

AFV-P series

Preen®

High Performance Programmable AC Power Source



i Intuitive Touch Screen HMI

- ▼ Output Frequency up to **15-1000Hz**
- ▼ AC Source with DC output **AC & DC**
- ▼ Transient Generation for Disturbance Tests
- ▼ Multiple Simulation Functions
- ▼ 600VA to 5kVA only in 2U or 5U
- ▼ Complete Interface Options: RS232 / RS485 / Ethernet / USB / GPIB
- ▼ Fast Response Time: $\leq 300\mu\text{s}$
- ▼ Low THD: $\leq 0.3\%$ at $<100\text{Hz}$
- ▼ User-friendly Control Software

High Performance Programmable AC Power Source

Preen AFV-P series is a programmable AC power supply featuring DC output capability and precision measurement. This compact power source comes in four power levels, 600VA, 1250VA, 2500VA and 5000VA, providing clean power with distortion less than 0.3% at 50/60Hz. It delivers output voltage 0-310VAC and frequency 40-500 Hz (opt. 15-1000 Hz). The AFV-P is ideal for commercial, defense and aerospace test applications from design verification, quality assurance, ATE to mass production.

With a total of 1200 Steps in 50 built-in Memories, users can easily use the AFV-P for testing various voltage and frequency combinations to simulate global AC power conditions or by adding Transient feature, extreme grid fluctuations, such as surge, sag, spikes and dropouts, can easily be configured. Having the state-of-the-art PWM technology, the AFV-P series is capable of delivering up to 4.5 times of peak current from its max. rated current that makes it ideal for inrush current test. Users can define the starting and ending phase angle from 0 to 360 degrees.

The 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. Users can also remotely control the AC source via standard interfaces of USB, RS232/RS485, LAN or optional GPIB and analog control. Free control software and LabVIEW driver are available for easy programming and remote control.

- **Compact & High Power Density**

2U/5U 2U: 600VA / 1250VA / 2500VA
5U: 5000VA

- **Ideal for Inrush Current Applications**

4.5 peak/rms Capable of delivering up to 4.5 times of peak current from RMS current

- **Low Distortion (THD)**

≤0.3% THD is only <0.3% when output is <100Hz

- **AC Source with DC Output**

DC Extend the applications to DC testing

- **Wide Output Voltage & Frequency**

0-310V **15-1000Hz**

- **Pre-compliance Tests**

IEC-61000-4-11 AFV-P is an ideal solution for pre-compliance tests.

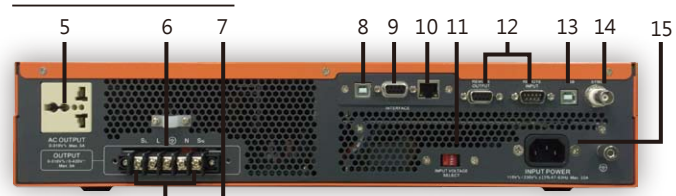
PANEL DESCRIPTION

- | | |
|-----------------------|---|
| 1. Power Switch | 10. RS232 / RS485 |
| 2. Touch Screen HMI | 11. Input Voltage Selector |
| 3. Rotary Knob | 12. PLC Remote In/Out |
| 4. Output / Reset | 13. USB Interface (for firmware update) |
| 5. AC Output Socket | 14. Sync. Singal I/O |
| 6. Output Terminals | 15. Input Socket * |
| 7. Remote Sense | |
| 8. USB Interface | |
| 9. Ethernet Interface | |

Front Panel Overview



Rear Panel Overview

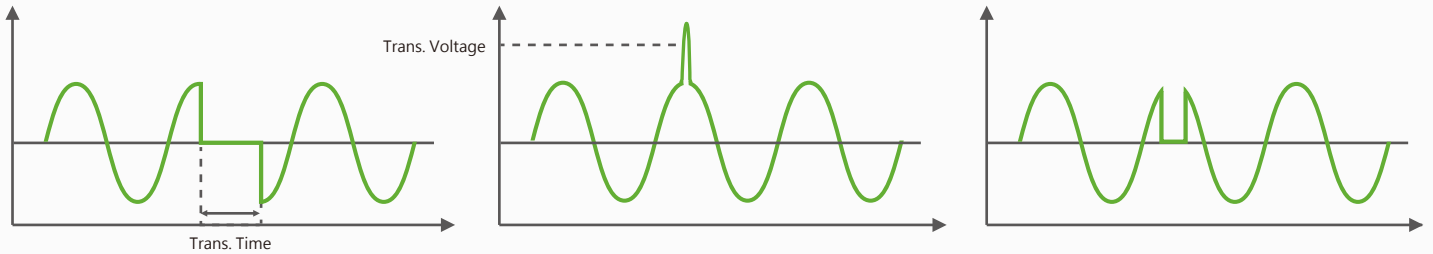


* AFV-P-1250, AFV-P-2500, AFV-P-5000 have input terminals.

Maximize your devices' reliability with Preen's AFV-P series programmable AC source.



Programmable Simulations: Transient Feature



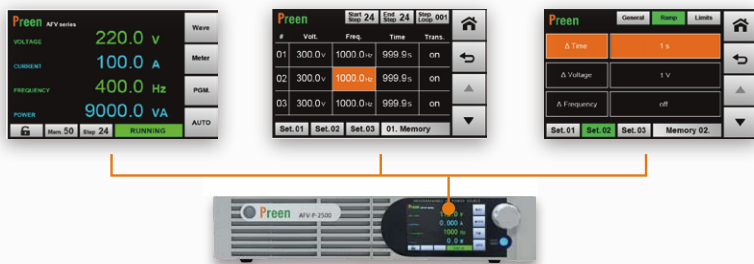
Through the Transient feature, user can have more control over the waveform by inserting disturbance at user-defined locations with user-defined drop/rise range. This is a useful feature to simulate different pre-compliance tests and various types of power line disturbance, such as surge, sag, spike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

Complete 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 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.

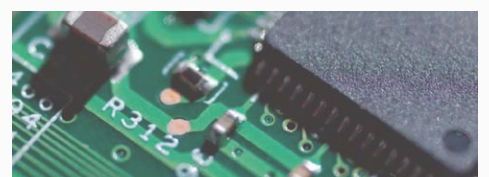
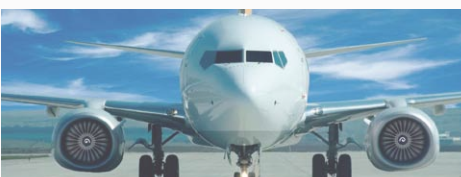
Intuitive Touch Screen Control



To create a complex sequence on the local control HMI is no longer a difficult task for AFV-P series. The 5 inches touch screen provides users a clear measurement display and an easy set up for parameters. AFV-P is also equipped with a rotary knob for better fine tune adjustments. Touch screen lock is available to avoid maloperation.

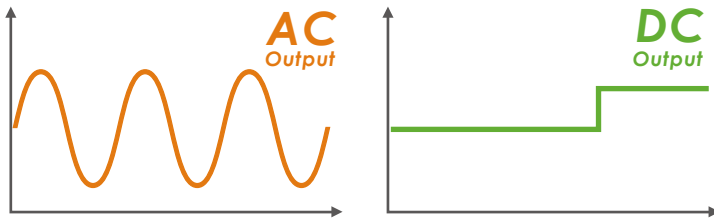
Wide Applications

AFV-P is ideal for power adapters testing by varying frequency and voltage during manufacturing test to represent different real-world grid conditions. AFV-P's output frequency can go up to 1000Hz, which is suitable to test avionic devices with 400Hz or 800Hz. The power line disturbance features, such as Step, Ramp, or Transient, allow the user to build a wide range of waveforms in a sequence to simulate grid faults and fluctuations, and these can also be easily configured by control software of AFV-P.



Key Features of AFV-P Series

AC Output & DC Output

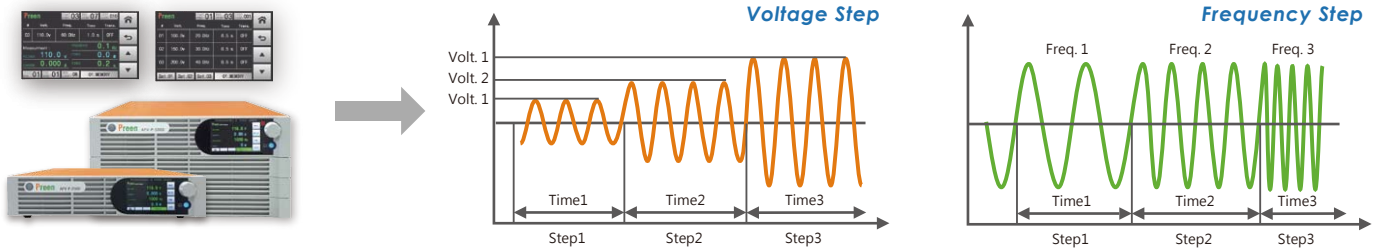


The AFV-P series not only provide AC output to simulate real-world grid conditions, but also can generate DC output based on user's settings. This DC output feature extends the applications to DC component testing and help user to effectively reduce the cost of purchasing another DC power supply. It is a ideal power testing solution for R&D and certification laboratories.

Programmable Simulation Functions: Step & Ramp Features

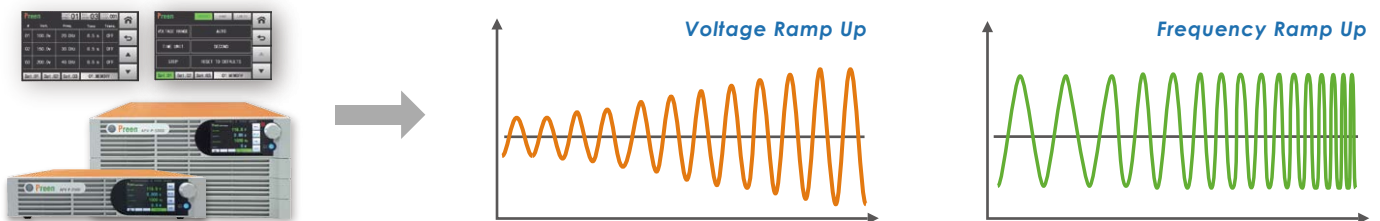
Step Feature

Through AFV-P's intuitive programmable feature settings page, user can create complex sequences by linking up to 1200 self-defined Steps in 50 Memories. Each Step's voltage, frequency and hold time can be defined independently, and users can set start Step and end Step to simulate grid voltage fluctuations or ON/OFF test. Because of its fast response time, AFV-P can finish the Step change in less than a cycle and provide user a reliably AC power simulation.



Ramp Feature

Ramp feature allows users to define slew rate of voltage and frequency at each Step. Users can set the rise/fall time, unit of time and voltage/frequency change between Steps to create a wide range of waveform. Additionally, Ramp feature can also effectively reduce the inrush current during motor or compressor startup by decreasing the slew rate, and save the cost on selecting an AC source with much higher output power for inductive-type loads.



Over Current Foldback

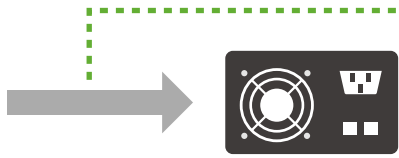
When it comes to over current, AFV-P series offers more than just output shutdown protection. Over current foldback feature enables AFV-P to maintain the output current at the set current limit value and decrease the output voltage as the load impedance increases. It is an extended protection feature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

Remote Sense Feature

AFV-P's remote sensing feature provides voltage drop compensation when it comes to output voltage decrease due to the cable length. AFV-P can automatically correct the reduced voltage and deliver accurate voltage to ensure stable voltage conditions.

Ideal for High Inrush Current EUT & Start / End Angle Setting

Power Supply Testing

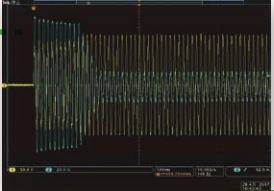
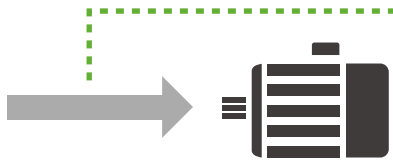


90° Start Angle



Inrush Current for 90° Start Angle

Motor Type Testing



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Capable to sustain high start inrush current generated by motor or compressor.

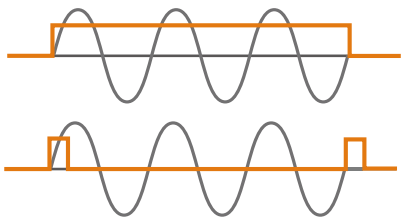
The AFV-P series can provide up to 4.5 times of peak current from its maximum rated current, which is ideal for inrush current test, such as electric motor test. Additionally, the AFV-P series allows user to set the start angle/end angle for the product output, which is suitable for testing switching power supplies.

Waveform Display & Comprehensive Measurement Capability

Through built-in measurement circuitries and advanced firmware design, Preen AFV-P series is capable to provide output waveform display and precise measurements, which help users to have a visual image of waveform and easily browse the readings of RMS voltage, output frequency, RMS current, peak current, apparent power (VA), active power (W), reactive power (VAR), power factor and crest factor. Additionally, the measurement report can be exported via AFV-P's control software to better analyze or track EUT's performance.



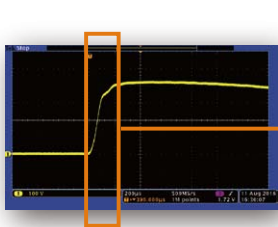
Synchronized Signal



5V DC Synchronized Signal

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

Fast Response & High Stability



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Measurement <math>< 300 \mu s</math>

For tests like sags, surges, dropouts, or spikes, slew rate is a critical factor. AFV-P series is a high performance AC source that has a high slew rate of less than 300 μs from 0~90% output voltage. It allows users to do pre-compliance test such as IEC-61000-4-11 or MIL-STD-704F.

SPECIFICATIONS

Model	AFV-P-600	AFV-P-1250	AFV-P-2500	AFV-P-5000		
INPUT						
Phase	Single					
Voltage	98~132VAC / 196~264VAC		196~264VAC or 175~235VAC			
Frequency	47 Hz - 63 Hz (opt. 400Hz)					
Max. Current	10A	20A	20A	40A		
OUTPUT						
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 Resolution	0.1Vrms					
Frequency	40-500Hz (opt. 15-1000Hz)					
Frequency Resolution	0.1Hz, 1Hz at >100Hz					
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 40-100Hz, ≤0.5% at 101-500Hz, ≤0.8% at 501-1000Hz (Resistive Load)					
Line Regulation	± 0.1V					
Load Regulation	≤0.07% F.S. (Resistive Load)					
Response Time	≤ 300uS					
Crest Factor	≥ 3					
Inrush Current	≥ 4.5 times of max. output current (r.m.s)					
DC OUTPUT						
Power	300W	600W	1250W	2500W		
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%			
MEASUREMENT						
Voltage Range	0 - 420Vrms					
Voltage Accuracy	±(0.2% of reading + 5 counts)					
Voltage Resolution	0.1V					
Frequency Range	15 - 1000Hz					
Frequency Accuracy	±0.1Hz at 40.0 - 500Hz, ±0.2Hz at 501 - 1000Hz					
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	±(1% of reading + 5 counts) at 40.0 - 500Hz, ±(1% of reading + 10 counts) at 501 - 1000Hz *2					
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 40.0 - 500Hz, ±(1% of reading + 10 counts) at 501 - 1000Hz			±(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) @ 40 - 500Hz, ±(2% of reading + 15 counts) @ 501 - 1000Hz					
Power Resolution	Hi: 1W / Lo: 0.1W			Hi: 1W		
GENERAL						
Efficiency	≥ 77% at max. power		≥ 80% at max. power			
Protection	OVP, OCP, LVP, OPP, OTP, RCP, Fan Fail					
Remote Interface	Standard: RS232 / RS485 / Ethernet / USB / PLC Remote In&Out, Optional: GPIB / Analog Control					
Over Current Foldback	CC Mode (Constant Current)					
Output Sync Signal	ON, Event for Voltage or Frequency Change (Output signal 5V , BNC type)					
Memories	50 Memories & 1200 Steps (24 Steps/Memory)					
Operating Temperature	0°C - 40°C					
Dimensions (HxWxD)	89 x 442 x 450 mm		89 x 442 x 600 mm		222.5 x 442 x 600 mm	
Weight	approx. 16 kg		approx. 20 kg		approx. 31.3 kg	approx. 70 kg

*1 All specifications are subject to change without notice.

*2 AFV-P-2500 is ±(1% FS + 5 counts).



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