

2-wire Low Cost 4-20mA Loop Feed Conditioner

2-wire Passive Small Size Loop Feed Output Conditioner

SY 4-20mA-P Series

Features	Applications
<ul style="list-style-type: none"> ●Power supply no needed, non-isolation, two-wire loop powered. ●Wide range input voltage signal (7.5 ~ 32V) ●4-20mA high accuracy(0.05,0.1,0.2) ●High linearity(Nonlinearity<0.1%) ●Low cost, small size, standard SIP7 package ●4-20mA signal input/,4-20ma loop feed output ●Industrial temperature(-45—+85 °C) 	<ul style="list-style-type: none"> ●PLC,DCS analog signal data acquisition and isolation ●4-20mA sensor signal acquisition & conditioning. ●Non-distortion in long distance signal transmission. ●Instrument signal acquisition ●Industrial fields analog signal acquisitions and monitoring ●Sensor signal and analog input interface match

Introduction

SY 4-20mA-P is a kind of two-wire 4-20mA analog signal acquisition&conditioning IC. It contains internal signal acquisition, conditioning and coupled conversion circuits. A very small input equivalent resistance makes this circuit achieve ultra-wide range (7.5 ~ 32V) voltage input which acquires from sensor signal loop. It can meet the users' requirements that achieve the signal long-distance transmission without distortion. The 4-20mA loop feed output designed is correspond to 2-wire loop powered in serial connection between 24VDC and sampling resistance (load resistance), and it can be well matched with analog input interface board (upper machine), PLC, DCS, and analog input terminals of other commonly used meters&instruments. And the conditioner module can meet the temperature, humidity, vibration and other harsh industrial on-site environmental requirements. SY 4-20mA-P product is very easy to use. Just by adding a 2KΩ to the multi-turn potentiometer ADJ to do adjustment, user can achieve the two-wire 4-20mA signal transmission.

Max. Rated Value

(If the product operates in the max. rated vale in the long-term, may affect the durability, if exceed the max. values, may cause unreparable damage.)

Continuous Voltage	36VDC
Power supply Volt. Input Range:	±25%Vdd
Operating Temperature	- 45°C ~ + 85°C
Wielding Temperature (<10S)	+300°C
Output short to common	Continuous

General Parameters

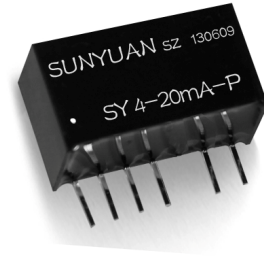
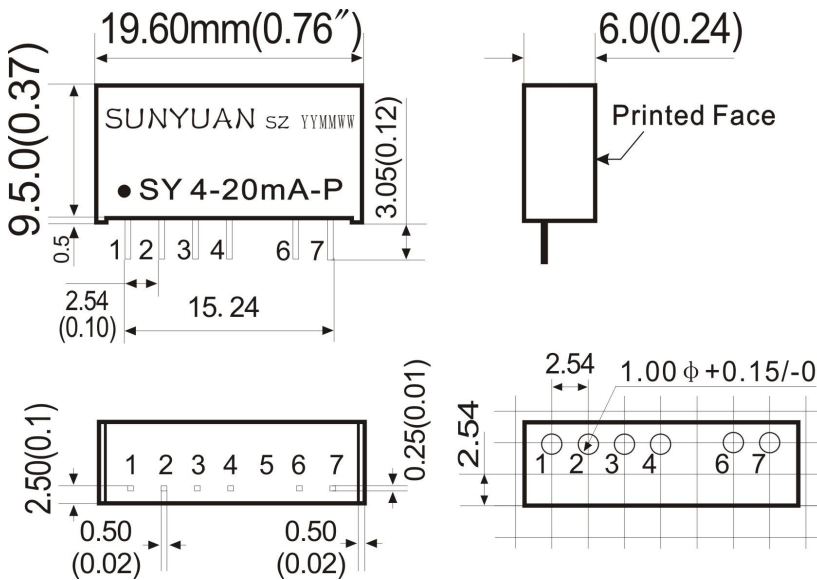
Parameters	Conditions	Min.	Typ.	Max.	Unit
Temperature Drift			±30	±75	PPm/°C
Nonlinearity			±0.1	±0.2	%FSK
Gain			1		mA/mA
Input current range		0.2	24	40	mA
Input impedance			50		Ω
Input over current capability				50	mA
Signal Output voltage range		7.5	24	36	VDC
Load capability	24VDC		750		Ω
Output linearity range		0.2	4	40	mA
Output Current :Io		0.2		50	mA

Output signal ripple				5	mV
Frequency response (Small signal bandwidth)	Io=20mA		2		KHz

Model selection examples

- 1. current input type: IN:4-20mA OUT:4-20mA Part No.:SY 4-20mA-P
- 2. voltage input type: IN:V(User-defined) OUT:4-20mA Part No.: V-4-20mA-P

Dimension & PIN Definition

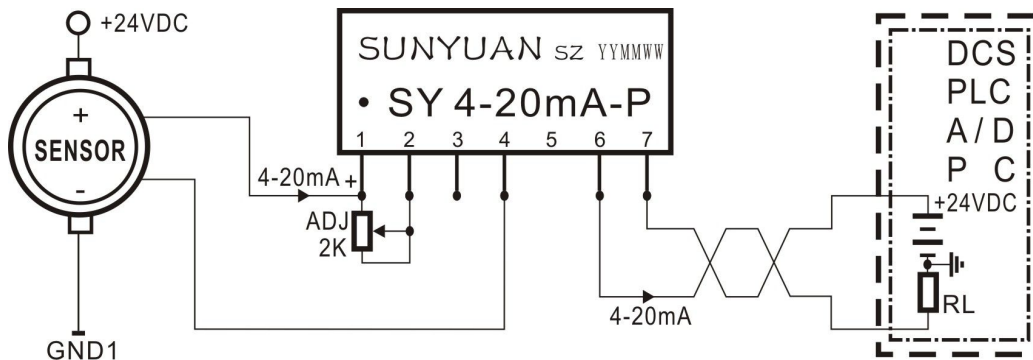


SY 4-20mA-P PIN Definition: SIP 7PIN Package

Gain adjust. Signal input+	Gain adjust. terminal	2.5V Reference output	Signal input-	NC	Current signal output+	Loop voltage input terminal
Sin+	ADJ	Vref	Sin-	NC	Io+	V+
1	2	3	4	5	6	7

Typical applications

- 1. Sensor 4-20mA current signal acquisition & conditioning circuit (2-wire loop feed output mode)

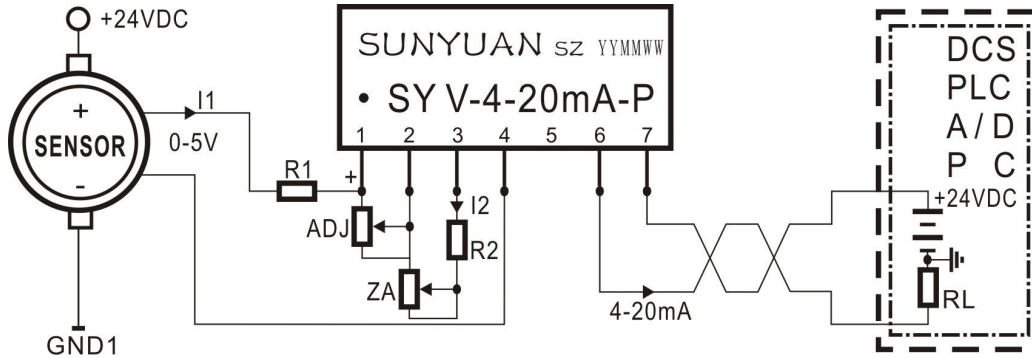


2. Sensor voltage signal acquisition & conditioning circuit (2-wire loop feed output mode)

0~Vin voltage input: $I1=Vin/(R1+ADJ)=160\mu A$

$I2=2.5V/(R2+ZA)=40\mu A$

1-5V input, $I1=5V/(R1+ADJ)=200\mu A$

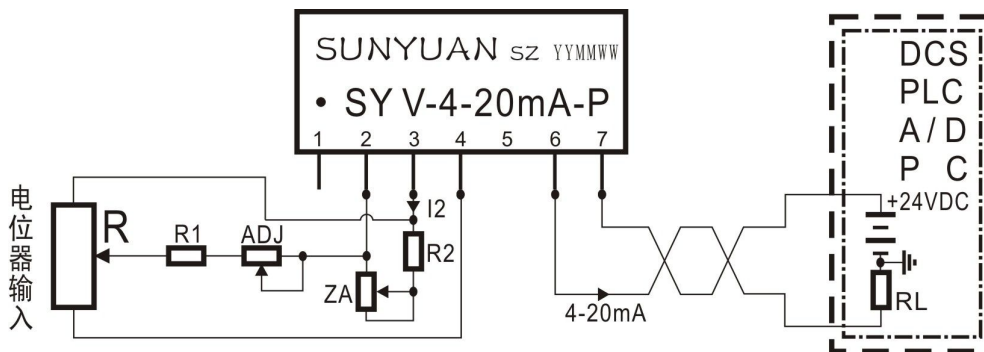


3. Potentiometer input (angle or displacement) signal acquisition & conditioning circuit (2-wire distribution loop powered output mode),

Resistor and potentiometer setting:

$R2+ZA=2.5*100/(4mA-2.5/R)$

$R1+ADJ=2.5V/0.16mA$



Adjustment:

Connect the potentiometer R with SY V-4-20MA-P and adjust it to it's min. value.

Adjust ZA to obtain 4mA output between PIN6 and PIN7.

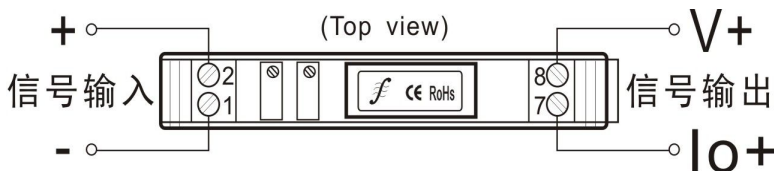
Adjust potentiometer R to it's max. value, then adjust ADJ to obtain 20mA output.

The recommended external potentiometer R resistance value: 0-5KΩ.

If measuring higher resistance value is required, user can add operational amplifier circuits in input terminal to do adjustment.

DIN3 SY 4-20mA-P Series Single-channel low cost small size 35mm rail-mounted type terminal description

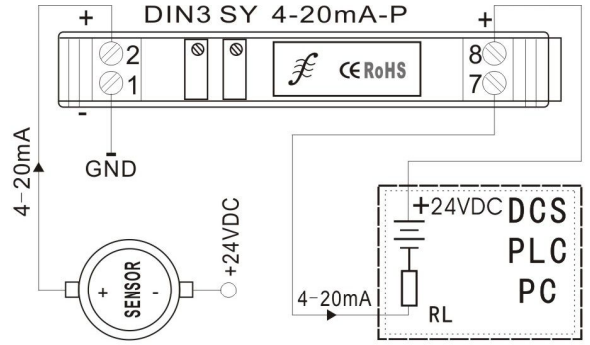
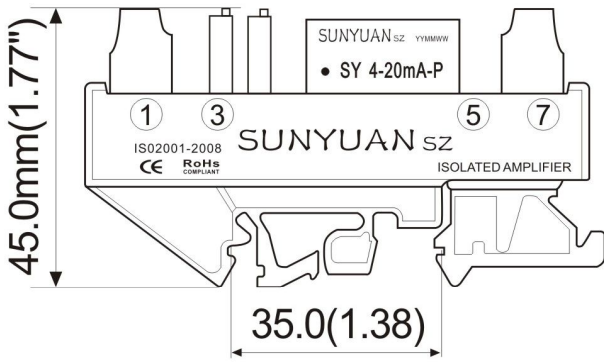
DIN3 SY 4-20MA-P is a kind of 4-20mA loop feed conditioners with super slim (12.5mm thick) 35mm rail-mounted base. New wiring terminals are used. The conditioner is easy to use and zero&gain adjustments are available. Due to size limitations, DIN3 series small size rail-mounted products only have 1-in 1-out conversion function.



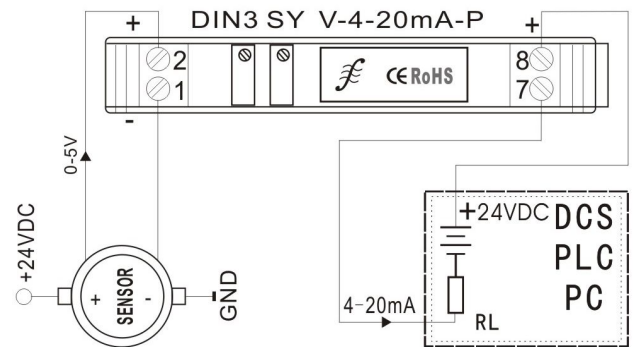
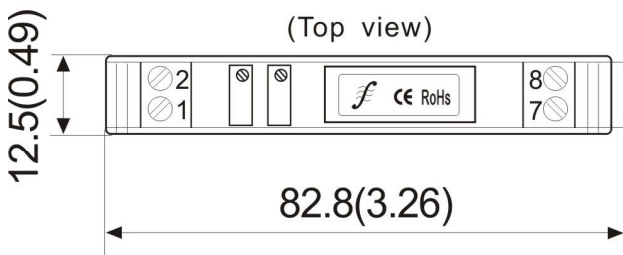
DIN3 SY 4-20mA-P Series DIN Rail-mounted I/I Conditioner or V/I Converter pin definition:

Signal input	Signal input	NC	NC	NC	NC	Current output	Voltage input
lin-	lin+	NC	NC	NC	NC	Io+	V+
1	2	3	4	5	6	7	8

DIN3 SY 4-20mA-P Series products external dimension & typical applications



4-20mA 转 4-20mA (I/I) 典型应用接线图

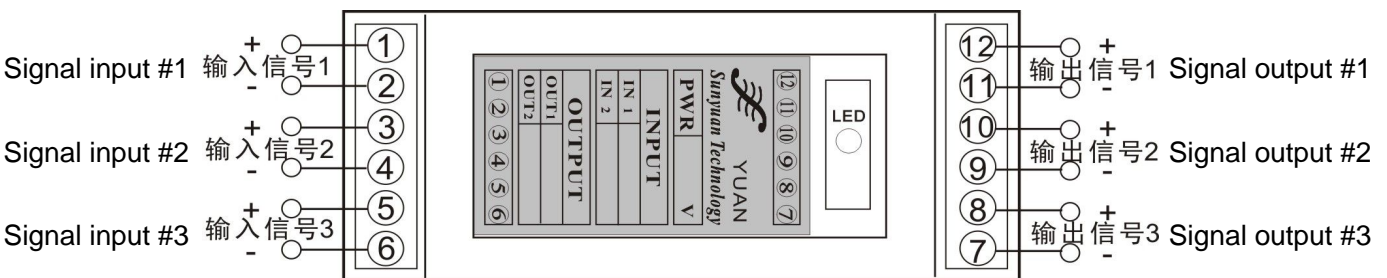


0-5V 转 4-20mA (V/I) 典型应用接线图

DIN3 系列小体积单路无源I/I/V/I转换器外形尺寸

Multi-channel DIN Rail-mounted DIN 1 x1/2x2/3x3 products typical applications:

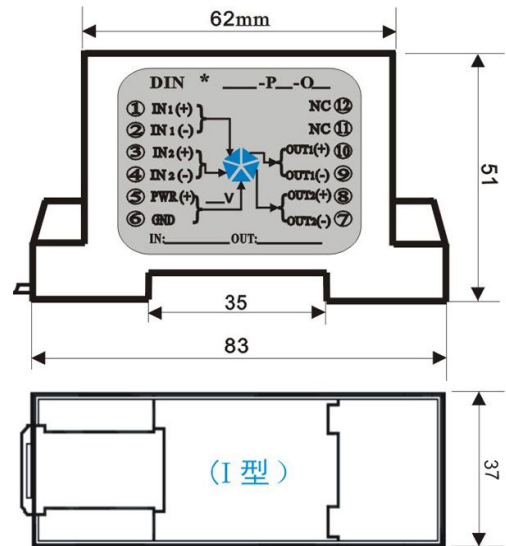
Sunyuan type I standard DIN35 Rail-mounted multi-channel multi-channel passive 4-20mA Conditioner has several sets of SY 4-20mA-P IC modules inside. The conditioners can be 1-input 1-output (DIN1X1), 2-input 2-output (DIN2X2), 3-input 3-output (DIN3X3) to achieve multi-channel current or voltage conversion. Zero and full adjustment is not required, internal anti-surge protection or suppression circuit is added to make sure that the products is much more reliable.



DIN 1X1 / 2X2 / 3X3 (无源型) 多路I/I/V/I转换器

DIN 1X1 / DIN 2X2 / DIN 3X3 SY4-20MA-P Dimension& PIN Definition

Pin	PIN Function Description	
1	Signal in1 +	Signal input #1+
2	Signal in1 -	Signal input #1-
3	Signal in2 +	Signal input #2+
4	Signal in2 -	Signal input #2-
5	Signal in3 +	Signal input #3+
6	Signal in3 -	Signal input #3-
7	Io3+-	Current output #3+
8	V3+	Voltage input #3+
9	Io2 +	Current output #2+
10	V2+	Voltage input #2+
11	Io1 +	Current output #1 +
12	V1+	Voltage input #1 +



*Note: The specification is subject to change without notice.