RP7900 Series Regenerative Power Supplies

Create Savings, Not Heat

The Keysight RP7900 Series regenerative power supply provides sourcing and electrical loading up to 30 kW. A bidirectional supply is ideal for testing energy storage and converters. Most electronic loads convert energy to heat, which can cause a temperature rise in a rack leading to measurement errors. A regenerative power supply safely returns the energy to the grid, eliminating additional costs to remove the excess heat.

Figure 1. Keysight RP7900 Series regenerative power system

Performance specification

Model	200/208 VAC models		400/480 VAC models			
	RP793x	RP795x	RP794x	RP796x	RP797x	RP798x
DC output ratings (0 to 40 °C)						
Voltage source	0 to 20 V – 0 to 160 V	0 to 500 V – 0 to 950 V	0 to 20 V – 0 to 160 V	0 to 500 V – 0 to 950 V	0 to 500 V – 0 to 2000 V	
Current source	0 to ± 125 A – 0 to ± 800 A	0 to ± 20 – 0 to ± 40 A	0 to ± 125 A – 0 to ± 800 A	0 to ± 20 – 0 to ± 40 A	0 to ± 30 A – 0 to ± 180 A	
Power	0 to 5 kW – 0 to ± 10 kW	0 to ± 5 kW – 0 to ± 10 kW	0 to 5 kW – 0 to ± 10 kW	0 to ± 5 kW – 0 to ± 10 kW	0 to ± 20 kW – 0 to ± 30 kW	
Output ripple and noise (20 Hz to 20 MHz)						
CV peak-to-peak [1]	30 – 200 mV	500 – 1000 mV	30 – 200 mV	500 – 1000 mV	0.75 – 3 V	
CV rms [2]	3 – 20 mV	100 – 200 mV	3 – 20 mV	100 – 200 mV	150 – 400 mV	
Load regulation						
Voltage [3]	1 – 6 mV	30 – 60 mV	1 – 6 mV	30 – 60 mV	25 – 100 mV	
Current	13 – 50 mA	9 – 17 mA	13 – 50 mA	9 – 17 mA	4 – 24 mA	
Programming accuracy ± (% of output + offset)[3]						
Voltage	0.02% + 2 mV – 0.02% + 16 mV	0.03% + 60 mV – 0.03% + 120 mV	0.02% + 2 mV – 0.02% + 16 mV	0.03% + 60 mV – 0.03% + 120 mV	0.03% + 40 mV – 0.04% + 150 mV	
Current	0.03% + 13 mA – 0.04% + 90 mA	0.1% + 12 mA – 0.1% + 24 mA	0.03% + 13 mA – 0.04% + 90 mA	0.1% + 12 mA – 0.1% + 24 mA	0.03% + 3 mA – 0.04% + 18 mA	
Transient response[4]						
Recovery time	300 µs	500 µs	300 µs	500 µs	300 µs	
Settling band	0.2 – 1.6 V	1.25 – 2.375 V	1.6 V	1.25 – 2.375 V	5 – 20 V	
Typical characteristic						
Command processing time	≤ 1 ms from receipt of command to start of output change. This applies to simple setting commands over the GPIB interface					
Input current per phase	17.3 A	35 A	8.66 A	17.3 A	36 A	52 A
AC Input						
Connection	L1, L2, L3, PE; does not require a neutral connection			L1, L2, L3, PE for firmware rev after B.06.03.985 and L1, L2, L3, N, PE (requires a neutral connection) for earlier firmware		
Phase and range	3 phase; 200 VAC ± 10% and 208 VAC ± 10%			3 phase; 380 - 480 VAC ±10%		

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, terminals ungrounded, or terminal grounded.
3. Percent of value + offset; at 25 °C ± 5 °C after a 30-minute warm-up; measurement NPLC=1; valid for 1 year.
4. Time to recover to within the settling band following a step change from 40% to 90% of full load with a 35 µs current rise and fall time.

More Information: www.keysight.com/find/RP7900

Key Features

Versatile power sourcing and electronic loading

- Offers a wide voltage range of up to 2000 V and a current of up to ±800 A.
- Power handling capability of up to 30 kW per instrument.
- Operates in a two-quadrant mode, functioning as both a power source and a regenerative electronic load.

Efficient power management and scalability

- Maximize testing throughput with fast output speed and sub-millisecond command-processing time.
- Facilitates easy parallel connection to create power or loading configurations of up to 600 kW.
- Regenerative capability returns 90% of power to the grid, reducing cooling costs and enhancing energy efficiency.

Advanced functionality and integration

- Optimize inverter MPPT algorithms with photovoltaic/solar array simulation, available with the RP7970/80 Series.
- Incorporates an eco-friendly, regenerative design, reducing cooling and electricity costs.
- Saves valuable rack space with compact 3U-high and 5U-high sizes.
- Part of the EV1003A HEV/EV Power Converter Test Solution, ensuring seamless integration into automotive testing environments

Comprehensive connectivity and control

- Connectivity options include LAN (LXI Core), USB, and GPIB, ensuring seamless integration into various testing environments and control systems.

Options

Part	Description
UK6	Commercial calibration with test result data

Accessories

Part	Description
PW9252A	PathWave Advanced Power Control and Analysis
PW9253A	PathWave Advanced Battery Test and Emulation
1CP108A[1]	Rack mount flange and 3U handle kit (for RP7931A - RP7973A)
1CP120A[1]	Rack mount flange and 5U handle kit (for RP7982A - RP7984A)
RP7908A	Rail kit for system II Keysight instrument racks

1. Requires RP7908A rail kit.

For more information

For more details on the Keysight RP7900 Regenerative Series Power System and ordering information, see:

Keysight RP7900 Series Datasheet

For more information on the Keysight RP7900 Regenerative Series Power System, please visit

www.keysight.com/find/RP7900

To find a distributor in your area, go to:

www.keysight.com/find/distributors

KEYSIGHT