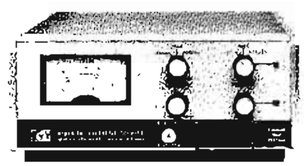
CONSTANT CURRENT SOURCES
Precise regulation and resolution
Models 6177B, 6181B, 6186B



6177B, 6181B

6186B

Description

These solid-state constant-current sources have excellent ripple, regulation, drift, and output impedance characteristics, making them ideal for semiconductor circuit development, component testing, and precision electroplating applications.

In addition, the high-speed remote programming characteristics lend these supplies to diverse applications, such as testing and sorting of semiconductors, resistors, relays, meters, etc. The capability of superimposing ac modulation on the dc output permits the supplies to be used for measurement of dynamic or incremental impedance of circuit components.

Specifications

Load regulation: less than 25 ppm of output +5 ppm of range switch setting for a load change which causes the output voltage to vary from zero to maximum.

Line regulation: less than 25 ppm of output +5 ppm of range switch setting for a 10% change in the line voltage.

Load transient recovery time: less than 200 μs for output current recovery to within 1% of the nominal output current following a full load change in output voltage.

Temperature coefficient: output change per degree C is less than 75 ppm of output current +5 ppm of range switch setting.

Stability: less than 100 ppm of output current +25 ppm of range switch setting after 1 hour warmup.

Resolution: 0.02% of range switch setting.

Temperature: operating, 0 to 55°C; storage, −40 to +75°C.

Dimensions:
6177B, 6181B: 7¾" wide, 3-7/16" high, 12⅜" deep.
6186B: 7¾" wide, 6-7/32" high, 12⅜" deep.

Weight:
6177B, 6181B: 10 lbs net, 13 lbs shipping
6186B: 13 lbs net, 17 lbs shipping.

Options
014: three digit graduated decadial current control, add $35
028: 230 V ac, (Models 6177B and 6181B only), add $10.

Model			6177B	6181B	6186B
Output Current			0–500 mA	0–250 ma	0–100 mA
Voltage Compliance			0–50 Vdc	0–100 Vdc	0–300 Vdc
Output Ranges		A	0–5 mA	0–2.5 mA	0–1 mA
		B	0–50 mA	0–25 mA	0–10 mA
		C	0–500 mA	0–250 mA	0–100 mA
AC Input			115 Vac ±10%, 48–63 Hz; 0.6 A, 55 W at 115 Vac For 230 Vac see Option 028	115 Vac ±10%, 48–63 Hz; 0.6 A, 55 W at 115 Vac For 230 Vac see Option 028	115/230 Vac, 48–63 Hz 0.9 A, 90 W at 115 Vac 115/230 Vac switch
Constant Current Remote Programming	Voltage Control (Accuracy: 0.5% of output current +.04% of range)	Range A	200 mV/mA	1 V/mA	10 V/mA
		Range B	20 mV/mA	100 mV/mA	1 V/mA
		Range C	2 mV/mA	10 mV/mA	100 mV/mA
	Resistance Control (Accuracy: 1% of output control +.04% of range)	Range A	400 ohms/mA	2K ohms/mA	10K ohms/mA
		Range B	40 ohms/mA	200 ohms/mA	1K ohm/mA
		Range C	4 ohms/mA	20 ohms/mA	100 ohms/mA
Voltage Limit Remote Programming	Voltage Control (Accuracy: 20%)		1 V/V	1 V/V	1 V/V
	Resistance Control		870 ohms/V	440 ohms/V	820 ohms/V
	Accuracy		20%	20%	15%
Output Impedance (R in parallel with C)*		Range A	R = 330 Meg, C = 500 pF	R = 1330 Meg, C = 10 pF	R = 10,000 Meg, C = 900 pF
		Range B	R = 33 Meg, C = 0.005 μF	R = 133 Meg, C = 100 pF	R = 1,000 Meg, C = 700 pF
		Range C	R = 3.3 Meg, C = 0.05 μF	R = 13.3 Meg, C = 1000 pF	R = 100 Meg, C = 1500 pF
Ripple and Noise: rms/p-p (dc to 20 MHz) Either output terminal can be grounded		Range A	0.40 μA rms/5 μA p-p	0.20 μA rms/0.5 μA p-p	50 μA rms/2 μA p-p
		Range B	4.0 μA rms/40 μA p-p	2.0 μA rms/7.5 μA p-p	0.5 μA rms/25 μA p-p
		Range C	40 μA rms/250 μA p-p	20 μA rms/100 μA p-p	5 μA rms/500 μA p-p
Programming Speed: from 0 to 99% of range switch setting with a resistive load. **(Output Current Modulation)			500 μs	500 μs	1 ms
Meter Ranges (Accuracy 2% of full scale)			6, 60, 600 mA; 60 Vdc	3, 30, 300 mA; 120 Vdc	1.2, 12, 120 mA; 360 Vdc
Price			$475	$475	$600

*This network is a simplified representation of a complex network. The formula $Z = RX_C/\sqrt{R^2 + X_C^2}$ is used for frequencies up to 1 MHz by substituting the values given for R and C. Above 1 MHz, the output impedance is greater than the formula would indicate—load transient overhools are less than 20% of range setling for a full load change with a 1μ sec. rise time.

**Output current can be modulated 100% up to 100 Hz; percent moduation desreases linearly to 10% at 1000 Hz.

OPTIONS AND ACCESSORIES
Increase DC Power Supplies Versatility
Models 14513A-14545A

Options are customer-requested, factory-performed modifications to standard instruments. A list of all options available on Hewlett-Packard dc power supplies is given below. To determine which options are available for a particular supply, refer to the appropriate product page.

Options

001: 208 V ac ±10%, 3-phase input, 57-63 Hz, no charge.
002: 230 V ac ±10%, 3-phase input, 57-63 Hz, no charge.
003: 460 V ac ±10%, 3-phase input, 57-63 Hz. 6464C, 6466C, 6469C, 6472C, 6475C, 6477C, 6479C, 6483C, $200; all other models, no charge.
005: 50 Hz ac input. 6110A, 6516A, $50. 6453A, 6456B, 6459A, 712C, $25. 6464C, 6466C, 6469C, 6472C, 6475C, 6477C, 6479C, 6483C, no charge; all other models, $10.
006/011: internal overvoltage protection crowbar. Refer to product pages for prices.
007: ten-turn output voltage control. 6205B, 6227B, 6228B, 6253A, 6255A, $50; all other models, $25.
008: ten-turn output current control. 6227B, 6228B, 6253A, 6255A, $50; all other models, $25.
009: ten-turn output voltage and current controls. Consists of Options 007 and 008 on same instrument. 6227B, 6228B, 6253A, 6255A, $90; all other models, $45.
010: chassis slides. Attached to supply at factory. 6253A, 6255A, 6427B, 6428B, 6433B, 6434B, 6438B, 6439B, 6443B, 6448B, $125. 6453A, 6456B, 6459A, $195; all other models, $50.
013: three-digit graduated decadial voltage control. Includes single 10-turn control. 6205B, 6227B, 6228B, 6253A, 6255A, $120. 6207B, 6209B, 6220B, 6224B, 6226B, 6294A, 6299A, 6515A, $35; all other models, $60.
014: three-digit graduated decadial current control. Includes single 10-turn control. 6227B, 6228B, 6253A, 6255A, $120. 6220B, 6224B, 6266B, $35; all other models, $60.
016: 115 V ac ±10%, 1-phase input. Factory modification replaces 230 V transformer with 115 V transformer, $75.
017: 208 V ac ±10%, 1-phase input. Modification replaces 115 or 230 V transformer with 208 V transformer, $75.
018: 230 V ac ±10%, 1-phase input. Modification replaces 115 V transformer with 230 V transformer. 6110A, 6282A, 6285A, 6286A, 6290A, 6291A, 6296A, 6516A, $50; all other models, $75.
020: voltage programming adjust. Allows the voltage programming coefficient and zero output voltage to be adjusted via an access hole in the rear panel, $25.
021: current programming adjust. Allows the current programming coefficient and zero output current to be adjusted via an access hole in the rear panel, $25.
022: voltage and current programming adjusts. Consists of Options 020 and 021 on same instrument, $45.
023: rack kit for mounting one 6464C-6483C supply in standard 19" rack, $25.
026: 115 V ac ±10%, single phase input. Factory modification reconnects power transformer (and other components where necessary) for 115 V operation, $10.
027: 208 V ac ±10%, single phase input. Factory modification reconnects power transformer (and other components where necessary) for 208 V operation. 6259B, 6260B, 6261B, 6268B, 6269B, $15; all other models, $10.
028: 230 V ac ±10%, single phase input. Factory modification reconnects power transformer (and other components where necessary) for 230 V operation, $10.
031: 380 V ac ±10%, 3-phase input, 57-63 Hz, $275.
032: 400 V ac ±10%, 3-phase input, 57-63 Hz, $275.
040: interfacing for multiprogrammer operation. Prepares standard Hewlett-Packard supplies for resistance programming by the 6940A Multiprogrammer or 6941A Extender. 6220B, 6224B, 6226B, 6256B, 6259B, 6260B, 6261B, 6263B, 6264B, 6265B, 6266B, 6267B, 6268B, 6269B, 6271B, 6274B, $60; 6101A, 6102A, 6111A, 6112A, 6113A, $30.

Accessories

14513A: rack kit for mounting one 3½" high, half rack (8½" wide) supply, $20.
14515A: rack kit for mounting one 5¼" high, half rack (8½" wide) supply, $23.
14525A: rack kit for mounting two 5¼" high, half rack (8½" wide) supplies, $12.
14523A: rack kit for mounting two 3½" high, half rack (8½" wide) supplies, $10.
14521A: rack kit for three 6211A-6118A supplies, $25.
  Option J01: rack kit for mounting two 6211A-6218A supplies (includes one filler panel), $35.
  Option J02: rack kit for mounting one 6211A-6218A supply (includes two filler panels), $35.
  6950A, Option J47: filler panel for one 6211A-6218A supply. Used with rack kit 14521A, $10.
14545A: set of 4 casters for one 6464C16483C supply, $35.

Specifications definitions

Load regulation: voltage load regulation is given for a load current change equal to the current rating of the supply. Current load regulation is given for a load voltage change equal to the voltage rating of the supply.
Line regulation: given for a 10% change in line voltage at any output voltage and current within rating.
Ripple and noise: stated as rms/p-p (dc to 20 MHz), at any line voltage and under any load condition within rating.
Temperature coefficient: output change per degree Centigrade change in ambient following 30 minutes warm-up.
Stability: total drift in output over 8 hour interval under constant line, load, and ambient after 30 min. warm-up.
Resolution: minimum output voltage or current change that can be obtained using front panel controls.
Output impedance (typical): represented by a resistance in series with an inductance (values in spec tables).
Load transient recovery: time required for output voltage recovery to within specified level of nominal output voltage following a change in output current equal to current rating of the supply or 5 amps, whichever is smaller.
Programming speed: typical time required to non-repetitively program from zero to within 99.9% of the maximum rated output voltage, or from the maximum rated output voltage to within 0.1% of that voltage above zero.