



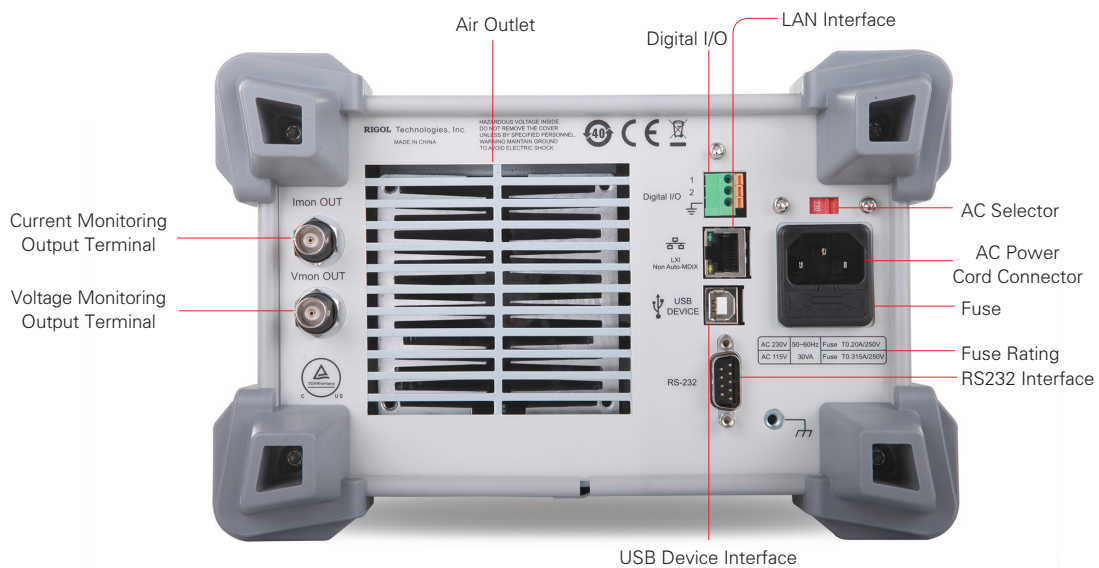
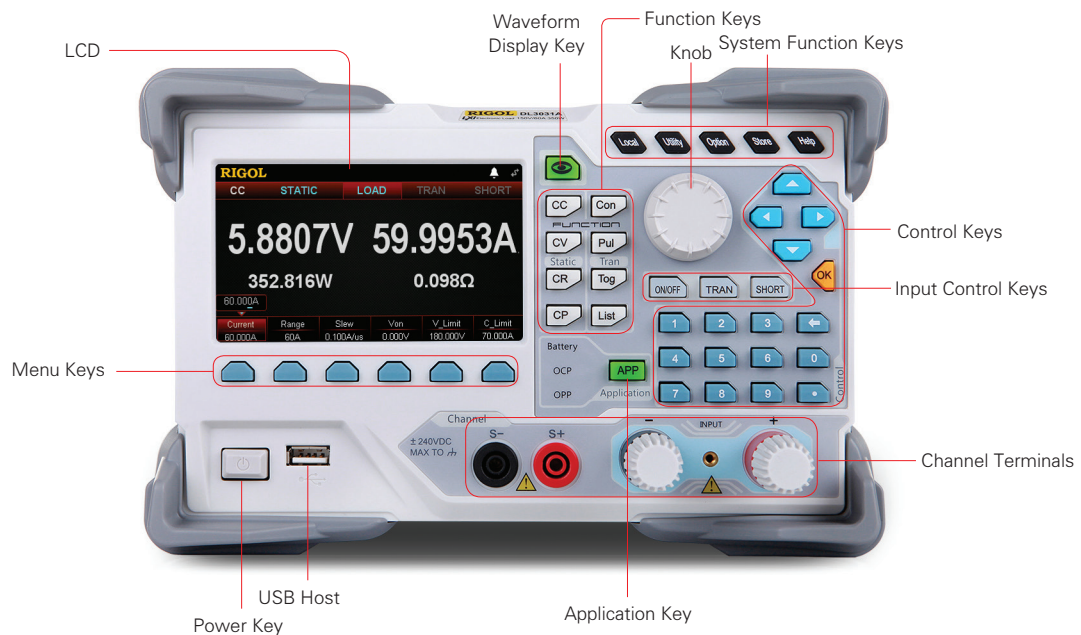
# DL3000 Series

## Programmable DC Electronic Load

- DL3021/DL3021A: single output, 150 V/40 A, total power up to 200 W
- DL3031/DL3031A: single output, 150 V/60 A, total power up to 350 W
- Dynamic mode: up to 30 kHz
- Adjustable current rising speed: 0.001 A/ $\mu$ s to 5 A/ $\mu$ s
- Min. readback resolution: 0.1 mV, 0.1 mA
- 4.3-inch TFT LCD, capable of displaying multiple parameters and states simultaneously
- Overvoltage/overcurrent/overpower/overtemperature/reverse voltage protection
- 4 static modes: CC, CV, CR, CP
- 3 dynamic modes: continuous, pulsed, toggled
- List function supports editing as many as 512 steps
- Battery test function, OCP test, OPP test, factory test function, etc.
- Short-circuit test function
- Power-off memory function
- Built-in RS232/USB/LAN communication interface
- USB-GPIB module (optional)

DL3000 is a cost-effective programmable DC electronic load with high performance. With a user-friendly interface and superb performance specifications, DL3000 series provides various interfaces for remote communication to meet your diversified test requirements. It can be widely used in various industries, such as automotive electronics, aerospace, and fuel cells.

## ► Design Features

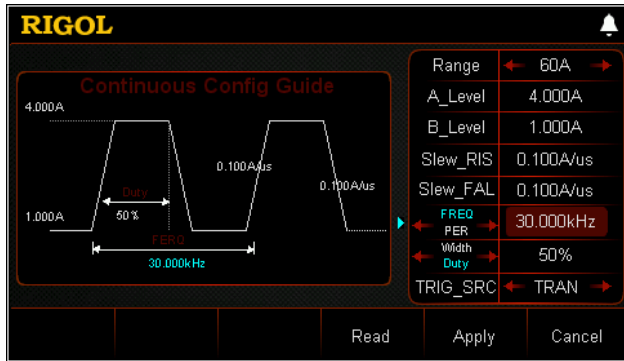


## ► Typical Applications

- General-purpose testing in the R&D lab
- DC power supply industry, such as regulated power supply, constant current power supply, switching mode power supply (SMPS), module power supply, power adapter, etc.
- Battery industry, such as various batteries and cell batteries
- Charger industry, such as battery charger and cell phone charger
- Power electronic device industry, such as MOSFET, IGBT, capacitor, and ballast resistor
- Teaching experiment

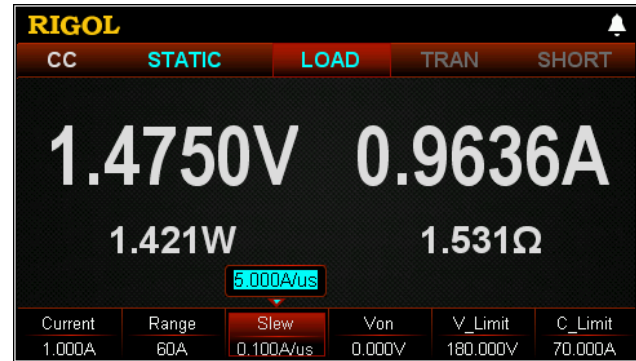
## ► Design Features

### 30 kHz dynamic mode



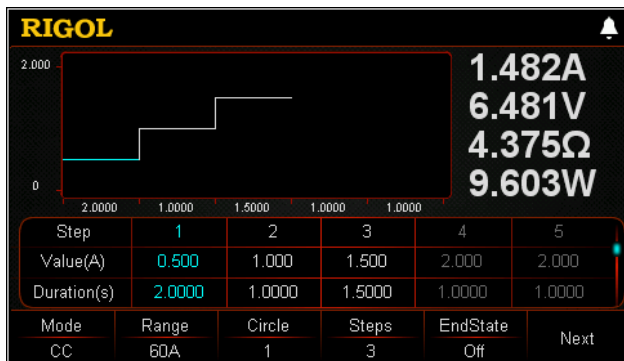
Transient test function enables the load to periodically switch between two set levels (Level A and Level B). It can be used to test the transient characteristics of the DUT. The highest frequency can be set to 30 kHz. Besides, in the guide interface, you can configure parameters in the parameter configuration list and view the configuration diagram at the left of the configuration list in the real-time manner.

### 5 A/μs current rising speed



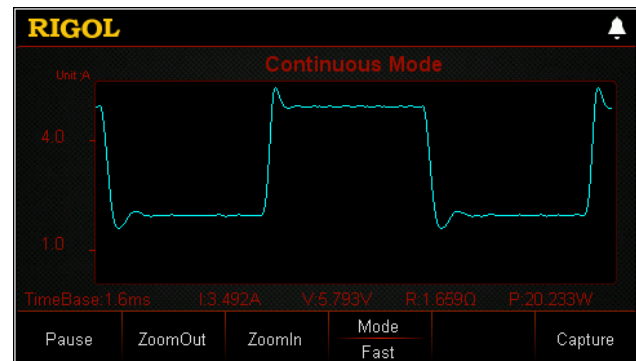
Current rising speed is defined as the speed of transition from one setting to another. You can set the actual transition time from one setting to another by changing the current rising speed. Adjustable current rising speed: 0.001 A/μs to 5 A/μs.

### Powerful list operation function



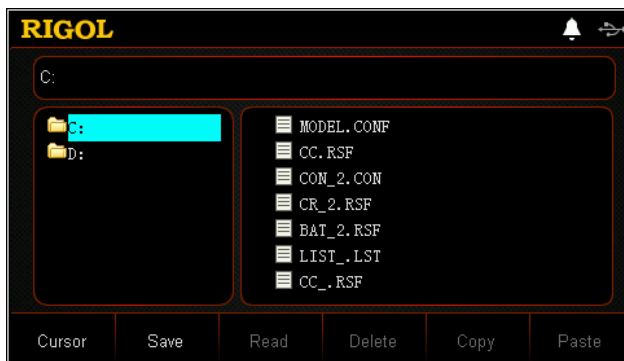
You can generate complex sequences by editing the setting value for each step, the dwell time, and slew rate (the slew rate can only be edited in CC mode) to meet the complex test demands.

### Powerful waveform display function



The electronic load provides the waveform display function and supports the following operations for the waveform, such as pausing the waveform, enlarging and narrowing the waveform, and capturing the waveform. Therefore, you can dynamically observe the trend of parameters changes.

### Easy-to-use function of file storage and recalling



The load allows you to save different types of files to the internal and external memories. You can recall and read them when necessary.

### Sound OVP/OCP/OPP/OTP/Reverse Voltage Protection

When OVP/OCP/OPP/OTP/reverse voltage protection occurs, the load will immediately turn off the input automatically and stop sinking. Then, a prompt message is displayed.

## ► Specifications

All the technical specifications are guaranteed when the instrument has been working for more than 30 minutes under the specified operating temperature.

DC Input (0°C ~40°C)				
Model	Voltage	Current	Maximum Power	Minimum Operating Voltage (DC)
DL3021	0~150 V	0~40 A	200 W	40 A@1 V
DL3021A				
DL3031	0~150 V	0~60 A	350 W	60 A@1.3 V
DL3031A				

CC Mode				
Model	Range	Resolution	Accuracy <sup>[1]</sup>	Temperature Coefficient
DL3021	0~4 A	1 mA	$\pm(0.05\%+0.05\%FS^{[2]})$	100 ppm/°C
DL3021A	0~40 A			
DL3031	0~6 A	1 mA	$\pm(0.05\%+0.05\%FS)$	100 ppm/°C
DL3031A	0~60 A			

CV Mode				
Model	Range	Resolution	Accuracy	Temperature Coefficient
DL3021	0~15 V	1 mA	$\pm(0.05\%+0.02\%FS)$	50 ppm/°C
DL3021A	0~150 V	5 mA	$\pm(0.05\%+0.025\%FS)$	
DL3031	0~15 V	1 mA	$\pm(0.05\%+0.02\%FS)$	50 ppm/°C
DL3031A	0~150 V	5 mA	$\pm(0.05\%+0.025\%FS)$	

CR Mode				
Model	Range	Resolution	Accuracy	
DL3021	0.08 Ω~15 Ω	2 mA/Vsense	$Vin/Rset*(0.2\%)+0.2\%IFS$	
DL3021A	2 Ω~15 kΩ			
DL3031	0.08 Ω~15 Ω	2 mA/Vsense	$Vin/Rset*(0.2\%)+0.2\%IFS$	
DL3031A	2 Ω~15 kΩ			

CP Mode		
Model	Range	Resolution
DL3021	0~200 W	100 mW
DL3021A		
DL3031	0~350 W	100 mW
DL3031A		

Con Mode				
Model	Frequency Range	Frequency Resolution	Frequency Accuracy	Duty Cycle Range
DL3021	0.001 Hz~15 kHz	0.8%	$\pm 0.5\%$	5%~95%, 1%
DL3021A	0.001 Hz~30 kHz			
DL3031	0.001 Hz~15 kHz			
DL3031A	0.001 Hz~30 kHz			

Current Slew Rate <sup>[3]</sup>			
Model	Range	Resolution <sup>[4]</sup>	Accuracy
DL3021	0.001 A/μs~0.25 A/μs 0.001 A/μs~2.5 A/μs (>5 V) <sup>[5]</sup>	0.001 A/μs	5%+10 μs
DL3021A	0.001 A/μs~0.3 A/μs 0.001 A/μs~3 A/μs (>5 V)		
DL3031	0.001 A/μs~0.25 A/μs 0.001 A/μs~2.5 A/μs (>5 V)	0.001 A/μs	5%+10 μs
DL3031A	0.001 A/μs~0.5 A/μs 0.001 A/μs~5 A/μs (>5 V)		

Readback Current				
Model	Range	Resolution	Accuracy	Temperature Coefficient
DL3021	0~4 A	1 mA	±(0.05%+0.05%FS)	50 ppm/°C
DL3021A	0~40 A	0.1 mA		
DL3031	0~6 A	1 mA	±(0.05%+0.05%FS)	50 ppm/°C
DL3031A	0~60 A	0.1 mA		

Readback Voltage				
Model	Range	Resolution	Accuracy	Temperature Coefficient
DL3021	0~150 V	1 mV	±(0.05%+0.02%FS)	20 ppm/°C
DL3021A				
DL3031	0~150 V	1 mV	±(0.05%+0.02%FS)	20 ppm/°C
DL3031A				

Readback Resistance		
Model	Range	Resolution
DL3021	0.08 Ω~15 kΩ	2 mA/Vsense
DL3021A		
DL3031	0.08 Ω~15 kΩ	2 mA/Vsense
DL3031A		

Readback Power		
Model	Range	Resolution
DL3021	0~200 W	100 mW
DL3021A		
DL3031	0~350 W	100 mW
DL3031A		

**Protection Function**  
 Overcurrent protection (OCP), overvoltage protection (OVP), overpower protection (OPP), overtemperature protection (OTP), as well as local/remote reverse voltage (LRV/RRV) protection.

Stability <sup>[6]</sup>		
Model	Current	Voltage
DL3021	±(0.01%±10 mA)	±(0.01%±10 mV)
DL3021A		
DL3031	±(0.01%±10 mA)	±(0.01%±10 mV)
DL3031A		

**Input Resistance**  
 350 kΩ

<b>Mechanical</b>	
Dimensions	239 mm(W) x 157 mm(H) x 442 mm(D)
Weight	Net weight: 7.58 kg

<b>Power</b>	
AC Input (50 Hz~60 Hz)	115 Vac±10%, 230 Vac±10% (max: 250 Vac)
Maximum Input Power	<30 VA

<b>Interface</b>	
USB Device Interface	1
USB Host Interface	1
LAN Interface	1
RS232	1
Digital I/O	1
USB-GPIB	1 (GPIB extended from the USB-GPIB interface module)

<b>Environment</b>	
Cooling Method	Fan Cooled
Operating Temperature	0°C ~40°C
Storage Temperature	-40°C ~70°C
Humidity	5%~80% RH
Altitude	Below 1,500 m

Note<sup>[1]</sup>: Data measured after 30-second current sinking at the programming value (applicable to the programming accuracy in CC mode and CV mode).

Note<sup>[2]</sup>: FS indicates the full scale.

Note<sup>[3]</sup>: Current slew rate: rising slew rate for 10%~90% of the current (0-maximum current).

Note<sup>[4]</sup>: When the current slew rate is above 2.7 A/μs, its programming resolution cannot reach 0.1A/μs.

Note<sup>[5]</sup>: When the input voltage is greater than 5 V, the maximum current slew rate is 5 A/μs; when the input voltage is greater than 4 V, the maximum current slew rate is 2.5 A/μs; when the input voltage is greater than 2 V, the maximum current slew rate is 0.1 A/μs.

Note<sup>[6]</sup>: Following a steady 30-minute current sinking, change in current/voltage sinking over 8 hours under constant load, line, and ambient temperature.

## ► Order Information

	Description	Order No.
Model	Programmable DC Electronic Load (single channel, 150 V/40 A 200 W)	DL3021
	Programmable DC Electronic Load (single channel, 150 V/40 A 200 W)	DL3021A
	Programmable DC Electronic Load (single channel, 150 V/60 A 350 W)	DL3031
	Programmable DC Electronic Load (single channel, 150 V/60 A 350 W)	DL3031A
Standard Accessories	Power Cord	-
	Either one of the following fuses: <ul style="list-style-type: none"> <li>• Fuse 50T-0200H 250 V 0.20 A (AC selector: 230 Vac)</li> <li>• Fuse 50T-0315H 250 V 0.315 A (AC selector: 115 Vac)</li> </ul>	-
	Quick Guide (hard copy)	-
Optional Accessories	LAN Interface	LAN-DL3
	Digital I/O Option	DIGITALIO-DL3
	Readback Resolution	HIRES -DL3
	High Frequency Option	FREQ-DL3
	High Slew Rate Option	SLEWRATE-DL3
	9-Pin RS232 Cable (female-to-female, cross-over)	CB-RS232-A
	Terminal Shield	DL-02
	USB-GPIB Module	USB-GPIB
	Sense Cable	CB-SENSE
	20 A Red and Black Test Lead	CB-20A-780MM
	40 A Red and Black Test Lead	CB-40A-780MM
	60 A Red and Black Test Lead	CB-60A-780MM
	DL3000 Series Rack Mount Kit (for a single instrument)	RM-1-DP800
	DL3000 Series Rack Mount Kit (for two instruments)	RM-2-DP800

## Warranty Period

Three years for the mainframe.



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