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Data Sheet

BK PRECISION

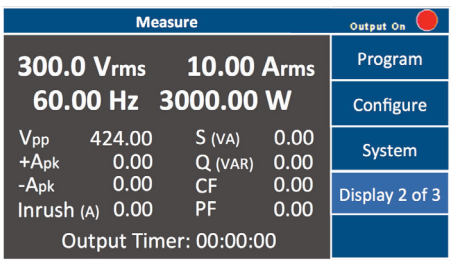
Programmable AC Power Source
9830B Series



The 9830B 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. 3-Phase power can be achieved by connecting 3 units of the same model in a master and slave configuration using the optional TL983P 3-Phase sync adapters.



Measurement display



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

Model		9832B	9833B
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	Single phase	45 Hz to 1200 Hz	
	3-Phase	45 Hz to 600 Hz	
Total Harmonic Distortion (THD)		≤ 0.5 % at 45 Hz to 400 Hz (resistive load)	
Remote Interface		LAN, USB, GPIB, and RS232	

3-Phase AC power



Connect additional units for split, 2 and 3 phase testing.



- Supports 3-phase Y configuration
- Full 0° to 360° phase control
- 45 Hz to 600 Hz operating frequency
- Up to 2000 VA / 3000 VA per phase

Features & Benefits

- AC, DC and AC+DC power source
- 3-Phase capability using 3 AC sources and the 3-Phase kit (TL983P-KIT)
- Low total harmonic distortion (THD) 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

Applications

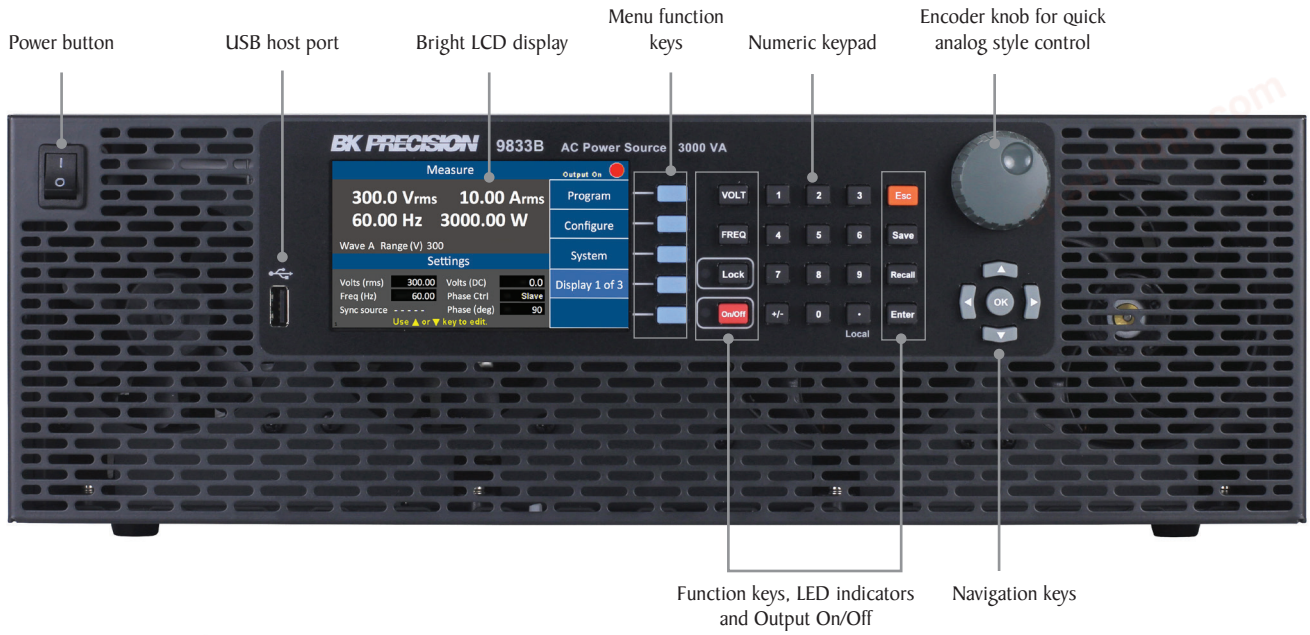
- Pre-compliance testing
- Simulate grid faults, voltage sags,frequency, and phase disturbances, according to IEC61000-4-11/14/28/34
- Electromagnetic compatibility (EMC), according to IEC61000-3-2
- Consumer electronics, appliances, industrial controls, avionics
- Evaluate transformers, TRIACs, SCRs, and passive components

Technical data subject to change
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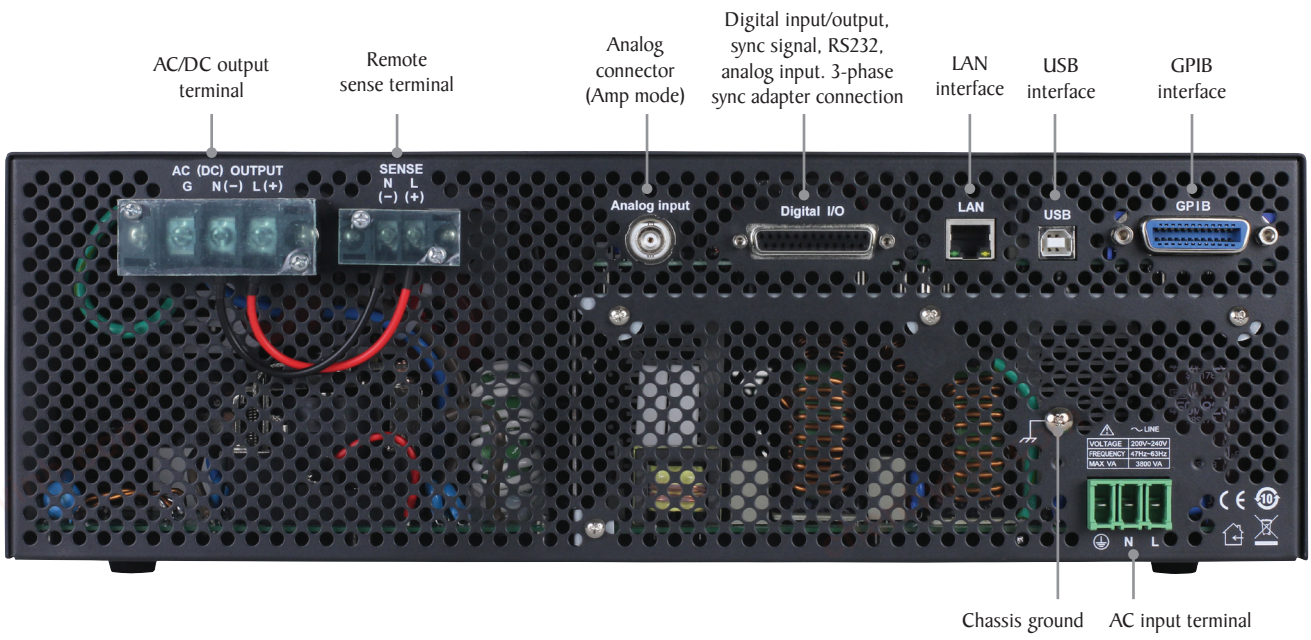
Front panel



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

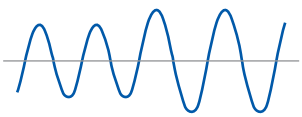


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Operation highlights

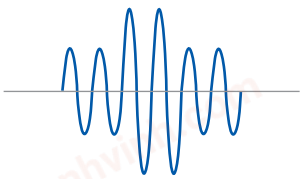
Adjustable AC/DC voltage levels, frequency and timing parameters allow for simulation of voltage drops and periodic power surges and sags. Step, pulse and list modes are used to generate complex power line disturbance simulations. Select from built-in waveforms or generate user-defined waveforms with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

Step mode



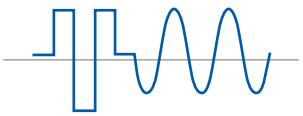
Generate step-up or step-down output based on user-defined voltage, frequency, phase, and interval settings.

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



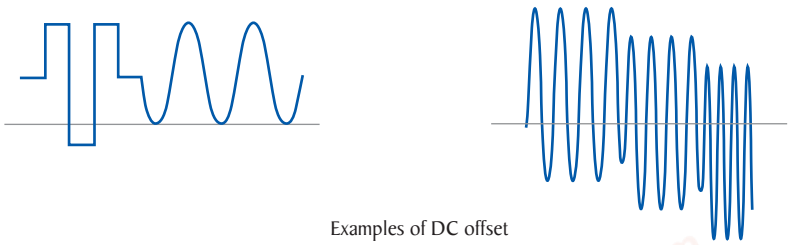
List mode supports the generation of complex output sequences with varying time, amplitude, frequency, and voltage. Up to 100 steps in 10 programs can be saved and executed. This allows the user to build a wide range of waveforms to simulate power grid faults and disturbances.

Waveform operations



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

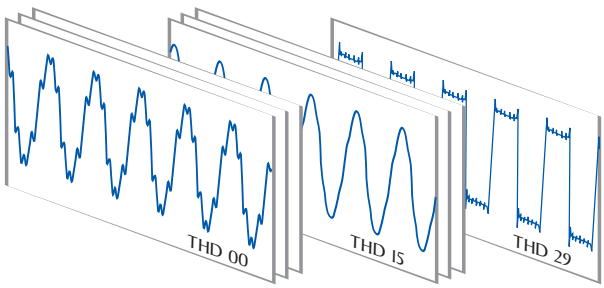
DC offset



Examples of DC offset

The 9830B 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

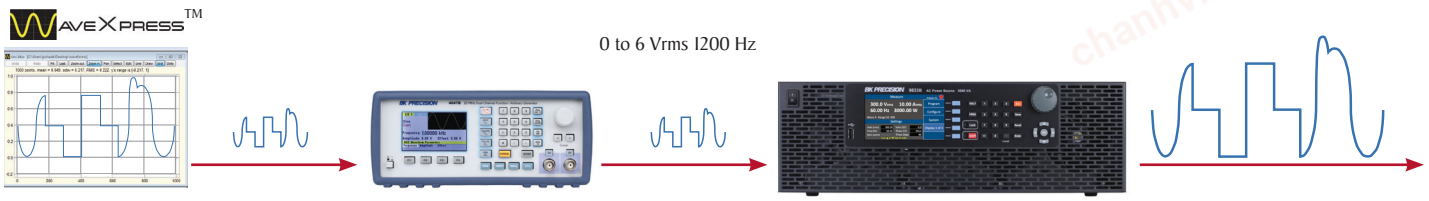
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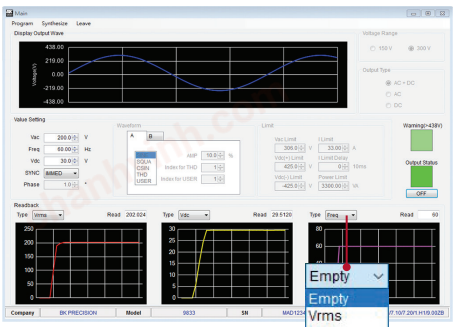
Operation highlights

Arbitrary waveform generation in amplifier mode

To further extend the capabilities of the 9830B 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.



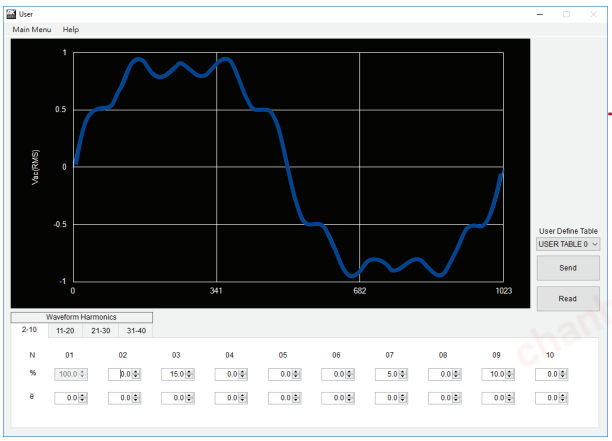
Front panel emulation



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

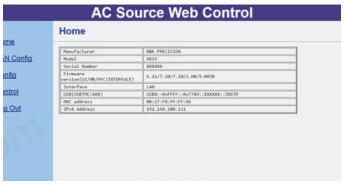


Create harmonic waveforms by specifying the amplitude and phase of each harmonic up to the 40th order.



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

Web server interface

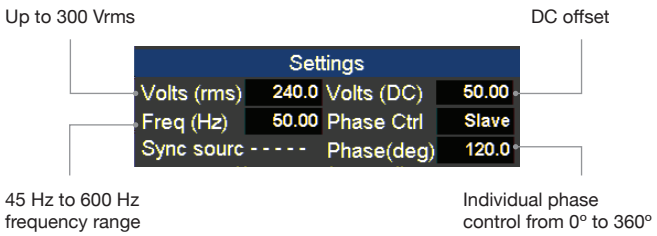


Built-in web server that allows users to configure, control, or monitor the basic settings of the power source from a remote computer using a web browser.

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Three and multi-phase operation

Phase settings



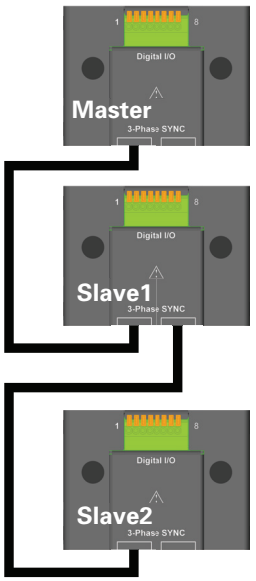
Set voltage, frequency, and phase directly from the front panel on each AC source.

3-Phase kit option



The 3-phase kit (TL983P-KIT) includes three adapters and two standard pin to pin RJ45 cables.

Phase synchronization



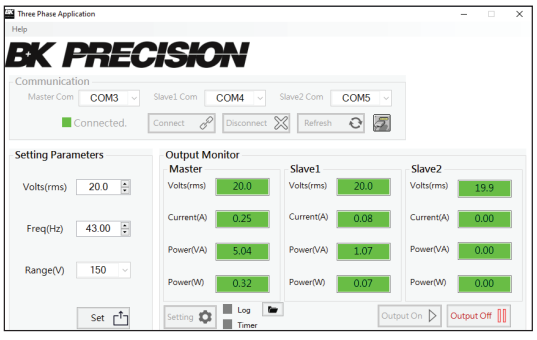
The TL983P adapters connect to the Digital I/O connector on the rear of the AC source. Standard RJ45 communication cables connect each adapter to route the 3-phase synchronization signal from the master to the slave units.



The 8-pin digital I/O terminal block preserves commonly used signaling pins including remote inhibit, AC on, and fault out capabilities while in 3-phase operation.

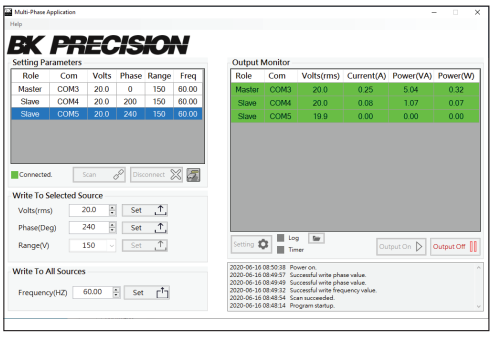
Application software

Application software offers convenient control, monitoring, and data logging capabilities. This software supports three-phase mode or multi-phase mode for different applications.



Three-phase mode

Control voltage and frequency of the three-phase system remotely using the application software. Phase values are fixed at 0°, 120°, and 240°. The output monitor window displays live voltage, current, and power measurements for each connected AC source.



Multi-phase mode

Multi-phase mode allows for direct control of individual AC source parameters including voltage and phase.

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Programmable AC Power Source
9830B Series

Specifications

Model			9832B	9833B
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	Single phase		45 Hz to 1.2 kHz	
	3-Phase		45 Hz to 600 Hz	
Phase Range			0 to 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			0.02 % 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[5]	AC	0.2 % + 0.2 % F.S.	
		DC	0.2 % + 0.4 % F.S.	
	Phase		0.15 %	
	Frequency		± 1 % (45 Hz to 100 Hz)	

1 - The maximum voltage is limited to 310 Vrms and ± 438 Vdc, 3 Phase mode not supported
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- Accuracy is based on F.S. = 300 VAC for AC Voltage or 424 Vdc for DC Voltage.
6 - Analog programming pin available on digital I/O connector, not available in 3-Phase

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.

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[5]	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 ± 10 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[6], 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)	
Warranty			3 Years	
Included Accessories			AC power cord with input connector & certificate of calibration	
Optional Accessories			Rackmount ears with handles (RK3U) & 3-Phase sync adapter (TL983P), 3-Phase kit (TL983P-KIT)	

9830B Series Accessories



Unterminated AC power cord (Standard)



Rackmount ears with handles RK3U (Optional)



3-Phase sync adapter TL983P (Optional), 3-Phase kit TL983P-KIT (Optional)

For the most current user manual visit: bkprecision.com

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About B&K Precision

For more than 70 years, B&K Precision has provided reliable and value-priced test and measurement instruments worldwide.

Our headquarters in Yorba Linda, California houses our administrative and executive functions as well as sales and marketing, design, service, and repair. Our European customers are most familiar with B&K through our French subsidiary, Sefram. Engineers in Asia know us through our B+K Precision Taiwan operation. The independent service centers in Singapore and Brasil service customers in Singapore, Malaysia, Vietnam, Indonesia and South America, respectively.



B&K Precision group member Independent service center Service center location

Quality Management System

B&K Precision Corporation is an ISO9001 registered company employing traceable quality management practices for all processes including product development, service, and calibration.

ISO9001:2015

Certification body NSF-ISR
Certificate number 6Z241-IS8

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