Current Source/227

1μA—1A Constant

- **Up to 1A, 50W regulated output**
- **Current output is voltage programmable**
- **Optionally programmable range and compliance limit**

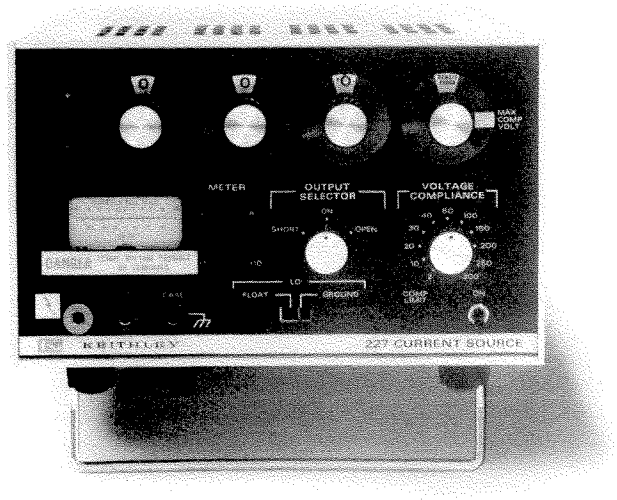
The programmable Model 227 current source delivers accurate, stable, high-power constant current over full-scale ranges of 1 to 1000mA, with adjustable compliance voltage. The 3-digit in-line readout of the Model 227 enables the current output to be set to within 0.005% of range, with a full-range accuracy of 0.62%.

The 227 has a continuously adjustable compliance voltage limit, which can be easily set from approximately 3V to 300V on the 100mA and lower ranges. The 100mA range compliance is similarly adjustable from approximately 3V to 50V. This compliance voltage limit can be preset using the convenient front-panel meter as a guide. This meter also indicates current and voltage output levels under load.

Other features include excellent output current regulation, low output noise, low output capacitance (with correspondingly high output impedance at high frequencies), fast programming ability and a buffered rear-panel voltage monitor output.

The output current may be determined by the voltage applied to the VOLTAGE PROGRAMMING input; 10V corresponds to full range output.

Using the 2271 programming option, range and compliance limit may also be programmed, and current output may be programmed by a resistance or a voltage level. The option also includes a "compliance limit" flag.



The 227 has a true bipolar current output that can be modulated, allowing operation as a true AC constant current source. The output can be floated up to ±500V off chassis ground, with less than 5 ppm of full-range change in output current per volt off ground.

AS A DC CONSTANT CURRENT SOURCE

OUTPUT:

Current: ±1μA (1000μA full range) to ±1000mA in four decade ranges; 3-digit in-line readout; 11% overrange to 1110.

Voltage Compliance: ±300V on 100mA range and lower; ±50V on 1000mA range. Compliance limit continuously adjustable from approximately 3V to full voltage compliance.

Floating: ±500V maximum off chassis ground, less than 5ppm of full range change in output current per volt.

RESOLUTION: ±0.005% of range, 3-digit readout.

ACCURACY: ±(0.5% of setting, ±0.12% of range).

AS A BIPOLAR PROGRAMMABLE CONSTANT-CURRENT SOURCE/AMPLIFIER

VOLTAGE PROGRAMMING (INPUT): DC-coupled 0 to ±11V. Input resistance 10kΩ. Input must be isolated from output load by greater than 10^6Ω.

TRANSFER FUNCTION: ±10V DC for ±full range current output. Accuracy ±0.5%. Zero offset less than 0.1% of range.

BANDWIDTH (−3dB): 600Hz minimum.

OPTIONAL PROGRAMMING: Model 2271 option permits remote programming of range, magnitude, polarity and compliance limit (see Model 2271).

GENERAL

STABILITY: ±(0.005% of setting, ±0.005% of range)/°C. Short-term stability up to 30 days is masked by this temperature coefficient.

LOAD REGULATION: ±0.005% of range from no load to full load.

LINE REGULATION: ±0.005% of range for 10% change in line voltage.

NOISE: Wideband noise less than (0.03% of range + 2mV) rms above 5Hz.

ENVIRONMENT: Operating: 0°C to 50°C. 0% to 80% relative humidity up to 35°C. Requires approximately 50mm (2 in.) top and 150mm (6 in.) rear panel clearances for air movement. **Storage:** −25°C to +70°C.

CONNECTORS: Output (front and rear), Voltage Programming Input (rear): Binding Posts.

POWER: 90-110, 105-125, 195-235, 210-250V (switch selected), 50-60Hz, 145W.

DIMENSIONS, WEIGHT: 133mm (5¼") half-rack, overall bench size 145mm high × 220mm wide × 385mm deep (5¾" × 8¾" × 15¼"). Net weight, 10.9kg (24 lbs.).

2271 Specifications

RANGE SELECT: Closure* on one of four lines selects range.

CURRENT SET:

Voltage Programming: Standard feature of Model 227. See Model 227 Specifications.

Resistance Programming: Transfer function: 10% of full range per kΩ (±0.5%). Zero at approximately 11kΩ. Stability: adds ±(0.01% of setting + 0.01% of range)/°C to Model 227 specification. Resistance must be isolated and shielded.

COMPLIANCE LIMIT:

External Operate: Closure* enables external control of both span and limit. Open enables 227 front-panel control.

Span Select: Closure* enables compliance limit to be set from 10 to 300V; open makes span 4 to 50V.

Compliance Limit Set: Resistance programmed, non-linear transfer function. 0 Ω yields high end of span, 25kΩ yields approximately mid span, open circuit yields low end. Resistance must be isolated and shielded.

Flag (Output): Logic "0" (≡ less than 0.4V drop while sinking 16mA to external power supply LO) appears when 227 is in compliance limit. Logic "1" (≡ greater than 2.4V at up to 400μA referenced to supply LO) appears when 227 is not in compliance limit.

REQUIRED CONTROL LEVELS:

*CLOSURE ≡ Closure to external power supply LO within 0.5V while sinking 50mA (range-select for 1A range requires sinking 100mA).
OPEN ≡ greater than 2kΩ referenced to external power supply LO.

EXTERNAL POWER SUPPLY: Control requires external power supply of 5V to 6V at 200mA.

CONNECTOR: DAM-15S type mounts on 227 rear panel.

ACCESSORY SUPPLIED: Mating connector.