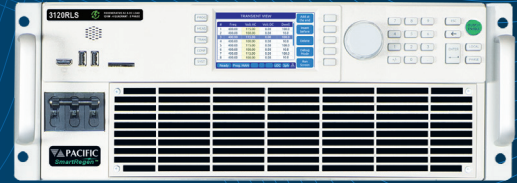


## Introducing the RLS Series

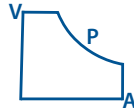
The Industry's Most Flexible,  
High Performing, and Intelligent  
Regenerative AC & DC  
Electronic Load



Regenerative



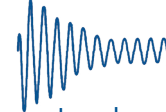
Power  
Density



Constant  
Power



High  
Current



Inrush  
Current  
Control



Scalable  
Power

### Key Features

- Regenerative Electronic Load > 90% Energy Efficiency
  - » 4-Quadrant AC & DC Load
  - » Fully Programmable
- High Power Density – Up to 12kW in 4U; Parallel up to 24kW
- AC, DC
- Single, Split, Three-Phase; Multi-Channel Configurations
  - » Isolated Neutrals independent channel modes
- Input Voltage Range: 350Vac L-N/606Vac L-L or  $\pm 500\text{Vdc}$
- Wide Load Input Frequency Range 15Hz - 1200Hz
- Galvanic Isolation from Facility AC Input to Load Input and Between Input Phases / Channels
- Dynamic, Quiet and Efficient Operation Using Silicon Carbide (SiC) Based Technology
- High AC Current Capability
- Waveform Capture and Scope Display
- Powerful Current Transient Programming Tools
  - » Generate Harmonics and Interharmonics Currents
  - » Analog I/O Signals Standard
- Intuitive User Interface Using Softkeys & Shuttle
- **SmartSource Suite:** Web Browser Control

### RLS Series

#### Regen 4-Quadrant AC & DC Load

The RLS Regenerative Load Simulator is designed to emulate real-world normal and abnormal load conditions for testing a wide range of AC or DC power generating or conversion equipment. The RLS's high-power density provides up to 12kVA/kW in a 4U chassis and can parallel up to 24kVA/kW.

The RLS Series is modular by design and scalable in power. Its flexible channel inputs and advanced control and programming capabilities make it ideal for generating complex user-defined current waveforms. Full operator control of current, power and power factor allows for testing a wide range AC or DC power sources.

#### Application Examples:

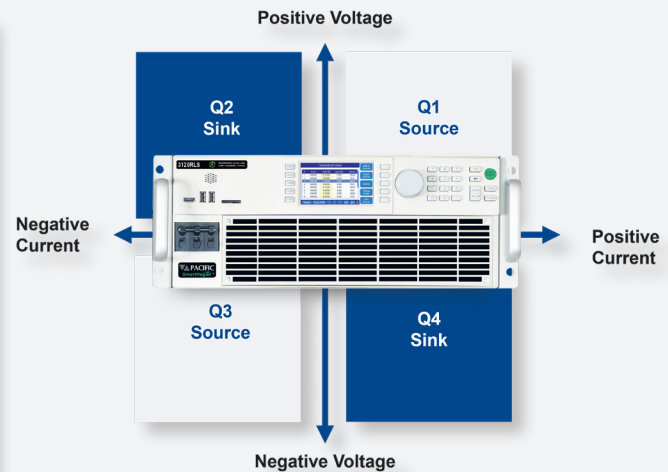
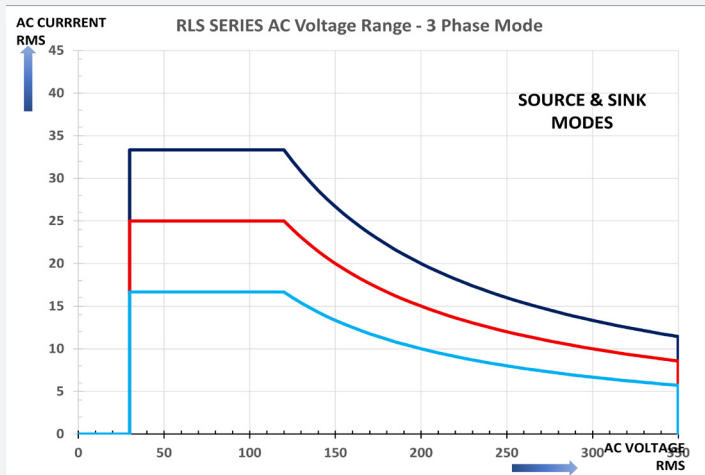
- EV Charger Load Testing, On Board Chargers (OBC), Wallboxes, V2G, V2H, V2X, and EV Charging Cables
- Solar PV/Grid-Tied Inverters RLC Loading for Anti-Islanding
- Energy Storage Systems (ESS), Home ESS Load Testing
- UPS Products and PDUs AC Load Testing
- EV Battery Discharge Testing
- Aerospace Power and Converter Testing
- Utility Power Quality and Grid Usage
- Burn-In Testing



Flexible Control

## Wide Input Voltage Range

The RLS Series uses a single, constant power voltage input range for both higher current at lower voltage and higher voltage at lower current load testing, eliminating the need to switch between multiple voltage ranges. This capability allows for testing a broad range of conditions and test requirements without interruption.

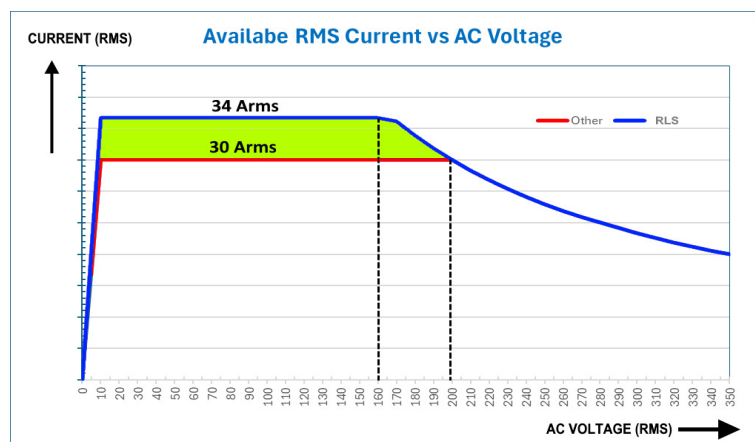


## Supports More Current at Low Voltage

The RLS supports a broader range of load current from the UUT.

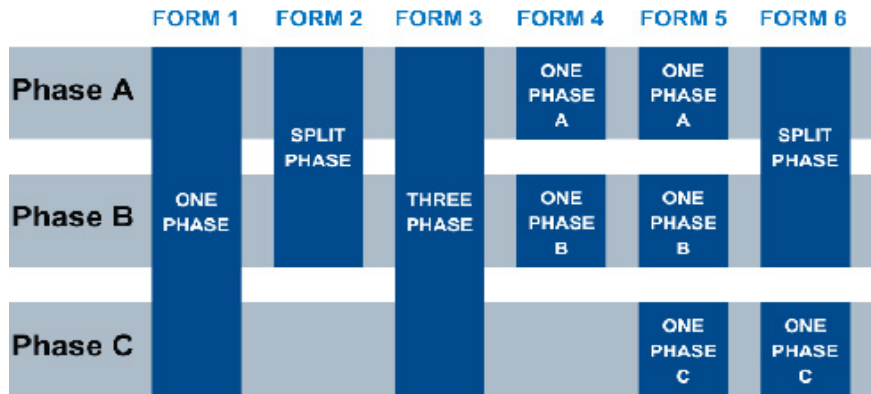
- Eliminate the risk of over or under sizing the load.
- Reduce the need for additional capital investment.

The RLS is capable of sinking 20% more current from 120V to 200V when compared to a typical unit.



# Ultimate Flexibility with Six Input Configurations

## Simultaneous AC & DC Operation on Individual Phases



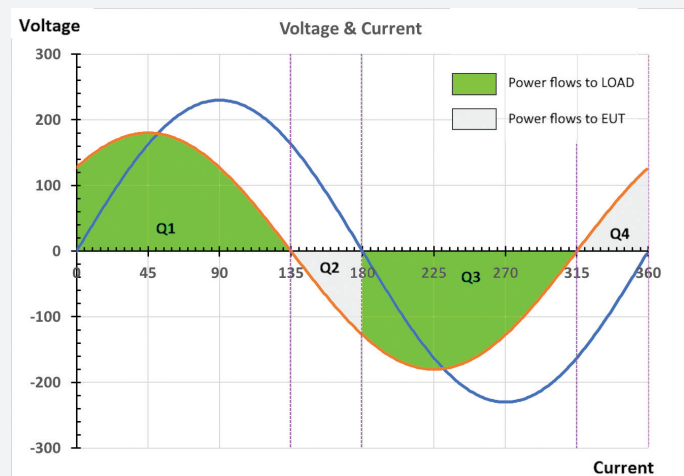
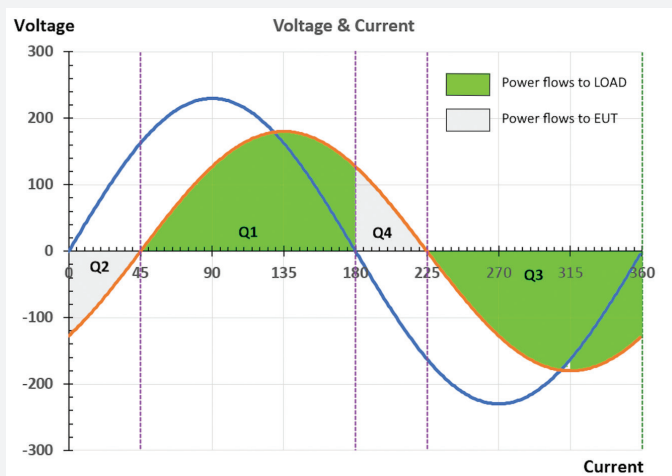
Automatic Switching of Operation Modes

Flexibly test a wide range of EUTs selecting from six different load input configurations.

- Unique input configuration modes allow different functions per phase: AC mode, DC mode or both.
- Forms 1 through 3 are typical for single, split or three-phase AC connections.
- The RLS Series has three isolated neutral connections, one for each phase/channel. This supports testing up to three independent sources.

## Fully Test AC Power with 4-Quadrant Load

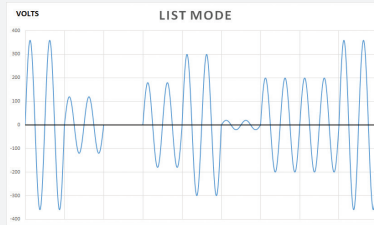
Simulate AC and DC loads for testing PV inverters, V2G, EV Chargers, EVSE, batteries, UPS, and AC/DC power supplies. Fully operate in all four quadrants using programmable phase shift in CC or CS modes. This allows simulation of inductive and capacitive loads to fully test AC power sources, as shown in the leading and lagging power factor examples.



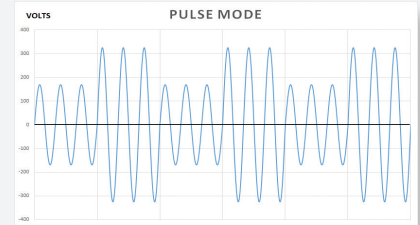
## Powerful Waveform & Measurement Tools

The RLS Series has a built-in waveform digitizer with scope function.

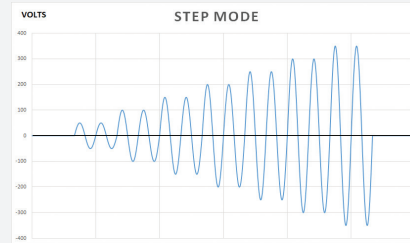
- Fast transient capabilities at **200μsec** time resolution
- LIST, PULSE and STEP Transients
- Waveforms: 10 Standard, Sine, Square, Triangle, Clipped
- Includes Harmonics generation (Interharmonics Option)
- Capture advanced measurements and waveforms.



List Mode



Pulse Mode



Step Mode

## Several AC/DC Load Operating Modes









Simulate AC/DC linear and non-linear loads (rectified), inductive and capacitive loads.






### AC Modes:

- Constant Current,
- Constant Power &
- Apparent Power,
- Constant Resistance,
- Constant Voltage
- CC+CR
- CC / CS Rectifier Mode 1 $\phi$  & 3 $\phi$

### DC Modes:

- Constant Current
- Constant Power
- Constant Resistance
- Constant Voltage
- CR+CC

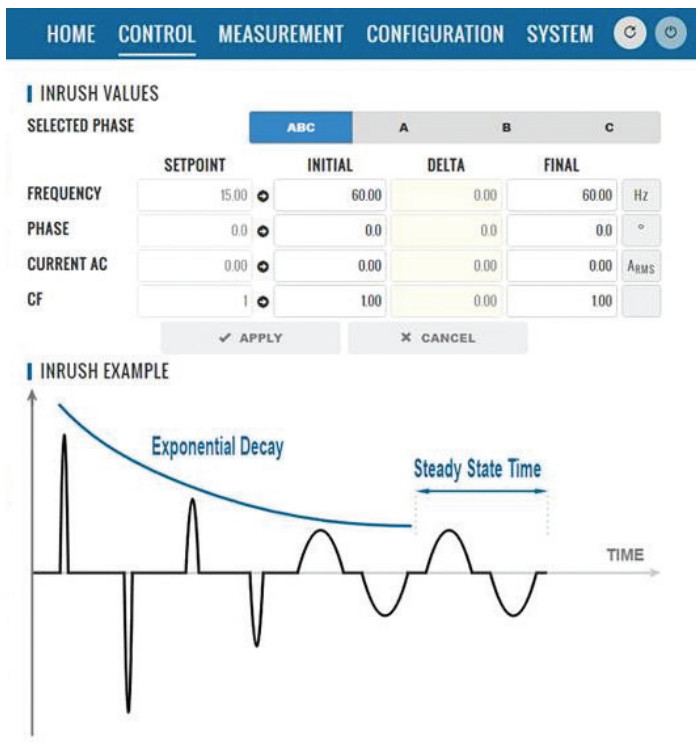
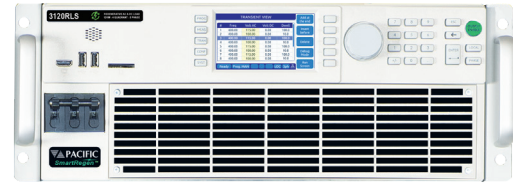
AC Load Modes			
	Constant Current (CC)		CR + CC
	Constant Power (CP)		CC / CS Rectifier 1 Phase
	Constant App Power (CS)		CC / CS Rectifier 3 Phase
	Constant Resistance (CR) RMS or Instantaneous Mode		
	Constant Voltage (CV)		

DC Load Modes	
	Constant Current (CC)
	Constant Power (CP)
	Constant Resistance (CR) RMS or Instantaneous Mode
	Constant Voltage (CV)
	CC + CR

## User Friendly Control Options

Multiple integrated control options include:

- Intuitive Touch Screen LCD Display with Soft Key driven Menus
- SmartSource Suite Web Interface
- LAN, GPIB, RS232 & USB Interfaces, and ModBus (optional)
- Supports external touch screen monitor via Video Output Interface



### Simplify Test Automation with SmartSource Suite Remote Control Platform

Easily monitor, control, and manage testing with the RLS's **SmartSource Suite** remote control platform. Use the embedded, web browser interface with real-time control. Access control panels and test sequences on-premises or on any mobile device (laptop, phone, tablet) via secure client access.

- Full control and measurement capability
- Program settings and measurement read back including digital scope and harmonics data
- Extensive safety protection settings
- Advanced load function control screens such as Inrush Current programming shown here
- Waveform selection, preview and edit modes
- Execution of user's custom test sequences
- Transient data entry and execution screen using a spreadsheet layout

## Built-in Galvanic Isolation Reduces Safety Risks

The RLS provides both facility-to-input isolation, and phase to phase or channel to channel isolation. Galvanic isolation provides complete separation between the facility power input and the load's inputs so there is no electron flow between channels.

- Channel to channel isolation provides flexibility to use each phase as its own independent power source with FULL frequency and voltage control.
- Fully isolated design reduces safety risks for the operator and prevents unexpected UUT damage by preventing unwanted current or ground loops. This built-in capability doesn't require a transformer which saves significant costs and space.



# Technical Specifications

MODEL:	360RLS	390RLS	3120RLS
Modes of Operation			
Constant Current, Constant Power & Apparent Power, Constant Resistance, Constant Voltage, CC+CR, CC / CS Rectifier Mode			
AC or DC Input Power			
Phase Modes (Form)	1, 2 or 3	1, 2 or 3	1, 2 or 3
Maximum Power(Total)	6 kW/kVA	9 kW/kVA	12 kW/kVA
Per Phase / Channel	2 kW/kVA	3 kW/kVA	4 kW/kVA
Load Input Voltage			
Input Range	AC Range: 30 - 350 V <sub>LN</sub> / 50 - 606 V <sub>LL RMS</sub> (Sync Mode)   DC Range: 0 - ±500 V <sub>DC</sub>		
Resolution: 0.01   Accuracy: ± 0.25% F.S			
Line Regulation	< 0.1% for 10% Line Change		
Current Regulation	± 0.02% (CSC Mode)		
Phase Angle - Range (B, C) 0 - 359.9°   Resolution: 0.1°			
Maximum Current			
3 & 2 Phase modes AC / DC	17.0 A <sub>RMS</sub> / 17.0 A <sub>DC</sub>	25.0 A <sub>RMS</sub> / 21.0 A <sub>DC</sub>	34.0 A <sub>RMS</sub> / 21.0 A <sub>DC</sub>
1 Phase mode AC / DC	51.0 A <sub>RMS</sub> / 51.0 A <sub>DC</sub>	75.0 A <sub>RMS</sub> / 63.0 A <sub>DC</sub>	100.0 A <sub>RMS</sub> / 63.0 A <sub>DC</sub>
Current Crest Factor (AC)	6.2 : 1	4.2 : 1	3.0 : 1
Load Input Frequency			
Range	15.00 – 1200Hz		
Mains Input <sup>1</sup>			
Input Voltage Range / Freq	208Vac ± 10%, 4 Wire, L1, L2, L3 and PE / 47 - 63 Hz		
Nom. Phase Current @ 208Vac	27A <sub>RMS</sub>	32A <sub>RMS</sub>	36A <sub>RMS</sub>
Input Power Factor: 0.99   Efficiency:> 0.90			
Measurements			
Vrms Range / Accuracy	0 – 350 V <sub>LN</sub> / 0-606 V <sub>LL</sub> / ± 0.25% F.S.		
Irms Range <sup>2</sup> / Accuracy	17.0 A / ± 0.5% F.S.	25.0 A / ± 0.5% F.S.	34.0 A / ± 0.5% F.S.
Power Range <sup>2</sup> / Accuracy	2 kW / ± 1.5 % F.S.	3 kW / ± 1.5 % F.S.	4 kW / ± 1.5 % F.S.
Scope Function	Sample Rate: 54932.47 Hz / Window: 1024 Samples / Bandwidth: 1200 Hz		
Transient Functions			
Programming	200 Steps / 400 Segments, LIST, PULSE & STEP Modes, Current AC, Current DC, Waveform, Ramp Time, Dwell Time. Time range: 0.1 - 10000000.0 ms, Time resolution 0.2 ms		
Execution: Run from step # to step #, Run, Step, Restart, Stop   Storage: Non-volatile, 100 Programs + Transients			
PARAMETERS / FUNCTIONS   SPECIFICATIONS			
Remote Control Interfaces			
USB Type B, LAN (LXI), GPIB / IEEE488, RS232, all on rear panel; External USB WIFI adapter / ModBus TCP / CAN/CAN-FD			
Analog & Digital I/O			
Analog Inputs (4): AI1, AI2, AI3, A14 User defined functions.   Analog Outputs (4): AO1 AO2, AO3, AO4 User-defined measurement functions			
Digital Inputs (6) / Outputs(6): Remote Inhibit, Trans. Trig., Phase Sync, User   Output Relay, Transient, Function Strobe, Sync			
Environmental			
Cooling Variable speed fan, front intake, rear exhaust   Energy Modes: Standby & Sleep			
Temperature Operating: 0 to 40 °C / 32 to 104 °F   Storage: 20 to 70 °C/-4 to 158 °F			
Humidity < 80%, non-condensing   Altitude: 2000 m / 6500 feet			
System Features			
USB Ports: 2 on Front Panel, 1 on Rear Panel, All Type A   SD Card: 32 GB max. Capacity			
Video Output Port: Monitor Out, Front Panel			
Dimensions & Weights			
Chassis Size H x W x D: 7.0" x 17.0" x 25.0" / 178 x 432 x 635 mm   Shipping: 20" x 27" x 38" / 508 x 686 x 965 mm			
Weight Single 4U Height Unit: Net:11.2 lbs. / 50.4 kg   Shipping: 151 lbs / 68.5 kg			
Regulatory Compliance			
Safety	IEC 61010-1:2010 (Edition 3)		
EMC - Emissions / Immunity	EN 55011:2009+A1:2010 / EN 61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8 and EN 61000-4 -11		
Product Category	EN 61326-1:2013 (Measurement, Laboratory and Control Equipment)		
Agency Approvals RoHS (2011/65/EU): EN50581:2012			

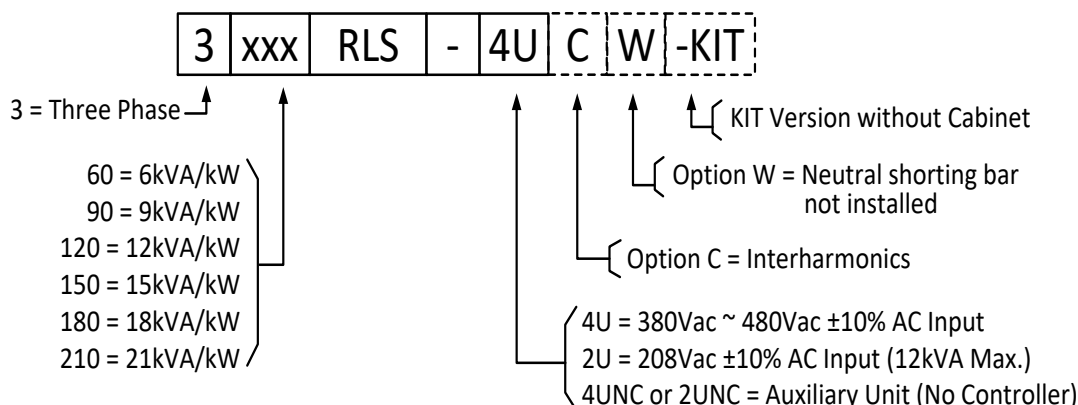
**Note 1:** 400 to 480Vac input models are available as well.

**Note 2:** Measurement range is times three in single phase mode.

## Ordering Information

### RLS Series Model Number Encoder:

Note: Solid outlined fields must be specified. Dashed outlined fields are optional.



NOTE: 4U indicates that the shorting bar for output neutrals will be installed on the units by default. If Option W is selected, the units will be shipped with shorting bar for neutrals removed and provided in the ship kit instead.

### Parallel load Kits:

These kits are available in power ratings of 24kW. For turnkey, integrated parallel load cabinet systems, contact factory.

#### Order Example 3120RLS-2U

- Bench Model, 12 kVA, 3-Phase, Regenerative Electronic Load, USB, RS232, LAN, GPIB & AUX I/O, Isolated Neutrals

#### Typical Delivery Items

- Electronic Load
- Rack Mount Handles
- Certificate of Compliance

#### Available Accessories

- Input shorting adapter for single phase input mode use. P/N 160086 (not for W)
- Paralleling Cable, 1 Ft. (Included with Aux NC models). P/N 778036
- Rack slides. P/N 703251

Auxiliary Models (No controller) Order Example: 3120RLS-2UNC

## Worldwide Service & Support

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Fax: +1 (949) 756-0756  
Email: [sales@pacificpower.com](mailto:sales@pacificpower.com)  
Web: [www.pacificpower.com](http://www.pacificpower.com)

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