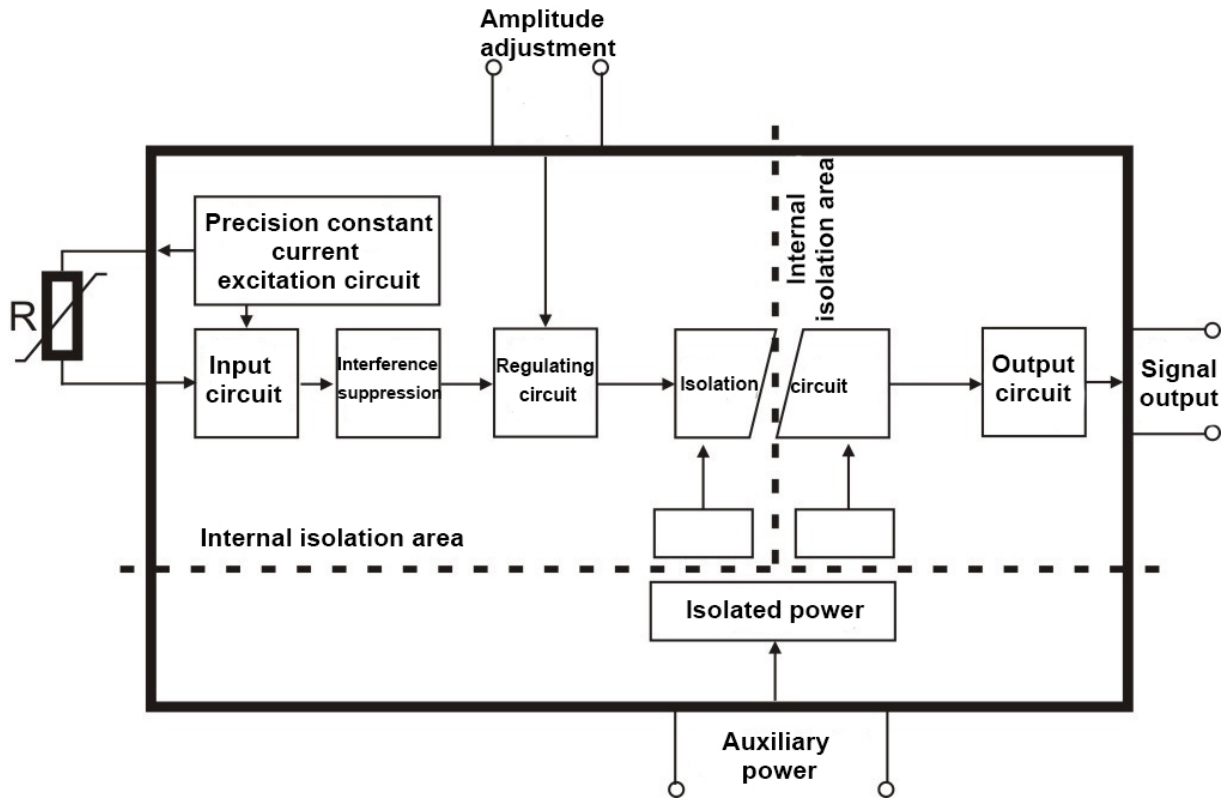
- Resistance signal isolation, acquisition and conversion
- Displacement resistance/potentiometer signal acquisition isolation and control
- Convert potentiometer signal to standard analog signal
- Distance measurement and acquisition
- Analog signal long-distance non-distortion transmission.
- Displacement control isolation safety barrier for CNC machines and rail transit equipment
- Industrial field ground wire interference suppression

### Introduction:

Sunyuan ISO EM R-P-O Series resistance signal conditioner is a kind of integrated circuit which isolate and convert resistance signal to voltage or current analog signal linear with resistance according to the resistance value change. This IC integrates a set of multiple high-isolation DC/DC power supplies and a set of magnetic and electrical coupling analog signal isolation amplifiers on the same chip, and built-in precision constant current source excitation circuit. It is especially suitable for isolation and converting two-wire potentiometer/resistance signal to standard signal, resistance signal's conversion and long-distance non-distortion transmission, and industrial field displacement resistance signal isolation, acquisition and conversion. SMD process structure and new technology isolation measures enable this device to achieve: 3-port 3KVDC isolation between auxiliary power, input signal and output signal, and meet the requirements of industrial-grade harsh working environment with wide temperature, humidity and vibration.

ISO EM R-P-O series displacement resistance signal isolation amplifier is very convenient to use, only a few external components are needed to realize the isolated transmission of the resistance signal. And it can realize the function of converting industrial field resistance control signals into standard analog voltage and current signals: one in and one out, one in and two out, and two in and two out.

Product principle block diagram:



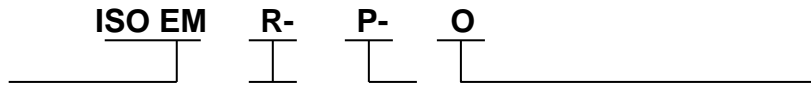
**Max. rated value:** (Long-term operation in the maximum rated environment affects the service life of the product, and irreparable damage may occur beyond the maximum value.)

Continuous Isolation Voltage	3KVDC/rms
PW (Power supply voltage input range)	±25%Vdd
Junction Temperature (Working temperature range)	- 45°C ~ + 85°C
Lead Temperature (Welding temperature<10S)	+300°C
Output voltage signal minimum load	2KΩ

**General parameters:**

- |  |  |
|--|--|
| Accuracy ----- 0.1%, 0.2%  | Isolation----- Signal input/output/power   |
| Auxiliary power ----- DC5V/12V/15/24V,<br>220VAC ±10%                        | Insulation resistance ----- ≥20MΩ  |
| Working temperature range ----- 25 ~ +70°C                                   | Withstand voltage ----- Input/output/power<br>1500VAC, 50Hz, 1min, leakage current 1mA |
| Working humidity ----- 10 ~ 90%<br>(No condensation)                         | Impact resistance voltage ----- 3KV,<br>1.2/50us(Peak)                                 |
| Storage temperature ----- -45~ +80°C   | Measurement method ----- Built-in precision<br>constant-current source excitation      |
| Storage humidity ----- 10 ~ 95%<br>(No condensation)                         | Frequency response ----- Signal<br>bandwidth≤1KHz                                      |
| Temperature coefficient ----- 100PPM/°C                                      | Response time ----- ≤10mS  |
| Power consumption ----- voltage output type<br>≤0.5W, current output type≤1W |  |

**Model and definition:**



<b>Magneto-electric isolation method</b> <b>ISO EM</b> Signal input /signal output/ auxiliary power 3KVDC, 3 port isolation	Input resistance value: <b>R</b>	Auxiliary power: <b>P</b>	Output: <b>O</b>
	R1: 0-50Ω	P1: DC24V	O1: 4-20mA
	R2: 0-100Ω	P2: DC12V	O2: 0-20mA
	R3: 0-200Ω	P3: DC5V	O4: 0-5V
	R4: 0-500Ω	P4: DC15V	O5: 0-10V
	R5: 0-1KΩ	P5: AC220V	O6: 1-5V
	R6: 0-2KΩ	P8: customized	O8: customized
	R7: 0-5KΩ		
	R8: customized		
	R9: 0-10KΩ		

**Model selection examples:**

**Eg 1:** Input signal: 0-1KΩ; Output signal: 0-5V; Auxiliary power: 24VDC;

Part number: ISO EM R5-P1-O4

**Eg 2:** 2 channel signal input: 0-5KΩ; 2 channel signal output : 4-20mA; Auxiliary power: 12V; DIN35 rail mounted; Part number: DIN2x2 ISO EM R7-P2-O1

**Eg 3:** 1 channel signal input: 0-10KΩ; Output signal: 0-10V; Auxiliary power: 15V; Small size DIN35 rail mounted; Part number: DIN3 ISO EM R9-P4-O5

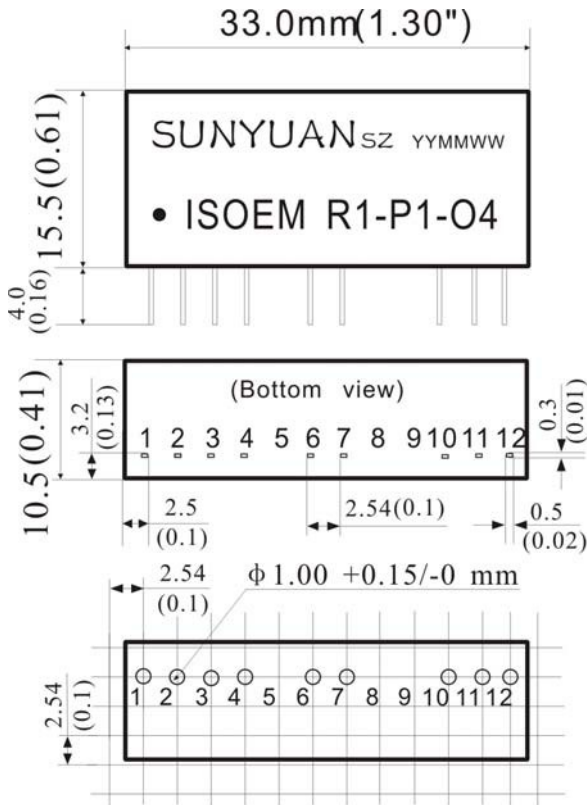
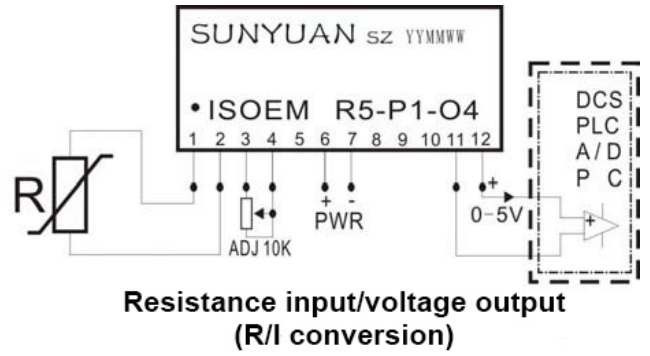
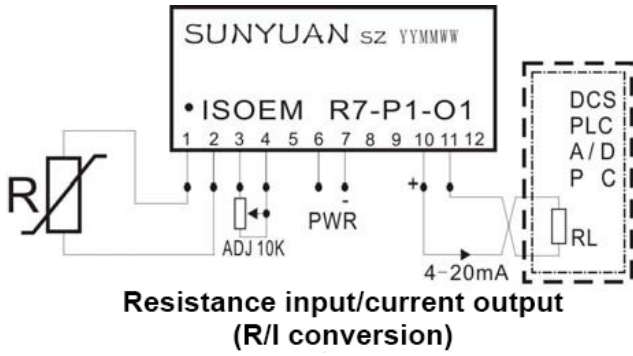
**Input parameters:**

Two wire resistance signal input	0-50Ω/0-100Ω/0-200Ω/0-500Ω/0-1KΩ/0-2KΩ/0-5KΩ/0-10KΩ
----------------------------------	---

**Output parameters:**

Output signal	Output overload capacity
Current signal: 0-1mA/0-20mA/4-20mA/etc	For current output item: No more than 350Ω, if need >350Ω, please inform.
Voltage signal: 0-5V/0-10V/1-5V/etc	≥ 2KΩ

**Typical application wiring diagram:**



**Dimension and PCB diagram:**

**ISO EM R-P-O Pin functions (SIP 12Pin):**

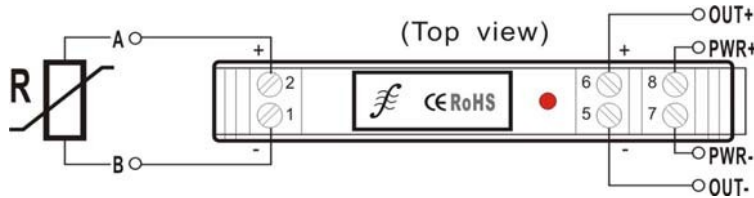
Resistance Input A	Resistance Input B	Gain Adjustment 1	Gain Adjustment 2	No connect	Power +	Power GND	No connect	No connect
<b>A</b>	<b>B</b>	<b>ADJ</b>	<b>ADJ</b>	<b>NC</b>	<b>PWR+</b>	<b>GND</b>	<b>NC</b>	<b>NC</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>

Current Output +	Signal Output GND	Voltage Output +
<b>Io+</b>	<b>GND2</b>	<b>Vo+</b>
<b>10</b>	<b>11</b>	<b>12</b>

**DIN3 ISOEM R-P-O Series one channel low cost, small size standard DIN35 rail mounted**

**product introduction:**

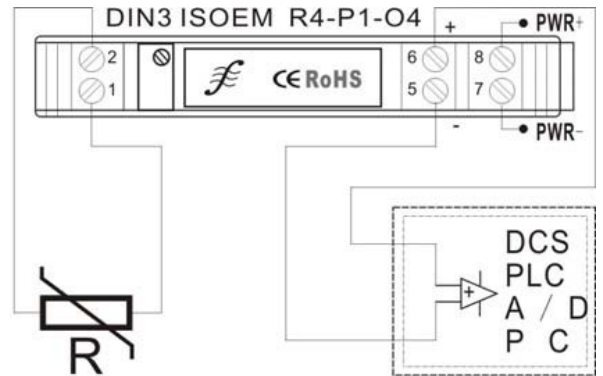
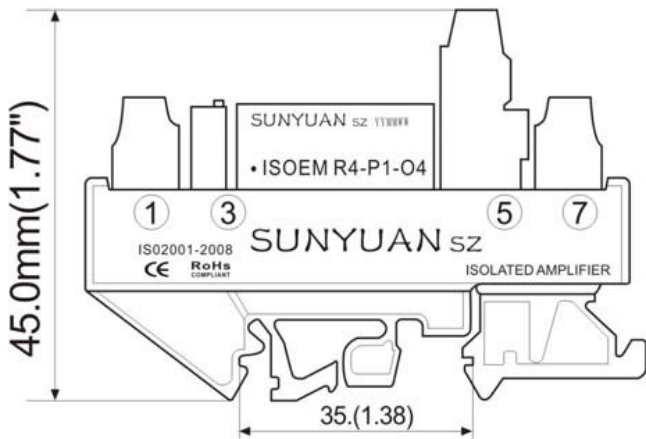
DIN3 ISOEM R-P-O series is designed by using super slim 12.5mm standard din rail-mounting base. It has wiring terminal blocks and ISO EM R-P-O series modules are embedded. The product does not need to adjust the zero point, only the full-scale adjustment multi-turn potentiometer is installed, which is convenient for users to use directly. Due to the limited space, DIN3 series two-wire resistance signal conditioner can only support one input and one output.



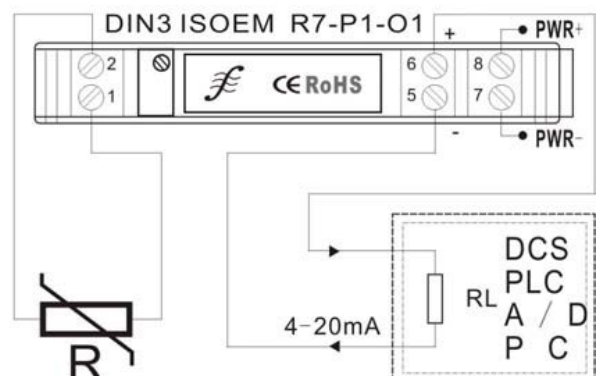
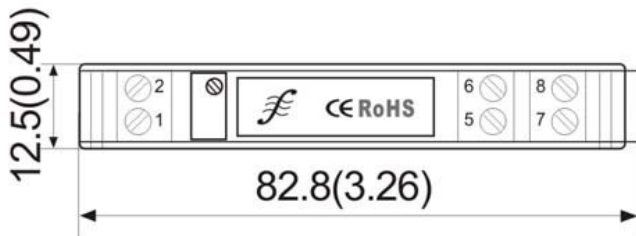
DIN3 IO EM R-P-O series standard DIN35 small size rail mounted RU/RI converter Pin functions:

Resistance input	Resistance input	No connect	No connect	Signal output	Signal output	Auxiliary power	Auxiliary power
A	B	NC	NC	Out-	Out+	PWR-	PWR+
1	2	3	4	5	6	7	8

**DIN3 ISO EM R-P-O series product dimension and typical application:**



0-500Ω to 0-5V wiring diagram

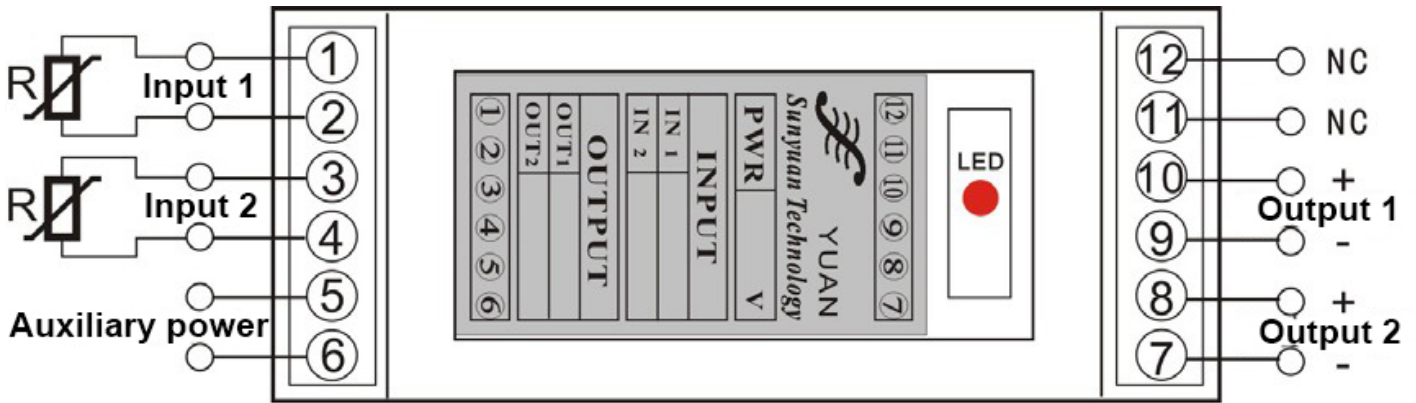


0-5KΩ to 4-20mA wiring diagram

**DIN3 series small size one channel RU/RI dimension**

**Multi-channel DIN rail mounted DIN 1X1/1X2/2X2 product typical application:**

**Sunyuan I** type standard DIN35 rail mounted multi-channel two-wire resistance signal conditioner, installed multiple ISO EM P-R-O series integrated modules inside to achieve the conversion of one in one out(DIN1x1), one in two out(DIN1x2), two in two out(DIN2x2), etc multi-channel resistance signal to voltage or current signal. There is no need for external zero and full scale adjustment, and an anti-surge suppression protection circuit is added inside, making the product more convenient, safer and more reliable.



**DIN 1x1/2x2/1x2 multi-channel resistance signal transmitter**

**DIN 1X1 / DIN 1X2 / DIN 2X2 series dimension and PIN functions:**

Pin	Pin functions	
1	<b>A</b>	First channel resistance input : A
2	<b>B</b>	First channel resistance input: B
3	<b>A</b>	Second channel resistance input : A
4	<b>B</b>	Second channel resistance input : B
5	<b>Power +</b>	Auxiliary power +
6	<b>Power -</b>	Auxiliary power -
7	<b>Vout2 -</b>	Signal output 2: -
8	<b>Vout2+</b>	Signal output 2: +
9	<b>Vout1 -</b>	Signal output 1: -
10	<b>Vout1+</b>	Signal output 1: +
11	<b>NC</b>	No connect
12	<b>NC</b>	No connect

