

RP5900 Series Regenerative DC Power Supplies



Power without Compromise

The RP5900 Series integrates a bidirectional DC power supply and an independent regenerative electronic load in one unit. Its two-quadrant design enables seamless switching between sourcing and sinking current for efficient testing in both directions. The regenerative feature returns up to 95% of the energy consumed to the grid, minimizing energy and cooling costs without disrupting grid performance. Paired with the Pathwave Advanced Power Suite software, the RP5900 provides robust automation of complex test scenarios, delivering deeper insights and faster analysis. Validate complex power devices faster, in less space, with no compromise on performance or programmability.



Keysight RP5900 Series DC power supplies

Operating Modes

Current priority (CC)	Voltage priority (CV)
Power priority (CP)	Resistance priority (CR)
CV+CC	CV+CR
CC+CR	CC+CV+CP+CR (Auto)

Model	2 kW Models	4 kW Models	6 kW Models	12 kW Models
	RP591xA	RP592xA	RP593xA	RP594xA
DC Power Ratings				
Voltage	0 – 800 V			
Current	0 – 40 A	0 – 80 A	0 – 120 A	0 – 240 A
Power	0 – 2 kW	0 – 4 kW	0 – 6 kW	0 – 12 kW
Output Ripple and Noise ³				
CV rms ²	≤ 80 – 800 mVrms	≤ 80 – 300 mVrms	≤ 80 – 160 mVrms	≤ 80 – 160 mVrms
CV peak-to-peak ¹	≤ 200 – 2,400 mVp-p	≤ 200 – 1,600 mVp-p	≤ 200 – 1,000 mVp-p	≤ 200 – 1,000 mVp-p
Load Regulation ³				
Voltage	16 mV – 160 mV			
Current	8 mA – 40 mA	16 mA – 80 mA	32 mA – 120 mA	64 mA – 240 mA
Programming Accuracy ³				
Voltage	0.03% + 24 mV – 0.03% + 240 mV			
Current 0.1% +	8 mA – 40 mA	16 mA – 80 mA	24 mA – 120 mA	48 mA – 240 mA
Load Transient Recovery Time ^{3,4}				
Recovery time	≤ 1 ms	≤ 1 ms	≤ 1 ms	≤ 1 ms
Setting band	0.8 V – 8 V	0.8 V – 8 V	0.8 V – 8 V	0.8 V – 8 V
Programming Resolution				
Voltage	1 mV – 10 mV	1 mV – 10 mV	1 mV – 10 mV	1 mV – 10 mV
Current	1 mA – 10 mA	1 mA – 10 mA	1 mA – 10 mA	10 mA
Line Regulation				
Voltage	≤ 16 mV – ≤ 160 mV			
Current	≤ 4.8 mA – ≤ 24 mA	≤ 9.6 mA – ≤ 48 mA	≤ 14.4 mA – ≤ 72 mA	≤ 28.8 mA – ≤ 144 mA
Typical Characteristics				
Command processing time	≤ 0.1 ms			

1. From 20 Hz to 20 MHz (-3 dB bandwidth) with resistive load, terminals ungrounded, or terminal grounded.
2. From 20 Hz to 10 MHz (-3 dB bandwidth) with resistive load up to 400V, terminals ungrounded, or terminal grounded.
3. Percent of value + offset; at 23 °C ± 5 °C after a 30-minute warm-up; measurement NPLC=1; valid for 1 year.
4. Time to recover within the settling band following a step change from 25% to 90% of full load.

More Information: www.keysight.com/find/RP5900

High Density, High Performance

Power that adapts to every test

- Return consumed energy back to the grid cleanly
- Smooth transitions between sourcing and sinking
- Autoranging output for broad V/I coverage
- Multiple operating modes (CV, CC, CR, CP)
- Voltage options: 80 V, 500 V, 800 V
- Power range: 2 kW – 12 kW, scalable to 16 parallel units
- Stackable parallel connections for greater output current

Smarter tools for deeper insights

- Built-in waveform generation for battery testing
- Battery emulation and profiling
- Averaged and digitized measurement modes
- Amp-hour and watt-hour calculations
- PathWave software applications for profiling and emulation

Safety and simplicity built-in

- Overvoltage, overcurrent, overpower, and undervoltage safeguards
- Fast hardware-level protection response
- Compact 1U and 2U rack designs
- Dedicated rack-mount kits
- Standard LAN, USB, CAN, GPIB, and RS232
- Built-in web interface for remote control

Accessories

Part Number	Description
PW9252A	PathWave Advanced Power Control and Analysis application
PW9253A	PathWave Advanced Battery Test and Emulation application
RP5901C	GPIB interface board for EL4900 DC loads and RP5900 supplies
RP5902C	Analog / RS232 interface board for EL4900 DC loads and RP5900 supplies
RP5903C	Parallel kit — Fiber optics cable and transmitter module
RP5904C	Rack-mount kit 1U for EL4900 DC loads and RP5900 supplies
RP5905C	Rack-mount kit 2U for EL4900 DC loads and RP5900 supplies

For More Information

For more information on the Keysight RP5900 regenerative DC power supplies, please visit:

www.keysight.com/find/RP5900

To find a distributor in your area, visit:

www.keysight.com/find/distributors

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.

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