

# The Best Choice for Grid Abnormal Simulation

Not only provide simulation for standard voltage and frequency, Preen's AFV-P series can also simulate sags, surges, dropouts and spike of mains supply, covering various power conditions and verification items. Featured with DC output and outstanding output performance, AFV-P series has been widely used in motor, home appliance, military, aircraft and power module industries.

**9 Times Inrush Current\***

Ideal for the loads which have high start inrush current

**Output Frequency Up to 2000 Hz**

Suitable for Defense and Military industries

**THD  $\leq$  0.3%**

High Output Performance

- **Power Line Disturbance Simulation (PLD)** for Pre-compliance Tests of IEC-61000-4-11/14/28 etc.
- **Multi-application** Widely Use in Home Appliances, Laboratories, Motors. It's Also Suitable for Renewable Energy, EV, and Lighting.
- **LED Dimming** Easily Set Up Leading Edge Dimming or Trailing Edge Dimming by TRIAC Dimmer Simulation.
- **Output Voltage Up to 1240V** To meet the high voltage requirements on simulations of wide input voltage variations, over-voltage and other extreme conditions.



Your contact:

**Schulz Electronic**  
Professional Power Supplies

Schulz-Electronic GmbH  
Dr.-Rudolf-Eberle-Straße 2  
D-76534 Baden-Baden  
Fon + 49 7223 9636-0  
Fax + 49 7223 9636-90  
vertrieb@schulz-electronic.de  
www.schulz-electronic.de

# High Performance Programmable AC Power Source



Preen's AFV-P series is a programmable AC power source with DC output and precision measurement. This compact power source provides clean power with THD less than 0.3% at 5-100 Hz and it delivers output voltage of 0-310 V and frequency of 15-1000 Hz (opt. 5-2000 Hz). It is ideal for commercial, defense and aerospace test applications from design verification, quality assurance, ATE to mass production.

AFV-P series comprises measurement features of rms voltage, rms current, true power, apparent power, power factor, crest factor, reactive power and etc. Its 5" touch screen with rotary knob allows quick adjustments and configurations of voltage, current and frequency. Total 1200 test steps in 50 built-in memories and transient generation functions allow simulations of voltage variations, surges, drops and frequency disturbances. Users can set up starting and ending phase angle from 0 - 359 degrees and they can also remotely control AFV-P series via standard interfaces. Free control software and LabVIEW driver are available for easy programming and remote control.

## Product Features

- Compact and high power density: 600VA to 2500VA is only 2U and 5000VA is 4U.
- Capable to simulate immunity regulations such as IEC-61000-4-11/14/28.
- THD is only under 0.3 % when output frequency is under 100Hz.
- Easy set up for voltage, frequency, current and other parameters via 5" touch panel and rotary knob.
- TRANSIENT generation provides users an easy setup for power line disturbance (PLD) simulation.
- Start/End phase angle: users can define the start and end phase angle from 0° to 359°.
- Current foldback feature: have output current maintain constant based on the load which output voltage varies.
- Fast response time: less than 300  $\mu$ s from 0~90% output voltage.
- Free control software and LabView driver.
- Complied with IEC61000-3-2 Electromagnetic Compatibility Requirements which making the AFV-P series ideal for various applications.

## Output Power

### 600VA~5kVA

## Interfaces

Standard	<b>RS-232</b>	<b>RS-485</b>
	<b>Ethernet</b>	<b>USB</b>
Option	<b>GPIO</b>	<b>Analog</b>

## Applications

- Home Appliance
- Laboratory/Certification Bureau
- Industrial Power Supply
- Electric Vehicles
- Motor & Compressor
- IT / SMT Production Line
- Aerospace & Defense
- Transportation

## QR Code

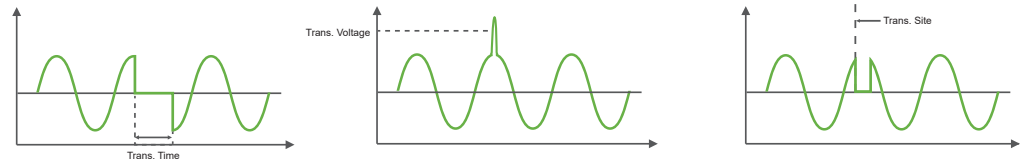


Product  
Info.



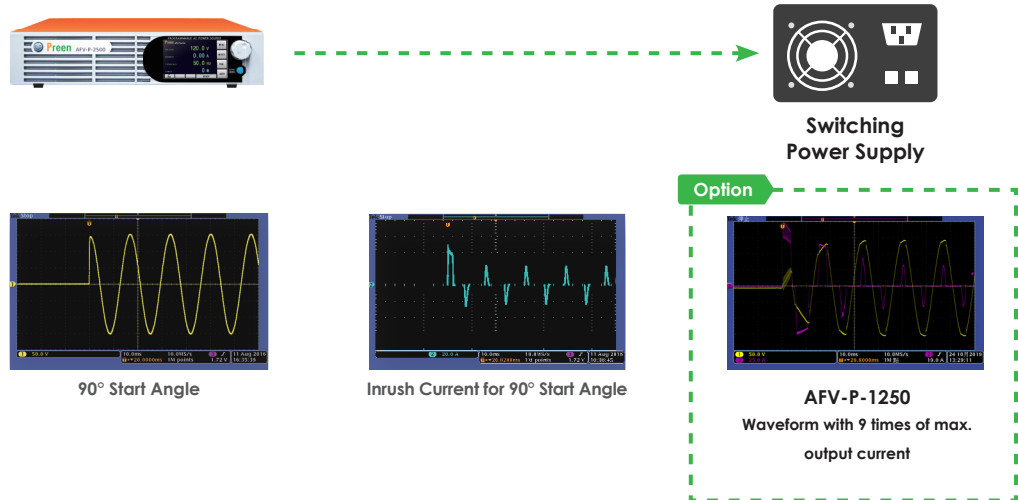
Product  
Video

## Transient Simulation



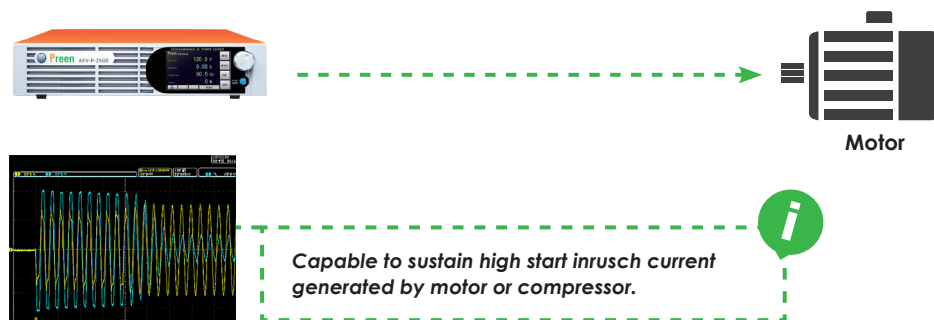
Through the Transient feature, user can have more control over the waveform by inserting disturbance at user-defined locations with user-defined drop/rise range. This is a useful feature to simulate different pre-compliance tests and various types of power line disturbance, such as surge, sag, spike and dropout, for immunity tests.

## High Inrush Current EUT & Start / End Angle Setting



For switching supply (rectified load), AFV-P series provides standard inrush current as 4.5 times of max. output current and the AFV-P-600 and AFV-P-1250 have optional 9 times of max. output current, which makes AFV-P series the lowest capacity in the market that can achieve the highest inrush current. Moreover, the AFV-P series allows users to set the start angle/end angle for the product output, which is suitable for testing switching power supplies.

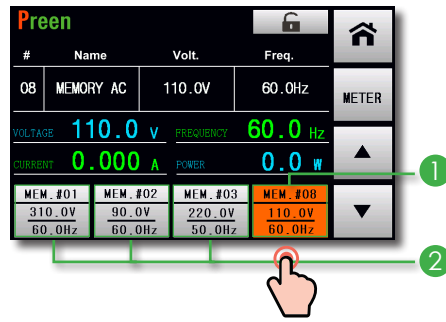
## Motor Type Testing



Video

AFV-P series can provide up to 4.5/opt. 9 times of peak current from its maximum rated current, which is ideal for inrush current tests, such as electric motor tests. Likewise, AFV-P series is capable to sustain high start inrush current generated by motors or compressors. The user doesn't have to buy high-capacity power supplies just in keeping with the high inrush current characteristic of the loads. Reduce the costs and save the space.

### Intuitive Touch Screen Control & 4 Groups of Hot keys



To create a complex sequence on the HMI is no longer a difficult task for AFV-P series. The 5 inches touch screen provides users a clear display and an easy set up. AFV-P series can display 4 shortcuts of Memory Sets, and the voltage and frequency setting of each Memory Sets can be clearly read. The user can quickly switch the output by selecting the shortcuts.

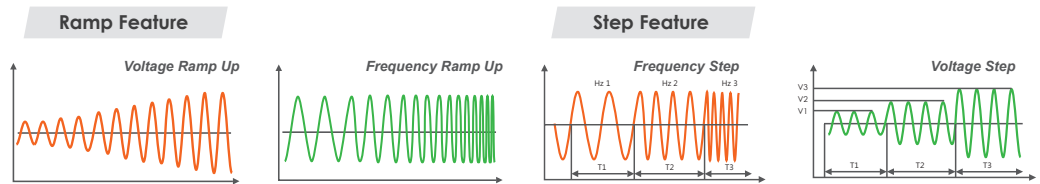
- 1 One user-assigned shortcut from 50 memory sets
- 2 Three fixed shortcuts from first three memory sets

### Multiple Communication Interfaces & Control Software



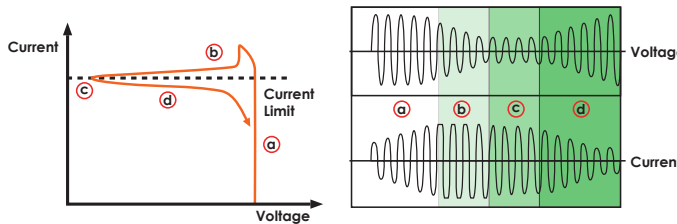
The AFV-P series is equipped with communication interfaces of USB, Ethernet, RS232, and RS485, so users no longer need to spend extra on remote interface card. Only GPIB and Analog are optional interfaces. AFV-P series also provides control software with comprehensive programming features and LabView driver, which help users to easily control the AC source without further needs of programming.

### Programmable Simulation Functions: Step & Ramp Features



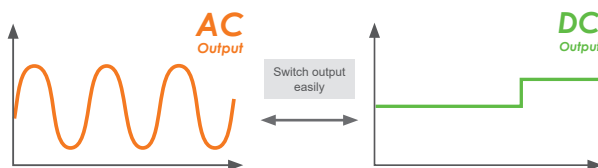
Ramp and Step feature allows users to define slew rate of voltage and frequency at each Step. Users can set the rise/fall time, time unit and voltage/frequency change between Steps to create a wide range of waveform. Additionally, Ramp feature can effectively reduce the inrush current by simulating soft start for motor or compressor startup.

### Over Current Foldback



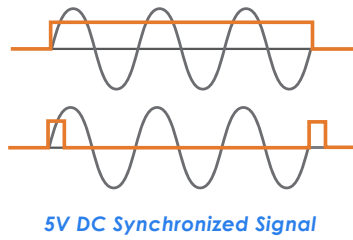
When it comes to over current, AFV-P series offers more than just shutdown protection. Over current foldback enables AFV-P series to maintain the output current at the rated current and correspondingly decrease the output voltage as the load impedance increases. It is an extended protection or an alternative to provide constant current for EUT.

### AC Output & DC Output



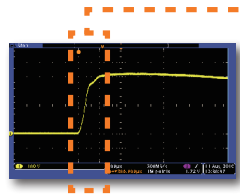
AFV-P series not only provide AC output to simulate real world grid conditions, but can also generate DC output based on user's settings. It is an ideal cost-effective power testing solution for R&D and certification laboratories.

## Synchronized Signal



AFV-P series provides two types of synchronized signal. It can either deliver a 5V DC signal continuously when the product output is on or deliver a 5V DC pulse signal every time there is a change on the product output. This feature makes AFV-P series an ideal AC source when applying with automatic test systems.

## Fast Response & High Stability



Response Time  
**< 300  $\mu$ s**

THD  
**< 0.3%**

Output Frequency  
**5-2000HZ**

AFV-P series is a high performance AC power source with fast response time, low total harmonic distortion and tight voltage regulation. With its technically advanced features, users can easily simulate power line disturbance, such as sags, surges, dropouts and spikes.

## High-Voltage Output 620V/1240V (Opt.)



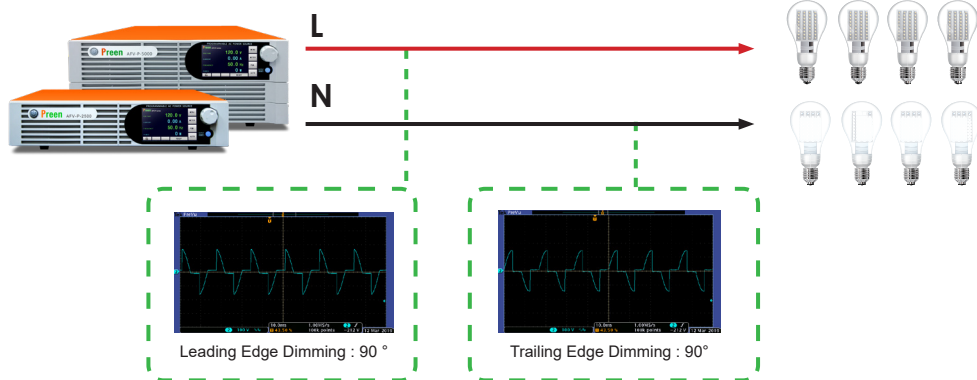
AFV-P-5000 :  
620V/60Hz /6.31A/3916.8W



AFV-P-1250 :  
1000V/60Hz/0.74A/741W

AFV-P series provides optional high-voltage output 620V or 1240V to meet the high voltage requirements on simulations of wide input voltage variations (15%~20%), over-voltage and other extreme conditions. For example, it can simulate US 277V with at least 15% and other wider range of over-voltage testing.

## LED TRIAC Dimmer (Opt.)

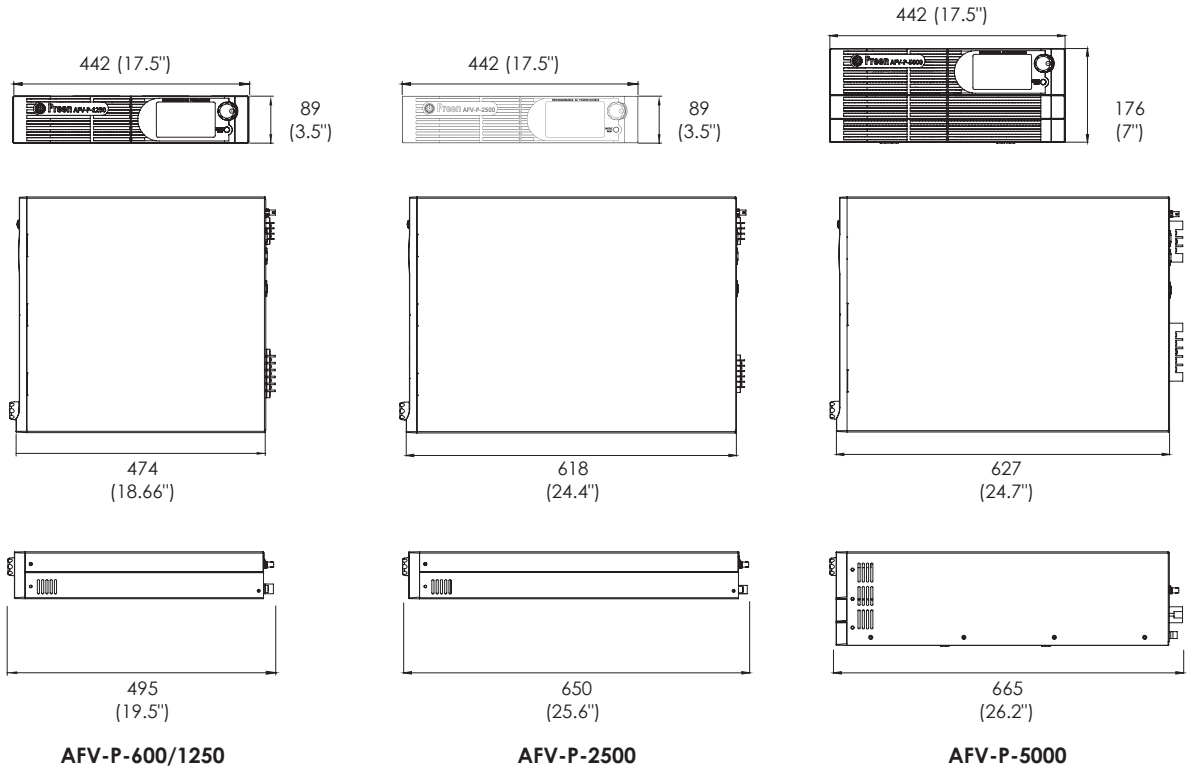


Video

AFV-P series provides optional LED TRIAC Dimmer function, which can simulate output of TRIAC dimmer. The user can select whether to perform LEADING EDGE DIMMING or TRAILING EDGE DIMMING via HMI. Compared with traditional TRIAC dimming, the output waveform can be controlled more accurately and effectively.

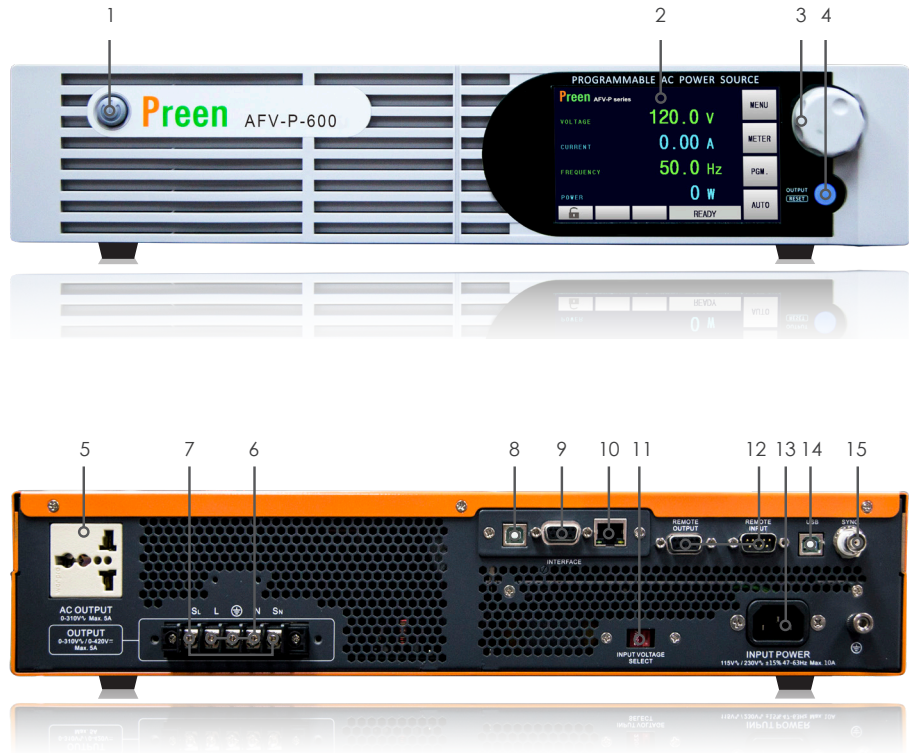
## DIMENSIONS

Unit : mm ( inch )



## PANEL DESCRIPTION

1. Power Switch
2. Touch Screen HMI
3. Rotary Knob
4. Output / Reset Button
5. AC Output Socket
6. Output Terminals
7. Remote Sense Terminal
8. USB Interface
9. RS-232 / RS-485
10. Ethernet Interface
11. Input Voltage Selector
12. PLC Remote In/Out
13. Input Socket \*
14. USB Interface (for firmware update)
15. Sync. Signal I/O



\* AFV-P-1250, AFV-P-2500, AFV-P-5000 have input terminals.

## SPECIFICATIONS

### AFV-P Series Single-Phase Output (600VA - 5kVA)

Model	AFV-P-600	AFV-P-1250	AFV-P-2500	AFV-P-5000	
<b>INPUT</b>					
Phase	1Ø / 2 Wire + G				
Voltage	98-132VAC / 196-264VAC		196-264VAC( opt. 175-235VAC )		
Frequency	47 - 63 Hz (opt. 400Hz)				
Max. Current	10A	20A	20A	40A	
<b>OUTPUT</b>					
Power	VA	600VA	1250VA	2500VA	5000VA
	W	500W	1000W	2000W	4000W
Phase	1Ø / 2 Wire + G				
Voltage Ranges	0 - 155Vrms / 0 - 310Vrms, user selectable				
Voltage Accuracy	± ( 0.5 % of setting + 0.1% F.S.)				
Voltage Resolution	0.1Vrms				
Frequency <sup>2</sup>	A : 5-2000Hz , B : 15-1000Hz				
Frequency Accuracy	±0.02%				
Frequency Resolution	0.1Hz, 1Hz				
Max. Current (RMS)	5A / 2.5A	10A / 5A	20A / 10A	40A / 20A	
Max. Current (Peak)	22.5A / 11.3A	45A / 22.5A	90A / 45A	180A / 90A	
Total Harmonic Distortion (THD)	≤ 0.3% at 5~100Hz , ≤ 0.5% at 101~500Hz , ≤ 0.8% at 501~1000Hz, ≤ 1.5% at 1001~1500Hz, ≤ 2% at 1501~2000Hz (Resistive Load)				
Line Regulation	± 0.1V				
Load Regulation	≤ 0.07% F.S. (Resistive Load)				
Response Time	≤ 300µs				
Crest Factor	≥ 3				
Inrush Current	≥ 4.5 times of max.output current ( R.M.S )				
<b>DC OUTPUT</b>					
Power	500W	1000W	2000W	4000W	
Voltage Ranges	0 - 210V / 0 - 420V				
Max. Current	2.5A / 1.25A	5A / 2.5A	10A / 5A	20A / 10A	
Ripple & Noise (RMS)	≤ 0.15%		≤ 0.24%		
<b>MEASUREMENT</b>					
Voltage Range	0 - 420Vrms				
Voltage Accuracy	±(0.2% of reading + 5 counts)				
Voltage Resolution	0.1V				
Frequency Range	5 - 2000Hz				
Frequency Accuracy	±0.1Hz at 5.0 - 500Hz, ±0.2Hz at 501 - 2000Hz				
Frequency Resolution	0.1Hz				
Current Range	Hi: 1 - 12A / Lo: 0.005 - 1.2A		Hi: 2 - 24A / Lo: 0.005 - 2.4A	Hi: 0.05A - 48.00A	
Current Accuracy <sup>*1</sup>	±(1% of reading + 5 counts) at 5.0 - 500Hz, ±(1% of reading + 10 counts) at 501 - 2000Hz				
Current Resolution	Hi: 0.01A / Lo: 0.001A		Hi: 0.01A		
Peak Current Range	0 - 45A		0 - 90A	0 - 180A	
Peak Current Accuracy	±(1% of reading + 5 counts) at 5.0 - 500Hz, ±(1% of reading + 10 counts) at 501 - 2000Hz			± ( 1% F.S.+ 5 counts )	
Peak Current Resolution	0.1A				
Power Range	Hi: 100 - 1200W / Lo: 0 - 120W		Hi: 200 - 2400W/ Lo: 0 - 240W	Hi: 0 - 4800W	
Power Accuracy	±(2% of reading + 10 counts) @ 5 - 500Hz, ±(2% of reading + 15 counts) @ 501 - 2000Hz				
Power Resolution	Hi: 1W / Lo: 0.1W		Hi: 1W		
<b>GENERAL</b>					
Efficiency	≥ 77% at max. power		≥ 80% at max. power		
Protection	OVP, OCP, LVP, OPP, OTP, RCP, Fan Fail and AMP Fail				
Remote Interface	Standard: RS232 / RS485 / Ethernet / USB / PLC Remote In&Out, Option:GPIB / Analog Control				
Over Current Foldback	Output Current maintains constant based on the load while output voltage varies				
Output Sync Signal	ON, Event for Voltage or Frequency Change (Output signal 5V , BNC type)				
Memories	50 Memories & 1200 Steps (24 Steps/Memory) 50 Memories, 4 Hot keys (The last hot key can be adjusted)				
Operating Temperature	0°C - 40°C				
Dimensions(HxWxD)	89 x 442 x 495mm		89 x 442 x 650mm	176 x 442 x 665mm	
	3.5 x 17.4 x 19.5inch		3.5 x 17.4 x 25.6inch	6.9 x 17.4 x 26.2inch	
Weight	16kg	20kg	31.3kg	61.5kg	
	35.3lbs	44.1lbs	69lbs	135.6lbs	

\* 1 AFV-P-2500 is ±(1% F.S. + 5 counts) \* 2 For type A: 5-2000Hz, please contact us for output power characteristic curve.

\* All specifications are subject to change without notice.

## ORDERING INFORMATION

### AFV-P Series Single-Phase Output (600VA - 5kVA)

Model Number	Description
AFV-P-600A	High Performance Programmable AC Power Source( 600VA/310V/5-2000Hz )
AFV-P-1250A	High Performance Programmable AC Power Source( 1.25kVA/310V/5-2000Hz )
AFV-P-2500A	High Performance Programmable AC Power Source( 2.5kVA/310V/5-2000Hz )
AFV-P-5000A	High Performance Programmable AC Power Source( 5kVA/310V/5-2000Hz )
AFV-P-600B	High Performance Programmable AC Power Source( 600VA/310V/15-1000Hz )
AFV-P-1250B	High Performance Programmable AC Power Source( 1.25kVA/310V/15-1000Hz )
AFV-P-2500B	High Performance Programmable AC Power Source( 2.5kVA/310V/15-1000Hz )
AFV-P-5000B	High Performance Programmable AC Power Source( 5kVA/310V/15-1000Hz )
AFV-P-T620A	620V Transformer Box( AFV-P-600 & AFV-P-1250 )
AFV-P-T620B	620V Transformer Box( AFV-P-2500 )
AFV-P-T620C	620V Transformer Box( AFV-P-5000 )
AFV-P-T1240A	1240V Transformer Box( AFV-P-600 & AFV-P-1250 )
AFV-P-T1240B	1240V Transformer Box( AFV-P-2500 )
AFV-P-T1240C	1240V Transformer Box( AFV-P-5000 )
AFV-P-001	RS-232/RS-485/USB/Ethernet Interface
AFV-P-002	GPIB Interface
AFV-P-003	Analog Control Interface
AFV-P-004	RS232 Cable (1.8m / Female to Male)
AFV-P-008	Input Power Cable 1.8M (for 600VA)
AFV-P-009	Input Power Cable 3M (for 1.25kVA/2.5kVA)
AFV-P-010	Input Power Cable 5M (for 5kVA)
AFV-P-011	Input 400Hz (at input 110V/220V $\pm 10\%$ )
AFV-P-012	Output 320V (at input 110V/220V $\pm 10\%$ )
AFV-P-013	LED TRIAC Dimmer Simulation
AFV-P-014	Output 9 Times of Inrush Current (AFV-P-600 & AFV-P-1250)

Your contact:




  
**Schulz-Electronic GmbH**  
 Dr.-Rudolf-Eberle-Straße 2  
 D-76534 Baden-Baden  
 Fon + 49.7223.9636.0  
 Fax + 49.7223.9636.90  
 vertrieb@schulz-electronic.de  
 www.schulz-electronic.de