Data Sheet

B&K PRECISION

High Voltage DC Electronic Loads
HVL Series

| USB | LAN | RS232 | GPIB |

The HVL Series DC electronic loads offer a wide operating voltage up to 1000 V and high power density providing 6 kW in a 5U form factor. Suitable for ATE system applications, this series supports a variety of dynamic loading conditions for evaluating DC-DC converters, batteries, battery chargers, photovoltaic arrays, and other high power DC sources.

In addition to CC/CV/CR/CW operating modes, the HVL Series features continuous, pulse, and toggle transient operations to precisely switch between two load levels. Advanced list mode programming makes it easy to set up and execute complex load sequences from the front panel. For applications requiring more power, up to 10 identical HVL Series models can be combined in parallel to increase total sink capabilities to 60 kW.

Operating software provides remote instrument control and monitoring from a PC. Separate battery test software simplifies battery discharge testing with data logging. Built-in remote PC interfaces include USB (USBTMC-compliant), LAN, RS232, and GPIB supporting SCPI commands. The front panel USB host port enables data logging directly to a connected flash drive.

Special Applications
The HVL Series wide operating voltage range and high power capabilities make it a comprehensive solution for electric vehicle (EV) batteries, on-board EV charger, and charging station test applications.

Features and benefits

- High power density up to 6 kW in a 5U form factor
- CC/CV/CR/CW operating modes
- Continuous, pulse, and toggle transient operation
- Transient mode speed up to 10 kHz in CC mode
- Thermostatically-controlled fans for quiet operation
- Advanced list mode programming
- Adjustable loop response speed
- Overvoltage (OVP), overcurrent (OCP), overpower (OPP) protection, reverse voltage, and key lock function
- Short-circuit test
- Adjustable voltage/current slew rate
- Soft start function to prevent sudden voltage/current spikes
- Oscillation protection
- Front panel USB host port for logging measurement data
- Save/recall instrument settings to internal memory
- External analog control and monitoring
- Operating software and battery test software provided
- 4.3-inch LCD screen
- USB, LAN, RS232, and GPIB interfaces standard
- LabVIEW™ driver provided
- Remote sense
- Rack-mount brackets with handles included
- cTUVus certification mark fulfills CSA and UL safety standards

Power	3 kW			6 kW		
Model	HVL600150	HVL80075	HVL100025	HVL600300	HVL800150	HVL100050
Rated Voltage	600 V	800 V	1000 V	600 V	800 V	1000 V
Rated Current	150 A	75 A	25 A	300 A	150 A	50 A
Form Factor	3U			5U		

Operation highlights

Advanced list mode

The HVL Series list mode is highly configurable for generating precise load sequences.
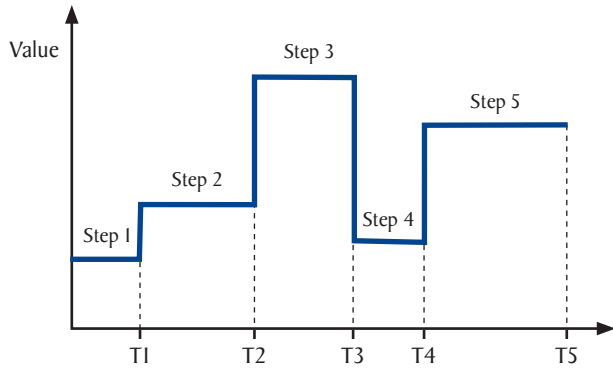
Each list mode program contains up to 100 user programmable steps. Save up to 10 list mode programs directly to internal memory for quick recall. Step parameters include current limit, step duration, and slew rate. List mode programs can be set to repeat a maximum of 100,000 times. BOST / EOST (Beginning / End of step Trigger) can be enabled for any step in the list to generate output triggers for synchronizing events with other externally connected instruments. List mode programs can be configured and run from the front panel or remotely using the provided application software.

List mode configuration menu

Direct data logging

Log voltage, current, or both at a user-defined sampling interval adjustable from 0.2 seconds to 5 minutes directly to an external USB flash drive. Data points are saved as a CSV file with date and time stamp.

Transient operation

Transient operation enables the DC load to periodically switch between two load levels.

Transient - continuous

Switch continuously between A and B load current levels where rise/fall slew rates and level width can be adjusted.
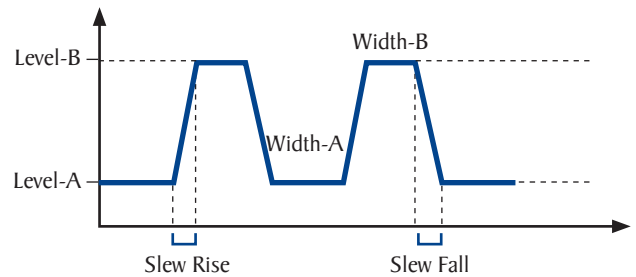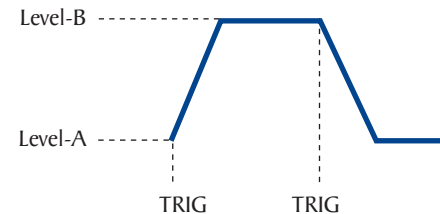

Transient - pulse

Upon enabling the input, the load executes one pulse cycle returning to Level-A, and waits to receive a trigger signal before executing another pulse.
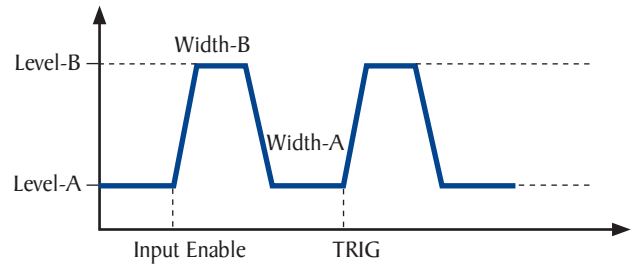

Transient - toggle

The DC load current will switch between Level-A and Level-B following receipt of a trigger signal.

Operation highlights

Rise and fall time measurement

The HVL Series can measure the rise or fall time from a specified start and stop voltage level of the measured input without the need for an external oscilloscope. The figure below illustrates how rise time is measured based on the two user-configured voltages.
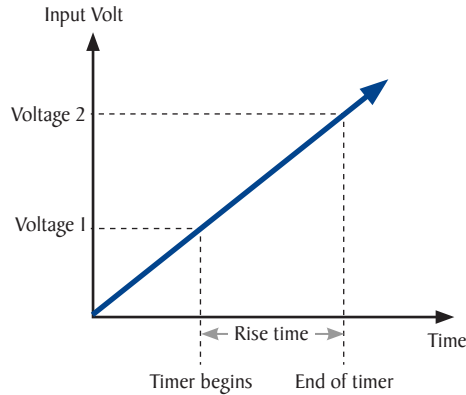
The resulting rise/fall time measurement is displayed on screen with 0.1 s resolution.
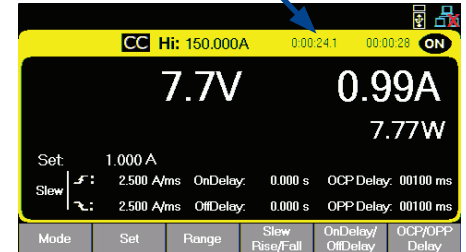
Parallel operation

For applications requiring more power, up to 10 identical HVL Series dc load models can be connected in parallel to increase the maximum sink power to 60 kW. Once configured, the connected units will display voltage and current of the complete system.
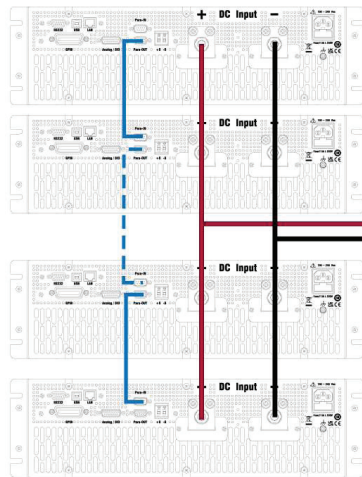
Sink up to 60 kW with 10 instruments connected in parallel.

Low voltage operation

The HVL Series can operate at low voltages for applications in fuel cell and solar cell testing.

Typical minimum operating voltage at full scale current					
HVL600150	HVL80075	HVL100025	HVL600300	HVL800150	HVL100050
3.5 V	2.0 V	3.5 V	3.5 V	2.0 V	3.5 V
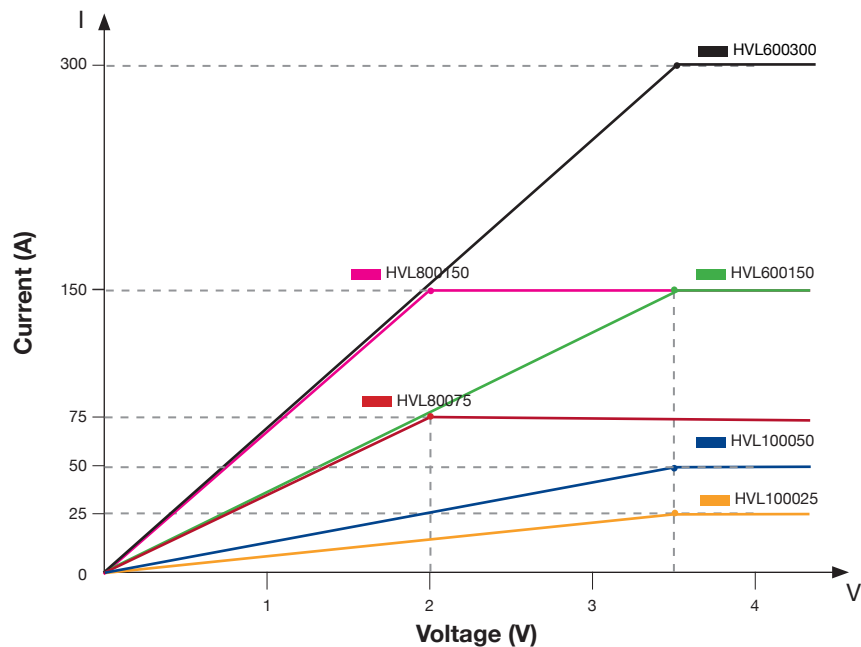
Operation highlights

Application software

PC software is provided for generating and executing test sequences and measurement data logging without the need to write source code.

- Log voltage, current, power measurements and export data in spreadsheet format for further analysis
- Configure and run transient operation, list mode, and more
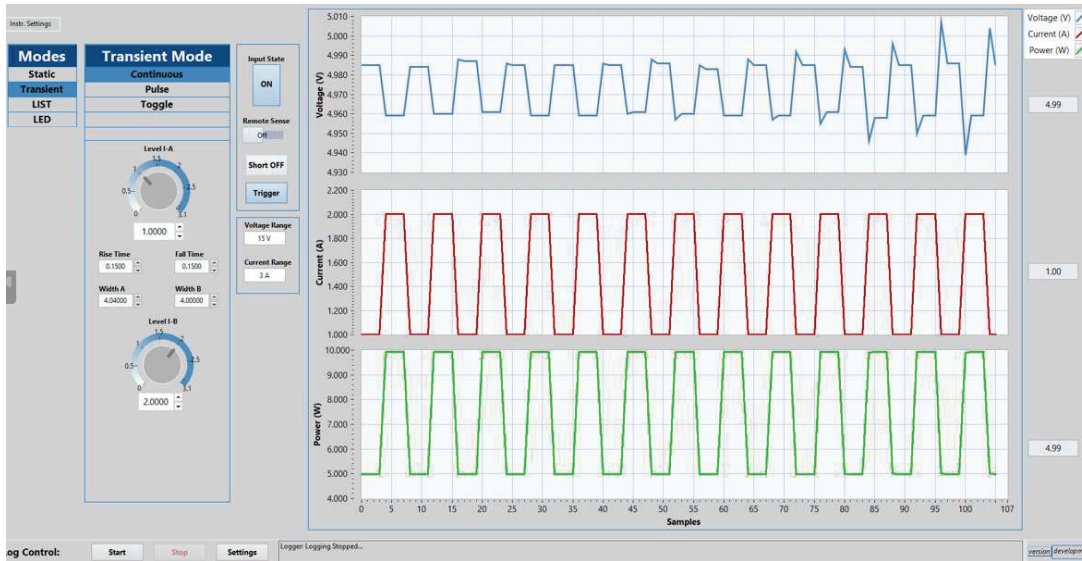
HVL Series Operating Software

Battery test software

Supplementary PC software available at bkprecision.com simplifies battery testing with the ability to create discharge sequences and log data. Couple the HVL Series with a compatible external power supply, to perform battery charge/discharge cycle tests on batteries.

Log charge and discharge data

Front panel

USB host
Save/Recall instrument settings, save screenshots, and log measurement data to an external flash drive

4.3-inch LCD
The bright display is easy to read

Multiple Display Modes
Toggle between detailed view and enlarged screen view

Programmable keys
Three user-programmable keys provide seamless switching between instrument setups for quick access to frequently used configurations and functions

Rear panel

RS232 interface
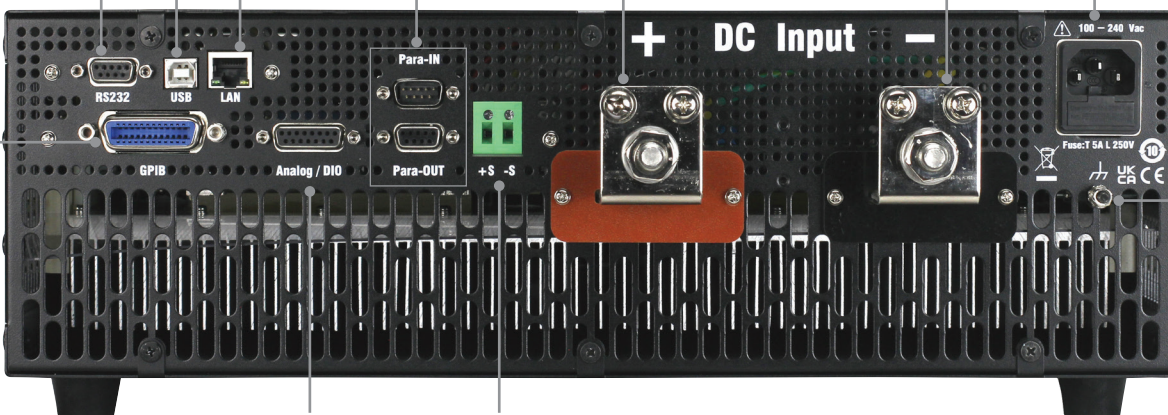
USB interface

LAN interface

Parallel Synchronization
Connect multiple DC loads in parallel for increased power

Input terminals

Universal AC input

GPIB interface

Chassis ground

Analog Digital I/O connector
External trigger, digital output, external analog control, voltage and current monitoring, external input on/off control

Remote sense terminals

Specifications

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C.

Model		HVL600150	HVL80075	HVL100025	HVL600300	HVL800150	HVL100050
Input Ratings							
Input Voltage		0 to 600 V	0 to 800 V	0 to 1000 V	0 to 600 V	0 to 800 V	0 to 1000 V
Input Current		0 to 150 A	0 to 75 A	0 to 25 A	0 to 300 A	0 to 150 A	0 to 50 A
Input Power		3000 W			6000 W		
Minimum Operating Voltage		3.5 V	2.0 V	3.5 V	3.5 V	2.0 V	3.5 V
CV Mode							
Range	Low	0 to 60 V	0 to 80 V	0 to 100 V	0 to 60 V	0 to 80 V	0 to 100 V
	High	0 to 600 V	0 to 800 V	0 to 1000 V	0 to 600 V	0 to 800 V	0 to 1000 V
Programming Readback / Accuracy		±(0.05% + 0.05% FS)[1]					
CC Mode							
Range	Low	0 to 15 A	0 to 7.5 A	0 to 2.5 A	0 to 30 A	0 to 15 A	0 to 5 A
	High	0 to 150 A	0 to 75 A	0 to 25 A	0 to 300 A	0 to 150 A	0 to 50 A
Programming Readback / Accuracy		±(0.05% + 0.05% FS)[1]					
CR Mode							
Range	Low	0.03 Ω to 4 Ω	0.03 Ω to 10.66 Ω	0.2 Ω to 40 Ω	0.015 Ω to 2 Ω	0.015 Ω to 5.33 Ω	0.1 Ω to 20 Ω
	High	4 Ω to 3200 Ω	10.66 Ω to 5000 Ω	40 Ω to 10 kΩ	2 Ω to 1600 Ω	5.33 Ω to 4000 Ω	20 Ω to 5 kΩ
Programming Accuracy (I > 10% of Range)		1% + 0.1% of full range			1% + 0.1% of Full Range		
CW Mode							
Range	Low	0 to 300 W			0 to 600 W		
	High	0 to 3000 W			0 to 6000 W		
Programming Accuracy		±(0.2% + 1% FS)					
Transient Mode (CC Mode)							
T1 & T2		100 µs to 10 s					
Accuracy		5 µs ± 100 ppm					
Slew Rate [2]	Low	0.05 to 3000 A/ms	0.025 to 1500 A/ms	0.008 to 500 A/ms	0.1 to 6000 A/ms	0.05 to 3000 A/ms	0.017 to 1000 A/ms
	High						
External Programming							
VMON Accuracy		0.1% + 0.1% FS					
IMON Accuracy		0.1% + 0.1% FS					
Input Impedance		210 kΩ ± 5%					

(1) Applies when set voltage (CV mode) or set current (CC mode) is greater than 0.2% of full scale.
(2) The slew rate specifications are not warranted, but are descriptions of typical performance. The actual transition time is defined as the time for the input to change from 10% to 90%, or vice versa, of the programmed current values. In case of very large load changes, e.g. from no load to full load, the actual transition time will be larger than the expected time. The load will automatically adjust the slew rate to fit within the range (high or low) that is closest to the programmed value.

Specifications (cont.)

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C.

Model	HVL600150	HVL80075	HVL100025	HVL600300	HVL800150	HVL100050
Programmable Protection						
Voltage (OVP)						
Range	0.394 V to 630 V	0.525 V to 840 V	0.656 V to 1050 V	0.394 V to 630 V	0.525 V to 840 V	0.656 V to 1050 V
Accuracy	0.2% + 0.788 V	0.2% + 1.05 V	0.2% + 1.313 V	0.2% + 0.788 V	0.2% + 1.05 V	0.2% + 1.313 V
Current (OCP)						
Range	0.098 A to 157.5 A	0.049 A to 78.75 A	0.016 A to 26.25 A	0.197 A to 315 A	0.098 A to 157.5 A	0.033 A to 52.5 A
Accuracy	0.2% + 0.197 A	0.2% + 0.098 A	0.2% + 0.033 A	0.2% + 0.394 A	0.2% + 0.197 A	0.2% + 0.066 A
Under Voltage Lockout (UVL)						
Range	0.45 V to 600 V	0.6 V to 800 V	0.75 V to 1000 V	0.45 V to 600 V	0.6 V to 800 V	0.75 V to 1000 V
Accuracy	2.5% + 0.75 V	2.5% + 1 V	2.5% + 1.25 V	2.5% + 0.75 V	2.5% + 1 V	2.5% + 1.25 V
General						
AC Input	100 VAC to 240 VAC ± 10%, 47 to 63 Hz					
Operating Temperature	41 °F to 104 °F (5 °C to 40 °C)					
Dimensions (H x W x D)	5.24" x 16.87" x 26.18" (133 x 428.4 x 665 mm)			8.74" x 16.87" x 24.21" (222 x 428.4 x 615 mm)		
Weight	48.5 lbs (22 kg)			73.8 lbs (33.5 kg)		
Warranty	3 Years					
Standard Accessories	Power cord, removable input protection cover, and certificate of calibration					
Regulatory Compliance						
Safety	Low Voltage Directive (LVD) 2014/35/EU, EN61010-1:2010+A1, cTUVus certification mark[3] fulfills US (UL 61010-1:2012) and Canadian (CAN/CSA-C22.2 NO. 61010-1-12) safety standards					
Electromagnetic Compatibility	EMC Directive 2014/30/EU, EN61326-1:2013					

(3) Tested and certified by a Nationally Recognized Testing Laboratory (NRTL), accredited by OSHA.

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 Headquarters
Yorba Linda,
California, USA

Sefram
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B&K Taiwan
Taipei, Taiwan

Cistek Equipamentos de Medição Ltda
São Paulo, Brasil

Dynamics Circuit
Singapore

● 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

Video Library

View product overviews, demonstrations, and application videos in English, Spanish and Portuguese.

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