Keysight NS-4 Class Expert ATE System Power Supplies

RP5900 Series Regenerative DC Power Supplies

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 analysis. Validate complex power devices in less space, with no compromise on performance or programmability.



Keysight RP5900 Series DC power supplies

	10 V RP59x1A	32 V RP59x2A	80 V RP59x3A	300 V RP59x4A	500 V RP59x5A	800 V RP59x6A	1500 V RP59x7A
DC Power Ratings							
Voltage	0 to 10 V	0 to 32 V	0 to 80 V	0 to 300 V	0 to 500 V	0 to 800 V	0 to 1500 V
Current(source)	–720 A to +1020 A	0 to ±480 A	0 to ±240 A	0 to ±120 A	0 to ±72 A	0 to ±48 A	0 to ±24 A
Current(load)	2 to 720 A	0 to 480 A	0 to 240 A	0 to 120 A	0 to 72 A	0 to 48 A	0 to 24 A
Power(source)	–7.2 kW to +10.2 kW	0 to ±12 kW	0 to ±12 kW	0 to ±12 kW	0 to ±12 kW	0 to ±12 kW	0 to ±12 kW
Power(load)	20 W to 7.2 kW	0 to 12 kW	0 to 12 kW	0 to 12 kW	0 to 12 kW	0 to 12 kW	0 to 12 kW
Load Regulation[3]							
Voltage	4 mV	12.8 mV	16 mV	60 mV	100 mV	160 mV	300 mV
Current(source)	170–1020 mA	80–480 mA	40–240 mA	20–120 mA	12–72 mA	8–64 mA	12–24 mA
Current(load)	120–720 mA	80–480 mA	40–240 mA	20–120 mA	12–72 mA	8–48 mA	12–24 mA
Output Ripple and Noise[3]							
CV peak-to-peak[1]	≤ 160 mVp-p	≤ 80–160 mVp-p	≤ 200 mVp-p	≤ 300–900 mVp-p	≤ 500–1,500 mVp-p	≤ 1,000–2,400 mVp-p	≤ 1,500 mVp-p
CV rms[2]	≤ 10 mVrms	≤ 30 mVrms	≤ 80 mVrms	≤ 60–120 mVrms	≤ 100–300 mVrms	≤ 160–800 mVrms	≤ 300 mVrms
Programming Accuracy							
Voltage	0.08% + 8 mV	0.05% + 22 mV	0.03% + 24 mV	0.03% + 90 mV	0.03% + 150 mV	0.03% + 240 mV	0.03% + 900 mV
Current	0.3% + 510 mA to 3.06 A	0.1% + 200 mA to 1.2 A	0.1% + 40 mA to 240 mA	0.1% + 30 mA to 180 mA	0.1% + 12 mA to 72 mA	0.1% + 8 mA to 48 mA	0.2% + 24 mA to 48 mA
Load Transient Recovery Time[3,4]							
Recovery time	≤ 100 ms	≤ 1 ms	≤ 1 ms	≤ 1 ms	≤ 1 ms	≤ 1 ms	≤ 1 ms
Settling band	0.1 V	0.32 V	0.8 V	3 V	5 V	8 V	15 V
Programming Resolution							
Voltage	1 mV	1 mV	1 mV	Source: 10 mV Load: 1 mV	10 mV	10 mV	10 mV
Current	Source: 10–100 mA Load: 100 mA	10 mA	10 mA	Source: 1 mA Load: 10 mA	1–10 mA	1–10 mA	1 mA
Line Regulation							
Voltage	≤ 2 mV	≤ 6.4 mV	≤ 16 mV	≤ 60 mV	≤ 100 mV	≤ 160 mV	≤ 300 mV
Current(source)	≤ 102–612 mA	≤ 48–288 mA	≤ 24–144 mA	≤ 12–72 mA	≤ 7.2–57.6 mA	≤ 4.8–28.8 mA	≤ 7.2–14.4 mA
Current(load)	≤ 72–432 mA	≤ 48–288 mA	≤ 24–144 mA	≤ 12–72 mA	≤ 7.2–57.6 mA	≤ 4.8–28.8 mA	≤ 7.2–14.4 mA

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.

High Density, High Performance

Power that adapts to every test

- Regenerate absorbed energy back to the grid
- Smooth transitions between sourcing and sinking
- Autoranging output for broad V/I coverage
- Multiple operating modes (CV, CC, CR, CP)
- Voltage options: 10 V, 32 V, 80 V, 300 V, 500 V, 800 V, and 1500 V
- Power range: 1.7 kW – 12 kW
- Parallel up to 16 units 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, and CAN; optional GPIB, RS-232, and analog
- Built-in web interface for remote control

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)

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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