Two-wire passive analog signal VI conversion 10KV high isolation transmitter

Passive two-wire voltage signal to 4-20mA high isolation transmitter: ISOH V-4-20mA series

Features

●Unique high-efficiency signal loop power-taking technology, no external working power supply
●Two-wire VI conversion analog signal input and output 10KVAC high isolation
●Analog voltage signal input, loop power supply 4-20mA current loop output mode
●Can Input potential potentiometer signal: 0-2KΩ / 0-5KΩ / 0-10KΩ, etc. Can input standard analog voltage signal: 0-5V/0-10V/1-5V/0-75mV, etc.
● (5V/3mA) regulated power supply can be provided at the input for circuits such as bridges
●Extreme accuracy and linearity over the full range, nonlinearity error < 0.1%
●Small volume (46X22X12 mm), error level: 0.1, 0.2
●Small size single row SIP 16Pin, UL94V-0 compliant flame retardant package

Typical application

●Displacement, potentiometer and other sensor voltage signal acquisition isolation
●PLC / DCS control system matches sensor voltage signal
●Load cell millivolt signal to 4-20mA analog signal
●Multi-channel analog acquisition ground loop isolation and interference suppression
●Sensor and transmitter 4-20mA signal isolation and VI conversion
●Pressure sensor voltage signal acquisition isolation and long-distance transmission
●Bridge (electronic ruler) detection circuit voltage signal isolation and distribution
● Power instrumentation, medical equipment monitoring isolation barrier
● DC, high voltage monitoring and isolation safety barrier for electric power and rail transit

Summarize

SunYuan ISOH V-4-20mA is the newly developed 10KVAC highest isolation voltage, small size (16 pin single line SIP16 Pin) low-cost passive two-wire sensor voltage signal to 4-20mA isolated transmitter module in the industry . The module can provide a set of 5V (3mA) function expansion power supply to the input circuit and supply power to the pre-stage circuit through the post current current loop feeding mode, and receive the voltage signal from the output of the pre-stage circuit, and output 4~20mA after isolation conversion. Standard two-wire current signal. The new product can realize high precision, high linearity 10KV anti EMC high isolation transmission and VI conversion between industrial field passive two-wire voltage sensor and instrumentation/PLC/DCS.

ISOH V-4-20mA product is designed as a low cost, small size, standard SIP16 Pin flame-retardant IC package that includes a signal modulation and demodulation circuit, a signal coupled isolation converter circuit and a VI conversion circuit. The product has the characteristics of wide output voltage range (12-36VDC), high conversion precision and good linearity. It is very convenient to use. Customers only need to add a small number of peripheral devices at the input end of the product to realize the distribution of voltage signals in the sensor and bridge (weighing) detection circuit of the electronic scale, displacement, potentiometer, etc. The product is small size and easy to install. It can be placed inside the sensor to directly convert the displacement and angular displacement resistance signals into a standard 4-20mA signal output. The full scale and zero point can be adjusted and calibrated by the user through an external potentiometer. The advanced integrated process structure and new technology isolation measures enable the device to achieve high signal isolation of 10,000 VAC.

ISOH V-4-20mA series new products enable analog voltage signals from industrial field sensors and signals between instrumentation, PLC and DCS, high-precision, high linearity 10KV anti EMC high-isolation transmission and

VI conversion. Products include IC package and DIN35 Rail-mounted packaging. It is widely used in track voltage monitoring, generator or motor safe operation monitoring, power transmission and distribution remote monitoring, instrumentation and sensor signal transceiver, medical equipment safety barrier, industrial automation control. nuclear power equipment and other fields etc.

The Maximum product rating (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（The maximum continuous isolation voltage between Input and output）10000Vrms	
Vin （The maximum voltage value of Input signal ）	36VDC
Junction Temperature （ The Maximum working temperature range ）	- 40 ~ +85 ℃
Storage Temperature （The Maximum storage temperature ）	+150℃
Lead Temperature (the highest soldering temperature of Pin / duration <10S)	+300℃/<10S
Output Short to Common （4-20mAOutput short circuit time）	Sustainable

General parameters:

Accuracy, linearity error level ---------- 0.1，0.2grade	Load regulation rate ---------- ＜0.05% meas.val./100Ω
Auxiliary power supply---------- No	Isolation ---------- signal input/output 10000VAC two isolation
Working temperature---------- -40 ~ +85℃	Packaging ---------- SIP 16 Pin (Single row 16 feet)
Working Humidity-------10 ~ 60% (No condensation)	Pressure resistance --------- 10KV(50HZ / S)， Leakage current ＜1mA
Storage temperature---------- -45~ +105℃	Withstand voltage ---------- 10KVAC， 1.2/50us(peak)
Storage Humidity---------10 ~ 95% (No condensation)	Temperature drift ---------- 0.0050%F.S./℃ (-40° C～ +85° C operating temperature range)

Model and definition

ISOH V(R)□ -4-20mA

Input/ Output	Input voltage or resistance value		Output two-wire current value
10KVAC	V1:0-5V	R6:0-2KΩ	4-20mA
Two isolation	V2:0-10V	R7:0-5KΩ	
	V3:0-75mV	R8: Customized	
	V4:0-2. 5V	R9:0-10KΩ	
	V8: Customized		

Product selection example

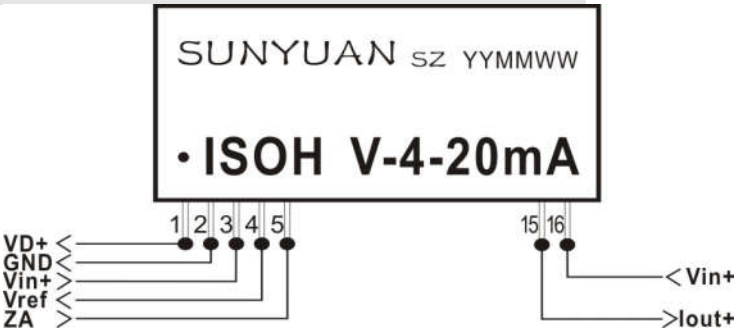
eg 1： signal input：0-5V； signal output：4-20mA； 10KVAC isolatoin；small size SIP16 packaging
Model No： **ISOH V1-4-20mA**

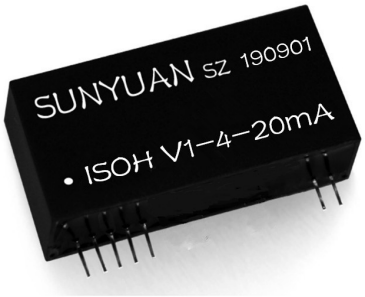
eg 2： Signal input：0-5KΩ； signal output :4-20mA； 10KVAC isolation ； small size SIP16 packaging
Model No： **ISOH R7-4-20mA**

Technical Parameters

Parameters	Test condition	ISOH V(R)-4-20mA			Unit
		MIN	TYP	MAX	
Isolation voltage AC，50Hz	60S		10000		VAC
Insulation resistance	500VDC		100		MΩ
Leakage current	240Vrms，50Hz		0.5		uA
Output current linear range		3.5		24	mA
Gain		0.005	0.3125	0.625	V/mA
Temperature drift coefficient	- 40- + 85℃		±50	±100	PPM/℃
Nonlinearity	0-5V	±0.1	±0.2	±0.4	%FSR
Input offset voltage			±1	±2	mV
Input voltage signal		0.075		10	V
Input resistance signal		50		10K	Ω
Frequency characteristics			100		Hz
Distribution voltage	Ireg=3mA	4.75	5	5.25	V
Loop supply voltage		12	24	36	V

Pin definition and function schematic

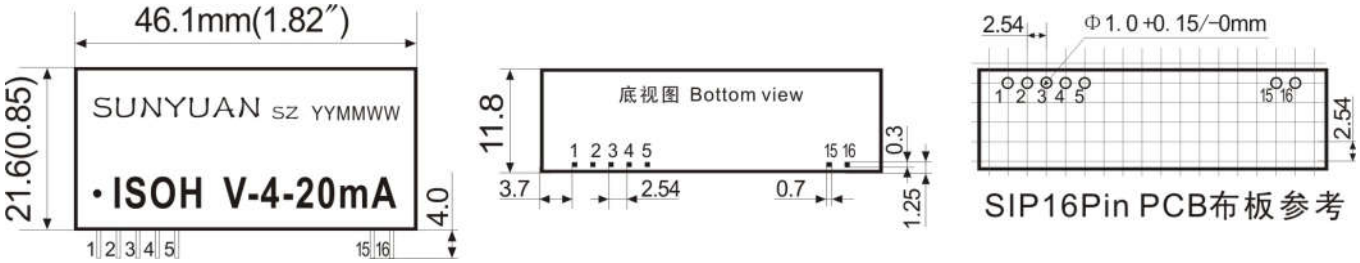




Pin function description (single row inline: SIP6 Pin)

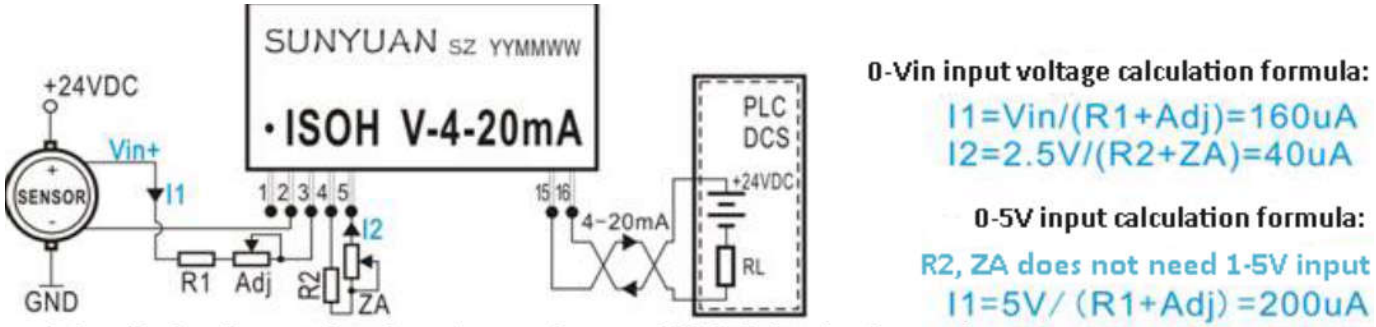
+5V Power distribution output positive terminal	signal Input Ground end	signal Input Positive terminal	+2.5V benchmark Voltage Output	Zero point Adjustment foot	Empty foot	Current Output Positive terminal	Voltage Input Positive terminal
VD+	**GND**	**Sin+**	**Vref**	**ZA**	**NC**	**Iout+**	**Vin+**
1	**2**	**3**	**4**	**5**	**6~14**	**15**	**16**

Dimensions and PCB layout



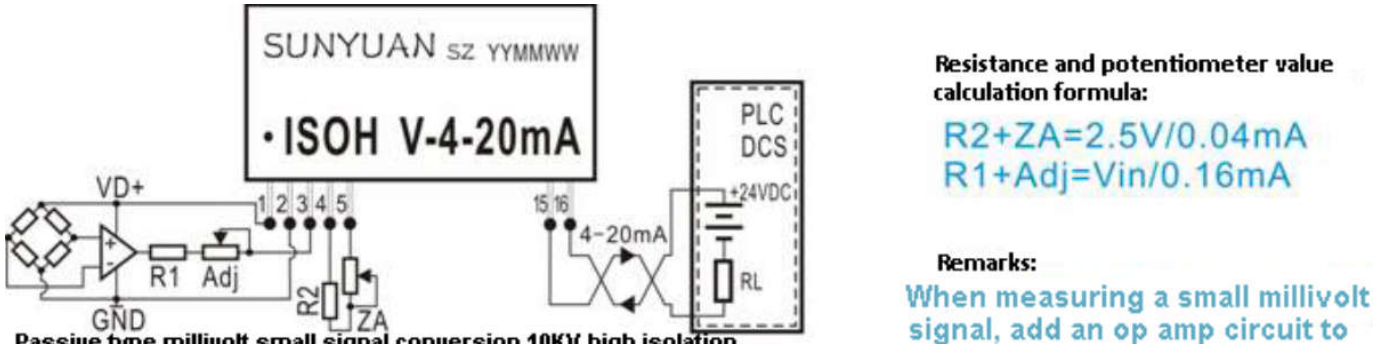
Typical application example

Application 1: Sensor voltage signal acquisition isolation transmission typical application (two-wire power distribution loop output mode)



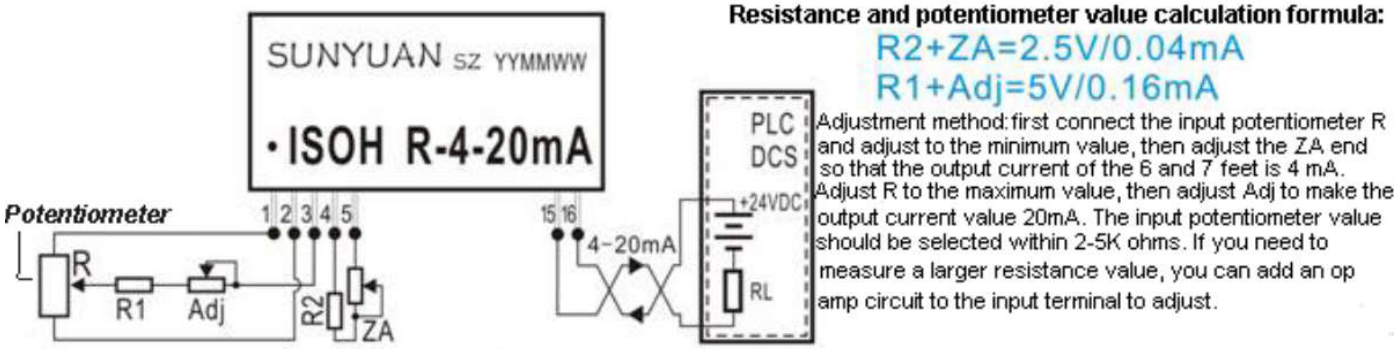
Typical application diagram of passive V/I conversion 10KV high isolation signal transmitter IC

Application 2: Bridge (weighing) detection circuit millivolt voltage signal isolation power distribution typical application (two-wire power distribution loop output mode)



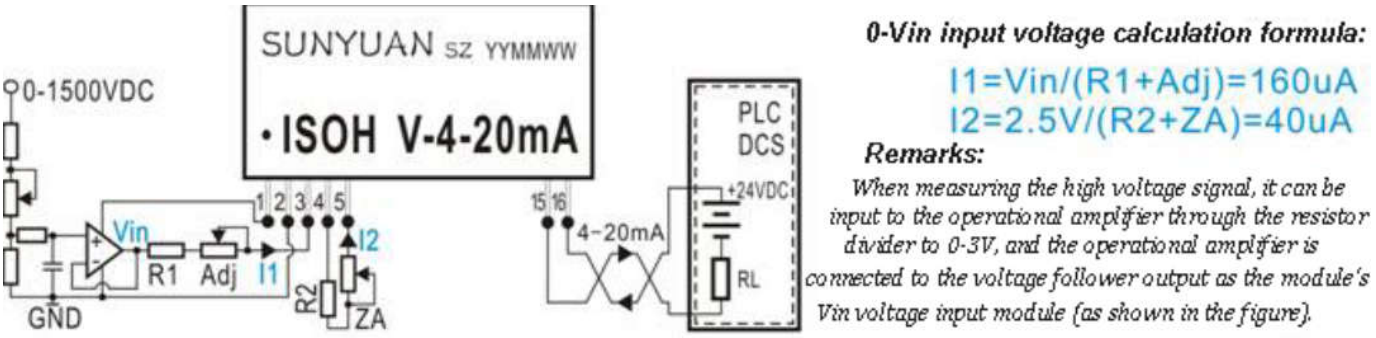
Passive type millivolt small signal conversion 10KV high isolation transmitter IC typical application diagram

Application 3: Displacement potentiometer resistance signal input typical application (two-wire power distribution loop output mode)



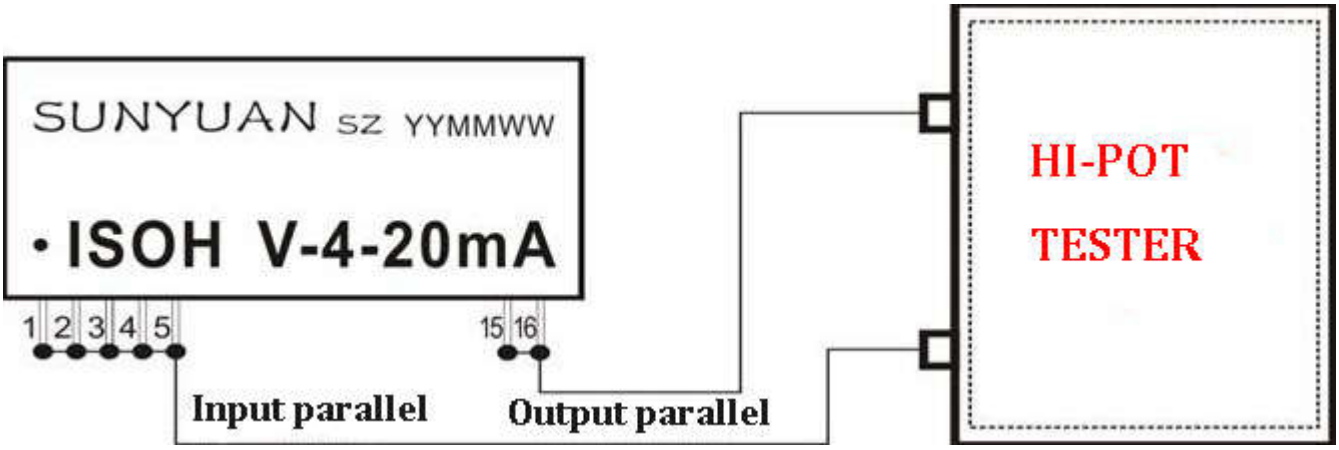
Passive displacement resistance signal conversion 10KV high isolation transmitter IC typical application diagram

Application 4: Rail Transit High Voltage Signal Acquisition Isolation Transmitter Typical Application (Two-Wire Power Distribution Loop Output Mode)



Passive high voltage signal conversion 10KV high isolation transmitter IC typical application diagram

High-voltage isolation safety detection method



High-voltage isolation safety test method and precautions

1. According to the wiring shown in the above figure, set the rated high voltage value of the high voltage tester according to the product isolation voltage parameter specification. Please pay attention to personal safety when testing, beware of electric shock!

Test environment: room temperature TA = 25 ° C, air humidity < 75%

2. The high-voltage test operator must wear rubber-insulated gloves with rubber insulation pads on the ground to prevent high-voltage electric shock.

3. The instrument case of the high voltage tester must be grounded reliably and should not be detected in a high temperature, humid and dusty environment.

4. When connecting the measured object, the high voltage tester must ensure that the high voltage output value is "0" and the detection function key is "reset" to prevent contact with other objects.

5. When the instrument is in the high voltage test state and the high voltage discharge is over, it is strictly forbidden to contact the measured object, test line or high voltage output.

6. Product isolation voltage test method As shown in the above figure, short the input terminal and output terminal pin respectively, and load the rated voltage value for 1 minute.

7. According to the rated isolation voltage value of the product, use the manual gear to adjust the output voltage of the tester from 0 to the rated value and keep it for a minute.

8. The insulation voltage test itself is a destructive test of the insulator. For the same product, the high voltage test should be minimized. If there are multiple tests between different customers, the general requirements are as follows: the batch product is tested according to the rated voltage value of the specification for the first time, and the test voltage value should be reduced by 0.7 times of the rated value each time. The number of high-voltage tests, otherwise the product will be irreparable damage during multiple high-voltage tests.