

# **Micro DC Leakage Current Sensor SLD23K serials**

## **Specifications**

Version: V1.0

**Shenzhen 3E Sensor Co., Ltd**

## 一、 Description

SLD23K serials are current sensors applied for measuring micro direct current, are closed loop taking advantage of the principle of magnetic modulation. Through hole design ensure no insert loss. The primary signal is direct current range from  $\pm 10\text{mA}$  to  $\pm 100\text{mA}$ . The output signal is analog voltage or current which is linearly proportional to amplitude of leakage current arising from the primary conductors. SLD1 serials have the features of high accuracy and good temperature drift. There're mainly applied for ground fault detection in direct current power supply system or measurement of micro direct current.

## 二、 Specifications

### 2.1、 conditions of measurement:

Auxiliary supply voltage:  $\pm 12\text{V} \dots \pm 15\text{V}$  ( $\pm 5\%$ ),

Room temperature( $T_a$ ):  $25^\circ\text{C}$ ,

Start time: 15 minutes after power on of measured sensor;

### 2.2、 Accuracy class: 1.0

2.3、Linearity error @  $0 \dots 110\% \cdot I_n$  (Nominal current):

$$\leq 1.0\%$$

2.4、Electric offset voltage ( $I_{oe}$ ) @  $T_a=25^\circ\text{C}$ ,  $I_p$  (primary current) = 0:

$\leq \pm 50\text{mV}$  ( @  $T_a=25^\circ\text{C}$ ,  $I_p=0$ , operating for 15 minutes after power on, calibrate the output voltage to 0mV, test the maximum drift of output voltage within 24 hours )

2.5、Temperature drift of  $I_{oe}$

$$\leq 3.0\text{mV}/^\circ\text{C}$$

2.6、Primary current range:

SLD23K-10mA: 0 ---  $\pm 10\text{mA}$ ;

SLD23K-20mA: 0 ---  $\pm 20\text{mA}$ ;

SLD23K-50mA: 0 ---  $\pm 50\text{mA}$ ;

2.7、primary frequency:  $\pm\text{DC}$

2.8、overload capacity: @  $T_a=25^\circ\text{C}$ ,  $I_p=0$

$I_{oe}$ :  $\leq 300\text{mV}$  After continuous  $30 \cdot I_n$  primary direct current for 10 seconds

2.9、analog output: 0 ---  $\pm 5\text{V}$  (or 0 ---  $\pm 4\text{V}$  or  $12\text{mA}$   $\pm 8\text{mA}$ , or customized output)

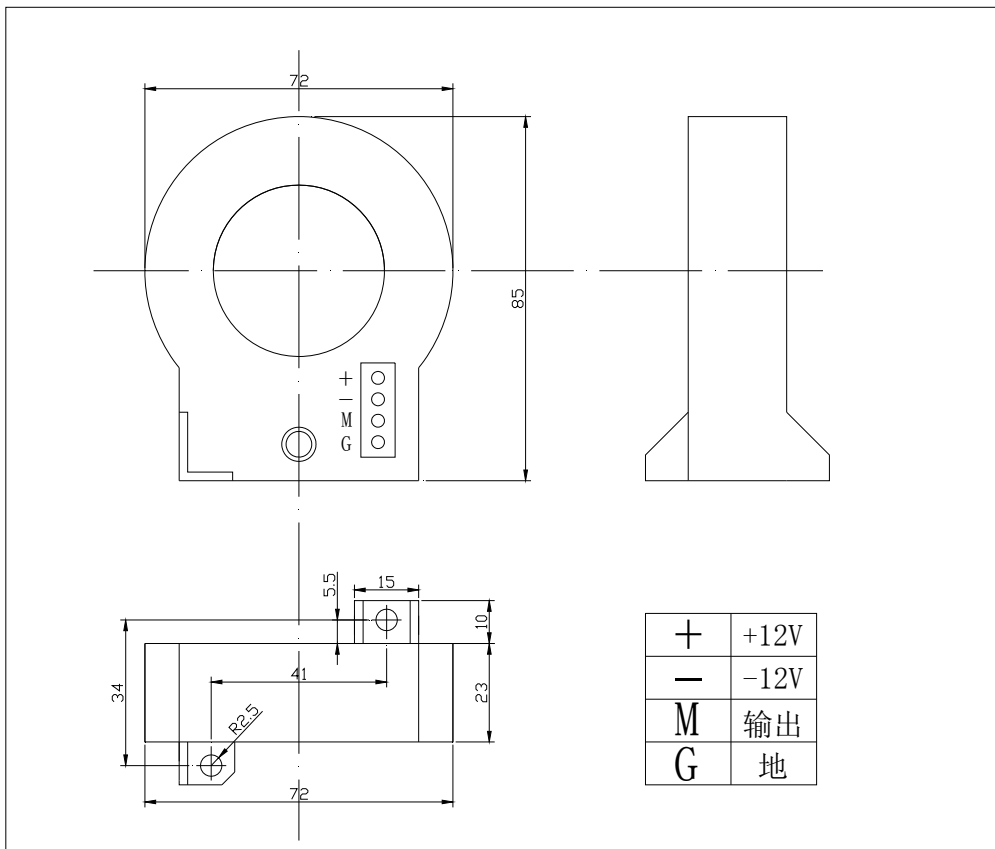
2.10、Load resistor:  $\geq 1\text{K}\Omega$

## 3E micro leakage current sensor specifications

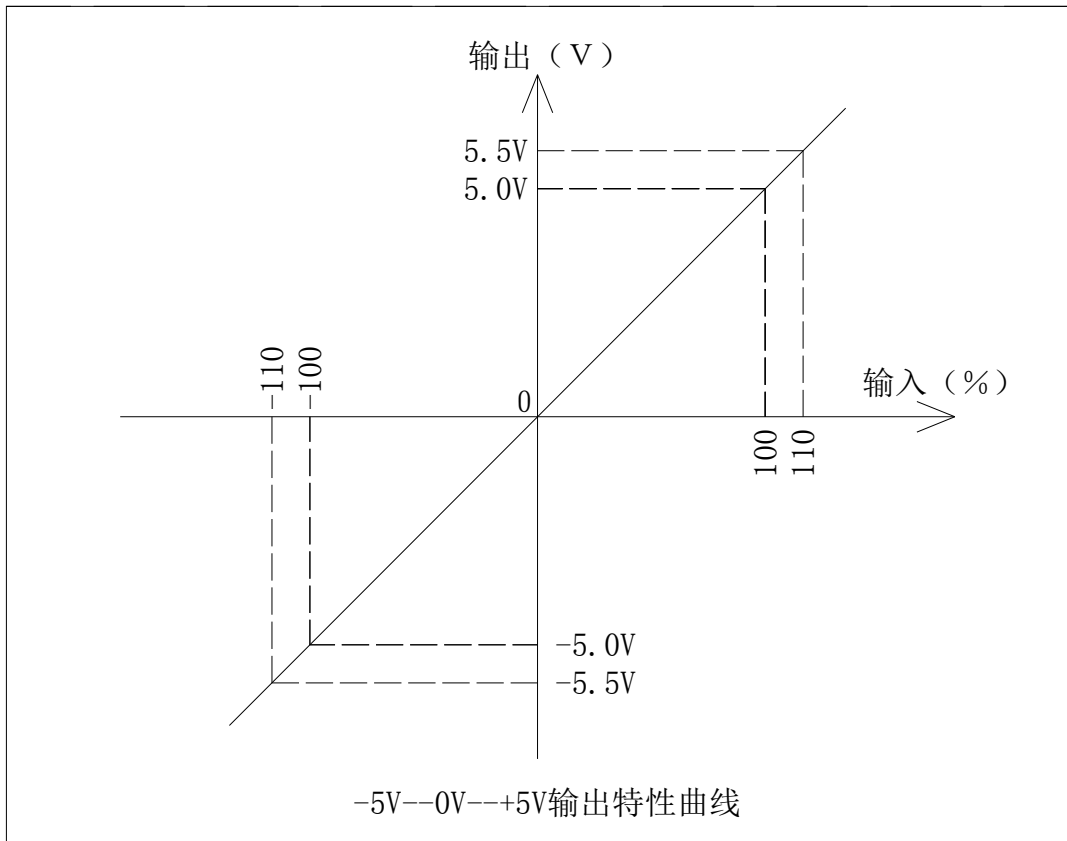
- 2.11、 response time:  $\leq 500\text{ms}$ ;
- 2.12、 Ambient operating temperature :  $-5^{\circ}\text{C} \text{---} +65^{\circ}\text{C}$
- 2.13、 voltage for DC isolation :  $\geq 3 \text{KV (DC)}$
- 2.14、 supply voltage:  $\pm 12 \text{V} \text{---} \pm 15 \text{V} (\pm 5\%)$
- 2.15、 power consumption:  $\leq 250\text{mW}$

### 二、 Dimensions and connection

General tolerance :  $\pm 0.5\text{mm}$



### 三、 The input-output curves



### 四、 installation

#### 4.1、 mounting:

Fasten the sensor with screw M4 in a suitable location using the two mounting holes in two sides of bottom. spring washer and washer are recommended to fasten the screws.

Arrow on the top of sensor indicates the positive current flow direction.

The distance between adjacent sensors  $\leq 1\text{mm}$ .

#### 4.2、supply volatge:

Auxiliary supply voltage is  $\pm 12\text{ V}--\pm 15\text{ V}$  ( $\pm 5\%$ ), auxiliary power supply could be shared by sensors in parallel operation.

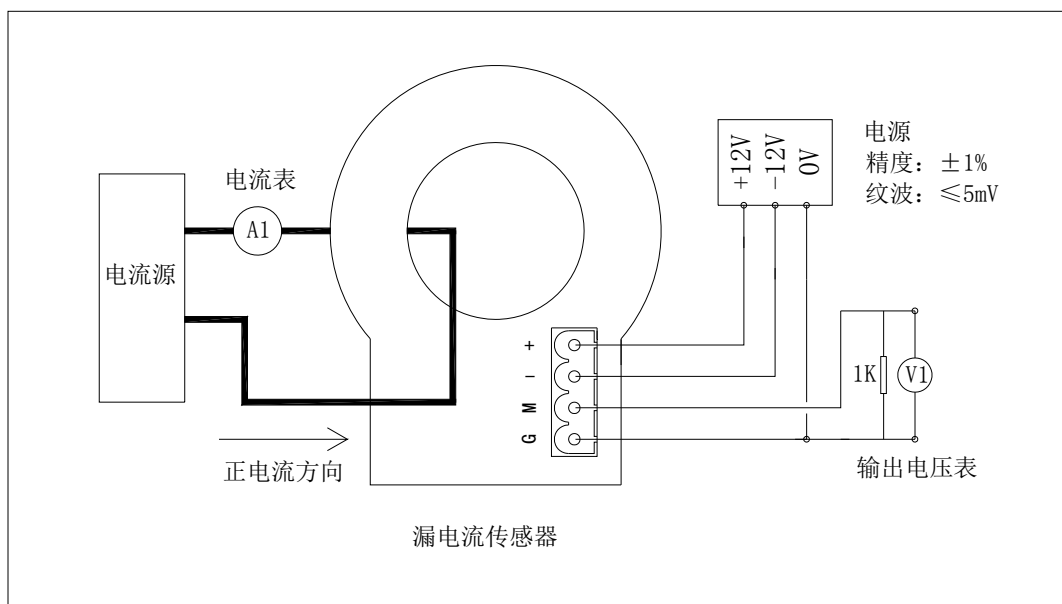
“G” (GND) in the Pins of sensor are both for supply voltage and output signal. Note the wire diameter and voltage-drop.

#### 4.3、connection

The connection of secondary is male terminal with  $\Phi 5.08\text{mm}$  4 Pins. maximum diameter of wire to the terminal of sensor is  $2.5\text{mm}^2$ . apply proper diameter of wire based on amount of the sensors and mechanical requirements. Peel the wire to  $5\text{mm}\sim 8\text{mm}$  at the end connecting to the terminal, twist and plug female connector in male terminal , fasten, then connect to the male terminal in sensor.

### 五、 **Verification of accuracy**

#### 5.1、circuit of verification



#### 5.2、 conditions of verification:

Supply power :  $\pm 12\text{V}$  (accuracy:  $\leq \pm 1\%$ , ripple wave  $\leq 5\text{mV}$ );

Ambient temperature:  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ;

Ambient humidity: (45~75)%;

Constant current grade : 0.2;

Measuring meter grade: 0.2;

Operating for 30 minutes after power on, calibrate to

0mV@ Ip=0

6.3、 verification procedure:

6.3.1、 constant current source output  $I_r$  ( $I_r \leq I_n$ ), for SLD1-10mA/ $\pm 5V$ , the estimated output voltage  $U_g$  is calculated as following format:

$$U_g = 5V \times I_r / I_n$$

6.3.2、 measure the output voltage  $U_o$  of sensor with measuring meter, the fiducial error  $\gamma$  derives from following format:

$$\gamma = (U_o - U_g) * 100 / 5V$$

6.3.3、 repeat step 6.3.1、6.3.2 by setting different  $I_r$  (positive or negative),  $|\gamma|$  is subjected to accuracy class 1.0.

## 六、 Remarks

6.1、 pay attention to the signs of supply voltage in terminal of sensor, the incorrect connection is possible to cause the injury or serious damage.

6.2、 Be caution to avoid collision or drop under transportation or installation.

6.3、 keep the force even at the process of plug in



or pull out the female connector.

6.4、 installation of sensor shouldn' t close to strong outside magnetic field.

6.5、 the output of sensor will exceed nominal output if the primary current exceeds nominal current. The protection circuit is suggested to take account.

6.6、 the housing of sensor is made in ABS plastic, the temperature isn' t higher over 85°C.

6.7 field calibration is applicable. sensors have easily accessible calibration pots.

#### **七、 Warranty**

The warranty is 2 years after delivery in addition to fore majeure and non-artificial factors.