

Micro-size Low Cost 4-20mA Current Loop Isolation Conditioner IC

2-wire Passive 4-20mA Current Loop Isolation Conditioner ISOS 4-20mA-E Series

Features	Applications
<ul style="list-style-type: none"> • Unique high efficient signal loop power extraction technique, external power supply is not required. • 2-wire 4-20mA signal input and output, 3000VDC isolation. • Active 4-20mA signal acquisition voltage (5-32V) extra wide input range. • Loop powered 4-20mA current loop output. • Active signal input, passive output to control the active load in current loop. • High linearity, non-linearity error < 0.2%. • SIP7 Pin standard PCB installation, UL94V-0 flame-retardant package. • Extra small size: 19.5X12.5X9.8mm, error grade: 0.1, 0.2 • Industrial operating temp. : -40 ~ +85 °C. 	<ul style="list-style-type: none"> • 2-wire passive load signal matching, conversion and controlling. • Sensor 4-20mA signal acquisition, isolated conversion and transmission. • PLC, DCS signal input channels isolation and anti-channeling. • Ground wire loop isolation and interference suppression. • Steady signal transmitting and receiving between meters and sensors. • Analog signal data isolated acquisition and long-distance transmission. • Power monitoring, medical equipment control and isolated safety barrier. • 4-20mA signal isolated transmission, realize the functions: 1-input 1-output, 2-input 2-output, 3-input 3-output.

Introduction

SunYuan ISOS 4-20mA-E is one of the smallest size (SIP 7Pin) low cost passive 2-wire 4-20mA signal isolated conditioner IC. The conditioner modules can convert active 4-20mA current signal into isolated passive controlling signal to control the two-wire powered (explosion-prevention method) 4-20mA current loop. The module achieves the matching between sensor signals acquisition and active load from analog input terminal, which effectively solves problems on the conflict between the active 4-20mA current signal and power supply of two-wire current loop input end.

ISO 4-20mA-E series module employed high-efficiency stealing electricity technology which makes the IC can operate without independent power supply. And the two-wire loop powered output method used which largely reduces the costs for customers in installation. Inside the IC, there are current signal modulation circuit, magnetoelectric isolation transform circuit and signal reduction demodulation circuit, etc. The low input equivalent resistance makes the voltage value of the current signal from the sensor output loop arrive at 5~32VDC to realize the long-distance, non-distortion transmission of signals without external power supply.

The output of ISO4-20mA-E is designed on the basis of the two-wire powered loop circuit of the 24VDC and 2-wire current loop, the current loop is connected with sampling resistance (two-wire meter) in parallel, the output also matches well with the analog input terminals of the industrial equipment like analog input interface board (host machine), PLC, DCS, and other instruments and meters, etc. That conditioner module is convenient to use to achieve the isolation, transmission and acquisition of two-wire 4-20mA signal by add an external 10KΩ multi-turn potentiometer to do adjustment and meets the requirements that operating in industrial field wide temperature, humidity, vibration, etc adverse operation conditions. The signal conditioner has two types of package, small size PCB-mounted package, 35mm DIN rail-mounted package. The 35mm DIN rail-mounted products can be 1-input 1-output, 2-input 2-output, 3-input 3-output and 16-channel isolation, etc

Maximum Rated Values:

(If exceed the values below, may cause unmendable damages.)

Continuous Isolation Volt.	3KVrms
Vin./ Input Signal Volt.(Max.)	32VDC
Operating Ambient Temp.:	- 40°C ~ + 85°C
Soldering Temp.(<10S):	+300°C
Output Short-circuit Time:	Continuous

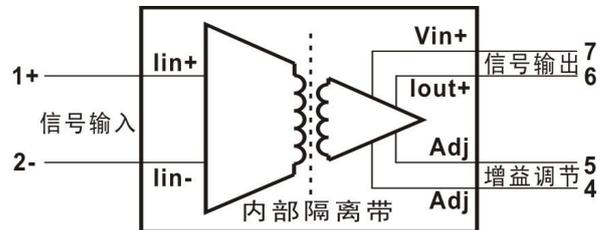
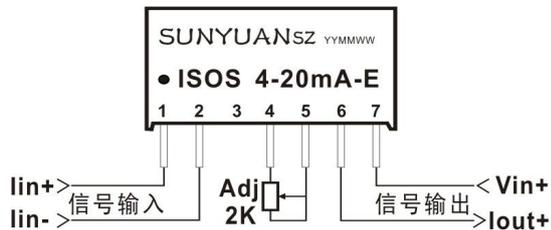
General Parameters

Accuracy, linearity error grade ----- 0.1, 0.2	Hysteresis error ----- < 0.5% meas.val./100Ω
Auxiliary power----- No	Isolation ----- signal input and output
Operating Temp.----- -20 ~ +70℃	Package ----- SIP 7 Pin
Operating Humidity-----10~90% (no condensation)	Withstand Volt. ----- 3KV(60HZ / S), leak current < 1mA
Storage Temp.----- -45~ +105℃	Impact Resistance Volt. ----- 3KV, 1.2/50us(peak value)
Storage Humidity-----10 ~ 95% (no condensation)	Temperature drift ----- 0.0050%F.S./℃ (-40℃~+85℃, operating temperature range)

Technical Parameters

Parameter	Conditions	Min.	Typical Value	Max.	Unit
Isolation Volt. AC, 50Hz	10S	3000			VDC
Insulation Impedance	500VDC		100		MΩ
Leak current	240Vrms, 50Hz		0.5		uA
Temp. Drift			±50	±100	PPm/℃
Non-linearity			±0.2	±0.5	%FSK
Load competence	24VDC		750		Ω
Input Signal Volt. Range		5	24	32	VDC
Output Signal Volt. Range	RL:250Ω	13	24	36	VDC
Output Linearity Range			4	24	mA
Output Current I _o		0.5		40	mA
Output Signal Ripple			10	20	mV
Frequency Response (small signal bandwidth)	I _o =20mA		100		Hz

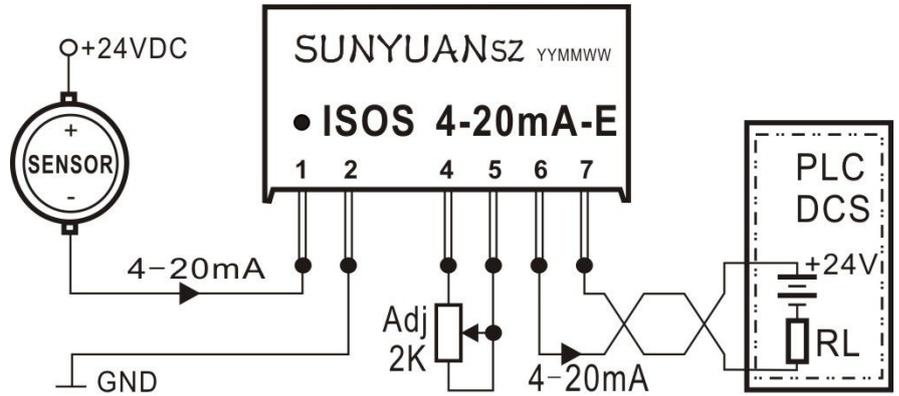
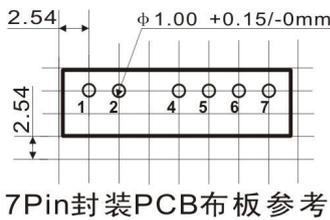
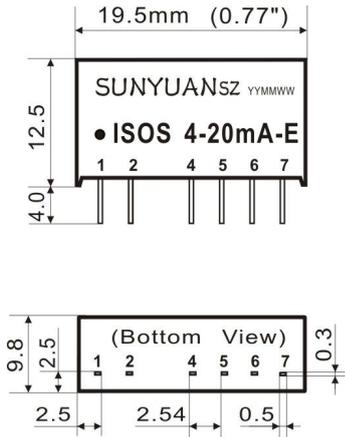
Pin Definition&Functional Block



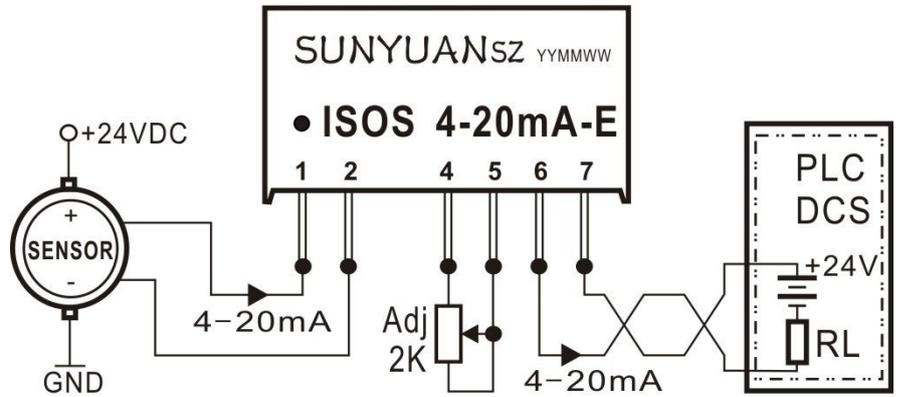
Pin function description (SIP 7Pin)

Signal input +	Signal input -	No connection	Gain adjustment	Gain adjustment	Current output +	Voltage input +
lin+	lin-	NC	ADJ	ADJ	lout+	Vin+
1	2	3	4	5	6	7

Dimension&Typical Application Circuits



小体积4-20mA隔离调理控制器IC典型应用图1



小体积4-20mA隔离调理控制器IC典型应用图2

Notifications

1. Please read the specification before using it; any doubt, contact our technical support personnel.
2. Do not use it in hazardous area.
3. Do not dismantle the product privately to avoid operation failure or damage.

After-sale Service

1. The products have passed quality inspection before ex-factory, if there are abnormal operation or failure, please contact our technical support personnel.
2. Quality warranty: 2 years. During valid quality warranty period, any quality problems, we will provide free replacement or maintenance free service.

Note:

1. All the parameters are tested @ Ta=25°C, humidity <75%, nominal input and rated output load.
2. The testing methods are done based on our internal quality inspection standards.
3. The the special requirements or parameters (not presented), please contact the technicians for details.
4. Customized products are available.
5. The specification is subject to change without notice.