# California Instruments RP Series

## General purpose AC power sources

- Portable Power, Low Cost.

- 800 VA, 1250 VA and 2000 VA Output Power

- Front and Rear Outputs

- 16 Hz to 5000 Hz Frequency Range

- High Peak Current Capability

- Remote Control Options

- Single or Three Phase Output

| ≋ | 208 | 230 | |
|---|-----|-----|---|
| ∼ | 115 | 230 | |

GPIB  RS232

## Compact AC Power

With European and US outlet sockets to connect the load, the RP Series programmable AC power sources are ideal for a wide variety of applications.

A built in current measurement function eliminates the need for an external current shunt or transformer. Load current of the UUT (Unit Under Test) can be read directly on the large LCD display to 0.1 A. For additional protection, a current limit function can be set from zero to the maximum current rating.

## Easy To Use Controls

Front panel digital rotary encoders are used to set voltage and frequency. These controls have an analog feel, with the precision and reliability of digital circuits. Settings are read directly on the large high contrast LCD displays.

Dual output voltage ranges provide maximum current at the required voltage.

The output frequency can be varied from 16 Hz up to 5000 Hz to cover both avionics and utility power applications.

## Quality Control

For product quality test applications, the RP Series can be used to simulate line conditions found anywhere in the world. This ensures products destined for export will operate as designed.

## Avionics Applications

As an affordable and reliable source of 400 Hz AC power, both units are well suited for commercial and defense avionics applications. Both unit can easily be integrated into avionics ATE systems.

## Functional Design

The small form factor and low weight of these units make them convenient to use in a variety of locations. Removable rubber feet protect the work surface if the unit is used in a bench top mode. The 3.5 inch height saves valuable rack space when compared to conventional AC power sources at this power level.

# RP Series : Product Specifications

### Extensive Transient Control[1]

With the addition of the remote control interface option, the RP units are capable of producing transients with a high degree of user programmability. Setting up transient programs is facilitated by a Windows Graphical User Interface program that allows amplitude, frequency and event duration to be programmed from a PC. Time resolution is 10 ms (0.010 sec) with a minimum time interval of 10 ms, depending on the transient type. Transient programming allows the effects of common line disturbances such as voltage surges, sags, drop-outs and frequency fluctuations on the unit under test to be evaluated.

### Remote or Local Operation

For automated test equipment (ATE) applications, the RP Series units can be outfitted with both IEEE-488 and RS232C options. A front panel lock out mode is supported on both models if operator interaction with the AC source is not required or desired.

### SCPI Protocol Programming Commands

All functions of the RP Series are completely programmable over the IEEE-488 or RS232C bus. For example, the following tasks can be performed over the bus:
- Set voltage to any level
- Change frequency
- Generate 1 ms or longer voltage dropouts at 90 °, 180 °, 270 ° or 0 °
- Measure rms current, voltage and apparent power
- Recall eight complete instrument setups from non-volatile memory with a single SCPI command
- Reset the instrument
- Adjust current limit value
- Lock the front panel to prevent operator interference
- Switch between high and low voltage range
- Turn output on and off

### Application Software

Windows 98™ or Windows 2000™ application software is included with the remote control interface option. This easy to use graphical interface program provides complete control over all instrument functions using either the RS232C or IEEE-488 interface. With enhanced capabilities such as data logging to file and Dynamic Data Exchange to other Windows programs, many applications can be addressed without the need for writing custom code.

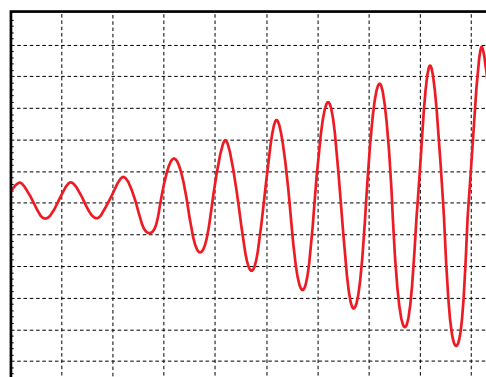1 Note: Transient control does not apply to output phase angle
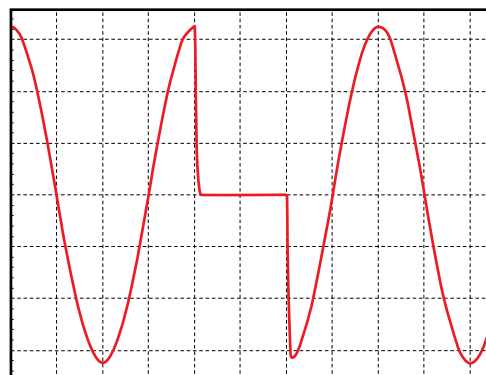

Drop transient causes output voltage to drop to zero for a user specified period
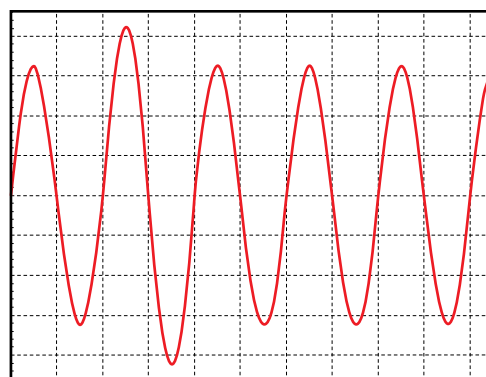

Voltage Surge transient causes output voltage to surge.


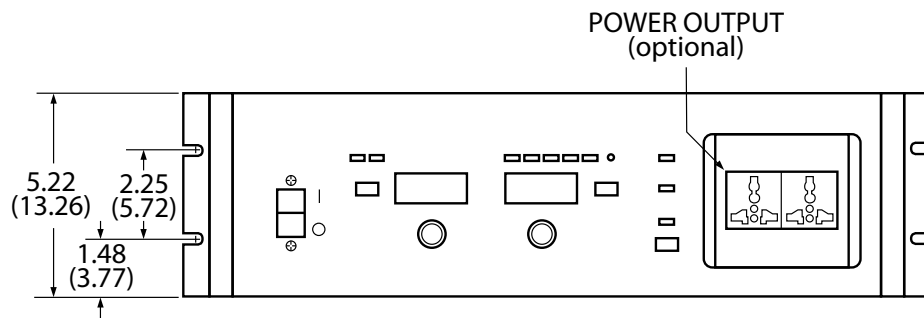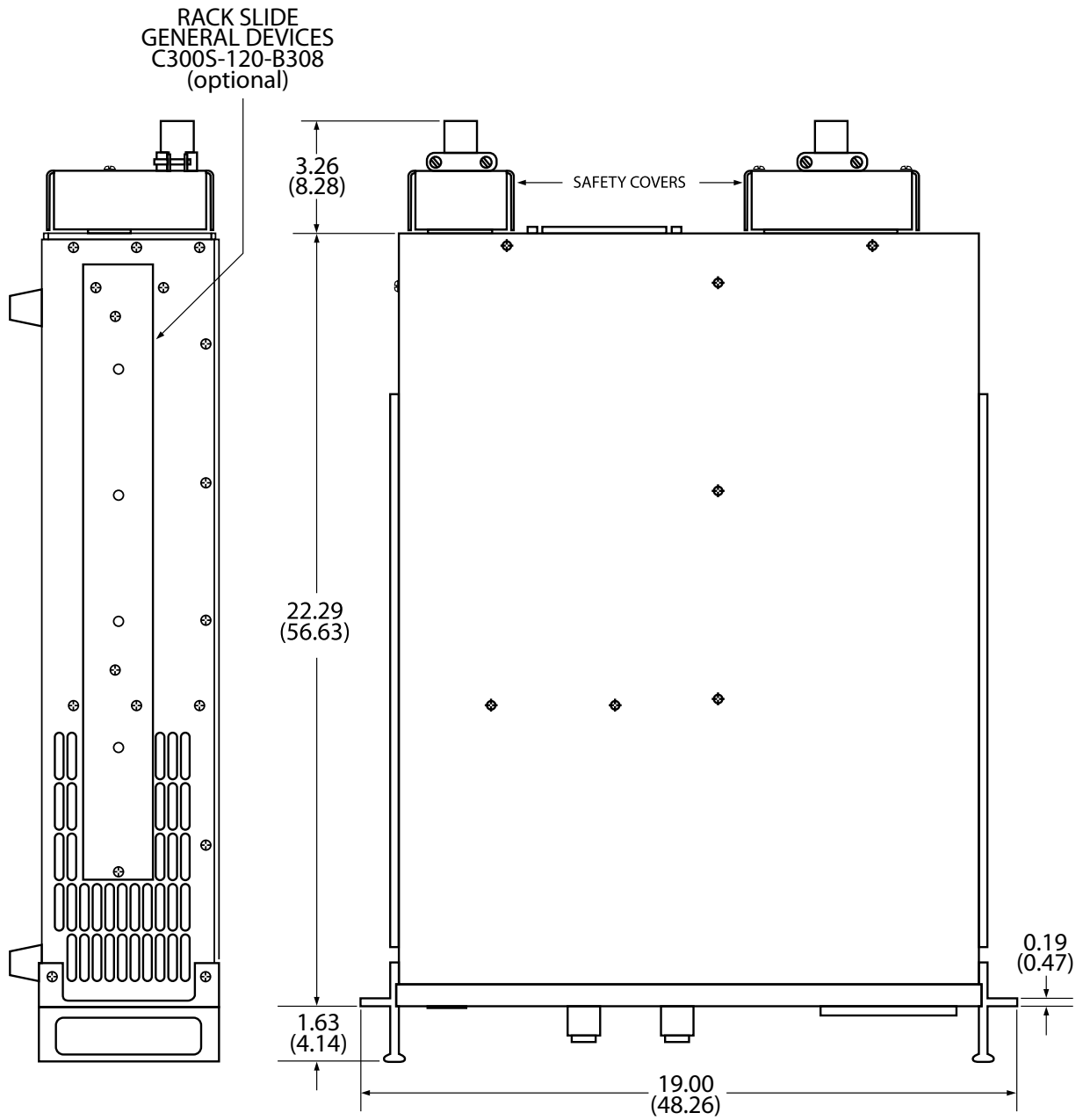Frequency Sweep transient at a user specified rate.


Voltage Sweep transient causes output voltage to change at a programmed rate.

**AMETEK**

## Output

| Model | 801RP | 1251RP | 2001RP | 2003RP |
|---|---|---|---|---|
| Phases | 1 | 1 | 1 | 3 (A,B,C) |
| Phase Angles | | | | A=0°, B=240°, C=120° |
| AC Power | 800VA | 1250VA | 2000VA | 675VA Max per phase |
| Load Connection Floating neutral (option) | Rear panel terminal block | Rear panel terminal block | Rear panel terminal block / optional Universal front panel sockets | Rear panel terminal block |

### Output : Voltage

| | 801RP | 1251RP | 2001RP | 2003RP |
|---|---|---|---|---|
| High range / Low Range | 0-270 / 0-135 V (L-N) | 0-270 / 0-135 V (L-N) | 0-300 / 0-150 V RMS (except -AV and -LZ options) | 0-270/0-135 V RMS (Except AV option) |
| Accuracy | ± 1 %FS @ 50/60 Hz | ± 1 %FS @ 50/60 Hz | ± 0.1 %FS @ 16Hz-100 Hz | ± 0.1 %FS @ 16Hz-100 Hz |
| Accuracy | ± 2 %FS @ 400 Hz | ± 2 %FS @ 400 Hz | ± 0.2%FS @ 100Hz-5000Hz | ± 0.2%FS @ 100Hz-5000Hz |
| Resolution | 0.1 V | 0.1 V | 0.1 V | 0.1 V |
| Line & Load Regulation High V range | ± 0.5 %FS | ± 0.5 %FS | | |
| Line & Load Regulation Low V range | ± 1 %FS | ± 1 %FS | | |
| Load Regulation | ± 1 %FS | ± 1 %FS | remote sense ± 0.1% FS | remote sense, 16-500Hz ± 0.1 %FS[2] |
| Line Regulation 10 % Line change | ± 0.1 %FS | ± 0.1 %FS | ± 0.02%FS | ± 0.02%FS |
| T.H.D | 0.5 typical % @ 50/60 Hz | 0.5 typical % @ 50/60 Hz | 16-100Hz 0.5 typ./1.0 max.% (into a resistive load) | 16-100Hz 0.5 typ./1.0 max.% 100-2000Hz 1.0 typ./2.0 max.% |
| Output Noise | < 0.1 V typical | < 0.1 V typical | < 0.1 V RMS typ. | < 0.1 V RMS typ. |

Note 2: Specifications apply over freq. ranges shown and above 5 % of V range.

### Output : Frequency (specifications valid from 45 Hz to 500 Hz)

| | 801RP | 1251RP | 2001RP | 2003RP |
|---|---|---|---|---|
| Range | 16 - 500Hz | 16 - 500Hz | 16 - 5000Hz | 16 - 5000Hz |
| Accuracy | ± 0.02% | ± 0.02% | ± 0.02% | ± 0.02% |
| Resolution below 100 Hz | 0.1Hz | 0.1Hz | | |
| Resolution above 100 Hz | 1 Hz | 1 Hz | | |
| Resolution | | | 16.0Hz-80.0Hz 0.01 Hz 80.1Hz-800.0Hz 0.1 Hz 800Hz-5000Hz 1Hz | 16.0Hz-80.0Hz 0.01 Hz 80.1Hz-800.0Hz 0.1 Hz 800Hz-5000Hz 1Hz |

### Output : Current

| | 801RP | 1251RP | 2001RP | 2003RP |
|---|---|---|---|---|
| Steady State Current High V range | 3.0 A rms | 4.6 A rms | 6.7 A rms | 2.5 A rms / Ø |
| Steady State Current Low V range | 6.0 A rms | 9.2 A rms | 13.4 A rms | 5.0 A rms / Ø |
| Peak Current High V range | 13.8 A peak | 13.8 A peak | 22.2 A peak | 7.5 A peak / Ø |
| Peak Current Low V range | 27.6 A peak | 27.6 A peak | 44.5 A peak | 15.0 A peak / Ø |

## Input

| Model | 801RP | 1251RP | 2001RP | 2003RP |
|---|---|---|---|---|
| Line Voltage[1] 2 wire + GND | 100-240 V rms Maximum operating range 85 - 265 V rms | 100-240 V rms Maximum operating range 85 - 265 V rms | 107/115V or 208/230V ± 10% V RMS (set by jumper) | 107/115V or 208/230V ± 10% V RMS (set by jumper) |
| Line Current (fused) | < 15 A rms | < 15 A rms | <35@96V, <30@115V, <15@230V A RMS | <30@115V,<15@230V A RMS |
| Line Frequency | 47 - 63 Hz | 47 - 63 Hz | 47 - 440 Hz | 47 - 440 Hz |
| Holdup Time | 20 ms | 20 ms | 10 ms | 10 ms |
| Power Factor | > 0.95 typical | > 0.95 typical | 0.7 | 0.7 |
| Isolation Input/output to Chassis | 1350 V / 2200 V | 1350 V / 2200 V | 1350 V / 2200 V | 1350 V / 2200 V |

# RP Series : Product Specifications

| Controller | | | | |
|---|---|---|---|---|
| Model | 801RP | 1251RP | 2001RP | 2003RP |
| Type | Programmable | Programmable | Programmable | Programmable |
| Controls | Digital Encoders | Digital Encoders | Digital Encoders | Digital Encoders |
| Readouts | dual 4 digit LCD's | dual 4 digit LCD's | dual 4 digit LCD's | dual 4 digit LCD's |
| Non Volatile Setups | 8 (with -IF option) | 8 (with -IF option) | 1 (8) (with -OP1 option) | 1 (8) (with -OP1 option) |
| **Protection** | | | | |
| Current limit Mode | Programmable trip level : Output trips off | Programmable trip level : Output trips off | Const. Current or Const. Volt | Const. Current or Const. Volt |
| Programmable Current Limit Resolution | 0.1 A rms | 0.1 A rms | 0.1 A rms | 0.1 A rms |
| Over Temperature | Output shut off | Output shut off | Output shut off | Output shut off |
| Over Voltage | Output shut off | Output shut off | Output shut off | Output shut off |
| **Measurements (* Requires Option -OP1 or -IF)** | | | | |
| Current Range (RMS steady state) | 0.0 - 10.0 A rms Accuracy ± 0.2 A rms Resolution 0.1 A | 0.0 - 10.0 A rms Accuracy ± 0.2 A rms Resolution 0.1 A | 0.00-4.00 / 0.00-15.00 A RMS Accuracy 0.2 % FS + 0.3 % rdng Resolution 0.001 / 0.01 A RMS | 0.00-4.00 / 0.00-6.00 A RMS Accuracy 0.2 % FS + 0.3 % rdng Resolution 0.001 / 0.01 A RMS |
| Peak Current* | | | Range Low/High 12.00 / 50.0A Accuracy 0.5% FS + 0.5% rdng Resolution 0.01 / 0.1A | Range Low/High 0.00-12.00 / 0.0-20.0 A Accuracy 0.5% FS + 0.5% rdng Resolution 0.01 / 0.1 A |
| Voltage* | Range 0 - 278 V Resolution 1 V (below 250 V) | Range 0 - 278 V Resolution 1 V (below 250 V) | Range 0 - 300 V RMS Accuracy 0.1% FS + 0.05% rdng Resolution 0.1 V RMS | Range 0 - 300 V RMS Accuracy 0.1% FS + 0.05% rdng Resolution 0.1 V RMS |
| Power* | | | Range Low/High 800/2000 W Accuracy 0.5% FS Resolution 0.2 W | Range 0.0-800.0 W Accuracy 0.5 % FS Resolution 0.2 W |
| Power Factor* | | | Range 0.00 - 1.00 Resolution 0.01 | Range 0.00 - 1.00 Resolution 0.01 |
| **Remote Control Options** | | | | |
| Remote Control Options | option -IF RS232C and IEEE-488 IEEE-488 Address 0-31 IEEE Functions SH1, AH1, T8, L3, RL2, SRQ0, PP0 RS232C settings 9600,8,n,1 Command Language SCPI | option -IF RS232C and IEEE-488IEEE-488 Address 0-31 IEEE Functions SH1, AH1, T8, L3, RL2, SRQ0, PP0 RS232C settings 9600,8,n,1 Command Language SCPI | RS232C and IEEE-488 IEEE Functions SH1, AH1, T8, L3, RL2 RS232C settings 19200,8,n,1 Command Language SCPI (Requires Option -OP1) | RS232C and IEEE-488 IEEE Functions SH1, AH1, T8, L3, RL2 RS232C settings 19200,8,n,1 Command Language SCPI (Requires Option -OP1) |
| Remote Inhibit (Requires Option -OP1) | | | Output shut down TTL in, active low BNC | Output shut down TTL in, active low BNC |
| Function Strobe (Requires Option -OP1) | | | On V or F change TTL out, active low BNC | On V or F change TTL out, active low BNC |
| **Physical** | | | | |
| Regulatory | CE | CE | CE | CE |
| Dimensions HxWxD | 3.5 x 16.8 x 22 in 89 x 427 x 560 mm | 3.5 x 16.8 x 22 in 89 x 427 x 560 mm | 5.25 x 19 x 22 in 133 X 483 X 560 mm | 5.25 x 19 x 22 in 133 X 483 X 560 mm |
| Weight (net) | 34 / 15.4 lbs / kg | 34 / 15.4 lbs / kg | 73 / 33 lbs / kg | 85 / 38.3 lbs / kg |
| Vibration and Shock | Designed to meet NSTA-1A | Designed to meet NSTA-1A | Designed to meet NSTA-1A | Designed to meet NSTA-1A |
| Temperature | Operating 0 to 40 ° C Storage -40 to +85° C | Operating 0 to 40 ° C Storage -40 to +85° C | Operating 0 to 40 ° C Storage -40 to +85° C | Operating 0 to 40 ° C Storage -40 to +85° C |

RACK SLIDE
GENERAL DEVICES
C300S-120-B308
(optional)

3.26
(8.28)

SAFETY COVERS

22.29
(56.63)

0.19
(0.47)

1.63
(4.14)

19.00
(48.26)

POWER OUTPUT
(optional)

5.22
(13.26)

2.25
(5.72)

1.48
(3.77)

**2001/2003 RP**

# RP Series

| Models | |
|---|---|
| 801RP | 800 VA rack-mount AC source     - single phase |
| 1251RP | 1250 VA rack-mount AC Source     - single phase |
| 2001RP | 2000 VA rack-mount AC Source     - single phase |
| 2003RP | 2000 VA three phase, rack-mount AC Source |

| 801RP and 1251RP Model Options | |
|---|---|
| Option Code | Description |
| -FN | Floating Neutral output. |
| -IF | IEEE-488 and RS232C Interface |
| -ISS | International Socket Strip |
| -ISR | Rack mounted ISS |
| -L22 | Locking knobs |
| -RI | Remote Inhibit Input (Req. -IF) |
| -RMS | Rack Slides (P/N 210367) |

| 2001RP Model Options | |
|---|---|
| Option Code | Description |
| -AV | Avionics version. All specifications equal to standard 2001RP with the following exceptions:<br>• Voltage ranges: 0-115 / 0-230 VRMS, • Frequency range: 360 - 5000 Hz • Current: 17.4 / 8.7 ARMS 58 / 29 APK<br>• THD: 1.0+1.0/KHz % above 1 KHz • Weight: 67 lbs. / 30 Kg |
| -L22 | Locking knobs |
| -LZ | Low output impedance version, All specifications equal to standard 2001RP with the following exceptions:<br>• Zo < 100 mΩ. • Voltage ranges: 0-135 / 0-270 VRMS • Frequency range: 16 - 500 Hz • Current: 14.8 / 7.4 ARMS 49.4 / 24.7 APK |
| -OP1 | Option package 1:<br>• Measurements • IEEE-488 / RS232C Interface and GUI software • Remote Inhibit input • Function Strobe output |
| -RMS | Rack Mount Slides |

| 2003RP Model Options | |
|---|---|
| Option Code | Description |
| -AV | Avionics version. All specifications equal to standard 2003RP with the following exceptions:<br>• Voltage ranges: 0-115 / 0-230 VRMS • Frequency range: 360 - 5000 Hz • Current: 17.4 / 8.7 ARMS 58 / 29 APK<br>• THD: 1.0+1.0/KHz % above 1 KHz • Weight: 67 lbs. / 30 Kg |
| -L22 | Locking knobs |
| -LF | Low Frequency option. Limits output frequency to 550 Hz max. |
| -OP1 | Option package 1:<br>• Measurements • IEEE-488 / RS232C Interface and GUI software • Remote Inhibit input • Function Strobe output |
| -RMS | Rack Mount Slides |

| Supplied with |
|---|
| **801RP and 1251RP** |
| North American Line Power Cord |
| USA and European line output mating connector· |
| Instruction Manual· Windows™ Graphical User |
| Interface and RS232C cable (with -IF option) |
| **2001RP** |
| User and Programming Manual on CD ROM |
| Windows™ Graphical User Interface (with -OP1 option) |
| RS232C Serial Cable (with - OP1 option) |
| **2003RP** |
| Instruction / Programming Manual |
| Windows™ Graphical User Interface (with -OP1 option) |
| RS232C Serial Cable (with -OP1 option) |