

## Speed Pulse Signal Isolated Transmitter/Amplifier



### General characteristics:

- >> Speed sensor signal input directly, square wave signal output
- >> Sine wave, saw tooth wave signal input, square wave signal output
- >> 200mV peak weak signal amplification and shaping
- >> To maintain the original signal frequency, fast response
- >> Power supply, signal, input/output: 3000VDC Three-port Isolation
- >> Power supply:5V/12V/15V/24V,etc.
- >> Low cost, ultra-small size, no need adjust, easy to use, high reliability
- >> Standard SIP12 Pin, meet UL94V-0 flame-retardant package
- >> Industry temperature range:-45~+85 deg.C

### Applications:

- >> Speed sensor signal isolation, acquisition and transformation
- >> Locomotive speed measurement
- >> Auto ABS anti-lock braking system
- >> Speed signal amplification and shaping
- >> Motor Speed Control System
- >> CNC machine tool spindle speed measurement and alarm monitoring
- >> Transmission and transmission of the signal without distortion

### Introduction:

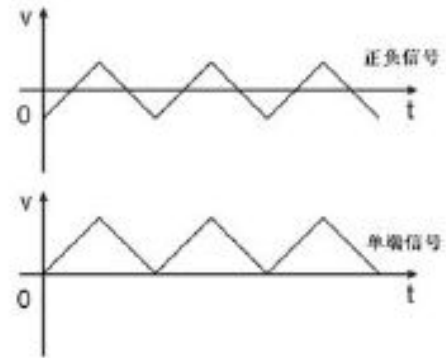
ISO S-P-O Series transmitter is a kind of isolation will speed sensor signal, sine wave, sawtooth wave signal or a weak signal isolation converted into fully consistent with the input frequency square wave signal hybrid integrated circuit. The product on the same chip integrates a group of multi-channel high-isolation DC / DC power supply, a high-performance signal isolation and signal amplification and shaping circuits. Especially suitable for the speed, sine wave signal isolation, etc. to convert the standard square wave pulse signal, the current velocity measurements in the automotive and automotive ABS anti-lock braking system widely used.

ISO S-P-O-chip integration of high-efficiency DC-DC isolated power supply can produce multiple, respectively, to internal input amplifier circuit, modulation circuit power supply, and output of the demodulation circuit, the conversion circuit, shaping circuitry. SMD process structures and new technology quarantine measures to enable the device to achieve: power, signal input / output isolation 3000VDC and can meet the industrial wide temperature, humidity, vibration, poor working-site environmental requirements. ISO S-P-O series of isolated transmitter is very easy to use, no additional external components, you can achieve the transmission speed sensor signal isolation.

**Max. operation range:**

If more than the scope may cause permanent damage

|                                  |         |
|----------------------------------|---------|
| Continue isolation voltage value | 3000VDC |
| Power Vin range:                 | ±10%Vin |
| Jointing temperature(10sec.)     | +300°C  |
| Input signal voltage:            | ±50V    |
| MAX current value(output signal) | 5mA     |



**Model Selection:**

**ISO S□ - P□ - O□**

**Input signal**

- S1: Positive and negative signal input  
Amplitude peak-peak value( $V_{p-p}$ ):200mV~50V
- S2: Positive signal input  
Amplitude peak-peak value( $V_{p-p}$ ):0-5V
- S3: Positive signal input  
Amplitude peak-peak value( $V_{p-p}$ ):0-12V
- S4: Positive signal input  
Amplitude peak-peak value( $V_{p-p}$ ): 0-24V
- S8: User-defined

**Power supply**

- P1: DC24V P2:DC12V P3:DC5V P4:DC15V
- P8: User-defined

**Output Signal**

- O1: output Level 0~5V O2: output Level 0~12V
- O3: output Level 0~24V O4: Open-collector output
- O8: User-defined

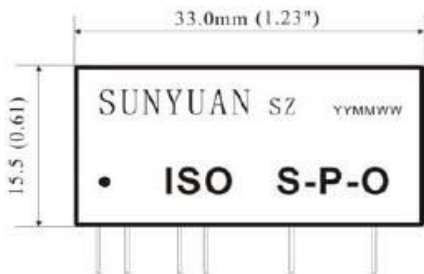
**Model No. Examples:**

1. Input signal: Car speed sensor, sine VP-P: 200mV ~ 10V, Output signal:0~5V level Power supply:24V  
Model No. is **ISO S1-P1-O1**
2. Input signal: Car speed sensor, sine VP-P: 200mV ~ 10V, Output signal: Open-collector output, Power supply:12V  
Model No. is **ISO S1-P2-O4**

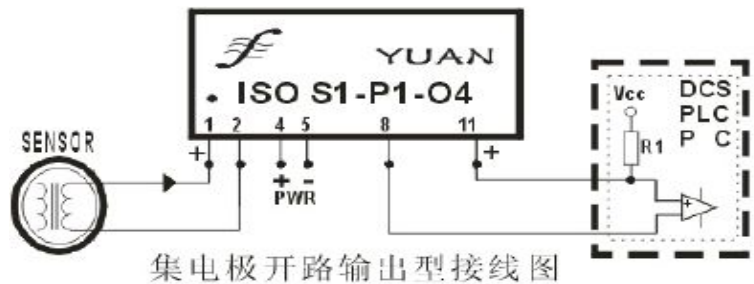
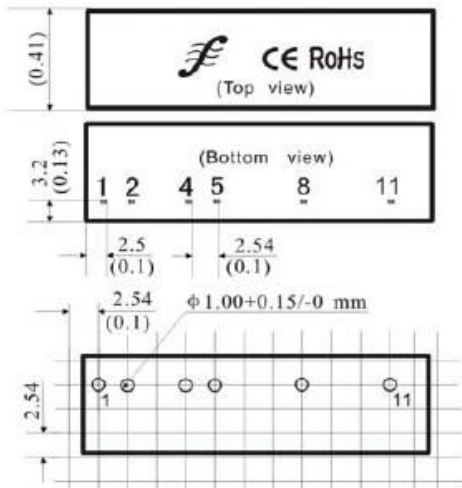
Technical parameters:

| Parameters            |                 | Test Condition           | Mix  | Type | Max  | Unit |
|-----------------------|-----------------|--------------------------|------|------|------|------|
| Isolated voltage      |                 | 1min                     | 1500 | 3000 |      | VDC  |
| Input signal          | Amplitude(VP-P) |                          | 0.2  | 10   | 60   | V    |
|                       | Frequency       |                          | 0    | 10   | 500  | KHz  |
|                       | impedance       |                          | 10   |      |      | Kohm |
|                       | current         | 5V input                 |      | 0.45 |      | mA   |
| Output signal         | Amplitude(VP-P) | O1:out level 0~5V        |      | 5    |      | V    |
|                       | Frequency       |                          | 0    | 10   | 500  | KHz  |
|                       | Voltage(High)   |                          |      | 5    |      | V    |
|                       | Voltage(Low)    | O1:out level 0~5V        |      | 0    | 0.05 | V    |
|                       | Current(High)   |                          |      | 2    | 5    | mA   |
|                       | Current(Low)    |                          |      | 2    | 8    | mA   |
|                       | Voltage         | O4:Open-collector output |      | 5    | 30   | V    |
|                       | Current         |                          |      | 3    | 10   | mA   |
| Response Time         |                 |                          |      | 1500 |      | ns   |
| Assistant power       | Voltage         | User-defined             | 3.3  | 12   | 24   | VDC  |
|                       | Current         | VD=12V                   |      | 42   |      | mA   |
| Power Loss            |                 |                          | 0.3  | 0.5  | 1    | W    |
| Operating temperature |                 |                          | -45  |      | 85   | °C   |
| Storage temperature   |                 |                          | -55  |      | 125  | °C   |

Physical Dimensions and PIN Definition:



High (Low) level output connecting diagram



Open-collector output connecting diagram

**Pin Description:**

| 1                       | 2                      | 3       | 4            | 5            | 6       | 7       | 8                       | 9       | 10      | 11                      | 12      |
|-------------------------|------------------------|---------|--------------|--------------|---------|---------|-------------------------|---------|---------|-------------------------|---------|
| Signal<br>input<br>Sin+ | Signal<br>input<br>GND | omitted | power<br>PW+ | power<br>PW- | omitted | omitted | Signal<br>output<br>Vo- | omitted | omitted | Signal<br>output<br>Vo+ | omitted |

## Speed Pulse Signal Converter IC

### Sine Wave Sawtooth Wave Signal Low Cost Dual Isolation Transmitter IC

#### SY S-P-O Series

| Features  | Applications   |
|---|--|
| <ul style="list-style-type: none"> <li>• Speed sensor signal input directly, square wave signal output.</li> <li>• Sine wave, sawtooth wave signal input, square wave signal output.</li> <li>• 200mV peak weak signal amplification and shaping.</li> <li>• Maintain the original signal frequency, fast response.</li> <li>• Power supply and signal channel 3000VDC Two-port Isolation</li> <li>• Power supply: 5V/12V/15V/24V, etc.</li> <li>• Low cost, ultra-small size, no need to adjust, easy to use, high reliability</li> <li>• Standard SIP12 Pin, meet UL94V-0 flame-retardant package</li> <li>• Industry temperature range: -25~+70 deg.C</li> </ul> | <ul style="list-style-type: none"> <li>• Speed sensor signal isolation, acquisition and transformation.</li> <li>• Locomotive speed measurement.</li> <li>• Auto ABS anti-lock braking system.</li> <li>• Speed signal amplification and shaping.</li> <li>• Motor Speed Control System.</li> <li>• CNC machine tool spindle speed measurement and alarm monitoring.</li> <li>• Transmission and transmission of the signal without distortion.</li> </ul> |

#### Introduction

SY S-P-O Series transmitter is a kind of isolation will speed sensor signal, sine wave, sawtooth wave signal or a weak signal isolation converted into fully consistent with the input frequency square wave signal hybrid integrated circuit. The product on the same chip integrates a group of multi-channel high-isolation DC / DC power supply, a high-performance signal isolation and signal amplification and shaping circuits. Especially suitable for the speed, sine wave signal isolation, etc. to convert the standard square wave pulse signal, the current velocity measurements in the automotive and automotive ABS anti-lock braking system widely used.

SY S-P-O-chip integration of high-efficiency DC-DC isolated power supply can produce multiple, respectively, to internal input amplifier circuit, modulation circuit power supply, and output of the demodulation circuit, the conversion circuit, shaping circuitry. SMD process structures and new technology quarantine measures to enable the device to achieve: power, signal input / output isolation 3000VDC, and can meet the industrial wide temperature, humidity, vibration, poor working-site environmental requirements.

SY S-P-O series of isolated transmitter is very easy to use, no additional external components, you can achieve the transmission speed sensor signal isolation.

| Max Rated Value:                    |         |
|-------------------------------------|---------|
| instant isolated voltage value:     | 3000VDC |
| Auxiliary power supply input range: | ±10%Vin |
| Welding temp. ( 10s ) :             | +300°C  |
| Input Voltage Single Max.           | ±50VP-P |
| Output Current Single Max.          | 5mA     |

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

**Model selection**
**SY S<sub>□</sub> - P<sub>□</sub> - O<sub>□</sub>**
**Input signal**

S1: Positive and negative signal input

 Amplitude peak-peak value( $V_{P-P}$ ):200mV~50V

S2: Positive signal input

 Amplitude peak-peak value( $V_{P-P}$ ):5V

S3: Positive signal input

 Amplitude peak-peak value( $V_{P-P}$ ):12V

S4: Positive signal input

 Amplitude peak-peak value( $V_{P-P}$ ): 24V

S8: User-defined

**Power supply**

P1:24VDC P2:12VDC P3:5VDC P4:15VDC

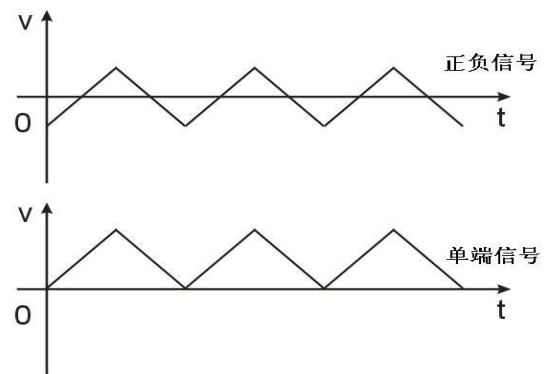
P8: User-defined

**Output Signal**

O1:Output Level 0~5V O2: Output Level 0~12V

O3: Output Level 0~24V O4: Open-collector output

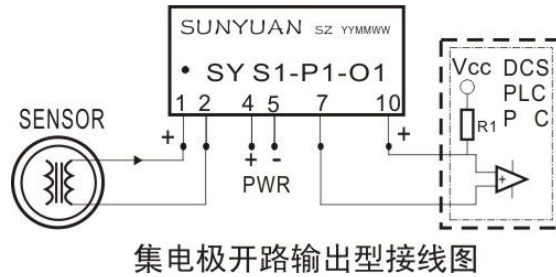
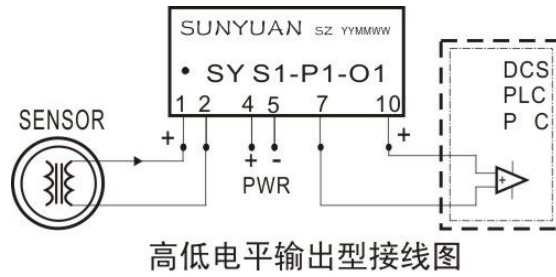
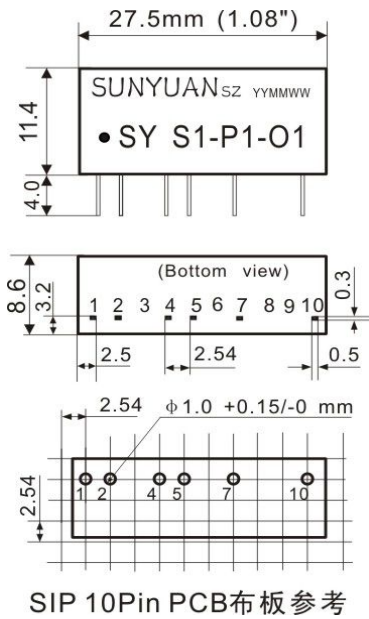
O8: User-defined


**Model selection examples:**
**E.g.1:** Input signal: Car speed sensor, sine VP-P: 200mV ~ 10V, Output signal:0~5V level, Power supply:24V

 Model No.: **SY S1-P1-O1**
**Technical parameters**

| Parameter             |                 | Test Condition            | Mix  | Type | Max  | Unit |
|-----------------------|-----------------|---------------------------|------|------|------|------|
| Isolated voltage      |                 | 1min                      | 1500 | 3000 |      | VDC  |
| Input signal          | Amplitude(VP-P) |                           | 0.2  | 10   | 60   | V    |
|                       | Frequency       |                           | 0    | 10   | 500  | KHz  |
|                       | impedance       |                           | 10   |      |      | Kohm |
|                       | current         | 5V input                  |      | 0.45 |      | mA   |
| Output signal         | Amplitude(VP-P) | O1:out level              |      | 5    |      | V    |
|                       | Frequency       |                           | 0    | 10   | 500  | KHz  |
|                       | Voltage(High)   |                           |      | 5    |      | V    |
|                       | Voltage(Low)    | O1:out level              |      | 0    | 0.05 | V    |
|                       | Current(High)   | 0~5V                      |      | 2    | 5    | mA   |
|                       | Current(Low)    |                           |      | 2    | 8    | mA   |
|                       | Voltage         | O4:Open-collect or output |      | 5    | 30   | V    |
|                       | Current         |                           |      | 3    | 10   | mA   |
| Response Time         |                 |                           |      | 1500 |      | ns   |
| Assistant power       | Voltage         | User-defined              | 3.3  | 12   | 24   | VDC  |
|                       | Current         | VD=12V                    |      | 42   |      | mA   |
| Power Loss            |                 |                           | 0.3  | 0.5  | 1    | W    |
| Operating temperature |                 |                           | -45  |      | 85   | °C   |
| Storage temperature   |                 |                           | -55  |      | 125  | °C   |

**SIP10PIN PCB-mounted Type Dimension & Pin Definition**

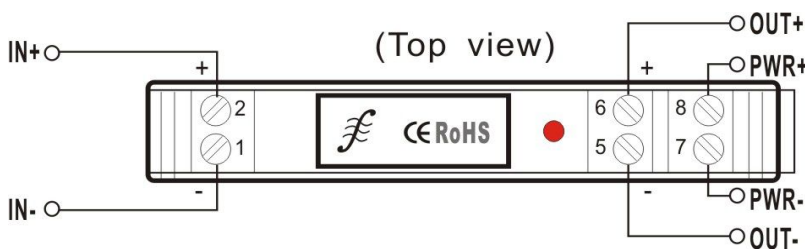


**SIP10PIN IC Package Pin Definition**

|                      |                      |           |               |               |             |                         |           |             |                         |
|----------------------|----------------------|-----------|---------------|---------------|-------------|-------------------------|-----------|-------------|-------------------------|
| Signal input<br>Sin+ | Signal input<br>Sin- | omitted   | power<br>PWR+ | power<br>PWR- | Omitte<br>d | Signal<br>output<br>Vo- | omitted   | omitte<br>d | Signal<br>output<br>Vo+ |
| <b>IN+</b>           | <b>IN-</b>           | <b>NC</b> | <b>PWR+</b>   | <b>PWR-</b>   | <b>NC</b>   | <b>OUT-</b>             | <b>NC</b> | <b>NC</b>   | <b>OUT+</b>             |
| <b>1</b>             | <b>2</b>             | <b>3</b>  | <b>4</b>      | <b>5</b>      | <b>6</b>    | <b>7</b>                | <b>8</b>  | <b>9</b>    | <b>10</b>               |

**DIN3 SY S-P-O series low cost, small sizes standard 35mm rail-mounted product pin function description**

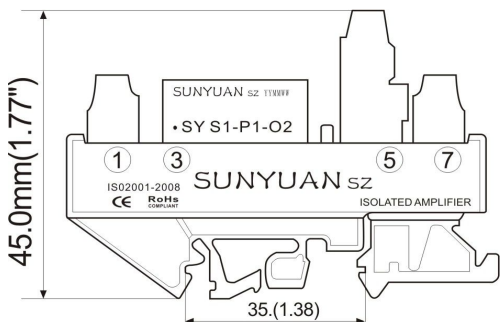
DIN3 SY S-P-O series products are designed based on ultra-thin compact size ( thickness 12.5 mm), standard 35mm rail mounted case. SY S - P - O series IC module is integrated into the PCB, and terminals are used as auxiliary power supply and signal input/output connections. The products is easy to use and zero&gain adjustments are not required. Due to the size limitation, DIN3 series small size rail-mounted products only have 1-in 1-out conversion function.



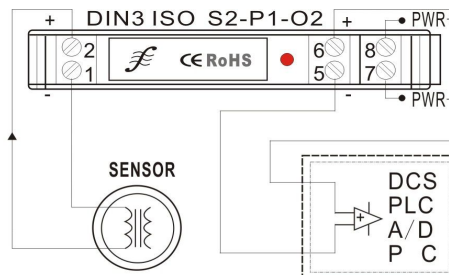
**DIN3 SY S - P - O Series Standard 35mm Rail-mounted Converter Pin Description**

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

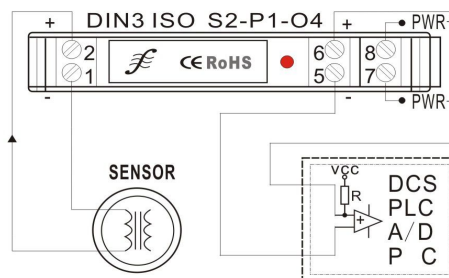
**Dimensions & Typical applications:**



DIN3 系列小体积单路转换器外形尺寸



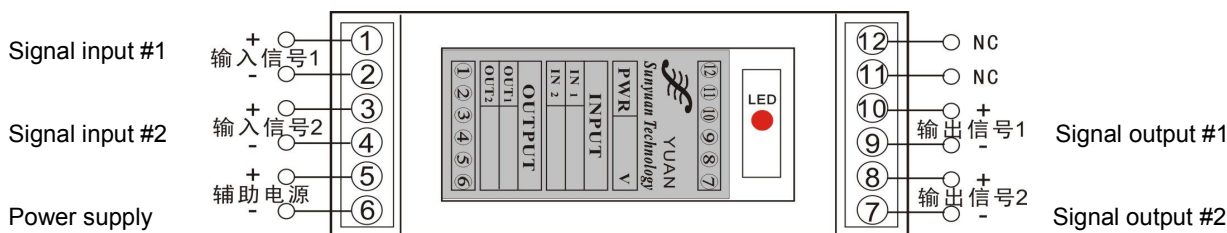
DIN3 SY S-P-O电压脉冲输出接线图



DIN3 SY S-P-O集电极开路输出接线图

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

Sunyuan Type I Standard DIN35 Rail-mounted multi-channel dual-isolation speed sensor signal converter embeds several sets of SY S-P-O series 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 signals (such as multiple speed sensor signal, sine wave, sawtooth wave signal, or small pulse signal) amplification and 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.

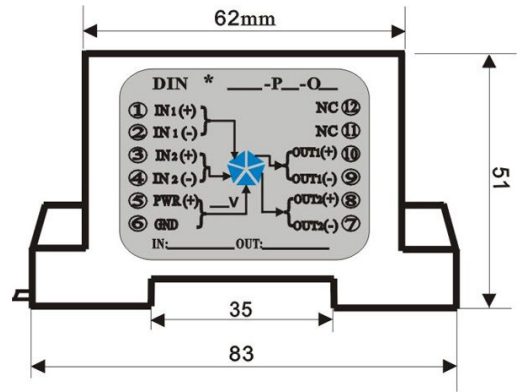


DIN 1X1 / 2X2 / 1X2 (有源型) 多路隔离放大器



**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 +      | Aux.power supply + |
| 6   | Power -      | Aux.power supply - |
| 7   | Vout2 -      | Signal output #2-  |
| 8   | Vout2+       | Signal output #2+  |
| 9   | Vout1 -      | Signal output #1-  |
| 10  | Vout1+       | Signal output #1+  |
| 11  | NC           | Omitted            |
| 12  | NC           | Omitted            |



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