# 100 Series Current Sources

### Model 100 & Model 101 Features

- Battery powered
- 10 µA factory-preset output current
- Internally programmable from 1 µA to 1 mA
- No AC line noise
- Choice of compliance voltages –
  Model 100: 2.5 V
  Model 101: 5 V

### Model 102 Features

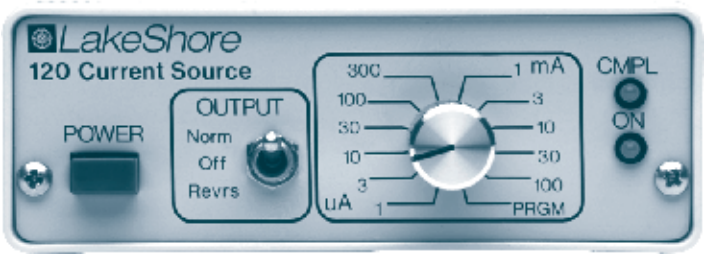
- 10 µA factory-preset output current
- Internally programmable from 1 µA to 1 mA using a fixed program resistor
- Compliance voltage of 8 V

### Model 110CS Features

- 10 µA factory-preset output current
- Externally programmable from 1 µA to 10 mA
- Compliance voltage of 11 V

### Model 120CS Features

- Switch-selectable output current from 1 µA to 100 mA
- Current reversal switch
- External programming capability
- Compliance voltage of 11 V (to 50 mA)




**Model 100 and Model 101**
The Models 100 and 101 are battery-powered DC current sources which provide a very stable output current without the noise commonly associated with AC line-powered instruments. They are well-suited for field maintenance and periodic monitoring of sensors, as well as operation in a highly noise-sensitive environment.

The main difference between the 100 and 101 is their compliance voltage: the Model 100, with a 2.5 V compliance voltage, is well suited for silicon diode applications including Lake Shore DT-470 and 670 diodes. The Model 101 has a compliance voltage of 5 V which is required for use with Lake Shore TG-120 GaAlAs diodes, or if the user desires to connect two silicon diode sensors in series. While the output current of both units is factory preset at 10 µA, the user may reprogram the unit to any value between 1 µA and 1 mA by changing the internal programming resistor.

**Model 102, Model 110CS, and Model 120CS**
The Models 102, 110CS, and 120CS are precision DC current sources suitable for benchtop use. They are capable of higher output currents and compliance voltages than their battery-powered counterparts.

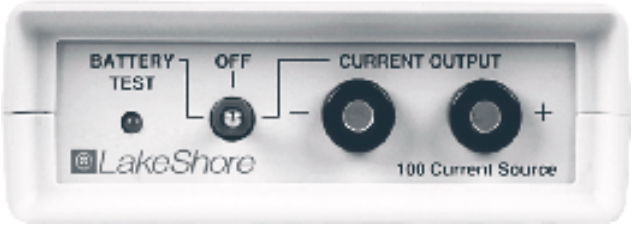
The Model 102 provides excellent performance at low cost. The output current is factory-preset at 10 µA, but the unit may be reprogrammed to any value between 1 µA and 1 mA by changing a programming resistor inside the instrument. Compliance voltage is 8 V. Power is supplied to the unit by an external AC wall-mount supply. The supply type must match the AC line voltage available and must be specified when ordering.

The Model 110CS offers a higher compliance of 11 V. The output current can be externally changed to any value between 1 µA and 10 mA by connecting a programming resistor to the terminal block on the unit's rear panel. AC line voltage is jumper-selected inside the unit. Desired line voltage should be specified when ordering, but the setting can be changed at any time by the user.

On the Model 120CS, output current is selected with a rotary switch on the front panel. Eleven fixed values span the range of 1 µA to 100 mA and a compliance voltage of 11 V. The 1× and 3× switched increments correspond to approximate decade changes in power with a resistive load. For odd current values, a programming resistor may be connected to the terminal block on the unit's rear panel. This source is ideally suited for use with resistance sensors where resistance may vary with temperature by as much as 6 orders of magnitude. The current reversal switch allows compensation for thermal EMF, important when measuring resistors at low voltage. AC line voltage is jumper-selected inside the unit. Desired line voltage should be specified when ordering, but the setting can be changed at any time by the user.

| | 100 | 101 | 102 | 110CS | 120CS |
|---|---|---|---|---|---|
| **Output** | | | | | |
| **Output current (10 µA factory preset)** | Internally programmable from 1 µA to 1 mA | Internally programmable from 1 µA to 1 mA | Internally programmable from 1 µA to 1 mA | Externally programmable from 1 µA to 10 mA | 1 µA, 3 µA, 10 µA, 30 µA, 100 µA, 300 µA, 1 mA, 3 mA, 10 mA, 30 mA, 100 mA switch selectable; externally programmable from 1 µA to 100 mA |
| **Accuracy at 10 µA**[1] | 0.05% of output | 0.05% of output | 0.05% of output | 0.05% of output | 0.05% of output, 0.1% on all other switched ranges |
| **Temperature coefficient (% output/°C ambient)** | 0.005% of output per °C | 0.005% of output per °C | 0.005% of output per °C | <0.01% of output per °C | <0.01% of output per °C |
| **Compliance voltage** | 2.5 V | 5 V | 8 V | 11 V | 11 V up to 50 mA, 10 V up to 100 mA |
| **Line regulation** | NA | NA | Less than 0.01% change in output for 10% change in line voltages within specified voltage range (see power) | Less than 0.01% change in output for 10% change in line voltages within specified voltage range (see power) | Less than 0.01% change in output for 10% change in line voltages within specified voltage range (see power) |
| **Load regulation** | Less than 0.01% change in output current from 1% to 100% compliance voltage | Less than 0.01% change in output current from 1% to 100% compliance voltage | Less than 0.01% change in output current from 1% to 100% compliance voltage | Less than 0.01% change in output current from 1% to 100% compliance voltage | Less than 0.01% change in output current from 1% to 100% compliance voltage |
| **AC current ripple** | NA | NA | Less than 0.01% of scale +1 nA (RMS) in a property shielded system | Less than 0.01% of scale +1 nA (RMS) in a property shielded system | Less than 0.01% of scale +40 µV (RMS) in a property shielded system |
| **General** | | | | | |
| **Ambient temperature range** | 15 °C to 35 °C | 15 °C to 35 °C | 15 °C to 35 °C | 15 °C to 35 °C | 15 °C to 35 °C |
| **Power** | 4 AA alkaline batteries | One 9 V alkaline battery | 12 VAC, 3 VA wall-mount supply selected for AC power required | 90 to 125, or 210 to 250 VAC, 50 or 60 Hz, 3 VA | 90 to 125, or 210 to 250 VAC, 50 or 60 Hz, 3 VA |
| **Battery life** | 1 year | 6 months | NA | NA | NA |
| **Enclosure type** | Plastic, benchtop | Plastic, benchtop | Plastic, benchtop | Benchtop | Benchtop |
| **Size** | 95 mm W × 33 mm H × × 158 mm D (3.7 in × 1.3 in × 6.2 in) | 95 mm W × 33 mm H × × 158 mm D (3.7 in × 1.3 in × 6.2 in) | 95 mm W × 33 mm H × × 158 mm D (3.7 in × 1.3 in × 6.2 in) | 106 mm W × 41 mm H × × 164 mm D (4.2 in × 1.6 in × 6.5 in) | 106 mm W × 41 mm H × × 164 mm D (4.2 in × 1.6 in × 6.5 in) |
| **Weight** | 0.3 kg (0.7 lb) | 0.3 kg (0.7 lb) | 0.3 kg (0.7 lb) | 0.5 kg (1.1 lb) | 0.5 kg (1.1 lb) |
| **CE mark approval** | Yes | Yes | No | No | No |

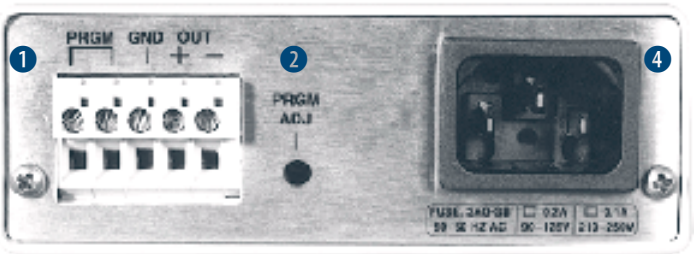
*[1] Programming resistor determines accuracy when used*




**Model 100/101**

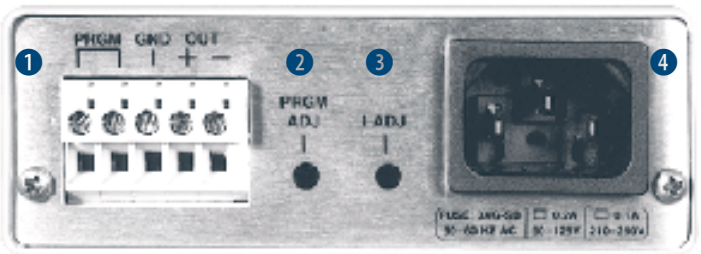

**Model 102**


**Model 110**




**Model 110 rear panel**


**Model 120**




**Model 120 rear panel**

❶ Terminal block
❷ Program adjust
❸ Current (I) adjust
❹ Line input

## Ordering Information

| Part number | Description |
|---|---|
| **100** | Battery powered current source (2.5 V compliance) |
| **101** | Battery powered current source (5 V compliance) |
| **102-115** | DC current source (8 V compliance), with 90 to 140 VAC wall mount power supply |
| **102-230** | DC current source (8 V compliance), with 200 to 250 VAC wall mount power supply |
| **110CS-115** | DC current source (11 V compliance) with 90 to 125 VAC line input |
| **110CS-230** | DC current source (11 V compliance) with 210 to 250 VAC line input |
| **120CS-115** | DC current source (11 V compliance up to 50 mA, 10 V above), with 90 to 125 VAC line input |
| **120CS-230** | DC current source (11 V compliance up to 50 mA, 10 V above), with 210 to 250 VAC line input |

**Accessories included with Model 100 and Model 101**

| | |
|---|---|
| —— | Four AA batteries (Model 100 only) |
| —— | One 9 V battery (Model 101 only) |
| **106-009** | Double banana plug (Model 102 only) |
| —— | Calibration certificate |
| **MAN-100/101** | User manual |

**Accessories available for Model 100, Model 101, and Model 102**

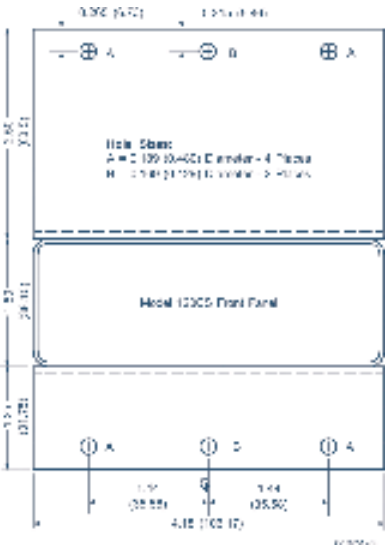
| | |
|---|---|
| **CAL-100-CERT** | Model 100 recalibration with certificate |
| **CAL-101-CERT** | Model 101 recalibration with certificate |
| **CAL-102-CERT** | Model 102 recalibration with certificate |

**Accessories included with Model 102, Model 110CS, and Model 120CS**

| | |
|---|---|
| **106-009** | Double banana plug (Model 102 only) |
| **115-006** | Detachable 120 VAC line cord (110CS and 120CS only) |
| —— | Instrument recalibration with certificate |
| **MAN-102** | Model 102 user manual |
| **MAN-110** | Model 110CS user manual |
| **MAN-120** | Model 120CS user manual |

**Accessories available for Model 110CS and Model 120CS**

| | |
|---|---|
| **1090** | Mounting adapter for four sources in a 483 mm H × 44 mm W (19 in × 1.75 in) rack space |
| **2090** | Mounting adapter for ¼ panel EIA installation |
| **CAL-110-CERT** | Model 110 recalibration with certificate |
| **CAL-120-CERT** | Model 120 recalibration with certificate |



**Model 2090 Mounting Adapter**