# 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

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