

# Displacement Sensor Potentiometer Signal Transmitter

Potentiometer, Electric-scale, Displacement Sensor Signal Small Size Converter

## SY R-P-O Series

Characteristics	Applications
<ul style="list-style-type: none"> <li>Resistance, electrical ruler, position sensor signal input</li> <li>Accuracy Grade:0.1,0.2</li> <li>Internally installed linear processing and long-line compensation circuit (non-linearity&lt;0.05%)</li> <li>Auxiliary power: 5V/12V/15V/24V DC Single supply</li> <li>Input potentiometer signal: 0-50Ω/0-500Ω/0-2KΩ/0-10KΩ</li> <li>Output standard voltage or current signal: 0-2.5V/0-5V/0-10V/1-5V/0-10mA/0-20mA/4-20mA,etc.</li> <li>IC PCB-mounted type, electrical ruler embedded or water proof case and DIN35 DIN rail-mounted type.</li> <li>Industrial grade temperature range: - 40 ~ + 85 °C</li> </ul>	<ul style="list-style-type: none"> <li>Electrical ruler/angular transducer signal isolation, acquisition and conversion.</li> <li>Displacement, potentiometer signal acquisition or isolation and control.</li> <li>Ground interference suppression in industrial site</li> <li>Resistance signal convert to standard analog signal</li> <li>Distance measurement and alarm.</li> <li>Analog signal long-term distortionless transmission</li> <li>CNC or Rail transit equipments displacement control and signal conversion.</li> <li>Precision measuring equipments displacement signal acquisition.</li> </ul>

### Introduction

Sunyuan SY R-P-O Series isolation amplifier is a kind of integrated circuits that convert position resistance signal into standard signal that linear to resistance accordingly. It integrates a set of input filtering circuits, input protection circuits and high accuracy regulated IC, isolation and amplification circuit, and zero gain adjustment circuit into a single chip. It is especially applied to convert resistance signal to standard signal and transmission of position signal, electrical ruler, angular transducer signal acquisition and conversion.

SY R-P-O Series non-isolated products have high precision and linearity (>0.05F.S), it is usually applied in bull-in electrical ruler, angular displacement signal transducer etc, precision measuring instrument. Small size, easy to install. It can be installed in the inner of the sensor and directly convert the position, angular signal to standard 4-20mA signal. Zero and Span can be adjusted through external potentiometer. New technique is used, it can meet industrial site temperature, humidity, vibration harsh environment requirements.

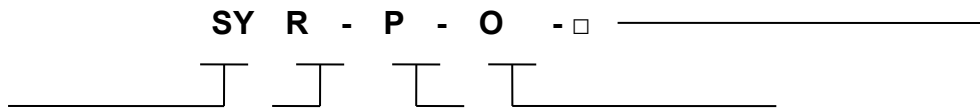
35mm DIN Rail-mounted type DIN1x1/2X2 SY R-P-O-B series Displacement Signal Transmitter is easy to use, the wiring method is terminal wiring. It can achieve displacement resistance signal isolation and transmission without external components. The transmitter with

### Max. rated value

(If beyond this range, it will cause product perpetual damaged)

Continuous isolation voltage	Non-isolation
Power supply voltage input range	±10%Vin
Lead temperature (<10s continuous)	+300°C
Min load of output voltage	2KΩ

### Model selection and definition



Non-isolation Type SY Series	Input R	Power supply: P	Output O	Installation Package
	R1:0-50Ω	P1: DC24V	O1: 4-20mA	A: PCB-mounted
	R2:0-100Ω	P2: DC12V	O4: 0-5V	B: DIN Rail 35
	R3:0-200Ω	P3: DC5V	O5: 0-10V	C: Internal embedded
	R4:0-500Ω	P4: DC15V	O6: 1-5V	E: External
	R5:0-1KΩ	P8: User-defined	O8:	
	R6:0-2KΩ			
	R7:0-5KΩ			
	R8:			
	R9: 0-10KΩ			

### Model selection examples

E.g.1	Input: 0-1KΩ	No power supply	Output: 4-20mA	PCB-mounted	Model NO: SY-R5-O1 -A
E.g.2	Input: 0-5KΩ	Power supply 12VDC	Output: 0-5V	DIN35 mounted type	Model NO: SY-R7-P2-O4 -B
E.g.3	Input: 0-10KΩ	No power supply	Output: 4-20mA	Internal embedded	Model NO: SY R9-O1-C
E.g.4	Input: 0-5KΩ	No power supply	Output: 4-20mA	External embedded	Model NO: SY R7-O1-E

### General parameters

Precision -----	0.05% 0.1% 0.2%
Power supply-----	DC5V, 12V, 15V, 24V, 220VAC ±10%
Insulation resistance -----	≥20MΩ
Work temperature-----	-25 ~ +70℃
Work humidity-----	10 ~ 90% (non-condensation)
Storage temperature-----	-45 ~ +80℃
Storage humidity-----	10 ~ 95% (non-condensation)

### Input parameters

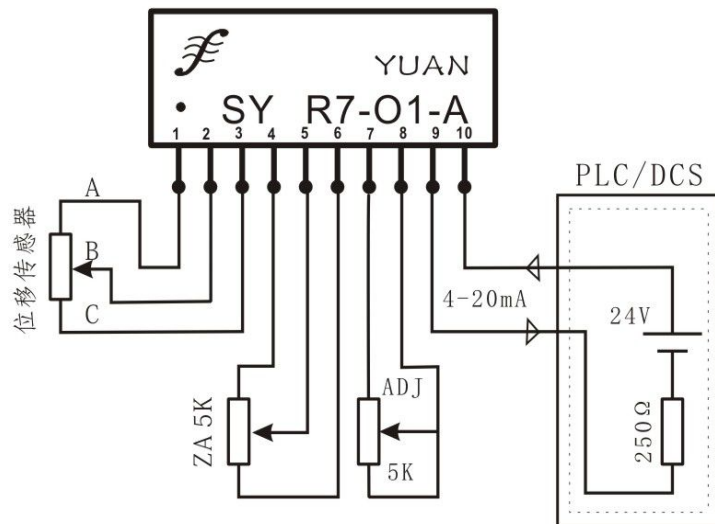
Electrical ruler/three-terminal adjustable potentiometer /rotation angle sensor etc.	0-50Ω/0-100Ω/0-200Ω/0-500Ω/0-1KΩ/0-2KΩ/0-5KΩ/0-10KΩ
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### Output parameters

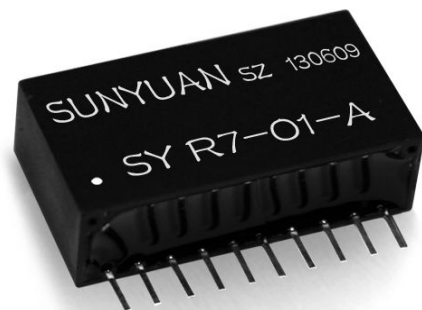
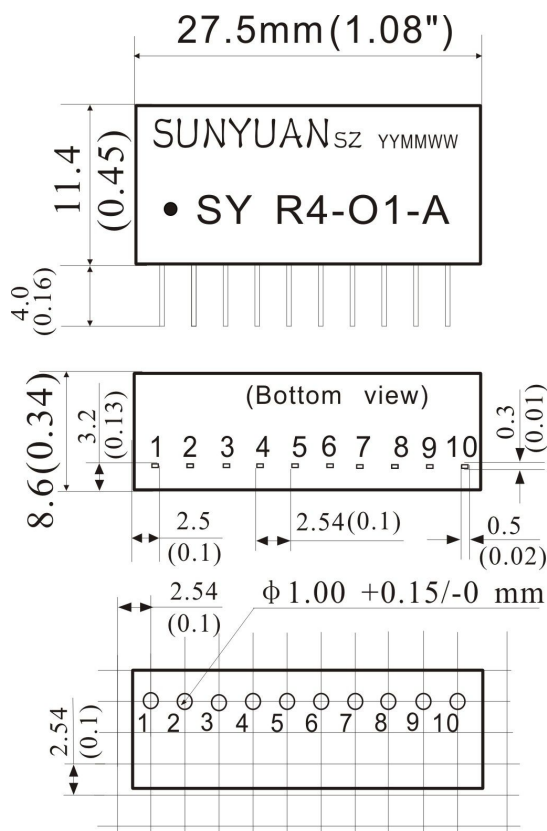
Output Item	Output overload capacity
Current signal: 4-20mA	Power supply is 24V, Max load: 650Ω No more than 350Ω, if need >350Ω, please inform us.
Voltage signal: 0-5V/0-10V/1-5V etc	≥2KΩ

### ※ Non-isolation SY R-P-O (SIP 10 PIN) Series PCB-mounted type

SY R-O-A Series position transducer can convert straight line or angular displacement sensor signal into 4-20mA standard analog signal. The displacement sensor signal transmitter does not need to be connected with external power supply, it is a kind of loop powered transmitters. The Span and Zero can be adjust by user through external potentiometers.



### Dimension and PCB diagram



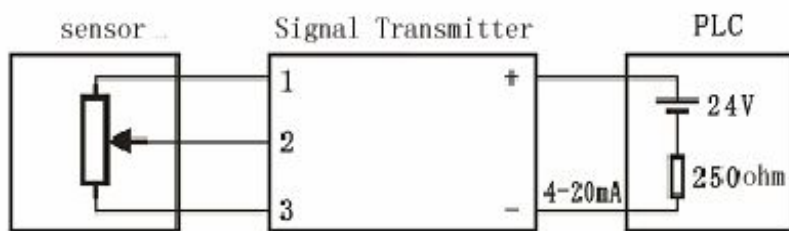
**Pin Description**

Electric ruler power+	Electric ruler Centre tap	Electric ruler Power GND	Zero adjust 1	Zero adjust 2	Zero adjust 3	Gain adjust 1	Gain adjust 2	Two-wire current output+	Power input+
A	B	C	ZA1	ZA2	ZA3	FB1	FB2	IO+	V+
1	2	3	4	5	6	7	8	9	10

**※ Special designed transducer for linear electrical ruler and angular position transducer SY R-O-C Series Non-isolation internal embedded type**

SY R-O-C Series small size sensor signal transmitter can convert position or angle signal to standard 4-20mA signal. High linearity, better than 0.05F.S. Span and Zero can be adjustable by user through the potentiometer on the PCB. It can be embedded into the electrical ruler. User can order the products with different suitable size and dimension according to application environment. There are total five external points to be connected to electrical ruler and power supply. (Size:PCB 22x45mm)

**Schematic & Wiring Diagram**



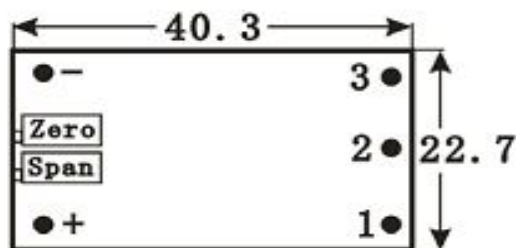
1	position sensor Power +
2	position sensor center
3	position sensor Power -
+	Signal transmitter Power+
-	Signal transmitter Power-

**Span:**20mA Full-scale adjustment potentiometer    **Zero:**4mA Zero adjustment potentiometer

**Adjustment method:**

Electrical ruler and power supply, load and measurement instrument (high precision current measuring meter is recommended) should be properly connected. Power on in ten minutes, then adjust ZERO when the electrical ruler is in state of zero to obtain Iout=4mA. Then adjust electrical ruler to rated max. Value to adjust Span, and adjust potentiometer to obtain Iout=20mA. Do that adjustment for two times to improve the accuracy grade.

**Dimension (Customized products available)    Unit:mm**



**Span:**20mA    **Zero:**4mA

**Type-C: Internal Embedded type**

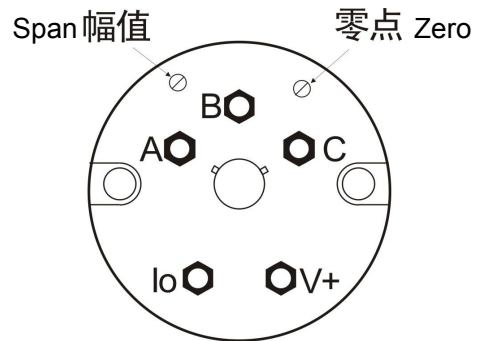
**※ SY R-O-E Series Non-isolation External-embedded Linear electric scale, angular displacement sensor used transmitter**

SY R-O-E Series small size sensor signal transmitter can convert position or angle signal to standard 4-20mA signal. High linearity, better than 0.05F.S. Span and Zero can be adjustable by user through the potentiometer in the top. It can be installed in the electric ruler externally.

There are total five external points to be connected to electrical ruler and power supply.

**Terminal description**

<b>A</b>	Electric-scale Power +
<b>B</b>	Electric-scale Centre Tap
<b>C</b>	Electric-scale Power -
<b>V+</b>	Signal transmitter Power+
<b>IO</b>	Signal transmitter Power-



**Adjustment method:**

Electrical ruler and power supply, load and measurement instrument (high precision current measuring meter is recommended) should be properly connected. Power on in ten minutes, then adjust ZERO when the electrical ruler is in state of zero to obtain  $I_{out}=4mA$ . Then adjust electrical ruler to rated max. Value to adjust Span, and adjust potentiometer to obtain  $I_{out}=20mA$ . Do that adjustment for two times to improve the accuracy grade.

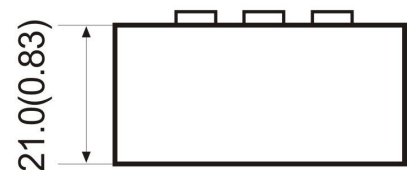
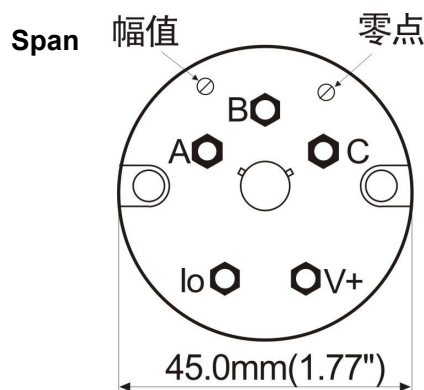
**External-embedded Electric-scale Transmitter Wiring Diagram**

**Electric-scale**



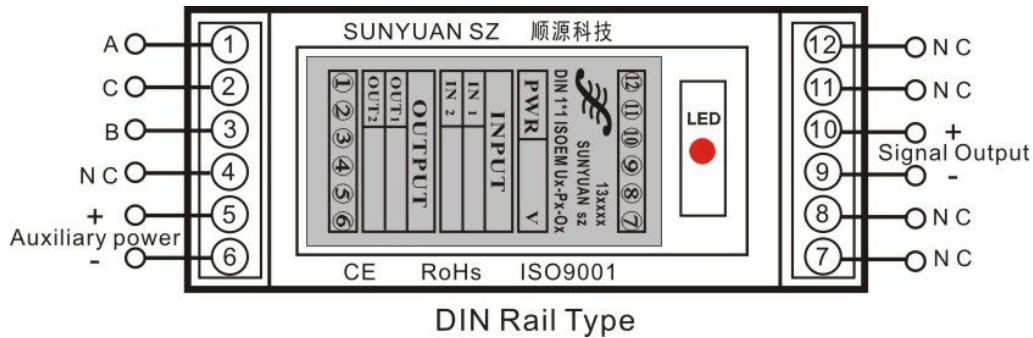
**E型（外置式）非隔离位移变送器**

**External-embedded Electric-scale Transmitter Dimension**



※ **SY R-O-B Series DIN35 I Type Rail-mounted Displacement Signal Transmitter (Active voltage output type)**

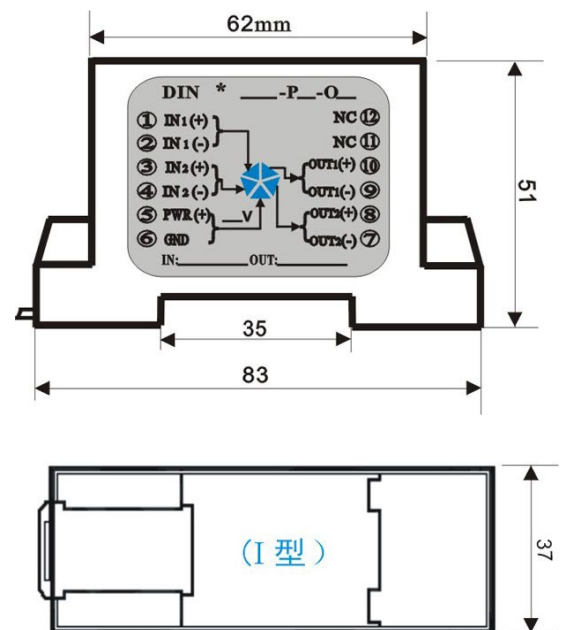
SY R-O-B Series DIN35 Rail-mounted Displacement Signal Transmitter embeds input filtering circuit, input protection circuits, high precision standard IC, protection of inversed circuits, isolation & amplification circuits, zero and span adjust circuit, etc into the pcb inside. The transmitter has high precision and linearity (better than 0.05F.S), it usually applied in electric-scale, angular displacement signal transmitters and other high precision meters and instruments.



Active Type Rail-mounted single-channel displacement signal transmitter (Voltage output)

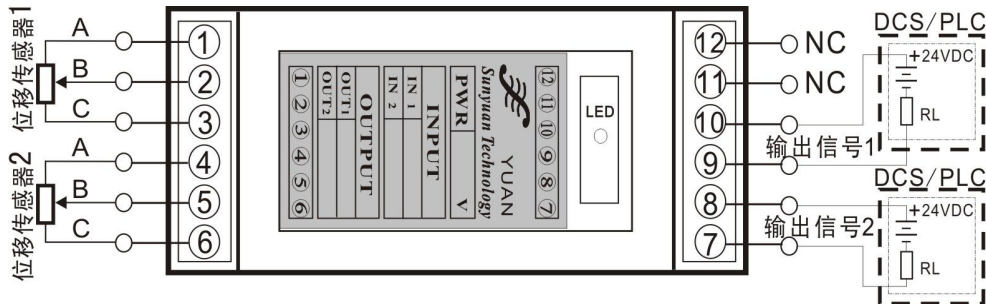
**DIN35 I Type Dimension & PIN Definition**

Pin	Terminal function description	
1	A	Electrical Scale power+
2	B	Electrical Scale Central tap
3	C	Electrical Scale power-
4	NC	No connection
5	Power In	Auxiliary power supply+
6	Power	Auxiliary power supply-
7	NC	No connection
8	NC	No connection
9	Out-	Output signal -
10	Out+	Output signal +
11	NC	No connection
12	NC	No connection



※ **SY R-O-B Series DIN35 II Type Rail-mounted Displacement Signal Transmitter (Passive type, current output type)**

SY R-O-B Series DIN35 Rail-mounted Displacement Signal Transmitter embeds input filtering circuit, input protection circuits, high precision standard IC, protection of inversed circuits, isolation & amplification circuits, zero and span adjust circuit, etc into the pcb inside. The transmitter has high precision and linearity (better than 0.05F.S), it usually applied in electric-scale, angular displacement signal transmitters and other high precision meters and instruments.



DIN 1X1 / 2X2 (无源型) 电流输出导轨式单/多路位移信号变送器

Passive Type Rail-mounted single/Multi-channel displacement signal transmitter (Current output)

### DIN 1X1 / DIN 2X2 II Type Dimension & PIN Definition

Pin	Pin	Terminal function descriptio
1	A	Electric Scale power #1+
2	B	Electric Scale power central tap #1
3	C	Electric Scale power #1-
4	A	Electric Scale power #2+
5	B	Electric Scale power central tap #2
6	C	Electric Scale power #2 -
7	IO+	Current output #2
8	V+	Voltage input #2
9	IO+	Current output #1
10	V+	Voltage input #1
11	NC	No connection
12	NC	No connection



Note: The specification is subject to change without notice!