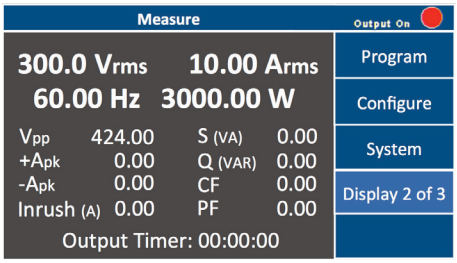
Data Sheet

Programmable AC Power Source
9830 Series

The 9830 Series programmable AC power sources provide high performance and low total harmonic distortion in a 3U form factor. The addition of positive and negative DC offset voltages expands the AC capabilities to operate in DC and AC+DC output coupling modes. The user can select built-in and user-defined harmonic waveforms or select from standard sine, square or clipped sine outputs. The high output current crest factor and low input resistance are suitable for high inrush current measurements when evaluating capacitive or inductive loads.

Measurement display



All 12 measurements can be displayed simultaneously on a large and bright 4.3" color LCD

Clipped Sine Wave

Applications

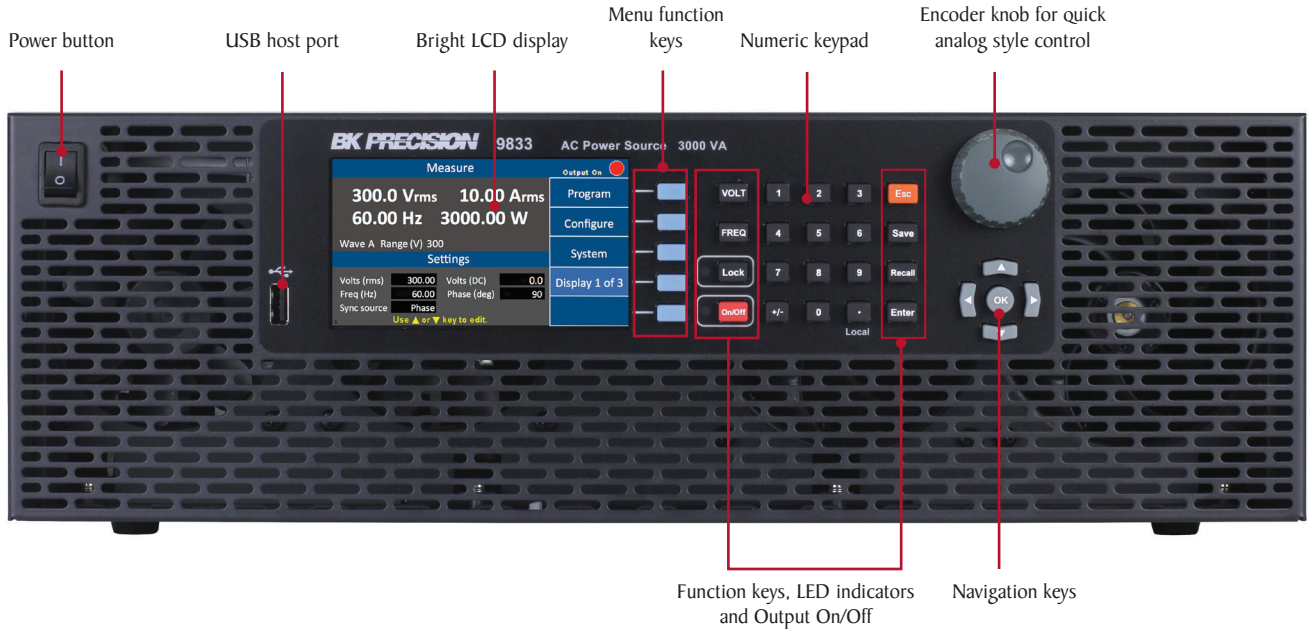
- Pre-compliance testing according to IEC61000-3-2 and IEC61000-4-11/14/28/34 Simulate common grid faults, voltage dips and other disturbances
- Evaluate transformers, TRIACs, SCRs, and passive components
- Manufacturing and single-phase avionics testing

Features & Benefits

- AC, DC and AC+DC power source
- Low total harmonic distortion meets the IEC 61000-3-2 standard
- Comprehensive measurement capabilities Vrms, Arms, Vdc, +Apk, -Apk, inrush current, frequency, power factor, apparent power, reactive power, true power, and crest factor
- 0.98 power factor at AC input stage
- Built-in standard waveforms sine, square, clipped sine
- 30 built-in THD waveforms
- Amplifier mode with 1.2 kHz bandwidth for generating user-defined arbitrary waveforms
- Step, List and Pulse modes for generating power line disturbance (PLD) simulations. List mode supports 10 user-defined programs with up to 100 programmable steps
- Generate custom harmonic waveforms on a PC and download them to the instrument's 5 non-volatile memory locations
- Digital I/O port supporting external trigger, transient indication, failure status indication, remote inhibit, RS232, and external analog output level programming interface
- Comprehensive protection modes OVP, OCP, OPP, OTP, fan failure, output timer and key lock
- LabVIEW™ driver and application software with soft panel for remote control available
- Control the AC source from a standard web browser via built-in web server

Model		9832	9833
Max. power		2000 VA	3000 VA
Max. voltage	AC (rms)	150 V / 300 V	
	DC	± 212 V / ± 424 V	
Max. current (rms)	0 - 150 V	20 A	30 A
	0 - 300 V	10 A	15 A
Frequency range		45 Hz - 1200 Hz	
Total harmonic distortion (THD)		≤ 0.5 % at 45 Hz - 400 Hz (resistive load)	
Remote interface		LAN, USB, GPIB, and RS232	

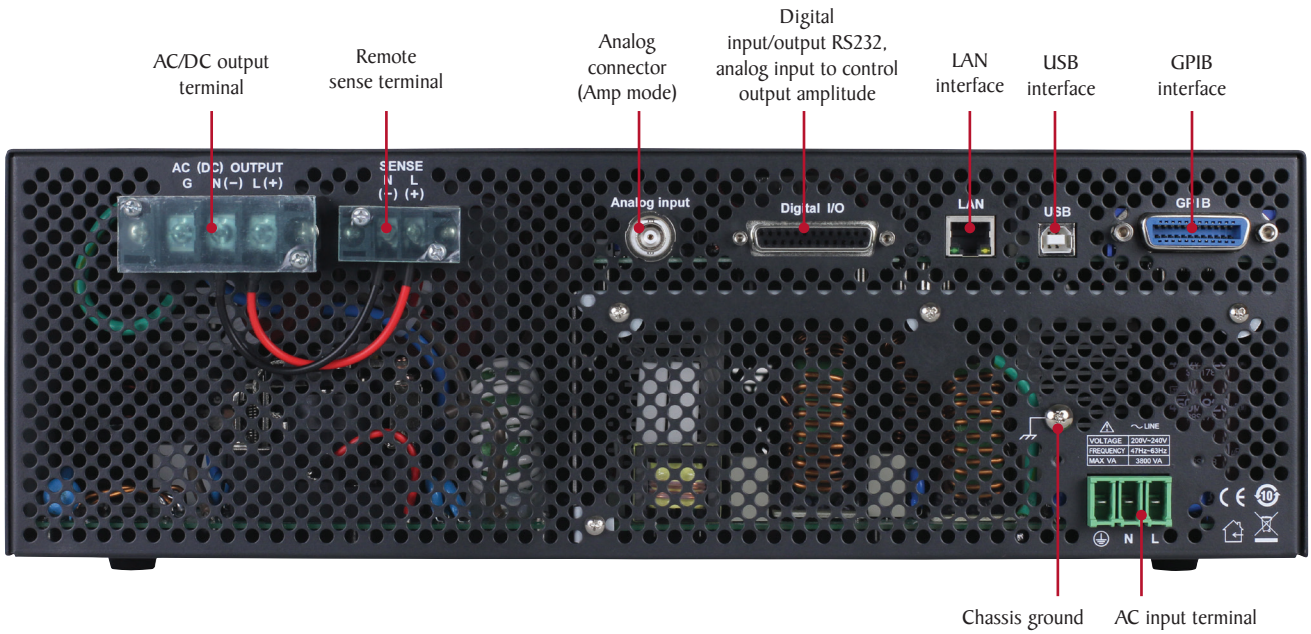
Front panel



Intuitive user interface

The numeric keys and rotary knob provide a convenient interface for setting output parameters quickly and precisely. All measurements and setting values are concurrently displayed on the screen including a graphical display of the output waveform. Up to 100 instrument settings can be saved and recalled to and from internal storage memory. Save screenshots and save /recall settings to the USB host interface.

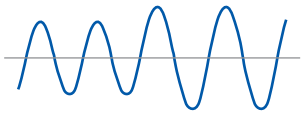
Rear panel



Flexible operation

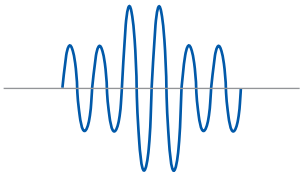
Adjustable AC/DC voltage levels, frequency and timing parameters allow for simulation of voltage drops and periodic power surges and sags. Step, pulse and list modes are used to generate complex power line disturbance simulations. Select from built-in waveforms or generate user-defined waveforms with the included PC software or by connecting an arbitrary waveform generator to the instrument's analog input.

Step mode



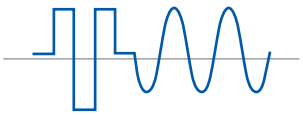
Generate step-up or step-down output based on user-defined voltage, frequency, phase, and interval settings.

Pulse mode



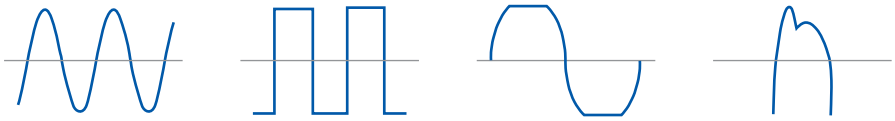
Pulse mode allows the generation of single or multiple pulses with user defined voltage, duty cycle, and phase. Either AC or DC (-424.0 to +424.0 V) output operation is supported.

List mode



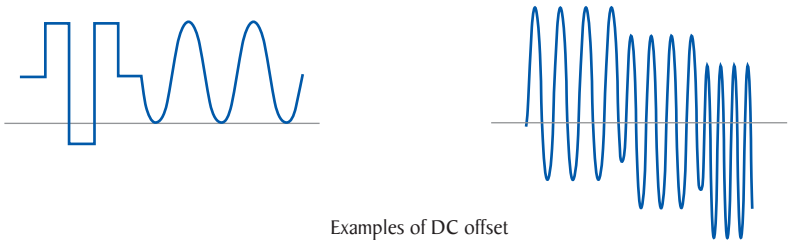
List mode supports the generation of complex output sequences with varying time, amplitude, frequency, and voltage. Up to 100 steps in 10 programs can be saved and executed. This allows the user to build a wide range of waveforms to simulate power grid faults and disturbances.

Waveform operations



Select sine, square, clipped sine or harmonic distortion waveforms. Set amplitude, frequency and phase.

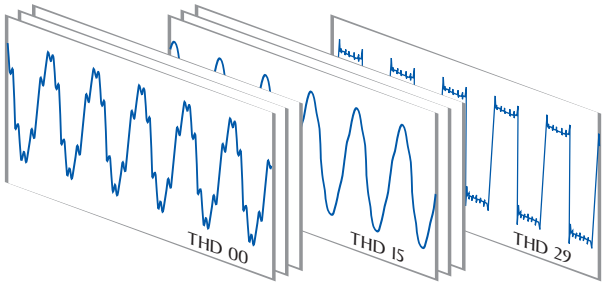
DC offset



Examples of DC offset

The 9830 Series is capable of generating AC+DC waveforms. When operating in pulse, step and list mode, the AC signal can be combined with either a positive or negative DC offset voltage, allowing users to create a wide range of waveforms.

Built-in THD Waveforms

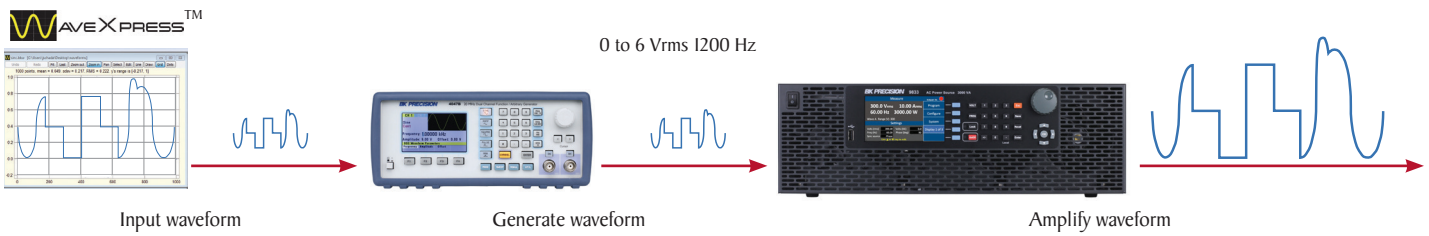


Select from 30 built-in THD (total harmonic distortion) waveforms

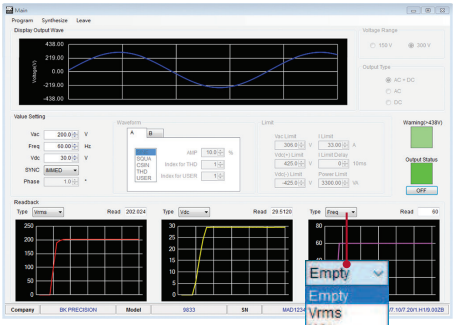
Flexible operation

Arbitrary waveform generation in amplifier mode

To further extend the capabilities of the 9830 series, custom waveforms can be applied to the analog BNC input. The custom waveform can be created using WaveXpress™, a comprehensive stand-alone B&K Precision application, allowing users to easily generate, edit, and upload custom waveforms to an arbitrary waveform generator, which then drives the AC power source output. WaveXpress™ allows users to define waveforms by importing a csv file, define it freehand on the computer, or by importing a real-world waveform captured on a digital oscilloscope.



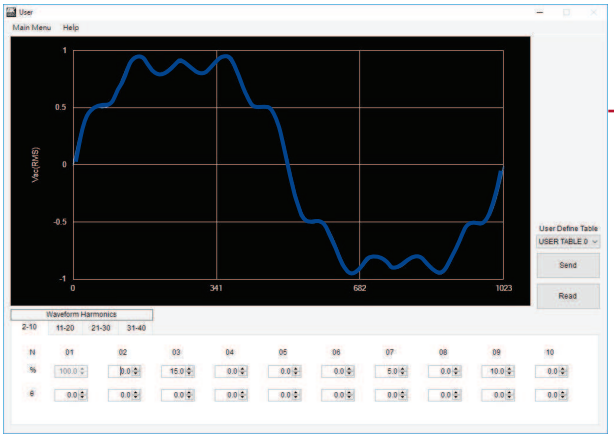
Front panel emulation



PC software is provided for front panel emulation, generating and executing List, Step, and Pulse modes, and logging measurement data without the need to write source code.

Select 1 of 14 available measurements for each of the 3 screens

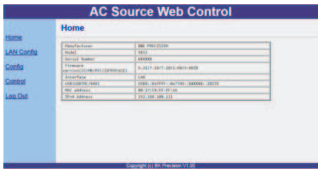
User-defined harmonic waveforms



Create harmonic waveforms by specifying the amplitude and phase of each harmonic up to the 40th order.

Create user-defined waveforms on a computer and download in to 5 user memory locations.

Web server interface



Built-in web server that allows users to configure, control, or monitor the basic settings of the power source from a remote computer using a web browser.

ElectriKit

A helpful tool for electricians, technicians, engineers, students, hobbyists and anyone dealing with electrical power.

Key Features

- Calculate DC power and single- or three-phase AC true power, reactive power, and apparent power
- Delta-wye transformation calculator
- AWG size calculator to determine wire diameter, cross-sectional area, and resistance
- Voltage drop calculator
- Ampacity table for insulated conductors per NEC Table 310.16
- Horsepower calculator for AC/DC motors
- THD harmonics calculator

Specifications

Model			9832	9833
AC Output				
Output Phase			Single	
Maximum Power			2000 VA	3000 VA
Voltage Range[1] (rms)	Low		0 to 150 V	
	High		0 to 300 V	
Current (rms)	Low		20 A	30 A
	High		10 A	15 A
Current (peak)	Low		65 A (< 100 Hz) 50 A (> 100 Hz)	97.5 A (< 100 Hz) 75 A (> 100 Hz)
	High		32.5 A (< 100 Hz) 25 A (> 100 Hz)	48.75 A (< 100 Hz) 37.5 A (> 100 Hz)
Frequency Range			45 Hz to 1.2 kHz	
Phase Range			0 - 359.7 °	
Total Harmonic Distortion[2]	45 Hz to 400 Hz		0.5 %	
	> 400 Hz to 1 kHz		1 %	
	> 1 k to 1.2 kHz		2 %	
Line Regulation[3]			0.1 %	
Load Regulation[3]			0.1 %	
Temp. Coefficient			0.2 % per °C	
Crest Factor	45 Hz to 100 Hz		3.25	
	100 Hz to 1.2 kHz		2.5	
Efficiency[4]			80 % (typical)	
DC Output				
Maximum Power			1000 W	1500 W
Voltage Range[1]	Low		0 to ± 212 V	
	High		0 to ± 424 V	
Current	Low		10 A	15 A
	High		5 A	7.5 A
Ripple and Noise (20 Hz to 20 MHz)			≤ 300 mVrms / ≤ 3 Vpp	
Output Characteristics				
Transient Response Time			1.5 ms (typical)	
Output Impedance			≤ 1 Ω	
Programming				
Resolution	Voltage		0.1 V	
	Phase		0.1 °	
	Frequency		0.01 Hz (< 100 Hz) 0.1 Hz (> 100 Hz)	
Accuracy	Voltage	AC	0.2 % + 0.2 % F.S.	
		DC	0.2 % + 0.4 % F.S.	
	Phase		0.15 %	
	Frequency		± 1 % (45 Hz to 100 Hz)	

Note: All specifications apply to the unit after a temperature stabilization time of 15 minutes over an ambient temperature range of 23 °C ± 5 °C.
1 - The maximum voltage is limited to 310 Vrms and ± 438 Vdc
2 - > 66% to full range
3 - AC mode with sine wave and remote sense enabled
4 - 150 VAC (150 V range) and 300 VAC (300 V range) with nominal input AC voltage.
5 - Analog programming pin available on digital I/O connector

Measurement				
Resolution	Voltage		0.1 V	
	Current		0.01 A	
	Power		0.01 W	
	Frequency		0.01 Hz (< 100 Hz)	
			0.1 Hz (> 100 Hz)	
Accuracy	Voltage	AC	0.25 % + 0.25 % F.S.	
		DC	0.25 % + 0.5 % F.S.	
	Current	AC	0.25 % + 0.375 % F.S. (rms) 0.4 % + 0.75 % F.S. (Peak)	0.25 % + 0.25 % F.S. (rms) 0.25 % + 0.5 % F.S. (Peak)
		DC	0.25 %+3 % F.S	0.25 %+2% F.S
	Power		1 % of F.S. for frequency ≤ 500 Hz 2 % of F.S. for frequency > 500 Hz	
	Frequency		0.5 %	
AC Input				
Voltage			190 V to 250 V	
Frequency			47 Hz to 63 Hz	
Maximum Power			2500 VA	3800 VA
Maximum Current			13.2 A	20 A
Power Factor			0.98 (typical)	
General				
Analog BNC Input	Input Voltage Range		0 to ± 12.5 V	
	Input Impedance		200 kΩ	
	Bandwidth		1.2 kHz	
Storage Memory			10 programs, up to 100 steps total (List mode) 5 memory locations for user-defined waveforms 9 instrument settings	
Remote Interface			Analog programming[5], USB (USBTMC or virtual COM), RS232[5], GPIB, and Ethernet	
Command Response time			50 ms	
Protection			OVP, OCP, OPP, OTP	
Operating Temperature			32 °F to 104 °F (0 °C to 40 °C)	
Storage Temperature			-40 °F to 185 °F (-40 °C to 85 °C)	
Environmental Conditions			≤ 80% Relative Humidity up to 35 °C, non-condensing	
Dimensions (W x H x D)			16.5" x 5.2" x 22" (420 x 132 x 560 mm)	
Weight			52.9 lbs (24 kg)	
Three-Year Warranty				
Included Accessories			AC power cord with input connector, test report & certificate of calibration	
Optional Accessories			Rackmount ears & handles (RK3U)	

9830 Series Accessories

Unterminated AC power cord (Standard)

RK3U

Rackmount ears with handles (Optional)

For the most current user manual visit: bkprecision.com