

Frequency Pulse Signal Converter IC

FV/FI Frequency to DC Current/Voltage Converter

SY F-P-O Series

Features	Applications
<ul style="list-style-type: none"> ● Precision level: 0.1 0.2 0.5 ● Very high linearity value (nonlinearity < 0.1%) ● 3KVDC isolation between power supply and signal channel ● Power supply: 5VDC, 12VDC, 24VDC single power supply ● 0-1KHz/0-5KHz/0-10KHz frequency signal isolation converting to standard 0-75mV/0-2.5V/0-5V/0-10V voltage signal or 0-10mA/0-20mA/4-20mA current signal ● Small size, standard SIP-16PIN (UL94V-0) ● Industrial temp. range: -20~+85 °C 	<ul style="list-style-type: none"> ● Sine wave, square wave and saw tooth wave signal isolation amplification and conversion ● Sensor signal acquisition, isolation and conversion ● Transducer(FA) frequency signal acquisition and control ● Generator, motor and other rotating equipment speed monitoring ● Transformer operating frequency detection ● Instrument and sensor signal transmitting & sending ● Non-electric quantity signal transferring

Introduction

SUNYUAN SY series frequency signal isolation converter is a kind of hybrid integrated frequency circuits to convert frequency signal in proportion to the standard dc current or voltage signals. The product integrates a group of multi-channel high-isolation DC / DC power supply and a high-speed frequency signal isolation converter, applicable to any frequency signal isolation transform. SMD process structures and new isolation technologies allow the device to achieve: 3000VDC isolation between the auxiliary power supply, signal input, signal output. And to meet the industrial wide temperature, humidity, vibration scene adverse work environment requirements.

SY series frequency signal isolation converter is very easy to use, with minimal external components to the frequency signal isolation transmitter.

Max Rated Value:	
instant isolated voltage value:	3000VDC
APS voltage input range:	±10%Vin
Welding temp. (10s):	+300°C

Notes: if input range is beyond above description, it may cause perpetual damage to the chips.

Technical parameters

Name		Testing conditions	Min	Typical	Max	Unit
Isolated voltage		AC,50Hz,1min	1000	1500		V(rms)
Signal input	Frequency		0	1000	20000	Hz
	Voltage		2.5	5	50	VP-P
Gain	Voltage	50k potentiometer		1		KHZ/V
	Current	50k potentiometer		1/4		KHZ/mA
Gain temperature drift				100		ppm/°C
Nonlinearity				0.1		%FSR
Input off-set voltage				1	5	mV
Signal output				5	10	V
Load capacity		Vout=10V	1	2		kΩ
Signal output ripple wave		No filtration		5	7	mV
Signal voltage temp. drift				25		μV/°C
Auxiliary power supply	voltage	Customized	5	12	24	VDC
	current	VD=24V		30		mA
Power supply output ripple		No filtering	10			mV
Operating temperature			-20		85	°C
Storage temperature			-40		125	°C

Model selection

DIN **X** **SY** **F** **-P** **-O**

DIN1X1: 1-IN 1-OUT
 DIN2X2: 2-IN 2-OUT
 Omitted: PCB-mounted

Input Frequency

F1: 0-1kHz
 F2: 0-5kHz
 F3: 0-10kHz
 F8: Customized

Power Supply

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

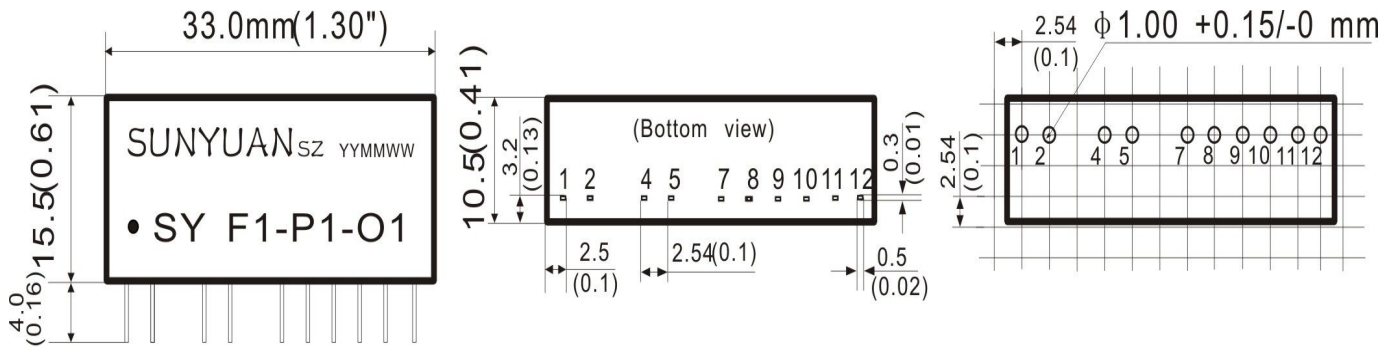


Model selection examples:

E.g.1.: input 0-10kHz, output 0-5VDC, power supply:12VDC, SIP 12PIN PCB-mounted type.
Product model No: SY F3-P2-O4

E.g.2.: input 0-5kHz, output 0-5VDC, power supply:5VDC, 1-IN 1-OUT, 35mm DIN Rail-mounted type.
Product model No: DIN1X1 SY F2-P3-O4

SIP12PIN PCB-mounted Type Dimension & Pin Definition



IC封装SIP12PinPCB布板参考

Typical Applications

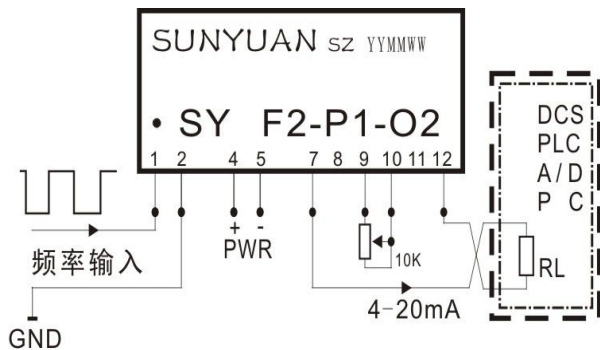


图1 频率输入/电流输出 (F/I) 转换

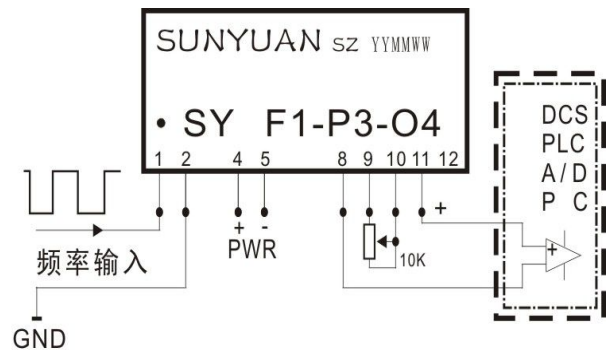


图2 频率输入/电压输出 (F/V) 转换

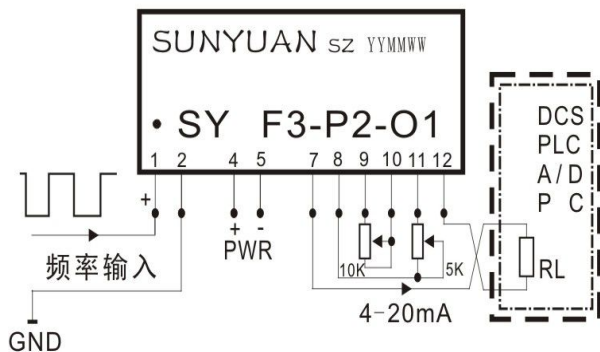


图3 频率输入/电流输出 (F/I) 转换

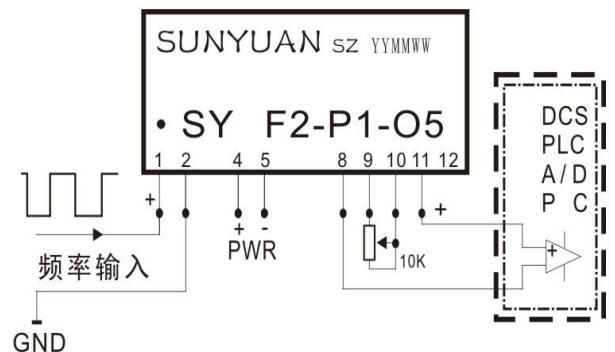


图4 频率输入/电压输出 (F/V) 转换

SY F-P-O Series Frequency input current output typ PIN description: SIP 12PIN Package

1	2	3	4	5	6	7	8	9	10	11	12
Freq. Input Fin+	Freq. Input GND	NC	Power supply PWR+	Power supply PWR-	NC	Current output Io+	Zero Adj. or NC	Gain Adj.	Gain Adj.	Zero Adj. or NC	Current output Io-

SY F-P-O Series Frequency input voltage output typ PIN description: SIP 12PIN Package

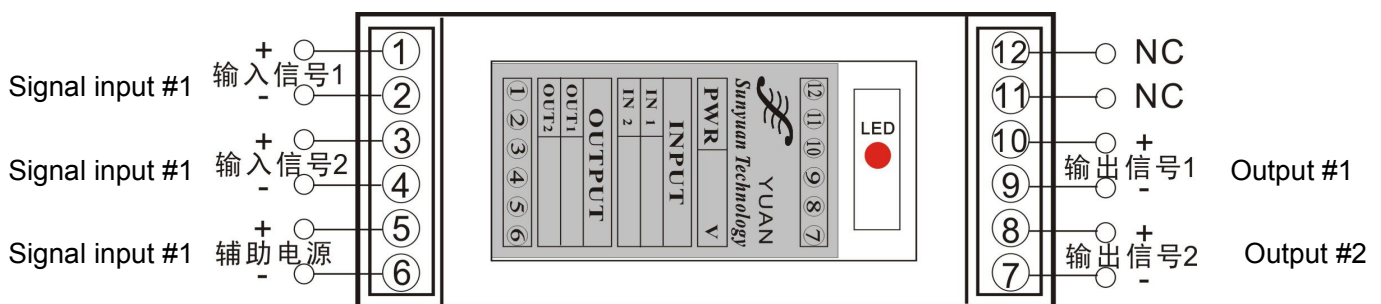
1	2	3	4	5	6	7	8	9	10	11	12
Freq. Input Fin+	Freq. Input GND	NC	Power supply PWR+	Power supply PWR-	NC	NC	Volt. output. GND	Gain Adj.	Gain Adj.	Volt. output. Vo+	NC

35mm DIN Rail-mounted Type

DIN1X1 (1-IN 1-OUT) DIN2X2 (2-IN 2-OUT) Typical Applications

Sunyuan DIN SY F-P-O Series rail-mounted type frequency signal dual-isolation transmitter with several sets of SY F-P-O series IC inside the rail-mounted case, and it's zero and output precision can be adjusted through the adjustable resistance in the PCB inside the rail-mounted case. PCB size: Length* Width: 79.5*32.5mm.

For 35mm DIN Rail-mounted type products, the calibration work already done before ex-factory, user can it without any adjustment. If higher precision grade is required, please adjust the zero and gain potentiometers in the side of rail-mounted case.

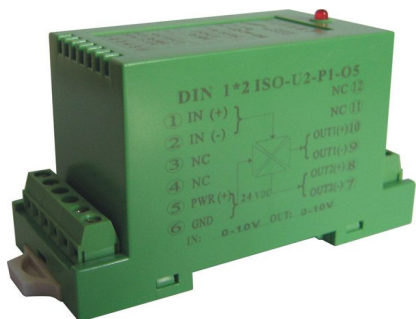
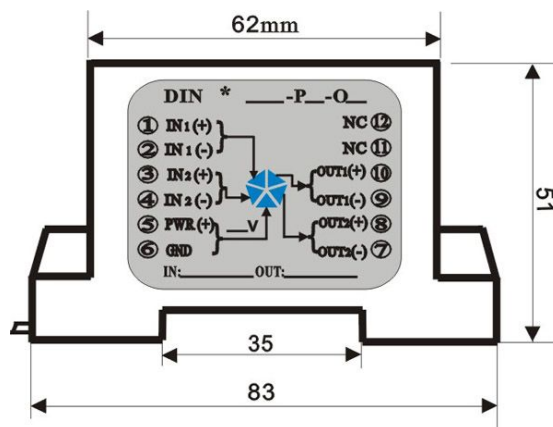


DIN 1X1 / 2X2 DIN Rail-mounted (FV/I) non-isolation Transmitter wiring diagram

DIN Rail-mounted Type Dimension & Pin Description (*Logo printed in the case)

Unit:mm

Pin	Pin Description	
1	Sin1+	Signal input #1 +
2	Sin1- (GND)	Signal input #1 -
3	Sin2+	Signal input #2 +
4	Sin2-(GND)	Signal input #2 -
5	Power in	Power supply +
6	Power GND	Power supply -
7	Out2 -	Signal output #2 -
8	Out2+	Signal output #2 +
9	Out1 -	Signal output #1 -
10	Out1+	Signal output #2 +
11	NC;	NC
12	NC;	NC



Product applications

Application case 1: (Refer to Fig. 5)

Measuring low voltage frequency signal, voltage output type.

Input: 0~10KHZ/3~10V pulse frequency signal; Output: 0~5V DC analog signal.

Method: Zero adjustment already done before ex-factory, user can use it without doing any adjustment. Use W1=10K multi-turn potentiometer, adjust W1 to make that the input is 10kHz, the output is 5VDC accordingly.

Application case 2: (Refer to Fig. 6)

Measuring low voltage frequency signal, current output type.

Input: 0~10KHZ, amplitude 3~10V pulse frequency signal; Output: 4-20mA analog signal.

Method: Adjust and calibrate zero. The input terminals should be short-circuited (PIN1, PIN2), use W2=5K (multi-turn potentiometer), adjust zero potentiometer to make it output 4mA accordingly.

Adjust and calibrate span. Use W1=10K (multi-turn potentiometer), adjust span potentiometer W1 to obtain that when input signal is 10KHZ, the output is 20mA accordingly.

Application case 3: (Refer to Fig. 7)

Measuring high voltage frequency signal, current output type.

Input: 0-10KHZ, amplitude is higher than 10V frequency signal; Output:4-20mA analog signal.

Method: Adjust and calibrate zero. The input terminals should be short-circuited (PIN1, PIN2), use W2=5K (multi-turn potentiometer), adjust zero potentiometer W2 to make it output 4mA accordingly.

Adjust and calibrate span. Use W1=10K (multi-turn potentiometer), adjust span potentiometer W1 to obtain that when input signal is 10KHZ, the output is 20mA accordingly.

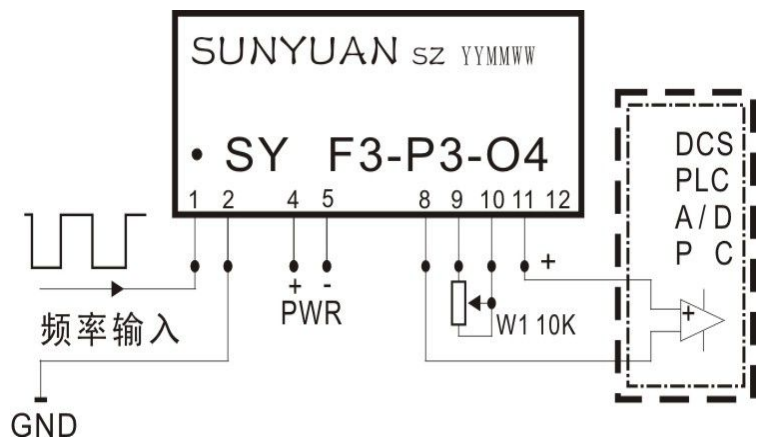


Fig. 5: Measuring low voltage frequency signal, voltage output type

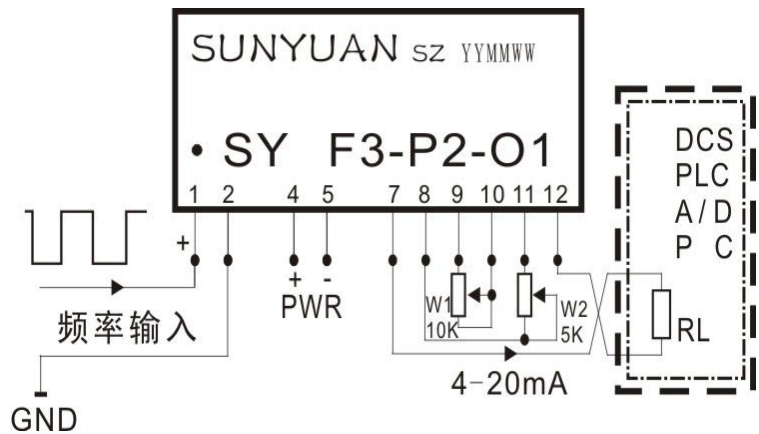


Fig. 6: Measuring low voltage frequency signal, current output type.

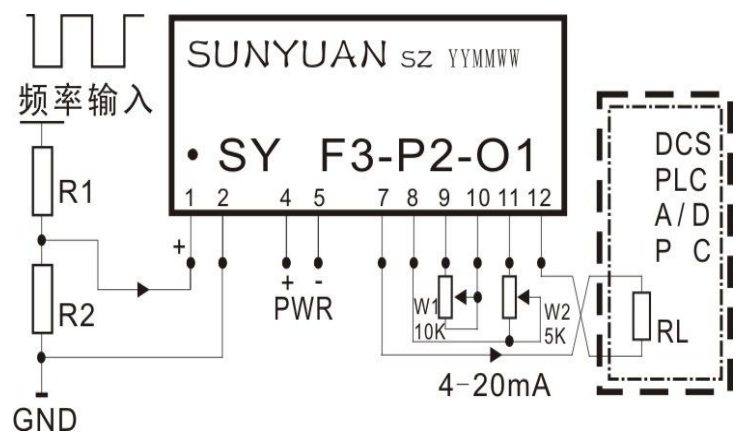


Fig. 7 Measuring high voltage frequency signal, current output type