

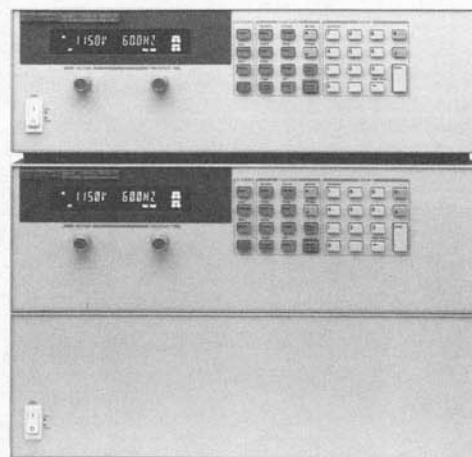
AC Source/Analyzers

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AC Power Source/Analyzers

HP 6800 Series
HP 6811A
HP 6812A
HP 6813A
HP 6814B
HP 6834B

- Cost effective 375 VA solution (6811A)
- ac and dc output capability
- Compact 1 Φ and 3 Φ "one-box" solutions
- Power line disturbance simulation
- Arbitrary waveform generation
- High accuracy readback
- Built-in harmonic analysis capability
- dc output capability (HP 6811A, 6812A, 6813A)
- Built-in HP-IB and RS-232 interface with SCPI programming
- CE mark
- Compliance testing to IEC 1000-3-2 quasi-stationary harmonic current limits (HP 6812A-6814B, 6834B)
- Full IEC 1000-3-2/3 compliance testing with the 6840 series Harmonic/Flicker Test Systems (see pages xxx and xxx)
- Two current measurement ranges. Low range increases sensitivity 10:1 (HP 6811A, 6812A, and 6813A)
- Maximum output frequency of 5 KHz (HP 6814B and 6834B)
- Programmable 1 Φ /3 Φ mode switch (HP 6834B only)
- Elgar PIP 9012 Code built into mainframe



HP 6811A, 6812A, 6813A, top; HP 6814B, 6834B, bottom

HP 6800 Series AC Power Source/Analyzers



HP 6811A 300 V _{rms} , 375 VA Single phase model Panel height: 5.25 inch	HP 6814B 300 V _{rms} , 3000 VA Single phase model Panel height: 10.5 inch
HP 6812A 300 V _{rms} , 750 VA Single phase model Panel height: 5.25 inch	HP 6834B 300 V _{rms} , 4500 VA _{total} One/three phase models Panel height: 10.5 inch
HP 6813A 300 V _{rms} , 1750 VA Single phase model Panel height: 5.25 inch	

Hewlett-Packard ac power source/analyzers are designed for applications which require precise control, accurate measurement, and analysis of single- and three-phase ac power. The feature set and performance levels of this product family provide the flexibility necessary to power and test a wide variety of devices. These products are ideal for applications such as power supply testing, UPS testing, avionics ATE, the testing of power-factor-corrected equipment and devices, and compliance testing to regulatory standards.

The HP 6800 series utilizes a low noise switching topology, which delivers high performance and reduced size. These products can output dc (HP 6811A, 6812A, 6813A), ac, complex, and user-defined waveforms for exceptional application flexibility over the bus or via an easy-to-use front panel.

Key Features

- Sine, square, and up to 12 user-defined waveforms
- Programmable voltage, current limit, frequency, phase, and distortion (clipped sine wave)
- Programmable dc output (HP 6811A, 6812A, 6813A)
- Programmable output impedance (HP 6811A, 6812A, 6813A)
- Voltage and frequency slew control
- Power line disturbance simulation (sag, surge, dropout, clipping, and event programming)
- Independent phase control (HP 6834B)
- Measurement of rms voltage, rms current, peak current, neutral current (HP 6834B), frequency, phase, real power, reactive power, apparent power, total 3 Φ power (HP 6834B), and power factor
- Harmonic analysis of voltage and current with magnitude and phase results up to the 50th harmonic
- THD measurement of voltage and current
- Over-current, over-voltage, over-power, over-temperature, and RI/DFI protection
- Built-in output isolation relays
- Sixteen non-volatile store and recall states
- User-definable power-on state
- Self-test at power-up
- HP VEE support
- Electronic calibration via the bus or front panel

Performance and Features to Meet Critical Testing Needs

Powerful Direct Digital Synthesis (DDS) Waveform Generation

The HP 6800 series offers the ultimate in waveform generation versatility. For testing products under ac line distortion conditions, clipped sine waves can be generated with 0% to 43% distortion. Up to twelve user-defined arbitrary waveforms can be defined and stored in non-volatile memory. These waveforms can be used to generate steady-state outputs or can be combined for more complex transient generation schemes. Testing for compliance to ac line harmonic immunity standards can easily be achieved. Sine waves with harmonic content specified by this standard can be downloaded into non-volatile memory and generated as needed.

For testing that requires dc output capability, dc transients or waveforms with a dc offset, the output of the HP 6811A, 6812A, and 6813A can be configured in ac or dc mode.

Flexible Transient Generation

When testing requires precise synchronization between waveform generation and measurement of the device under test, the HP 6800 series transient generation capability provides a powerful tool. The Step and Pulse modes offer an easy and convenient method of executing single-step and continuous-output changes. The output voltage amplitude, frequency, phase, waveform shape, voltage slew rate, and frequency slew rate can be controlled in response to an input trigger generated from an internal or external event. The List transient mode further extends this capability for more complex waveform generation needs. Up to 100 sequences of output settings can be precisely executed in response to a trigger or paced by programmed dwell times without computer intervention.

Extensive Measurement and Analysis

The HP 6800 series has measurement functionality equivalent to commercially available high-accuracy power analyzers. This eliminates the need for this standalone instrument for most applications, and lowers systems cost, increases available rack space, and simplifies cabling. All measurements are made with 16-bit resolution, suitable for even the most demanding applications.

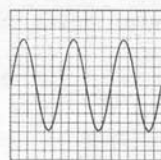
The HP 6800 series has built-in voltage and current waveform digitization combined with harmonic analysis capability. Amplitude, phase, and total harmonic distortion results up to the 50th harmonic are provided for output frequencies equal to or less than 250 Hz. This measurement feature, accessible via the front panel or over the bus, provides a sophisticated solution for testing during product development.

AC Source/Analyzers

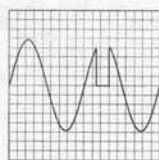
AC Power Source/Analyzers

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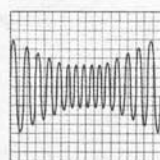
HP 6800 Series Waveform Examples with a Resistive Load



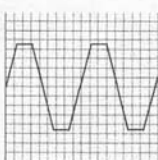
Low distortion sine wave



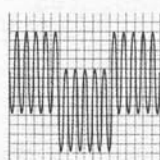
Phase referenced cycle dropout



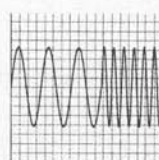
Voltage amplitude change



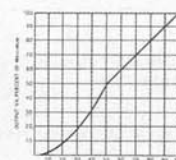
Programmable distortion with programmable slew rate



Waveform with a dc offset (clipped sine wave)



Frequency change



VA Capabilities for the 6814B, 6834B, 6843A

HP 6800 Series
HP 6811A
HP 6812A
HP 6813A
HP 6814B
HP 6834B

Specifications Per phase for a sine wave with a resistive load at 0° to 40° C, within an output frequency range of 45 Hz to 1000 Hz, and in ac coupled mode unless otherwise noted¹

	HP 6811A	HP 6812A	HP 6813A	HP 6814B	HP 6834B
Number of phases	1	1	1	1	1/3
Output frequency range	dc; 45 Hz to 1 kHz	dc; 45 Hz to 1 kHz	dc; 45 Hz to 1 kHz	45 Hz to 5 kHz	45 Hz to 5 kHz
Output ratings					
Power	375 VA	750 VA	1750 VA	3000 VA	4500 VA
Maximum rms voltage	300 V	300 V	300 V	300 V _{1-n} (high range) 150 V _{1-n} (low range)	300 V _{1-n} (high range) 150 V _{1-n} (low range)
DC voltage range	±425 V	±425 V	±425 V	N/A	N/A
Maximum rms current	3.25 A	6.2 A (real-time mode)	13 A (real-time mode)	² 10 A (300 V range) ² 20 A (150 V range)	² 15 A/5 A (300 V range) ² 30 A/10 A (150 V range)
Maximum dc current	2.5 A	5 A	10 A	N/A	N/A
Maximum repetitive and nonrepetitive peak current	40 A	40 A	80 A	40 A (300 V range) 120 A/40 A (150 V range)	60 A/20 A (300 V range) 96 A/150 V (range)
Crest factor	12	6	6	4	4
Constant voltage ripple and noise (20 kHz to 10 MHz)	-60 dB (relative to full scale)	-60 dB (relative to full scale)	-60 dB (relative to full scale)	-60 dB (relative to full scale)	-60 dB (relative to full scale)
Line regulation	0.1%	0.1%	0.1%	0.1%	0.1%
Load regulation	0.5%	0.5%	0.5%	0.5%	0.5%
Maximum total harmonic distortion	0.25% at 50 Hz/60 Hz 1% worst case 45 Hz to 1 kHz	0.25% at 50 Hz/60 Hz 1% worst case 45 Hz to 1 kHz	0.25% at 50 Hz/60 Hz 1% worst case 45 Hz to 1 kHz	1% (45-1000 Hz) 1% + 1% kHz (>1 kHz - 5 kHz)	1% (45-1000 Hz) 1% + 1% kHz (>1 kHz - 5 kHz)
Programming accuracy (25° C ±5° C)					
rms voltage	0.15% + 0.3V (45 to 100 Hz) 0.5% + 0.3V (>100 to 500 Hz) 1% + 0.3V (>500 to 1000 Hz)	0.15% + 0.3V (45 to 100 Hz) 0.5% + 0.3V (>100 to 500 Hz) 1% + 0.3V (>500 to 1000 Hz)	0.15% + 0.3V (45 to 100 Hz) 0.5% + 0.3V (>100 to 500 Hz) 1% + 0.3V (>500 to 1000 Hz)	0.15% + 0.3V (45 to 100 Hz) 0.5% + 0.3V (>100 to 500 Hz) 1% + 0.3V (>500 to 1000 Hz)	0.15% + 0.3V (45 to 100 Hz) 0.5% + 0.3V (>100 to 500 Hz) 1% + 0.3V (>500 to 1000 Hz)
DC voltage	0.1% + 0.5V	0.1% + 0.5V	0.5% + 0.3V	N/A	N/A
Frequency	0.01% + 10 μHz	0.01% + 10 μHz	0.01% + 10 μHz	0.01% + 10 μHz	0.01% + 10 μHz
(HP 6834B in 3Φ mode)					
Phase	N/A	N/A	N/A	N/A	0.1° (45-100 Hz) 1° (>100-1 kHz) 1% + 1% 1 kHz (>1 kHz-5 kHz)
Measurement accuracy (25° ±5° C)					
rms voltage (45-100 Hz)	0.03% + 100 mV ³ + 250 mV	0.03% + 100 mV ³	0.03% + 100 mV ³	0.05% + 250 mV (45 Hz-1 kHz) 0.05% + 0.05%/ kHz + 250 mV	0.05% + 250 mV (45 Hz-1 kHz) 0.05% + 0.05%/ kHz + 250 mV
DC voltage	0.03% + 150 mV ³	0.03% + 150 mV ³	0.03% + 150 mV ³	N/A	N/A
rms current ⁴ (45-100 Hz)	0.05% + 8 mA ³	0.05% + 15 mA ³	0.05% + 15 mA ³	0.1% + 50 mA	0.1% + 25 mA
Frequency	0.01% + 0.01 Hz ²	0.01% + 0.01 Hz ²	0.01% + 0.01 Hz ²	0.01% + 0.01 Hz	0.01% + 0.01 Hz
Power (VA) ⁴ (45-100 Hz)	0.1% + 3.5 VA ³	0.1% + 3.5 VA ³	0.1% + 3.5 VA ³	0.15% + 5 VA	0.15% + 5 VA
Power (watts) ⁴ (45-100 Hz)	0.1% + 0.3 W + 9.4 mW/V ³	0.1% + 0.3 W + 12.7 mW/V ³	0.1% + 0.3 W + 12.7 mW/V ³	0.15% + 5 W	0.15% + 5 W
Power factor ⁴	0.01	0.01	0.01	0.01	0.01
Isolation to ground	300 Vrms	300 Vrms	300 Vrms	300 Vrms	300 Vrms

30-minute warm-up period

Specifications subject to change without notice

¹ It is possible to program the output frequency of HP 6812A and 6813A from dc to 45 Hz (see note 3).

² Full current is available at voltages between 50% and 100% of the output voltage range.

³ Product may be operated between dc and 45 Hz subject to the following conditions: measurements may be extended to 4.5 Hz at full accuracy only by selecting a digitization

rate of 250 μseconds per point; frequency content of the measured signal must be limited to 4 kHz or less to avoid aliasing effects.

⁴ High current measurement range shown

⁵ Single-phase operation

AC Source/Analyzers

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AC Power Source/Analyzers (cont'd)

Supplemental Characteristics Non-warranted characteristics determined by design that are useful in applying the product

	HP 6811A	HP 6812A	HP 6813A	HP 6814B	HP 6834B
Average programming accuracy					
rms current	1.2% + 50 mA	1.2% + 50 mA	1.2% + 50 mA	0.2% + 80 mA	0.2% + 80 mA/ 0.2% + 40 mA
Average programming resolution					
rms voltage	125 mV	125 mV	125 mV	80 mV	80 mV
DC voltage	250 mV	250 mV	250 mV	N/A	N/A
Overvoltage programming (OVP)	2 V	2 V	2 V	2 V	2 V
rms current	2 mA	4 mA	4 mA	5 mA	7.5 mA/2.5 mA
Peak current	12.5 mA	12.5 mA	25 mA	N/A	N/A
Output frequency	10 mHz	10 μ Hz	10 μ Hz	10 μ Hz	10 μ Hz
Phase	N/A	N/A	N/A	N/A	0.001° (45 Hz to 5 kHz)
Average measurement resolution					
rms voltage	10 mV	10 mV	10 mV	10 mV	10 mV
rms current	2 mA	2 mA	2 mA	3 mA	2 mA/6 mA
Net weight	28.2 kg (62 lb)	28.2 kg (62 lb)	32.7 kg (72 lb)	79.5 kg (175 lb)	87.7 kg (193 lb)
Shipping weight	31.8 kg (70 lb)	31.8 kg (70 lb)	36.4 kg (80 lb)	119.1 kg (262 lb)	127.3 kg (280 lb)

Remote Sensing: Up to 10 Vrms can be dropped across each load lead.
Command Processing Time: The average time for the output rms voltage to start to change after receiving an HP-IB command is 10 milliseconds.

Calibration Interval: One year

HP-IB Capabilities: SH1, AH1, T6 L4, SR1, RL1 PPO, DC1, DT1, E1, and CO, and a command set compatible with IEEE-488.2 and SCPI

Regulatory Compliance: Listed to UL-1244; certified to CSA 22.2 No. 231; conforms to IEC 1010

RFI Suppression: Complies with CISPR-11, Group 1, Class A

Warranty Period: Three years

AC Input Ratings *Input power configuration for the standard unit

	HP 6811A	HP 6812A	HP 6813A	HP 6814B	HP 6834B
Voltage range (Vac)	87 to 106 Vac *104 to 127 Vac 174 to 220 Vac 191 to 254 Vac	87 to 106 Vac *104 to 127 Vac 174 to 220 Vac 191 to 254 Vac	174 to 212 Vac *191 to 254 Vac	*180 to 254 L-L (3 Φ) 342 to 456 L-L (3 Φ)	*180 to 254 L-L (3 Φ) 342 to 456 L-L (3 Φ)
Maximum input	12 A (at 100 Vac) 10 A (at 120 Vac)	24 A (at 100, 120 Vac) 28 A (at 100 Vac)	22 A (at 200/208 Vac)	18 A	25 A
Current (rms)¹	7.5 A (at 200/208 Vac) 6.5 A (at 230 V)	13 A (at 200, 208 Vac) 13 A (230 Vac)	20 A (at 220/230/240 Vac)	10 A	15 A
Input power (max)²	100 VA/ 700 W	2500 VA/1400 W	3800 VA/2600 W	5800 VA/4100 W	8900 VA/5900 W
Input frequency	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Price	\$5,500	\$7,040	\$9,690	\$11,730	\$14,180

¹ Measured at low line

² Measured at high line

Ordering Information

Opt 0BN Extra Documentation	+ \$36
Opt 1CM Rackmount Kit (p/n 5062-3977)	+ \$41
Opt 1CP Rackmount Kit with Handles, HP 6811A, 6812A, 6813A only (p/n 5062-3983)	+ \$92
Opt 100 87 to 106 Vac, 48 to 63 Hz (Japan only), HP 6811A, 6812A	\$0
Opt 200 174 to 220 Vac, 47 to 63 Hz. If Option 200 is not ordered, the ac source will be configured to operate at 191 to 254 Vac, 47 to 63 Hz. (HP 6811A)	\$0
Opt 230 191 to 254 Vac, 48 to 63 Hz (HP 6811A, 6812A)	\$0
Opt 831 12 AWG, 200 to 240 Vac, unterminated (HP 6811A, 6812A, 6813A)	\$0
Opt 833 1.5 mm ² wire size, 200 to 240 Vac, unterminated (HP 6811A, 6812A)	\$0
Opt 834 10 AWG, 100 to 120 Vac, unterminated (HP 6811A, 6812A)	\$0
Opt 841 Line Cord with NEMA 6-20P; 20 A, 250 V Plug (HP 6811A, 6812A, 6813A)	+ \$15
Opt 845 Line Cord with IEC 309; 16A, 220 V Plug (HP 6811A, 6812A)	+ \$36
Opt 846 Line Cord with NEMA L5-30P; 30 A, 120 V Plug (HP 6811A, 6812A)	+ \$56
Opt 847 Line Cord with CEE 7/7; 16 A, 220 V Plug (HP 6811A, 6812A)	+ \$36
Opt 848 Line Cord with BS 546; 15 A, 240 V Plug (HP 6811A, 6812A)	+ \$36

Price

Opt 832 4 mm ² wire size, unterminated (HP 6813A)	\$0
Opt 841 Line Cord with NEMA 6-20P; 20 A, 250 V Plug	+ \$15
Opt 842 Line Cord with IEC 309, 32 A, 220 V Plug (HP 6813A)	+ \$77
Opt 844 Line Cord with NEMA L6-30P, 30 A, 250 V Locking Plug (HP 6813A)	+ \$56
Support rails (p/n 1494-0059) required when rackmounting the HP 6812A and 6813A Opt 1CM and Opt 1CP	\$115
Opt 400 360 to 440 Vac, 3-phase, 47 to 63 Hz operation (HP 6814B, 6834B)	+ \$867
HP E3664A cabinet rails must be ordered with Opt 1CM for rackmounting the HP 6814B and 6834B	\$50

Accessories

HP p/n 5060-3513 Three 30-A replacement fuses for 180 to 235 Vac line (HP 6814B, 6834B)	\$29
HP p/n 5060-3512 Three 16-A replacement fuses for 360 to 440 Vac line (HP 6814B, 6834B)	\$29
HP p/n 5063-2310 Heavy-duty rack slide kit (HP 6814B, 6834B)	\$300

Key Literature

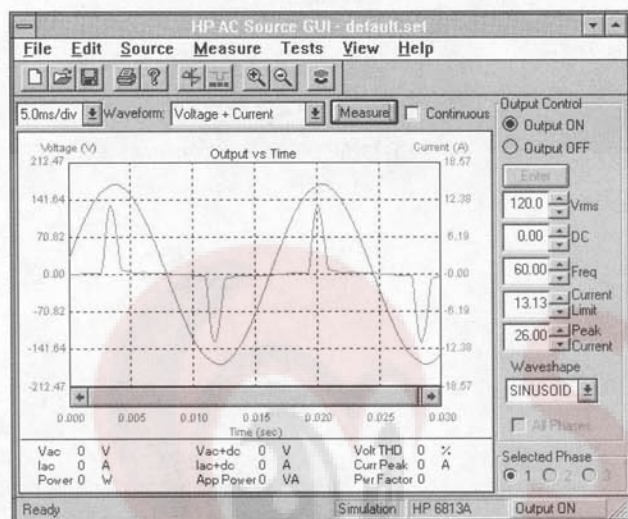
1997/98 *Power Products Catalog*, 5965-5284
Product Note, p/n 5963-7044E

AC Power Source/Analyzers

Graphical User Interface

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- Fast and easy ac source setup
- Easy-to-use table for transient generation
- "Click and drag" graphical creation of transients
- "Oscilloscope" view of dynamic and static voltage and current measurements shown in a single window
- Quickly develop, view, and download harmonic and arbitrary waveforms
- Command view window shows all SCPI commands being sent to the ac source and parameters received from the ac source
- Configure and save ac source states, arbitrary waveforms and transient generation files for convenient recall
- Continuous logging and filing of measurement data
- On-line product manual and Help
- Use with the HP 6800 series Harmonic/Flicker Test Systems in normal (standard ac source) mode
- Runs on Windows 95 and Windows NT 4.0
- Automatic setup of inrush, dropout, surge and say



Graphical User Interface

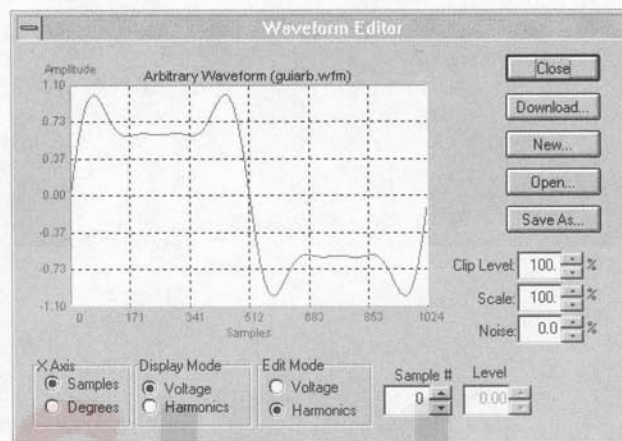
Increase Your Testing Productivity at No Cost

Simplify your ac power testing with the new ac source graphical user interface. This new product provides easy access to the capabilities of the HP ac source products, and allows you to get up and running quickly in your application. The HP ac source graphical user interface is shipped with every HP 6800 series ac source and HP 6840 Harmonic/Flicker Test System on 3.5-inch floppy disk media.

Access the Powerful Capabilities of the HP 6800 and 6840 Series Products

The graphical user interface allows you to easily perform key tests such as inrush characterization with the built-in data acquisition capability of HP's ac source and harmonic/flicker test system products.

Graphical and numeric test results can be saved for future analysis or reporting. Create arbitrary waveforms that can be easily downloaded to the HP 6800 and 6840 products' non-volatile memory—without writing a line of software code. These waveforms can be saved in PC-based files so that you can accumulate a customer library of waveforms specifically tailored to your applications. These waveforms can be later recalled and downloaded to the HP 6800 or 6840 products at your convenience.



Minimum PC Configuration

486DX33 or faster
8 MB of Ram
2 MB of hard disk space

Supported Interfaces

HP 82335B, HP 82340B, HP 82341C,
HP 82341D, National AT-GPIB/TNT, RS-232