

Selection Guide

| Signal Conditioning Modules Contents | | | | | |
|--------------------------------------|---|--|--|--|--------------------|
| Module's Name | SG-3011 | SG-3016 | SG-3013 | SG-3071 | SG-3081 |
| Input Mode | Thermocouple | Strain Gauge | RTD (Pt-100) RTD (Pt-1000) RTD (Ni120) | DC Voltage | DC Current |
| Input Type | J, K, T, E, R, S, B, N, C, L, M, L2 (DIN 43710) | $\pm 10\text{mV}$, $\pm 20\text{mV}$, $\pm 30\text{mV}$, 50mV , $\pm 100\text{mV}$ | Pt 100 (-100°C ~ 600°C) $\alpha = 0.00385$ Pt 100 (-100°C ~ 600°C) $\alpha = 0.003916$ Ni120 (-80°C ~ 100°C) Pt1000 (-200°C ~ 600°C) $\alpha = 0.00385$ 2/3/4 wires | Bipolar: $\pm 5\text{V}$, $\pm 10\text{V}$ Unipolar: 0~10V | 0~20 mA 4~20 mA |
| Voltage output (Bipolar) | - | $\pm 5\text{V}$, $\pm 10\text{V}$ | $\pm 5\text{V}$, $\pm 10\text{V}$ | $\pm 5\text{V}$, $\pm 10\text{V}$ | - |
| Voltage output (Unipolar) | 0~10V | 0~10V, 0~5V | 0~10V | 0~10V | 0~10V |
| Excitation voltage output | - | 1~10Vdc (20 mA max.) | - | - | - |
| Current Output | 0~20 mA | 0~20 mA | 0~20 mA | 0~20 mA 4~20 mA | 0~20 mA 4~20 mA |
| Isolation | 3000Vdc | 3000Vdc | 3000Vdc | 3000Vdc | 3000Vdc |
| Power Supply | 10~30Vdc | 10~30Vdc | 10~30Vdc | 10~30Vdc | 10~30Vdc |
| Dimensions (mm) | 113 x 70.5 x 24.5 | 113 x 70.5 x 24.5 | 113 x 70.5 x 24.5 | 113 x 70.5 x 24.5 | 113 x 70.5 x 24.5 |
| Weight (g) | - | 103 | 105 | 94 | 96 |
| DIN-rail mounting | Yes | Yes | Yes | Yes | Yes |
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SG-3011

Isolated thermocouple input module



Functional Description

The SG-3011 is a thermocouple input signal conditioner. SG-3011 uses microprocessor-controlled high-resolution 24-bit dual-slope, integrating A/D converter to acquire thermocouple signal and cold junction compensation input. Temperature measurement is handled by thermocouple linearization and cold junction compensation function. The supported thermocouple types are J, K, T, E, R, S, B, N, C, L, M, L2 (DIN 43710).

The SG-3011 features optical isolation technique providing 3000Vdc isolation. The power supply that drives the module's input and output circuitry is internally isolated, enabling SG-3011 to offer true channel - to - channel isolation.

It's easy to mount the SG-3011 on a standard DIN rail and can operate in environment with wide temperature range.

Applications

- Input/output signal conditioning
- Input, output or power isolation

Specifications

Input Type:

| Temperature Type | Temperature Range °C |
|---------------------|----------------------|
| Type J | -40 ~ +760 |
| Type K | 0 ~ +1000 |
| Type T | -100 ~ +400 |
| Type E | 0 ~ +1000 |
| Type R | +500 ~ +1750 |
| Type S | +500 ~ +1750 |
| Type B | +500 ~ +1800 |
| Type N | -100 ~ +1300 |
| Type C | 0 ~ +2000 |
| Type L | -200 ~ +800 |
| Type M | -200 ~ +100 |
| Type L2 (DIN 43710) | -200 ~ +900 |

Features

Will be available soon

- 3000Vdc isolation (three-way)
- Wide input/output range
- Stable voltage or current output
- Easy to configure input/output range
- Flexible DIN-rail mounting
- LED indicator

Voltage Output

- Unipolar: 0~10V
- Output impedance: <50Ω

Current Output

- Current: 0~20 mA
- Current load resistance: 0~450Ω (Source)

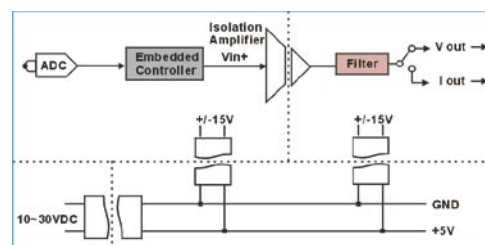
Supply Voltage

- Input Range: 10~30Vdc

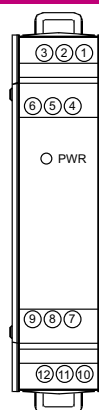
General Specifications

- Three-way isolation: 3000Vdc
- Accuracy: $\pm 0.2\%$ of full scale range
- Operating temperature: -25 ~ 75°C
- Storage temperature: -30 ~ 85°C
- Dimensions: 113 mm x 70.5 mm x 24.5 mm

Block Diagram



Pin Assignment



| Pin | Name |
|-----|---------|
| 1 | TC+ |
| 2 | TC- |
| 3 | Reserve |
| 4 | FGND |
| 5 | FGND |
| 6 | FGND |
| 7 | VCC |
| 8 | VOUT+ |
| 9 | IOUT+ |
| 10 | GND |
| 11 | VOUT- |
| 12 | IOUT- |

Ordering Information

Standard

SG-3011: Isolated thermocouple input module

SG-3013

Isolated RTD input module



Functional Description

The SG-3013 is a RTD input signal conditioning module to transform RTD input to voltage or current output. SG-3013 uses a microprocessor-based transducer, which integrating two high resolution ADCs and an MCU, to acquire the RTD signal. The supported RTD types are Pt100 , Pt1000 , Ni 120 , Cu100 ,and Cu1000.

The SG-3013 supports 3000Vdc isolation. The power supply that drives the module's input and output circuitry is internally isolated, enabling SG-3013 to offer true channel - to - channel isolation.

It's easy to mount the SG-3011 on a standard DIN rail and can operate in environment with wide temperature range.

Applications

- Input/output signal conditioning
- Input, output or power isolation

Specifications

Signal Input

- Input Type: Pt100 $\alpha=0.00385$ / Pt100 $\alpha=0.003916$ / Pt1000 $\alpha=0.00385$ / Ni 120 / Cu 100 at 0°C, $\alpha=0.00421$ / Cu 100 at 25°C, $\alpha=0.00427$ / Cu 1000 at 0°C, $\alpha=0.00421$
- Temperature Range:
Pt100 $=0.00385$, -200°C~+600°C
Pt100 $=0.003916$, -200°C~+600°C
Pt1000 $=0.00385$, -200°C~+600°C
Ni 120 , -80°C~+300°C
Cu 100 at 0°C, $=0.00421$, -20°C~+150°C
Cu 100 at 25°C, $=0.00427$, 0°C~+200°C
Cu 1000 at 0°C, $=0.00421$, -20°C~+150°C

- Input Connection: 2/3/4 wires

Voltage Output

- Unipolar: 0~5V, 0~10V
- Output impedance: <50 Ω

Current Output

- Current: 0~20 mA, 4~20 mA
- Current load resistance: 0~500 Ω (Source)

Supply Voltage

- Input Range: 10~30Vdc
- Consumption: 1.2W

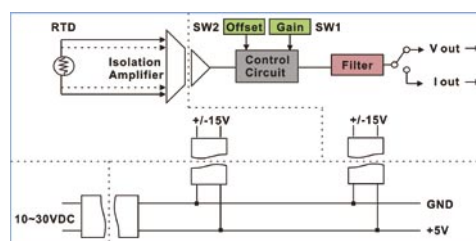
Features

- 3000Vdc isolation (three-way)
- Wide input/output range
- Stable voltage or current output
- Easy to configure input/output range
- Flexible DIN-rail mounting
- LED indicator

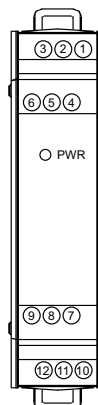
General Specifications

- Three-way isolation: 3000Vdc
- Accuracy: $\pm 0.1\%$ of full scale range
- Operation bandwidth: 5.24KHz
- Operating temperature: -25 ~ 75°C
- Storage temperature: -30 ~ 85°C
- Weight: 95 grams
- Dimensions: 113 mm x 70.5 mm x 24.5 mm

Block Diagram



Pin Assignment



| Pin | Name |
|-----|--------|
| 1 | EXC- |
| 2 | SENSE- |
| 3 | FGND |
| 4 | EXC+ |
| 5 | SENSE+ |
| 6 | FGND |
| 7 | VCC |
| 8 | VOU+ |
| 9 | IOU+ |
| 10 | GND |
| 11 | VOU- |
| 12 | IOU- |

Ordering Information

Standard

SG-3013: Isolated RTD input module

SG-3016

Isolated strain gauge input module



Functional Description

The SG-3016 is a voltage input to voltage or current output signal conditioning module. It has 3000Vdc three-way isolation for input, output and power. It also can change the input/output range via internal configuration switches.

The SG-3016 has an LED display to show whether the SG-3016 is functioning correctly and has three VRs (Zero, Span, Exci) to calibrate accuracy of the input/output range.

The bandwidth of the SG-3016 is typically 3KHz. It is easy to mount the SG-3016 on a standard DIN rail and operate in environments with wide temperature range.

Applications

- Input/output signal conditioning
- Input, output or power isolation

Specifications

Voltage Input

- Electrical input: $\pm 10\text{mV}$, $\pm 20\text{mV}$, $\pm 30\text{mV}$, $\pm 50\text{mV}$, $\pm 100\text{mV}$

Voltage Output

- Bipolar: $\pm 5\text{V}$, $\pm 10\text{V}$
- Unipolar: $0\sim 5\text{V}$, $0\sim 10\text{V}$
- Excitation voltage: $1\sim 10\text{Vdc}$ (20 mA max)
- Output impedance: $<50\Omega$

Current Output

- Current: $0\sim 20\text{mA}$
- Current load resistance: $0\sim 500\Omega$ (Source)

Supply Voltage

- Input Range: $10\sim 30\text{Vdc}$
- Consumption: 1.44W (voltage output)
1.74W (current output)

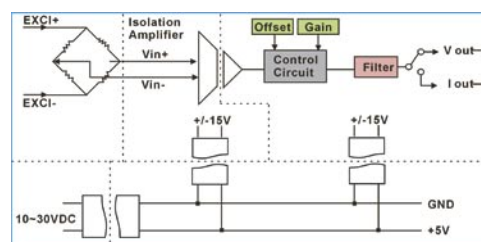
Features

- 3000Vdc isolation (three-way)
- Wide input/output range
- Stable voltage or current output
- Easy to configure input/output range
- Three VRs for calibrating accuracy of the input/output range
- Flexible DIN-rail mounting
- LED indicator

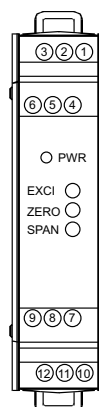
General Specifications

- Three-way isolation: 3000Vdc
- Accuracy: $\pm 0.1\%$ of full scale range
- Operation bandwidth: 3KHz
- Operating temperature: $-25\sim 75^\circ\text{C}$
- Storage temperature: $-30\sim 85^\circ\text{C}$
- Weight: 103 grams
- Dimensions: 113 mm x 70.5 mm x 24.5 mm

Block Diagram



Pin Assignment



| Pin | Name |
|-----|--------|
| 1 | INPUT+ |
| 2 | INPUT- |
| 3 | FGND |
| 4 | EXCI+ |
| 5 | EXCI- |
| 6 | AGND1 |
| 7 | VCC. |
| 8 | OUT+ |
| 9 | VCC. |
| 10 | GND |
| 11 | OUT- |
| 12 | GND |

Ordering Information

Standard

SG-3016: Isolated strain gauge input module

SG-3071

Isolated DC voltage input / output module



Functional Description

The SG-3071 is a voltage input to voltage or current output signal conditioning module. It can access either bipolar or unipolar voltage input range. It has 3000Vdc three-way isolation for input, output and power. It can change the input/output range via internal configuration switches.

The SG-3071 has an LED display to show whether the SG-3071 is functioning correctly and has two VRs (Zero, Span) to calibrate accuracy of the input/output range.

The bandwidth of the SG-3071 is typically 3KHz. It is easy to mount the SG-3071 on a standard DIN rail and operate in environments with wide temperature range.

Applications

- Input/output signal conditioning
- Input, output or power isolation

Specifications

Voltage Input

- Bipolar: $\pm 5V$, $\pm 10V$
- Unipolar: $0 \sim 5V$, $0 \sim 10V$
- Input impedance: $2M\Omega$
- Input bandwidth: 3KHz (typical) @-3dB

Voltage Output

- Bipolar: $\pm 5V$, $\pm 10V$
- Drive: 10 mA (max)
- Output impedance: $<50\Omega$

Current Output

- Current: $0 \sim 20\text{ mA}$, $4 \sim 20\text{ mA}$
- Current load resistance: $0 \sim 500\Omega$ (Source)

Supply Voltage

- Input Range: $10 \sim 30Vdc$

Features

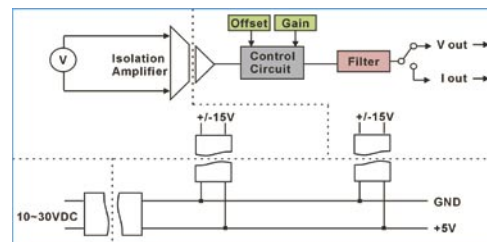
- 3000Vdc isolation (three-way)
- Wide input/output range
- Stable voltage or current output
- Easy to configure the input/output range
- Two VRs for calibrating accuracy of the input/output range
- Flexible DIN-rail mounting
- LED indicator

- Consumption: 1.80W (voltage output)
2.30W (current output)

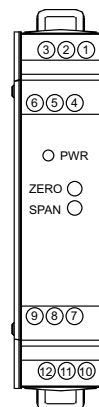
General Specifications

- Three-way isolation: 3000Vdc
- Accuracy: $\pm 0.1\%$ of full scale range (typical)
- Operation bandwidth: 3KHz
- Operating temperature: $-25 \sim 75^\circ C$
- Storage temperature: $-30 \sim 85^\circ C$
- Weight: 94 grams
- Dimensions: 113 mm x 70.5 mm x 24.5 mm

Block Diagram



Pin Assignment



| Pin | Name |
|-----|--------|
| 1 | INPUT+ |
| 2 | INPUT- |
| 3 | FGND |
| 4 | N.C |
| 5 | N.C |
| 6 | N.C |
| 7 | VCC. |
| 8 | OUT+ |
| 9 | VCC. |
| 10 | GND |
| 11 | OUT- |
| 12 | GND |

Ordering Information

Standard

SG-3071: Isolated DC voltage input / output module

SG-3081

Isolated DC current input/output module



Functional Description

The SG-3081 is a current input to voltage or current output signal conditioning module. It has 3000Vdc three-way isolation for input, output and power. It also can change the input/output range via internal configuration switches.

The SG-3081 has an LED display to show whether the SG-3081 is functioning correctly and has two VRs (Zero, Span) to calibrate accuracy of the input/output range.

The bandwidth of the SG-3081 is typically 3KHz. It is easy to mount the SG-3081 on a standard DIN rail and operate in environments with wide temperature range.

Applications

- Input/output signal conditioning
- Input, output or power isolation

Specifications

Current Input

- Unipolar: 0~20 mA, 4~20 mA
- Input impedance: 250 Ω

Voltage Output

- Unipolar: 0~5V, 0~10V
- Output impedance: <50 Ω
- Drive: 10mA (max)

Current Output

- Current: 0 ~ 20 mA, 4 ~ 20 mA
- Current load resistance: 0~500 Ω (Source)

Supply Voltage

- Input Range: 10~30Vdc
- Consumption: 1.61W (voltage output)
2.10W (current output)

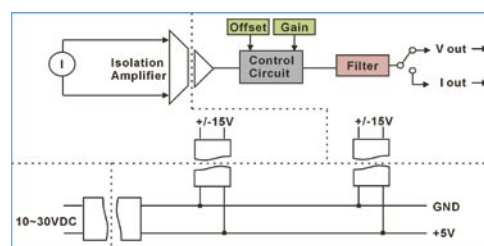
Features

- 3000Vdc isolation (three-way)
- Wide input/output range
- Stable voltage or current output
- Easy to configure input/output range
- Two VRs for calibrating accuracy of the input/output range
- Flexible DIN-rail mounting
- LED indicator

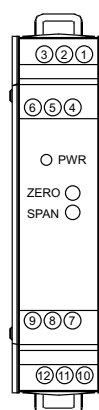
General Specifications

- Three-way isolation: 3000Vdc
- Accuracy: $\pm 0.1\%$ of full scale range (typical)
- Operating temperature: -25 ~ 75°C
- Storage temperature: -30 ~ 85°C
- Operation bandwidth: 3KHz
- Weight: 96 grams
- Dimensions: 113 mm x 70.5 mm x 24.5 mm

Block Diagram



Pin Assignment



| Pin | Name |
|-----|--------|
| 1 | INPUT+ |
| 2 | INPUT- |
| 3 | FGND |
| 4 | N.C |
| 5 | N.C |
| 6 | N.C |
| 7 | VCC. |
| 8 | OUT+ |
| 9 | VCC. |
| 10 | GND |
| 11 | OUT- |
| 12 | GND |

Ordering Information

Standard

SG-3081: Isolated DC current input / output module

PW-3090 Series

Isolated power module



Functional Description

The PW-3090 series is an efficient (83%) DC-to-DC power module with 1000 Vdc isolated protection. It can have non-regular DC input (18~36V) but still can provide a stable DC output (5V, 12V, 24V, $\pm 5V$, $\pm 15V$). It can provide your devices with a stable power source against harmful effects in the operating environment.

Applications

- Isolated power supply for signal conditioning modules

Specifications

- Input Voltage Range: 18~36VDC
- Temperature Coefficient: $\pm 0.03\%/^{\circ}\text{C}$
- Ripple & Noise: 100mVp-p max
- Line Regulation: $\pm 0.2\%$ max
- Load Regulation: $\pm 0.2\%$ max
- Short Circuit Protection
- Isolation Resistance: 10^9 ohms min
- Switch Frequency: 200KHz

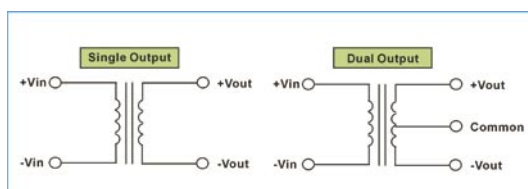
General Specifications

- Isolation Voltage: 1000Vdc
- Operating temperature: $-25 \sim 70^{\circ}\text{C}$
- Storage temperature: $-30 \sim 85^{\circ}\text{C}$
- Operation bandwidth: 3KHz
- Weight: 110 grams
- Dimensions: 113 mm x 70.5 mm x 24.5 mm

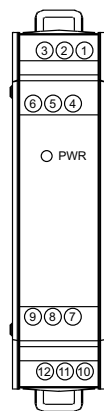
Features

- 1000Vdc isolation (three-way)
- Wide input range(18~36V)
- Stable DC output
- Easy to configure output voltage
- Flexible DIN-rail mounting

Simplified Schematic Diagram



Pin Assignment



| Pin | Name | |
|-----|-----------|-----|
| 1 | -Vout | OUT |
| 2 | -Vout | |
| 3 | Common | |
| 4 | +Vout | OUT |
| 5 | +Vout | |
| 6 | Common | |
| 7 | +18~36VDC | IN |
| 8 | +18~36VDC | |
| 9 | +18~36VDC | |
| 10 | GND | IN |
| 11 | Frame GND | |
| 12 | GND | |

Ordering Information

Standard

- PW-3090-24S:** Output power voltage
+24V @ 400mA (max.) Accuracy: $\pm 2\%$
- PW-3090-12S:** Output power voltage
+12V @ 800mA (max) Accuracy: $\pm 2\%$
- PW-3090-5S:** Output power voltage
+5V @ 2000mA (max) Accuracy: $\pm 2\%$
- PW-3090-15D:** Output power voltage
 $\pm 15V$ @ 300mA (max) Accuracy: $\pm 2\%$
- PW-3090-5D:** Output power voltage
 $\pm 5V$ @ 1000mA (max) Accuracy: $\pm 2\%$