UI/IU Conversion High Accuracy Isolation Amplifier

4-20mA to 0-5V Analog Conversion Dual Isolation Converter

SY U-P-O/SY A-P-O Series

Features	Applications
● Accuracy grade: 0.05 0.1 0.2 ● Very high linearity value（nonlinearity < 0.1%） ● Low cost,small size,SIP8 anti-fire UL94V-0 package ●No external component, no “ZERO” and “G.adj” adjustment needed. ● Power supply/signal two port isolation:2000VDC ● Auxiliary power:5VDC/12VDC/15VDC/24VDC ●0.4-2V/0.5-2.5V/1-5V/2-10V voltage signal 0-10mA/0-20mA/4-20mA current signal input & output ●Temperature range: -45~+85 ℃	●Non-standard analog signal to standard analog signal converter and amplification. ●Matchable conversion between sensor signal and non-standard signal from PLC/DCS/FA,etc ● No distortion in long distance signal transmission ● Analog signal data acquisition ● 4-20mA/0-5V signal isolation and transfer ● Equipment and sensor signal acquisition ● Signal transmit no-distortion ● Ground interference control

Introduction

SY-U/A-P-O Series non-isolated signal converter/transmitter is a kind of ic which an convert high impedance signals to low impedance ones. The device is extremely small in size and very easy to use by using unique low cost solutions. No external components are needed in applications.It designed to provide the solutions on the conversion between (0.4-2V/0-5V/1-5V/0-10V/0-20mA/4-20mA,etc) none-standard analog signals (from PLC, DCS, Meters) and standard analog signals. The converter has high accuracy and good linearity, 2000VDC isolation voltage between power supply and signal channel which can restrain the surge and common-mode interference in electricity system. The module integrates DC/DC converter and analog amplifier into a single chip. It is mainly used in circumstances where A/V signals require to convert into other standards signals and signal isolation is not required.

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 unrepairable damage.)

Continuous Isolation Voltage	2KVDC/rms
Power supply Volt. Input Range:	±25%Vdd
Operating Temperature	- 45℃ ~ + 85℃
Wielding Temperature （<10S）	+300℃
Voltage Signal Output Min. Load	2KΩ

General parameters

Precision, linearity error grade ------0.05, 0.1, 0.2	Backlash---------- < 0.5%
Auxiliary power ---------- 5V,12V,15V,24VDC,etc	Isolation ---------- Signal channel and power supply
Operating temp. ---------- -20 ~ +70℃	Insulation resistance ---------- ≥20MΩ
Operating humidity---------10 ~ 90% (no condensation)	Withstanding volt. ---------- 2KVDC(60HZ/S), leakage current 1mA.
Storage Temp. ---------- -20 ~ +85℃	Anti-impulse voltage--------3KVDC, 1.2/50us (peak value)
Storage humidity ---------- 10 ~ 95% (no condensation)	

Model selection

SY A□ -P□ - O□

SUNYUAN Brand

Input current

A2：0-10mA
A3：0-20mA
A4：4-20mA
A8：Customized

Auxiliary power

P1：DC24V P2：DC12V
P3：DC5V P4：DC15V
P8：Customized

Output

O1：4-20mA O2：0-20mA
O3：4-12-20mA O4：0-5V
O5：0-10V O6：1-5V
O8：Customized

SY U□ - P□ - O□

SUNYUAN Brand

Input voltage

U1：0-5V
U2：0-10V
U3：0.4-2V
U4：0-2.5V
U8：Customized

Auxiliary power

P1：DC24V P2：DC12V
P3：DC5V P4：DC15V
P8：Customized

Output

O1：4-20mA O2：0-20mA
O3：4-12-20mA O4：0-5V
O5：0-10V O6：1-5V
O8：Customized

Model selection examples:

E.g.1.: Input 0.4-2V, output 4-20mA, auxiliary power supply 5V, Product model No.:**SY U3-P3-O1**
E.g.1.: Input 4-20mA, output 0-5V, auxiliary power supply 5V, Product model No.: **SY A4-P3-O4**
E.g.1.: Input 10-0V, output 0-10V, auxiliary power supply 24V, Product model No.: **SY U8-P1-O5**

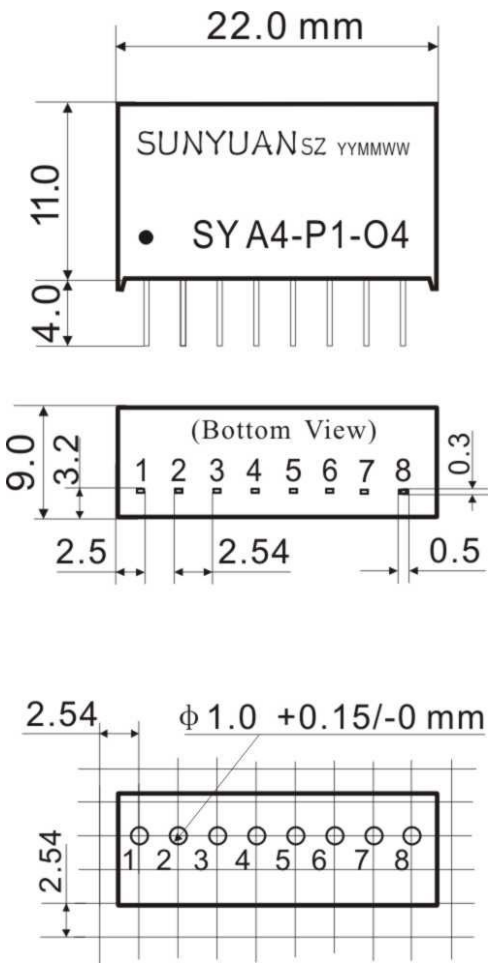
Note 1. For **SY U-P-O Series** and **SY A-P-O Series** products, advanced feedback zero technique is adopted to make sure good linearity in input and output. Due to the limit of size, the current output products do not have zero offset circuits inside, so when placing orders, please be kindly noted that the input and output do not have zero offset functions. E.g.: input 0-20mA, output 4-20mA or input 0-5V, output 4-20mA, etc, these input and output signals have zero offset (not zero to zero), so user cannot use SY U/A-P-O series SIP 8PIN products. But user can order ISOEM U/A-P-O series SIP 12PIN products with 3KV isolation among input, output and power supply. Please inquire us for ISOEM series data sheet if required.
Note 2. If the non-isolation between signal channel and auxiliary power supply is required, please do notify us when placing orders, customized products are available, the model No is SY U/A-P-O-**B.**

Technical parameters

Parameters		Test Conditions	Min.	Typical Value	Max.	Unit
Isolation voltage (power supply & signal channel)		AC,50Hz,1min		1000		V(rms)
Gain				0.25		V/mA
Gain temp. drift				25		ppm/℃
Non-linearity				0.1	0.2	%FSR
Voltage Signal Input			0		10	V
Current input impedance			50	250	1000	Ω
Current signal output			0		20	mA
Current load capacity			0	350	500	Ω
Frequency response		-3DB		1		KHz
Signal output ripple		No filtering			10	mVRM
Signal voltage temp. drift					0.01	mV/℃
Auxiliary power	**Voltage**	User-defined	3.3	12	24	VDC
	Consumption			0.3	0.5	W
Operating ambient temp.			-45		85	℃
Storage Temp.			-55		105	℃

Note 3： If there are special load requirements on output voltage signal or current signal, please do notify us when placing orders.

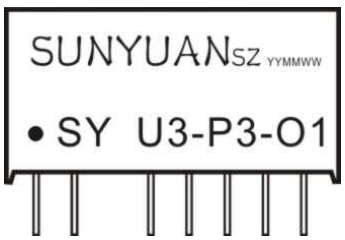
Dimension & PCB size



Pin Definition

1.Current signal output type. (E.g.: Input 0.4-2V, output 4-20mA, auxiliary power 5V. Model: SY U3-P3-O1)

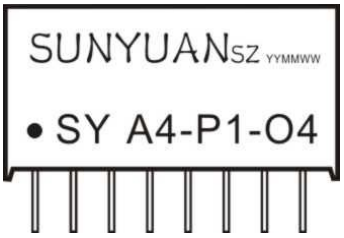
1	2	3	4	5	6	7	8
Power supply+ PWR+	Power supply- PWR-	NC	Signal input SIN	Signal input - GND	Signal output GND	Signal output Io+	Signal power input VD



Note 4: when signal and its power supply is non-isolated and power supply>≥12VDC, the power supply can connect to PIN8 directly (refer to typical applications, V/I converter Fig. 2).

2. Voltage signal output type. (E.g.: Input 4-20mA, output 0-5V, auxiliary power 24V. Model: SY A4-P1-O4)

1	2	3	4	5	6	7	8
Power supply+ PWR+	Power supply- PWR-	Signal power input+ VD	Signal input SIN	Signal input- GND	Signal output GND	Signal output Vo+	Signal power input- VS



Note 5: If non-isolation between power supply and signal channel is required and the output voltage signal is

within 0-5VDC, the auxiliary power supply ≥±9V, user can directly connect power supply to PIN3 and PIN8. (Refer to Fig.4 in typical applications)

Note 6: If non-isolation between power supply and signal channel is required and the output current signal is within 0-20mA, load≤250Ω, the auxiliary power supply ≥12V, user can directly connect single power supply to PIN8. (Refer to Fig.2 in typical applications)

Note 7: If the external auxiliary power supply is connected to **+,-** pin of "PWR", there is 2kVDC isolation voltage between auxiliary power and signal channel. The functions of "VD/VS" pin are also changed, for current output products, pin VD should be omitted and do not connected to any other circuits (Refer to Fig.1, Fig.2 in typical applications below). For voltage output products, pin "VD/VS" and pin "PWM+/PWM-" has the same functions (Refer to Fig.3 Fig.4 in typical applications below).

Typical applications

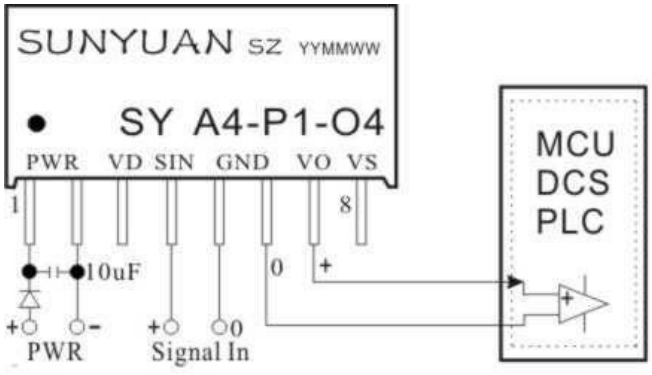


Fig.1 需要外接辅助电源的(I/V转换)

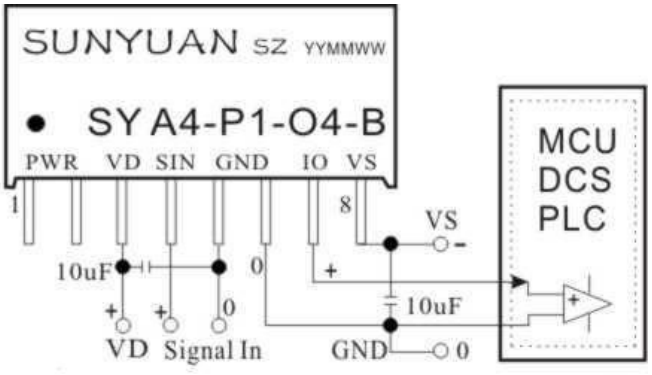


Fig.2 无需辅助电源方式的(I/V转换)

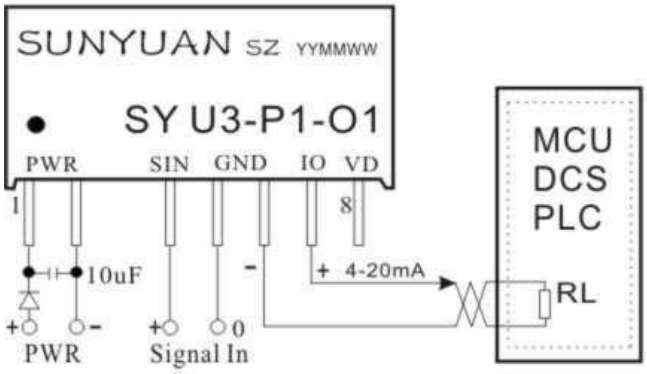


Fig.3 需要外接辅助电源的(V/I转换)

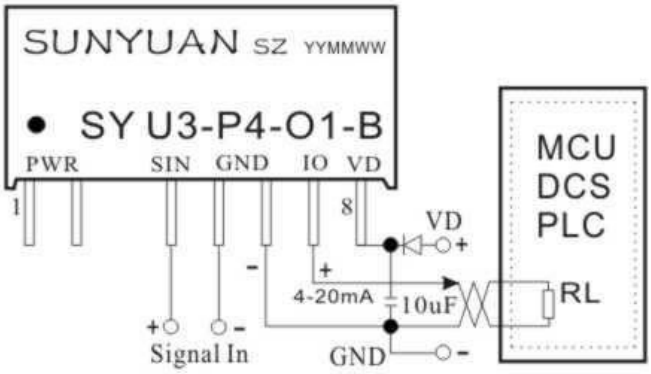
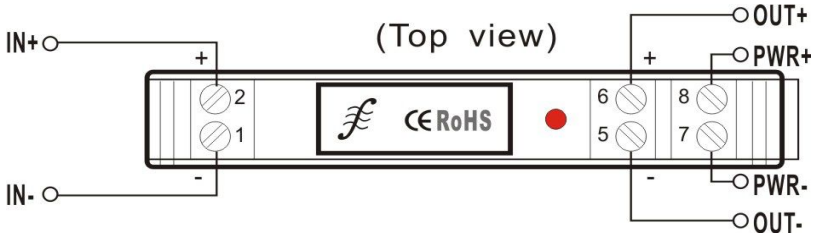
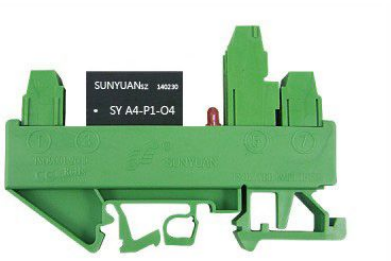


Fig.4 无需辅助电源方式的(V/I转换)

DIN3 SY U/A-P-O series low cost, small sizes standard 35mm Rail-mounted product pin function description

DIN3 SY U/A-P-O series converters are designed based on ultra-thin compact size (thickness 12.5 mm), standard DIN35 rail mounted case. SY U/A - P - O series IC is integrated into the PCB, and wiring terminals are used as auxiliary power supply and signal input/output connections.The converter is easy to use and zero&gain adjustments are not required. Due to size limitations, DIN3 series small size rail-mounted products only have 1-in 1-out conversion function.

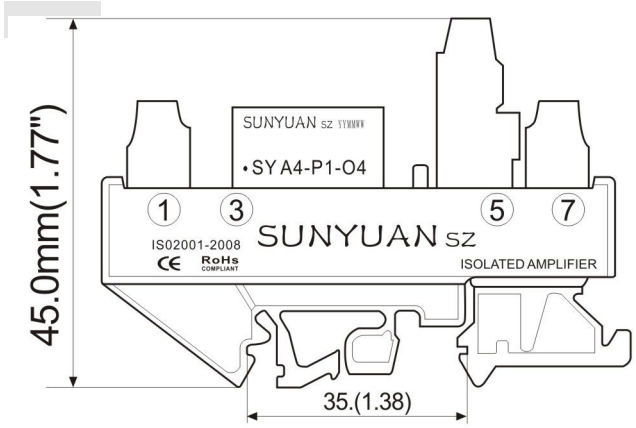




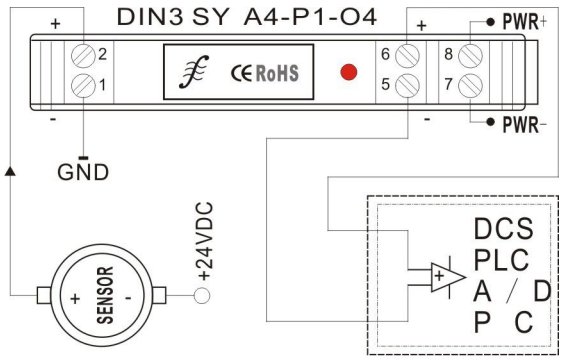
DIN3 SY U/A-P-O Series Standard 35mm Rail-mounted IU/UI Converter Pin Description

Signal input	Signal output	omitted	omitted	Signal output	Signal output	Auxiliary power	Auxiliary power
Iin-	**Iin+**	**NC**	**NC**	**Out-**	**Out+**	**PWR-**	**PWR+**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

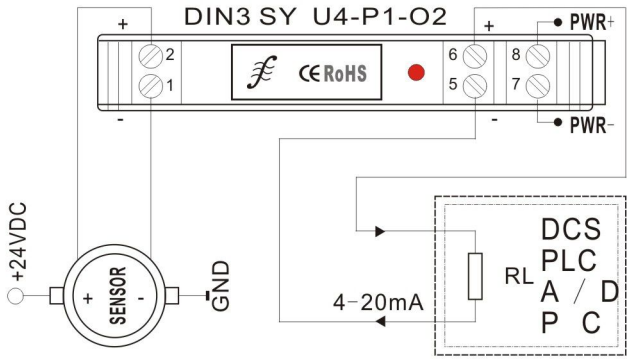
Dimensions & Typical applications:



DIN3 系列小体积单路UI/IU转换器外形尺寸



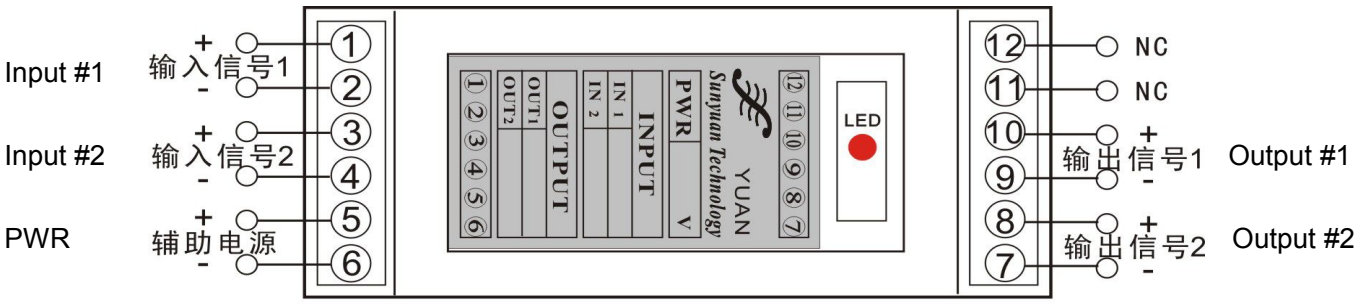
4-20mA 转 0-5V 接线图



0-2.5V 转 0-20mA 接线图

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

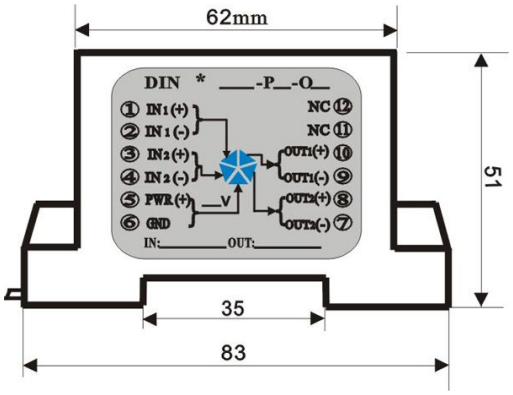
Sunyuan type **I** standard DIN35 Rail-mounted multi-channel dual-isolation U/I I/U converter has several sets of SY A-P-O series or SY U-P-O IC modules inside. The converters can be 1-input 1-output (DIN1X1), 1-input 2-output (DIN1X2), 2-input 2-output (DIN2X2) to achieve multi-channel current voltage 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.

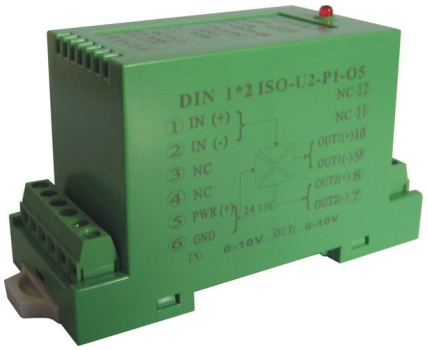


DIN 1X1 / 2X2 / 1X2（有源型） 多路隔离放大器

DIN 1 x1/DIN 1 x2 / DIN 2 x2 SY series products sizes and pin function description

Pin	Pin function	
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	Power +	Auxiliary power +
6	Power -	Auxiliary power _
7	Vout2 -	Signal output #2 -
8	Vout2+	Signal output #2 +
9	Vout1 -	Signal output #1 -
10	Vout1+	Signal output #1 +
11	NC	NC
12	NC	NC





Note: The specification is subject to change without notice.