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## TECHNICAL PRODUCT INFORMATION

### Test & measurement instruments

- high - quality
- moderate prices
- excellent precision

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# 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.



# High Performance Programmable AC Power Source

RoHS  
Compliant

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	RS-232	RS-485
	Ethernet	USB
Option	GPIO	Analog

## Applications

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

## QR Code

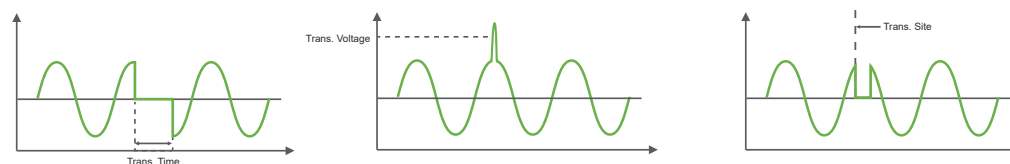


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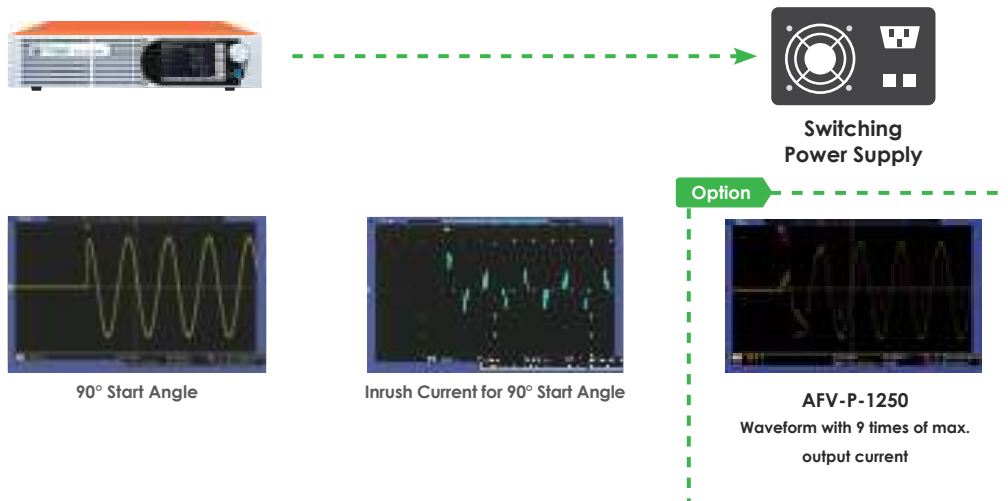
Product  
Video

## Transient Simulation



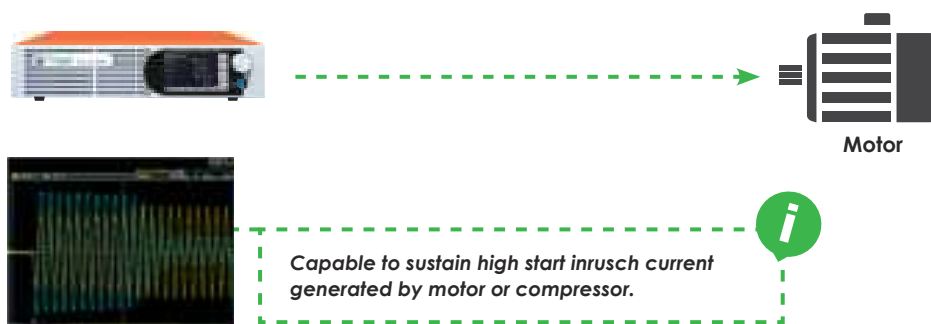
Through the Transient feature, user can have more control over the waveform by inserting disturbance at user-defined locations with user-defined drop/rise range. This is a useful feature to simulate different pre-compliance tests and various types of power line disturbance, such as surge, sag, spike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

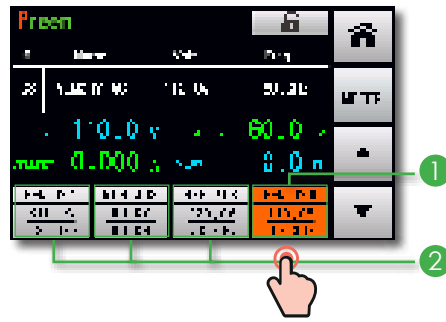
## Motor Type Testing



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.

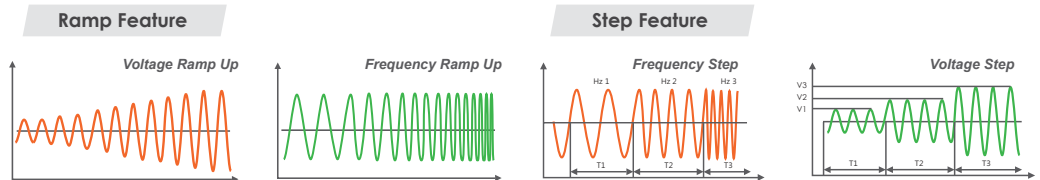
- ① One user-assigned shortcut from 50 memory sets
- ② Three fixed shortcuts from first three memory sets

## Multiple Communication Interfaces & Control Software



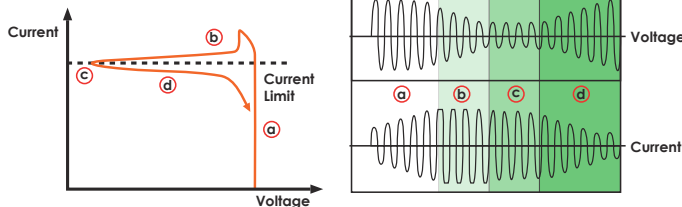
The AFV-P series is equipped with communication interfaces of USB, Ethernet, RS232, and RS485, so users no longer need to spend extra on remote interface card. Only GPIB and Analog are optional interfaces. AFV-P series also provides control software with comprehensive programming features and LabView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

## Programmable Simulation Functions: Step & Ramp Features



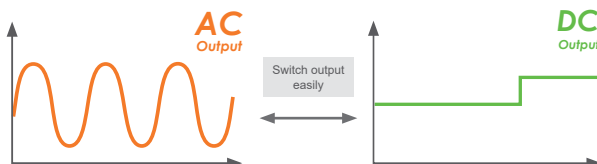
Ramp and Step feature allows users to define slew rate of voltage and frequency at each Step. Users can set the rise/fall time, time unit and voltage/frequency change between Steps to create a wide range of waveform. Additionally, Ramp feature can effectively reduce the inrush current by simulating soft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

## Over Current Foldback



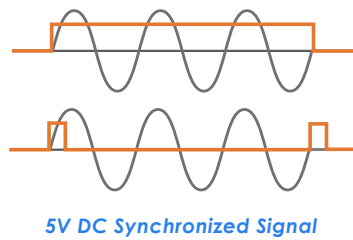
When it comes to over current, AFV-P series offers more than just shutdown protection. Over current foldback enables AFV-P series to maintain the output current at the rated current and correspondingly decrease the output voltage as the load impedance increases. It is an extended protection or an alternative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

## AC Output & DC Output



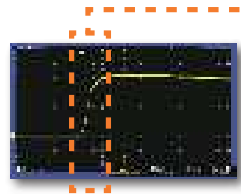
AFV-P series not only provide AC output to simulate real world grid conditions, but can also generate DC output based on user's settings. It is an ideal cost-effective power testing solution for R&D and certification laboratories.

## 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



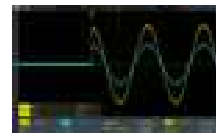
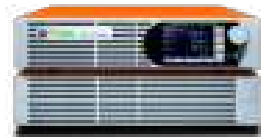
Response Time  
**< 300  $\mu$ s**

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.)



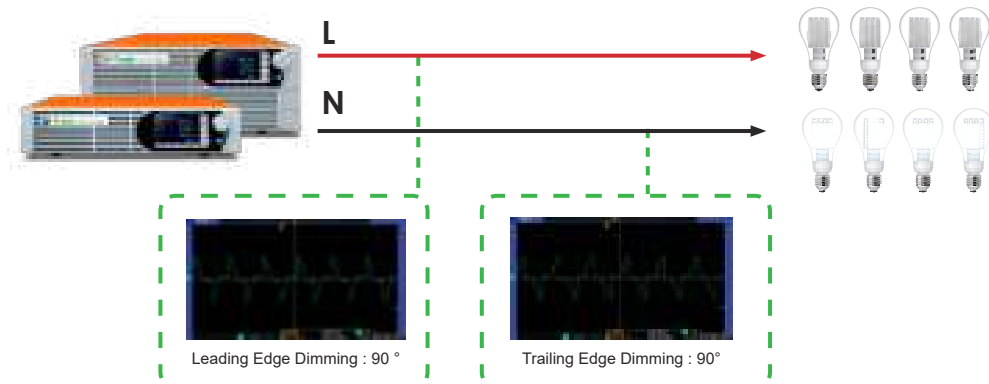
AFV-P-5000 :  
620V/60Hz /6.31A/3916.8W



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.)



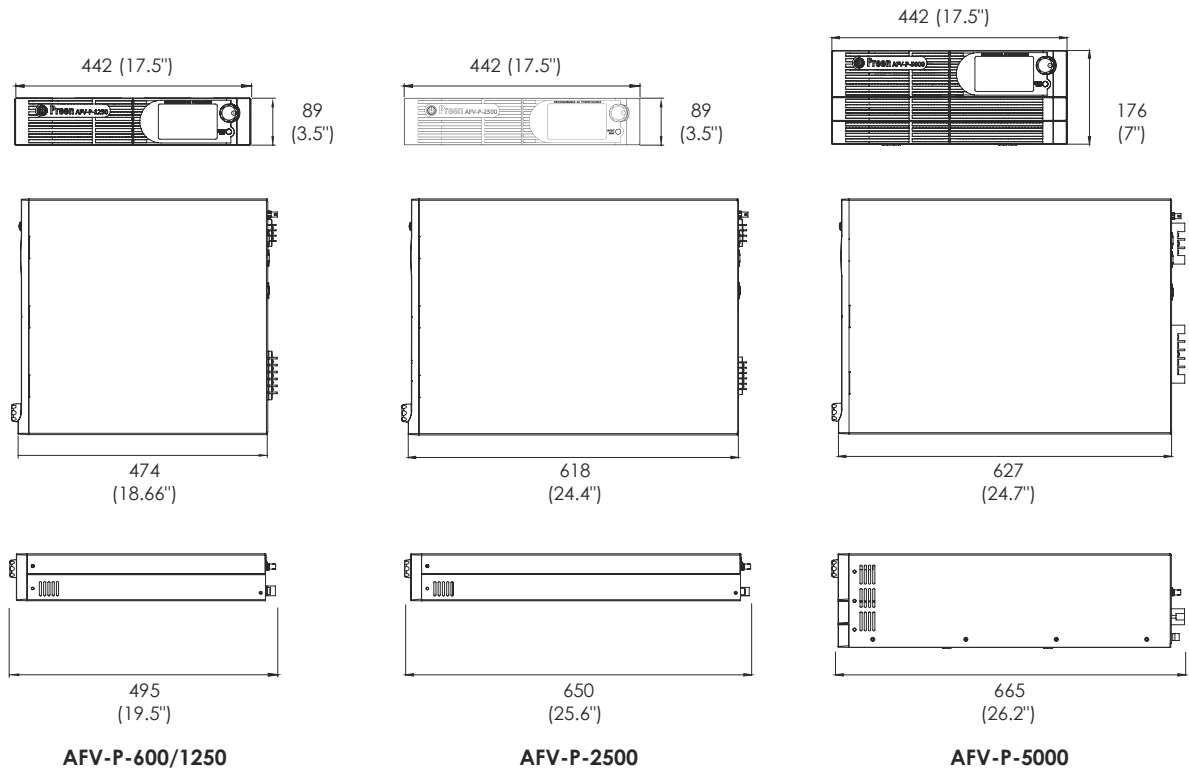
Video

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			
INPUT											
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			
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 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 )									
DC OUTPUT											
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%			
MEASUREMENT											
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			
GENERAL											
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	GPIO 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)