

G01B02 Multi-channel constant current voltage source Usage

1. Overview

G series multi-channel constant current voltage source is a power supply used with in-band circuit piezoelectric sensor. This voltage source is suitable for all kinds of imported or domestic in-band circuit (ICP) piezoelectric sensors, including accelerometers, force and pressure sensors. The constant current source design is mainly used in the laboratory while taking into account the field use, the constant current source uses the built-in battery power supply. In order to meet the measurement of different sizes of signals, the constant current source has $\times 1$ and $\times 10$ amplification functions. Constant current voltage source has the characteristics of easy operation, stable and reliable performance, portability, low noise and so on. After the output of the sensor signal by the constant current source, it can be directly connected with various display readings or analytical instruments to read the measured value or further analyze the signal.

2. Technical indicators:

Indicators	Units	G01B02
Number of channels		4 Channels
Constant current source supply voltage	V	18-30
Constant current source supplies current	mA	4
Magnification		$\times 1, \times 10$
Frequency range ($\pm 5\%$)	Hz	0.1-100000 ($\times 1$); 0.1-30000 ($\times 10$)
Broadband charged noise	mV rms	$<0.01 (\times 1), 0.5 (\times 10)$
Interchannel interference noise	$\mu\text{V rms}$	<50
Precision	%	$< \pm 1$
Output signal voltage range (AC end)	V	Plus or minus five
Output signal voltage range (DC end)	V	0-5
Power supply		24V built-in lithium battery
Input/output receptacle		BNC
Exterior dimensions	mm	145 x 155 x 62
Weight	kg	1.05

3. How to operate

1) About the power supply

This machine uses 24V large capacity built-in lithium battery power supply, open the switch can be used (preheat more than 2 minutes). In general, the battery voltage (displayed) should be kept above 18V. When the voltage is low, the special charger should be used as soon as possible to charge. In order to avoid mains interference, try to charge when not in use. Avoid charging batteries for long periods.

2) Connection of constant current source to sensor and successor instrument

The signal input and output interfaces are BNC jack. The input interface of the signal is on the front panel, and the output interface of the signal is on the back panel, there are two. AC interface: Output regular AC signal, Max. $\pm 5\text{V}$.

Measuring SYSTEM Inspection

Switch on the power switch, at this time the front panel red light indicator, indicating that the sensor is not connected. The voltmeter indicates the internal battery voltage, and the voltage value is in the normal service range of 18-25V.

After the sensor is connected, the green light on the front panel and the red light off indicate that the sensor is connected to the power supply. Due to the time constant process in the built-in circuit of the sensor, it is best to start the test after 3 minutes of standby after the sensor is connected.

Therefore, the measurement system composed of the constant current source and the built-in circuit sensor does not need to be setup, and the measured value can be directly converted by the voltage reading of the subsequent display device and the voltage sensitivity of the sensor.

Constant current source with 10 times amplification function, when the vibration signal is very small is not conducive to the acquisition of the toggle switch can be moved to the right side, choose to enlarge the output signal 10 times. Because the signal amplification will amplify the noise interference at the same time, so this function is carefully selected.

4) About long distance signal transmission

For long distance signal transmission (>100M), as the cable lengthens, its capacitance will also increase, and the upper limit of the measurement frequency of the system will be limited. In order to not affect the high frequency response, it can be achieved by increasing the constant current of the constant current source. The specific value can be obtained by the following calculation formula

$$f_{\max} = (I_c - 1) * 10^9 / 2 \pi C * U$$

In formula: f_{\max} (Hz) highest allowable frequency

I_c (mA) Constant current

C (pf) Cable capacitance

U (V) Maximum signal voltage

For example: $I_c=4\text{mA}$, $C=3000\text{pf}$ (about 30 meters cable), $U=5\text{V}$, then $f_{\max}=21.2\text{kHz}$ If you want to increase the frequency upper limit, you need to increase the constant current I_c . Usually, the constant current source is set at 4mA when leaving the factory. However, if the current increase is not consumed on the cable, it will inevitably lead to the rise of the current of the built-in circuit, which will increase the thermoelectric noise, increase the circuit temperature, affect the maximum service temperature and the life of the sensor itself. Therefore, the constant current should not be casually increased. The user who really needs it can provide the constant current source current according to the actual situation.

Note:

1. Digital display dial real-time indication of electricity. When the voltage is greater than 18V, the sensor can work normally, and when it is less than 18V, please charge it in time.
2. Built-in large capacity lithium battery, do not close to heat sources and violent collision.
3. Try to avoid using it when charging, which may cause noise interference due to mains interference.
4. When scrapped, please handover to a professional company to deal with lithium batteries.

