

# 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)	$\pm 10\text{mV}$ , $\pm 20\text{mV}$ , $\pm 30\text{mV}$ , $50\text{mV}$ , $\pm 100\text{mV}$	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
Page	6-2	6-3	6-4	6-5	6-6

# SG-3011

## Isolated thermocouple input module



### Functional Description

The SG-3011 is a thermocouple input signal conditioner. SG-3011 uses a microprocessor-based transducer, which integrating two high resolution ADCs and an MCU, to acquire the thermocouple signal. Accurate temperature is then provided by this smart transducer with cold junction compensation. The thermocouple input can be J, K, T, E, R, S, B, N, C, L, M or L2 (DIN 43710) type.

The SG-3011 uses photocoupler isolation technique to provide 3000Vdc isolation for the module's power supply and internally input and output circuitry.

The SG-3011 provides the temperature measurement by thermocouple. The input range of the SG-3011 is 10~30Vdc. It is easy to mount the SG-3011 on a standard DIN rail and can operate in environments 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: 0~500Ω (Source)

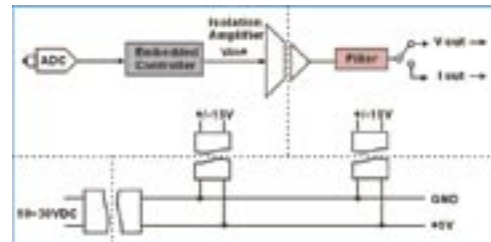
#### Supply Voltage

- Input Range: 10~30Vdc

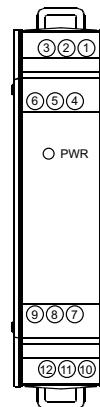
#### General Specifications

- Three-way isolation: 3000Vdc
- Accuracy:  $\pm 0.1\%$  of full 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	FGND
4	N.C
5	N.C
6	N.C
7	VCC
8	VOU+
9	IOU+
10	GND
11	VOU-
12	IOU-

### Ordering Information

#### Standard

**SG-3011:** Isolated thermocouple input module

# SG-3013

Isolated RTD input module



### Functional Description

The SG-3013 is a RTD 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-3013 has an LED display to show whether the SG-3013 is functioning correctly and has two VRs (Zero, Span) to calibrate the accuracy of the input/output range.

The bandwidth of the SG-3013 is typically 5.24KHz. It's easy to mount the SG-3013 on a standard DIN rail and can operate in environments with wide temperature range.

### Applications

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

### Specifications

#### Signal Input

- Input Type: Pt-100, Pt-1000, Ni 120
- Temperature Range:  
Pt100  $\alpha=0.00385$ ,  $-100^{\circ}\text{C}\sim+600^{\circ}\text{C}$   
Pt100  $\alpha=0.003916$ ,  $-100^{\circ}\text{C}\sim+600^{\circ}\text{C}$   
Ni 120,  $-80^{\circ}\text{C}\sim+100^{\circ}\text{C}$ ,  
Pt1000  $\alpha=0.00385$ ,  $-200^{\circ}\text{C}\sim+600^{\circ}\text{C}$
- Input Connections: 2/3/4 wires

#### Voltage Output

- Bipolar:  $\pm 10\text{V}$
- Unipolar:  $0\sim 5\text{V}$ ,  $0\sim 10\text{V}$
- 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:  $10\sim 30\text{Vdc}$
- Consumption:  $2\text{W}$

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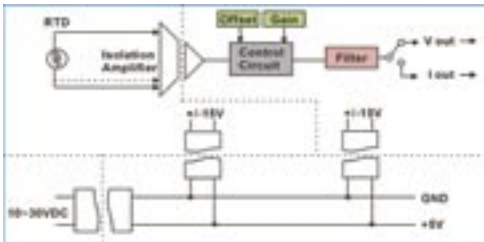
### Features

- 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

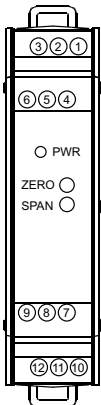
### General Specifications

- Three-way isolation: 3000Vdc
- Accuracy:  $\pm 0.1\%$  of full range
- Operation bandwidth: 5.24KHz
- Operating temperature:  $-25\sim 75^{\circ}\text{C}$
- Storage temperature:  $-30\sim 85^{\circ}\text{C}$
- Weight: 105 grams
- Dimensions: 113 mm x 70.5 mm x 24.5 mm

### Block Diagram



### Pin Assignment



Pin	Name
1	IEXC+
2	A. GND
3	IEXC-
4	FGND
5	IN+
6	IN-
7	VCC.
8	OUT+
9	VCC.
10	GND
11	OUT-
12	GND

### 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)

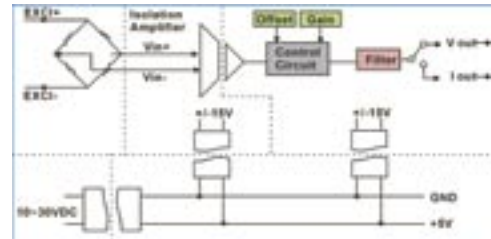
### Features

- 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

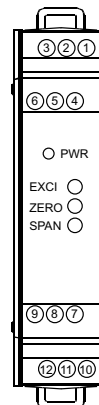
### General Specifications

- Three-way isolation: 3000Vdc
- Accuracy:  $\pm 0.1\%$  of full 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: 0~5V, 0~10V
- 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 ~ 20 mA, 4 ~ 20 mA
- Current load resistance: 0~500  $\Omega$  (Source)

#### Supply Voltage

- Input Range: 10~30Vdc

### Features

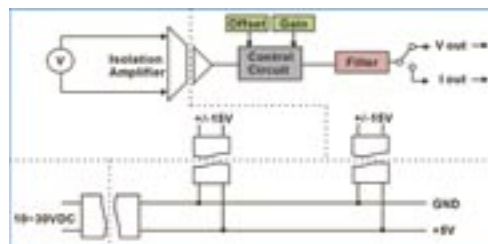
- 3000Vdc isolation (three-way)
- Wide input/output range
- Stable voltage or current output
- Easy to configure the input/output range
- Two VRs for calibrating accuracy of the input/output range
- Flexible DIN-rail mounting
- LED Indicator

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

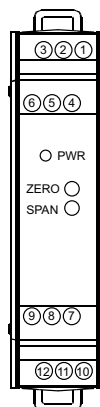
### General Specifications

- Three-way isolation: 3000Vdc
- Accuracy:  $\pm 0.1\%$  of full range (typical)
- Operation bandwidth: 3KHz
- Operating temperature: -25 ~ 75°C
- Storage temperature: -30 ~ 85°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  $\Omega$

#### Voltage Output

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

#### Current Output

- Current: 0 ~ 20 mA, 4 ~ 20 mA
- Current load resistance: 0~500  $\Omega$  (Source)

#### Supply Voltage

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

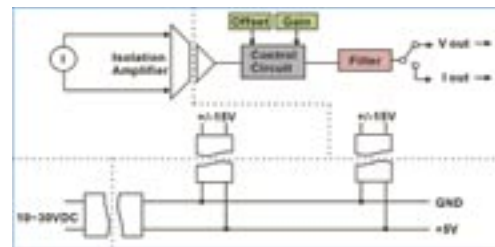
### Features

- 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

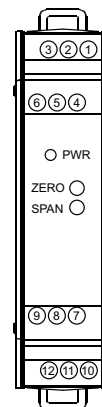
### General Specifications

- Three-way isolation: 3000Vdc
- Accuracy:  $\pm 0.1\%$  of full 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

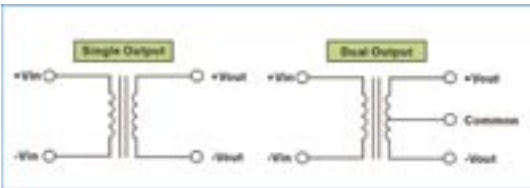
#### General Specifications

- 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	
5	+Vout	
6	Common	
7	+18~36VDC	IN
8	+18~36VDC	
9	+18~36VDC	
10	GND	
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:  $\pm 2\%$