Value / Power

Three Phase AC Power Model 2003RP

- **Programmable Power, Low Cost**
  Cost effective solution for three phase AC power requirements

- **675 VA Output Power per Phase**
  5.0 A_{RMS} current per phase

- **16 Hz to 5000 Hz Frequency Range**
  Commercial, Military and Avionics applications

- **High Peak Current Capability**
  Drives a wide variety of non-linear loads

- **Optional Measurements**
  Accurately measures TRMS Volt, TRMS Current, Peak Current, Crest Factor, Real Power and Power Factor

- **Remote Control**
  IEEE-488 and RS232C Interface for automated test applications. Includes Windows™ operating software

Model 2003RP

CE

Compact AC Power

Offering simple rotary front panel controls, the 2003RP programmable AC power source is ideally suited for a wide range of three phase AC power applications.

Selectable input voltage ranges allow this product to be used anywhere in the world to provide a convenient source of variable utility power for the testing and evaluation of domestic and commercial equipment.

In addition, the frequency range extends to 5000 Hz, making this product ideal for a wide range of avionics and defense applications.

Accurate measurement functions are available as an option to eliminate the need for external test equipment in many test setups. Voltage, current, peak current, power, and power factor for each individual phase output can be read on the large LCD display or over the bus. A programmable current limit function provides overload protection of the unit under test.

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 and measurements are read directly on the large, high contrast LCD displays.

Dual output voltage ranges of 135 V_{RMS} L-N and 270 V_{RMS} L-N, provide maximum current at the required voltage.

The output frequency can be varied from 16 Hz up to 5000 Hz to cover commercial, avionics and defense power applications.

Product Development

The precise voltage regulation and wide frequency range of the 2003RP, combined with its easy-to-use front panel, make it a great three phase AC source for lab use. Built in measurements may be added (option -OP1) to extend the unit's usefulness for design applications of three phase AC products.

Avionics Applications

As an affordable and reliable source of three phase, 400 Hz power, the 2003RP is well suited for commercial and defense avionics applications. In addition to the standard 2003RP, a special avionics version is available (-AV option). This version increases output current from 5.0 A_{RMS} to 5.8 A_{RMS} per phase at 115 V_{RMS}. The 2003RP-AV uses high frequency output transformers and offers a lowest output frequency of 360 Hz. The weight of the 2003RP-AV is 10 % less than that of the standard unit.

Functional Design

The small form factor of the 2003RP makes it 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 low 5.25 inch height also saves valuable rack space when used in a rack and stack system.
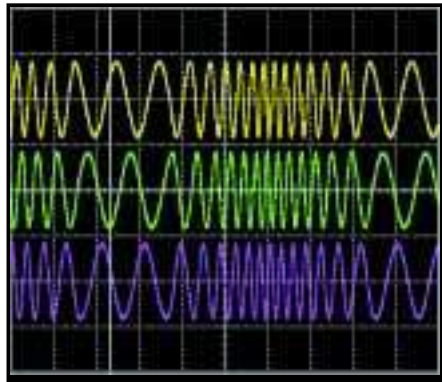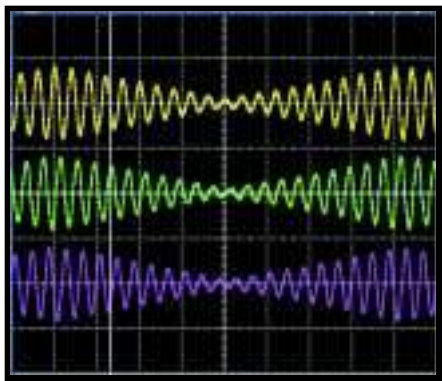
California Instruments
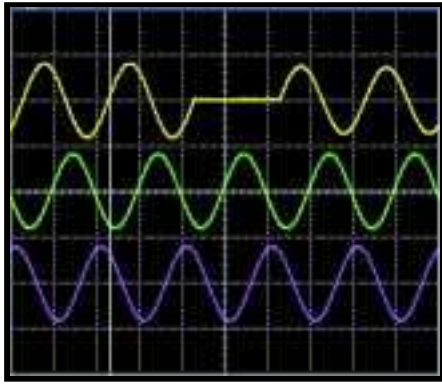
Drop transient causes phase A output voltage to drop to zero for one cycle
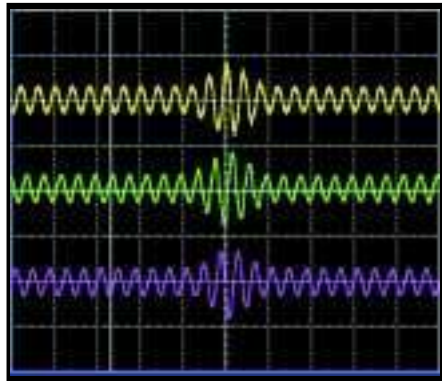
Voltage Surge transient causes all phase voltages to surge.

Frequency Sweep transient causes the output frequency to change at a user specified rate.

Voltage Sweep transient causes all phase voltages to change at a programmed rate.

Extensive Transient Control[1]

With the addition of option package -OP1, the 2003RP is 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 1 ms (0.001 sec) with a minimum time interval ranging from 1 to 40 ms, depending on the transient type. Maximum transient time intervals are 9999 seconds. Transient programming allows the effects of common line disturbances such as phase loss, voltage surges, sags, drop-outs and frequency fluctuations on the unit under test to be evaluated.

Precision Measurements

For bench or automated test equipment (ATE) applications, the 2003RP can be ordered with the -OP1 option, offering both IEEE-488 and RS232C remote control interfaces as well as extended measurements. These measurements are available from the front panel and over the bus. The 2003RP measurements can be calibrated over the bus, lowering cost of ownership.

SCPI Protocol Programming Commands

All functions of the 2003RP are programmable over the available IEEE-488 or RS232C interface. For example, the following tasks can be performed over the bus:

- Set voltage and frequency to any level
- Generate voltage dropouts, sags or surges
- Measure TRMS current, peak current, crest factor, TRMS voltage, true power, apparent power and power factor
- Recall eight complete instrument setups from non-volatile memory
- Adjust current limit value
- Lock the front panel to prevent operator interference
- Switch between high and low output voltage range
- Drop output voltage on one or more phase outputs at specific phase angles for a user specified duration. (see note 1)

Application Software

Windows™ application software is included with the -OP1 option package. This easy-to-use graphical interface program provides complete control over all instrument functions using the RS232C or IEEE-488 interface. With enhanced capabilities such as output sequencing, data logging and transient generation, many applications can be addressed without the need to write software.
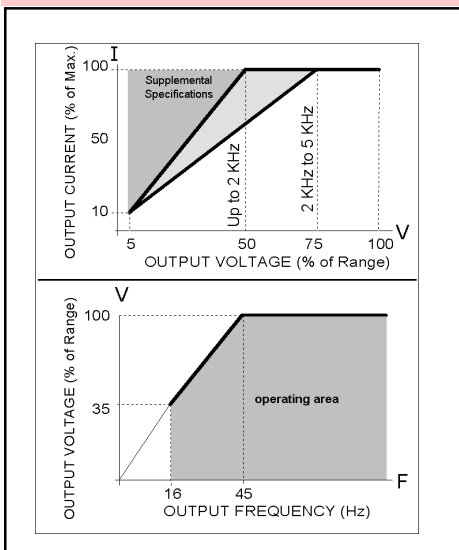

Free Windows™ Graphical User Interface software included with option package OP1.

Note 1: Voltage drop outs can be programmed at random phase angles or at 0, 90, 180 and 270 degrees with respect to phase A.

Specifications

Voltage, Current and Frequency rating charts

Parameter		2003RP	Unit
Controller			
Type		Programmable	
Controls		Digital Encoders	
Readouts		dual 4 digit LCD's	
Output			
No. of Phases		3 (A, B, C)	
Phase angles		A = 0°, B = 240°, C = 120°	
AC Power	Max. per phase	675	VA
Load Connection	floating neutral	Rear panel terminal block	
Voltage			
Ranges	High / Low	0-270/0-135	V RMS
Accuracy[2]	16 Hz - 100 Hz	± 0.1	% FS
	100 Hz - 2000 Hz	± 0.2	% FS
Resolution		0.1	V
Load Regulation[2]	remote sense, 16 - 500 Hz	± 0.1	% FS
Line Regulation	10 % Line change	± 0.02	% FS
T.H.D.[2] (into a	16 Hz - 100 Hz	0.5 typ./ 1.0 max.	%
resistive load)	100 Hz - 2000 Hz	1.0 typ./ 2.0 max.	%
Output Noise		< 0.1 typ.	V RMS
Frequency			
Range	*(see V-F rating chart)*	16-5000	Hz
Accuracy		± 0.02	%
Resolution	16.00 Hz - 80.00 Hz	0.01	Hz
	80.1 Hz - 800.0 Hz	0.1	Hz
	800 Hz - 5000 Hz	1	Hz
Current per Phase (see I-V rating chart)			
RMS Current	High / Low V range	2.5 / 5.0	A RMS
Peak Current	High / Low V range	7.5 / 15.0	A
Protection			
Adj. Current limit	Resolution	0.1	A RMS
	Modes	Const. Current or Const. Volt	
Over Temperature		√	
Over Voltage		√	
Input			
Connection		Rear panel terminal block	
Line Voltage	2 wire + GND	96 - 127 V or 187 - 253 V	V RMS
Line Current		< 35	A RMS
Line Frequency		47 - 440	Hz
Holdup Time		10	ms
Isolation	Input to Chassis/Output	1350 / 2200	V
Measurements[2] - Specifations valid from 300 - 500 Hz, Phase Selectable. (* Requires Option -OP1)			
Current	Range Low / High	0.000-4.000 / 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	0.00-12.00 / 0.0-20.0	A
	Accuracy	0.5 % FS + 0.5 % rdng	
	Resolution	0.01 / 0.1	A
Voltage*	Range	0.0 - 300.0	V RMS
	Accuracy	0.1 % FS + 0.05 % rdng	
	Resolution	0.1	V RMS
Power*	Range	0.0-800.0	W
	Accuracy	0.5 % FS	
	Resolution	0.2	W
Power Factor*	Range	0.00 - 1.00	
	Resolution	0.01	
Remote Control (* Requires Option -OP1)			
Interface*		RS232C and IEEE-488	
	IEEE Functions	SH1, AH1, T8, L3, RL2	
	RS232C settings	19200,8,n,1	
	Command Language	SCPI	
Remote Inhibit*	Output shut down	TTL in, active low	BNC
Function Strobe*	On V or F change	TTL out, active low	BNC
Physical			
Dimensions	HxWxD	5.25 x 19 x 22	inches
	HxWxD	133 x 483 x 560	mm
Weight (net)		85 / 38.3	lbs / kg
Vibration and Shock		Designed to meet NSTA-1A	
Temperature	Operating	0 to 40	° C
	Storage	- 40 to + 85	° C

Note 1:   All specifications are for L-N. Phase angle specifications are valid under balanced load conditions only. Ambient temp. 23° ± 5° C.
Note 2:   Supplemental specifications apply outside indicated frequency ranges.   3: At 400 Hz input, nominal line voltage minimum required.

Remote Control Option

The 2003RP can be ordered with an option package (-OP1) to add a combined RS232C and IEEE-488 remote control interface. Front panel and bus measurements are included with this option.

Ordering Information

Models:

2003RP 2000 VA three phase, rack-mount AC Source

Options:

-AV Avionics version. All specifications equal to standard 2003RP with the following exceptions:
- Voltage ranges: 0-115 / 0-230 V_{RMS}
- Frequency range: 360 - 5000 Hz
- RMS Current: 2.9 / 5.8 A_{RMS}
- Weight: 73 lbs. / 33 Kg

-L22 Locking knobs

-OP1 Option package 1:
- Measurements
- IEEE-488 / RS232C Interface and GUI software
- Remote Inhibit input
- Function Strobe output

-RMS Rack Mount Slides

Supplied with:
- Instruction / Programming Manual
- Windows™ Graphical User Interface (with -OP1 option)
- RS232C Serial Cable (with -OP1 option)

Lower Power Models

For applications requiring up to 2000 VA of single phase output power, models 801RP, 1251RP and 2001RP offer single phase outputs. The 801RP and 1251RP models are housed in a 3.5 inch high rackmount enclosure. The 2001RP uses the same chassis as the 2003RP. Refer to the 801RP/ 1251RP and 2001RP data sheets for details.

Portable AC Sources

For mobile or bench top applications, 1000 VA and 1250 VA portable AC power sources are available as well. The 1001P and 1251P offer programmable AC power from 16 Hz to 500 Hz at 1000 VA and 1250 VA respectively. For applications that only require fixed voltage and frequency settings, the 1001WP frequency converter provides push button selection of nominal 50 or 60 Hz and 100V, 115V, 220V, 230V and 240V settings. Refer to the P and WP Series data sheet respectively for details.

Customer Support

For technical support and service, or to discuss your AC power application needs, contact California Instruments Corp. or your local representative.
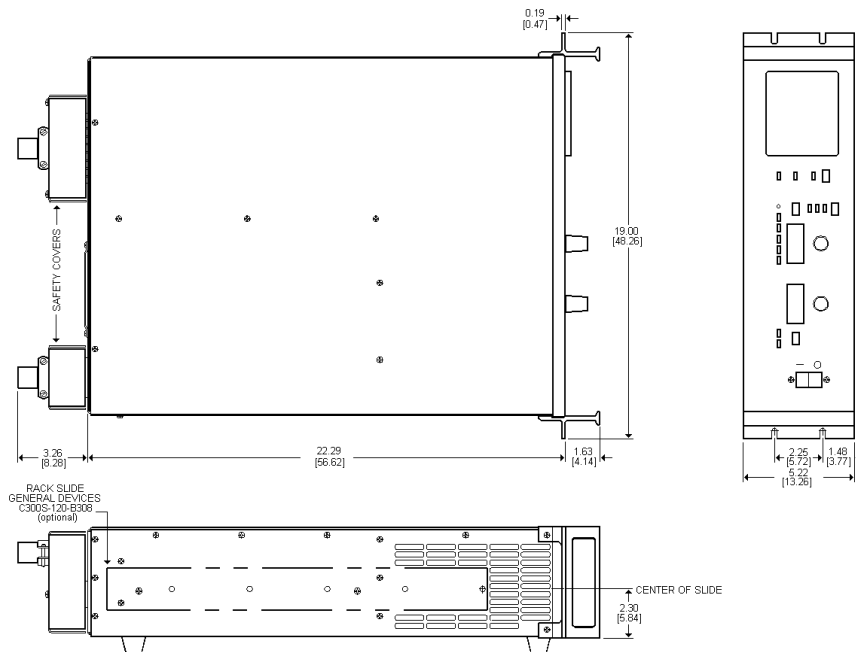
CE Mark

The 2003RP has been fully tested for compliance with all applicable CE Mark requirements.

CE

Contact California Instruments:
Toll-Free: 800-4AC-POWER
800-422-7693
FAX: 858-677-0940
Email: sales@calinst.com
Web page: http://www.calinst.com

2003RP *Dimension drawing*

California Instruments

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