

## Programmable AC Power Source

### MODEL 6400 SERIES

#### Key Features:

- Output Rating:
  - Power: 375VA, 1 $\phi$  (6404)
  - 800VA, 1 $\phi$  (6408)
  - 1500VA, 1 $\phi$  (6415)
  - 2000VA, 1 $\phi$  (6420)
  - 3000VA, 1 $\phi$  (6430)
  - 6000VA, 1 $\phi$  (6460)
  - 1 $\phi$  or 3 $\phi$  (6463)
  - 9000VA, 1 $\phi$  or 3 $\phi$  (6490)
- Voltage: 0~150V / 0~300V / Auto (6404, 6408, 6415, 6420, 6430)
- 0~150V / 0~300V (parallel) (6460)
- 0~300V / 0~500V (serial) (6460)
- 0~150V / 0~300V (6463, 6490)
- Output distortion less than 0.3%, and peak repetitive current over 2.5 times for rms current (6404, 6408)
- High accuracy measurement for RMS voltage, RMS current, true power, frequency, power factor, and current crest factor
- Built-in power factor correction circuit provides input power factor over 0.98 to meet IEC regulations
- Programmable current limit
- Built-in output isolation relays
- EEPROM storage for user defined voltage and frequency combination for instant recall at anytime
- Optional GPIB, RS-232, and Analog Programming Interface
- Over voltage, under voltage, over power, over current, over temperature, and short circuit protection
- Temperature controlled fan speed
- Self-test at power-on
- User-definable power-on state



## PROGRAMMABLE AC POWER SOURCE MODEL 6400 SERIES

Chroma 6400 Series Programmable AC Power Source uses state of the art PWM technology to deliver pure, instrument grade AC power at very low cost ever achieved before. The 6400 AC power source offers maximum rated power for the output voltage from 0 to 300VAC, at the frequency from 45 to 1kHz. It is not only suitable for commercial applications (47-63Hz), but also for avionics, marine, and military applications at 400Hz.

The 6400 Series Programmable AC Power Source generates very clean output with typical distortion less than 0.3%. With the incorporated of power factor correction circuit, the 6400 AC Power Source yields higher efficiency and delivers more output power than competitive instruments. Furthermore, it is capable of providing high peak repetitive current that is required to drive most electronic products with high crest factor input design.

The 6400 AC Power Source uses advanced DSP circuit to offer precision and high-speed measurement for true RMS voltage, true RMS current, true power, frequency, power factor, and current crest factor.

The 6400 AC Power Source is very easy to operate through the front panel keypad, or the remote controller via GPIB, RS-232 or APG (Analog Programming) interface. The optional interface is designed as a plug-in card to change the unit in seconds into a computer controlled system power source.

Designed with self-diagnostic routine and protections against over voltage, under voltage, over-power, over current, over temperature and fan fail, the instrument has the qualities and reliability that can suit for the most demanding applications in production tests, R&D design, and QA verification.



# Chroma



## THE COST EFFECTIVE PROGRAMMABLE AC POWER SOURCES

The 6400 Series AC Power Source supplies very clean output with typical output distortion less than 0.3% THD. The output is transformer isolated (6404 & 6408) providing an exceptionally low total harmonic distortion without sacrificing efficiency. Remote sense connections are provided for superb output regulation to compensate for load line losses while keeping the output at a precise level regardless of output load condition.

The 6400 Series incorporates input power factor correction circuitry resulting in high efficiency and lower input line current. The 6400 Series employs advanced DSP circuitry (6404 & 6408) or 16-bit measurement circuit to provide precise high-speed measurement of the output for true RMS voltage, true RMS current, true power, frequency, power factor, and current crest factor. These output measurements can be displayed on the large, easy to read, front panel readout. The 6400 Series are easy to operate using the front panel keypad, (6404 & 6408) with 9-user programmable output voltage, frequency, and current limit combinations for quick and consistent testing. An optional controller can be added for GPIB, RS232 or analog programming for completely automated testing applications. The interface is a plug-in card that can change the 6400 from a manual unit to a computer-controlled system AC power source.



With the small 5.25 inches height packaged (6404 & 6408), and lightweight, the model 6400 is perfectly suitable for bench top applications where space is at a premium. The easy to use and easy to read front panel control/readout system makes setup and quick measurements simple. The front panel receptacles can be used for most line cord plugs without adapters. Rear panel terminals are also provided for hard-wired connections. A temperature controlled fan speed circuit is used to keep fan noise reduced when operating on the bench or in a quiet lab environment. The 6400 Series can also be easily rack-mounted without special mounting kits or modifications.

The wide output voltage range of 0-300 VAC (0-500VAC for Model 6460) can be selected for either 0-150 VAC or 0-300 VAC, or set to auto-ranging output voltage. The 45-1000 Hz output frequency range provides excellent flexibility in a small compact unit with a great performance / cost ratio. The programmable current limit adds to the flexibility while reducing current flow potential for non-destructive testing easily.

The 6400 Series provides a self-diagnostic routine, easy to set programmable output over voltage limit, input line under voltage protection, output overpower, over current, over temperature, and fan failure protection.

The 6400 Series offers quality, reliability, and flexibility for the most demanding applications in production tests, R&D, and QA verification.

## APPLICATIONS



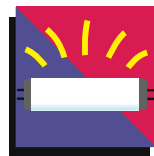
IEC standard compliance testing



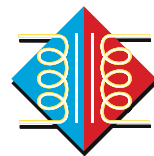
PC & monitor testing



Servo motor, synchro motor testing



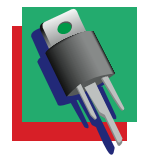
AC ballast testing



Transformers testing



Relays, switches testing



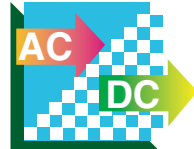
TRIACs, SCRs & passive components testing



Product safety testing



UPS function & environmental testing



Power supply input function & environmental testing



Air conditioner testing



Avionics testing of military & aircraft

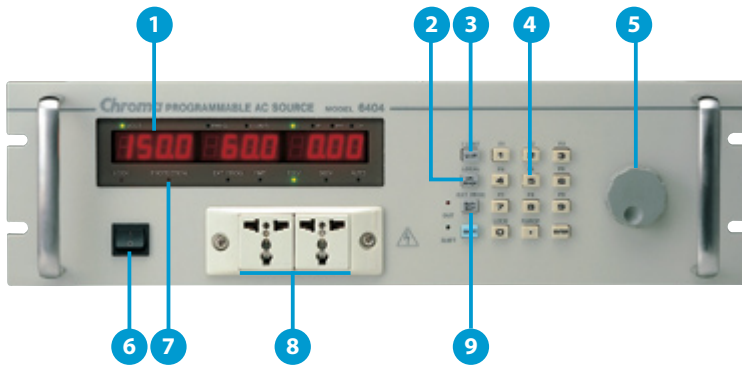


Breakers, fuses testing



Lamp circuit testing

## PANEL DESCRIPTION



1. Measurement item indicators
2. Select measurement items of current, power factor, or crest factor
3. Set output voltage, frequency, and current limit
4. Data setting and function keys
5. Rotary knob for adjusting output setting
6. Power switch
7. Status indicators
8. Universal output socket
9. Output enable and disable

## SPECIFICATIONS

Model	6404*	6408*	6415	6420	
Output / Phase	1	1	1	1	
<b>Output Ratings</b>					
Power / Phase	375VA	800VA	1500VA	2000VA	
<b>Voltage</b>					
Range / Phase	150V/300V/Auto				
Accuracy	0.2% F.S. for freq. $\leq$ 200Hz, 0.4% F.S. for freq. > 200Hz		0.2% + 0.2% of F.S.		
Resolution	0.1V	0.1V	0.1V	0.1V	
Distortion	typical. 0.3% for freq. $\leq$ 200Hz, 0.8% for freq. > 200Hz		0.5% for (45-500Hz), 1% for (> 500-1kHz)		
Line Regulation	0.1%	0.1%	0.1%	0.1%	
Load Regulation	0.1%	0.1%	0.1%	0.1%	
Temp. Coefficient	0.02% per °C				
Max. current	rms	2.5A/1.25A	5.33A/2.67A	15A/7.5A	20A/10A
	peak	7A/3.5A $\leq$ 100Hz 5.5A/12.75A > 100Hz	14.92A/7.47A $\leq$ 100Hz 7.47A/5.87A > 100Hz	45A/22.5A $\leq$ 100Hz (45-100Hz) 37.5A/18.75A (> 100-1kHz)	60A/30A (45-100Hz) 50A/25A (> 100-1kHz)
<b>Frequency</b>					
Range	45-500Hz	45-500Hz	45-1000Hz	45-1000Hz	
Accuracy	0.1%	0.1%	0.1%	0.1%	
Resolution	0.1Hz	0.1Hz	0.1Hz	0.1Hz	
<b>Input Ratings</b>					
Voltage Range	90-132V / 180-250V	90-132V (6408-1), 180-250V (6408-2)	190-250V, 1 $\emptyset$	190-250V, 1 $\emptyset$	
Frequency Range	47-63Hz	47-63Hz	47-63Hz	47-63Hz	
Current	7.5A max.	12A max.(6408-1), 6A max. (6408-2)	12A max.	15A max.	
Power Factor	0.8 typical.	0.98 min.	0.95 min.	0.97 min.	
<b>Measurement</b>					
<b>Voltage / Phase</b>					
Range	0-150V/0-300V	0-150V/0-300V	0-150V/0-300V	0-150V/0-300V	
Accuracy (rms)	0.1% + 0.1% F.S.		0.25% + 0.1% F.S.		
Resolution	0.1V	0.1V	0.1V	0.1V	
<b>Current / Phase</b>					
Range (peak)	0-2A/2-10A	0-4A/4-20A	0-70A	0-100A	
Accuracy (rms)	0.5% + 0.2% F.S.	0.5% + 0.2% F.S.	0.4% + 0.2% F.S.	0.4% + 0.15% F.S.	
Resolution	0.01A	0.01A	0.01A	0.01A	
<b>Power / Phase</b>					
Range	0-375W	0-800W	0-1500W	0-2000W	
Accuracy	0.5% F.S.	0.5% F.S.	1% F.S. (CF<6)	1% F.S. (CF<6)	
Resolution	0.1 W	0.1 W	0.1 W for P<1000W, 1W for P>1000W		
<b>Frequency</b>					
Range	45-500Hz	45-500Hz	45-1000Hz	45-1000Hz	
Accuracy	0.02%	0.02%	0.02%	0.02%	
Resolution	0.1Hz	0.1Hz	0.1Hz	0.1Hz	
<b>Others</b>					
Efficiency	75% typical	80% typical	80% typical	80% typical	
Protection	UVP, OVP, OCP, OPP, OTP, Short				
Safety & EMC	CE (Include LVD and EMC Requirement)				
Dimension (H x W x D)	133.35 x 482.6 x 471.4 mm / 5.25 x 19 x 18.56 inch		221.5 x 425 x 567 mm / 8.72 x 16.73 x 22.32 inch		
Weight	18 kg / 39.65 lbs	23 kg / 50.66 lbs	23 kg / 50.66 lbs	27 kg / 59.47 lbs	

\*The 6408 has been discontinued and is no longer available.

## SPECIFICATIONS

Model	6430	6460	6463	6490
<b>Output / Phase</b>	1	1 (parallel or series)	1 or 3 selectable	1 or 3 selectable
<b>Output Ratings</b>				
<b>Power / Phase</b>	3000VA	6000VA	2000VA	3000VA
<b>Voltage</b>				
Range / Phase	150V/300V/Auto	150V/300V(parallel), 300V/500V(series)	150V/300V	150V/300V
Accuracy	0.2% + 0.2% of F.S.	0.2% + 0.2% of F.S.	0.2% + 0.2% of F.S.	0.2% + 0.2% of F.S.
Resolution	0.1V	0.1V	0.1V	0.1V
Distortion	0.5% for (45-500Hz), 1% for (> 500-1KHz)	1%	1%	1%
Line Regulation	0.1%	0.1%	0.1%	0.1%
Load Regulation	0.1%	0.2%(series), 0.8% (parallel)	0.2%(3 phases), 0.8% (1 phase)	0.2%(3 phases), 0.8% (1 phase)
Temp. Coefficient	0.02% per °C	0.02% per °C	0.02% per °C	0.02% per °C
<b>Max. current -rms / Phase</b>	30A/15A	60A/30A/15A (150V/300V/500V)	20A/10A (150V/300V)	30A/15A (150V/300V)
Peak Current/ phase-crest-factor	3(45-100Hz), 2.5(>100-1KHz)	180A/90A/45A (45-100Hz), 150A/75A/38A (>100-1kHz)	60A/30A (45-100Hz), 50A/25A (>100-1kHz)	90A/45A (45-100Hz), 75A/38A (>100-1kHz)
<b>Frequency</b>				
Range	45-1000Hz	45-1000Hz	45-1000Hz	45-1000Hz
Accuracy	0.1%	0.15%	0.15%	0.15%
Resolution	0.1Hz	0.01Hz (45-99.9Hz), 0.1Hz (100-999.9Hz)		
<b>Input Ratings</b>				
<b>Voltage Range</b>	190-250V, 1Ø	190-250V, 3Ø	190-250V, 3Ø	190-250V, 3Ø
<b>Frequency Range</b>	47-63Hz	47-63Hz	47-63Hz	47-63Hz
<b>Current</b>	23A max.	23A max./phase	15A max./phase	23A max./phase
<b>Power Factor</b>	0.98 min.	0.98 min. under full load	0.97 min. under full load	0.98 min. under full load
<b>Measurement</b>				
<b>Voltage / Phase</b>				
Range	0-150V/0-300V	0-150V/0-300V	0-150V/0-300V	0-150V/0-300V
Accuracy (rms)	0.25% + 0.1% F.S.	0.25% + 0.1% F.S.	0.25% + 0.1% F.S.	0.25% + 0.1% F.S.
Resolution	0.1V	0.1V	0.1V	0.1V
<b>Current / Phase</b>				
Range (peak)	0-140A	0-280A	0-100A	0-140A
Accuracy (rms)	0.4% + 0.1% F.S.	0.4% + 0.1% F.S.	0.4% + 0.15% F.S.	0.4% + 0.1% F.S.
Resolution	0.01A	0.01A	0.01A	0.01A
<b>Power / Phase</b>				
Range	0-3000W	0-3000W	0-2000W	0-3000W
Accuracy	1% F.S. (CF<6)	1% F.S. (CF<6)	1% F.S. (CF<6)	1% F.S. (CF<6)
Resolution	0.1 W for P<1000W, 1W for P>1000W	0.01 W	0.01 W	0.01 W
<b>Frequency</b>				
Range	45-1000Hz	45-1000Hz	45-1000Hz	45-1000Hz
Accuracy	0.02%	0.01%+2 count	0.01%+2 count	0.01%+2 count
Resolution	0.1Hz	0.01Hz	0.01Hz	0.01Hz
<b>Others</b>				
<b>Efficiency</b>	80% typical	80% typical	80% typical	80% typical
<b>Protection</b>	UVP, OVP, OCP, OPP, OTP, Short	OPP, OLP, OTP, FAN Fail		
<b>Safety &amp; EMC</b>	CE (Include LVD and EMC Requirement)			
<b>Dimension (H x W x D)</b>	221.5 x 425 x 567 mm / 8.72 x 16.73 x 22.32 inch	765.94 x 546 x 700 mm / 30.16 x 21.5 x 27.56 inch*1	990 x 546 x 700 mm / 38.98 x 21.5 x 27.56 inch*1	990 x 546 x 700 mm / 38.98 x 21.5 x 27.56 inch*1
<b>Weight</b>	27 kg / 59.47 lbs	107 kg / 235.68 lbs	156 kg / 343.61 lbs	156 kg / 343.61 lbs

**Note\*1** : For dimension including the wheel set, please add 80mm to overall height.

## ORDERING INFORMATION

- 6404** : Programmable AC Source 0~300V / 45~500Hz / 375VA Discontinued
- 6408-1** : Programmable AC Source 0~300V / 45~500Hz / 800VA (input rating 90-132V)
- 6408-2** : Programmable AC Source 0~300V / 45-500Hz / 800VA (input rating 180-250V)
- 6415** : Programmable AC Source 0~300V / 45~1000Hz (1500VA)
- 6420** : Programmable AC Source 0~300V / 45~1000Hz (2000VA)
- 6430** : Programmable AC Source 0~300V / 45~1000Hz (3000VA)
- 6460-2** : Programmable AC Source 0~300V / 45~1000Hz (6000VA), output 1Ø, input 3Ø 220V
- 6460-3** : Programmable AC Source 0~300V / 45~1000Hz (6000VA), output 1Ø, input 3Ø 380V
- 6463-2** : Programmable AC Source 0~300V / 45~1000Hz (6000VA), output 1Ø or 3Ø Selectable, input 3Ø 220V
- 6463-3** : Programmable AC Source 0~300V / 45~1000Hz (6000VA), output 1Ø or 3Ø Selectable, input 3Ø 380V
- 6490-2** : Programmable AC Source 0~300V / 45~1000Hz (9000VA), output 1Ø or 3Ø Selectable, input 3Ø 220V
- 6490-3** : Programmable AC Source 0~300V / 45~1000Hz (9000VA), output 1Ø or 3Ø Selectable, input 3Ø 380V
- A650001** : Remote Interface for Model 6415 / 6420 / 6430 / 6500 Series (External V Input, RS-232 Interface, GPIB Interface)
- A640003** : Remote Interface for Model 6404 / 6408 Series (External V Input, RS-232 Interface, GPIB Interface)
- A640004** : Softpanel for Model 6400 Series
- A610004** : Universal Socket Center for Model 6415 / 6420 / 6430 Series

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