

PAS-F Series

45kVA to 1.6MVA



Programmable Grid Simulator

INTEPRO
SYSTEMS

THE POWER TEST EXPERTS

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Preen[®]

PAS-F Series

45kVA to 1.6MVA



PAS-F-331500 pictured above. See product specification tables for other options and sizes.

Product Overview

The PAS-F Series is a broad line of programmable three phase output regenerative utility grid simulators. With power levels ranging from 45kVA up to 1.6MVA, the series is capable of testing the largest of dispersed energy inverters. The PAS-F combines utility grid simulation and regenerative bi-directional AC source that is capable to both source and sink full current from the unit under test (EUT).

Output is adjustable up to 300VL-N (519VL-L) and 45-65Hz. Creating voltage and frequency disturbances such as steps and gives users a powerful instruments for design validation test. The DSP based controller allows independent phase angle and voltage control for testing against phase unbalance in three phase products.

The PAS-F offers embedded Low-Voltage-Ride-Through test windows that allow for simple programming used for compliance routines. The PAS-F offers independent phase control to meet requirement such as IEEE1547 where multi-phase inverters must be tested on an individual bases and all phases simultaneously. The PAS-F is a reference AC source for use in UL1741, IEEE1547, BDEW and CEI0-16 type compliance test.

Product Features

Low-voltage ride-through mode

Low-voltage ride-through mode	
Setting parameters for low-voltage ride-through test:	
Rated voltage (V)	220.0
Rated frequency (Hz)	50.00
Voltage at dropping point(V)	44.0
Voltage at recovery point (V)	198
Lasting time of voltage at dropping point (ms)	625
Time for rise (s)	3.0
Active power	0.0 KW
Frequency	0.00 Hz

Initial LVRT set up programming

Low-voltage Ride-through Mode	
Mode selection:	
1. Three phase (R,S,T)	<input type="checkbox"/>
2. Single phase_R	<input checked="" type="checkbox"/>
3. Double phases_R,S	<input checked="" type="checkbox"/>

Programming for single, double or three phase LVRT compliance tests

Product Features (cont.)

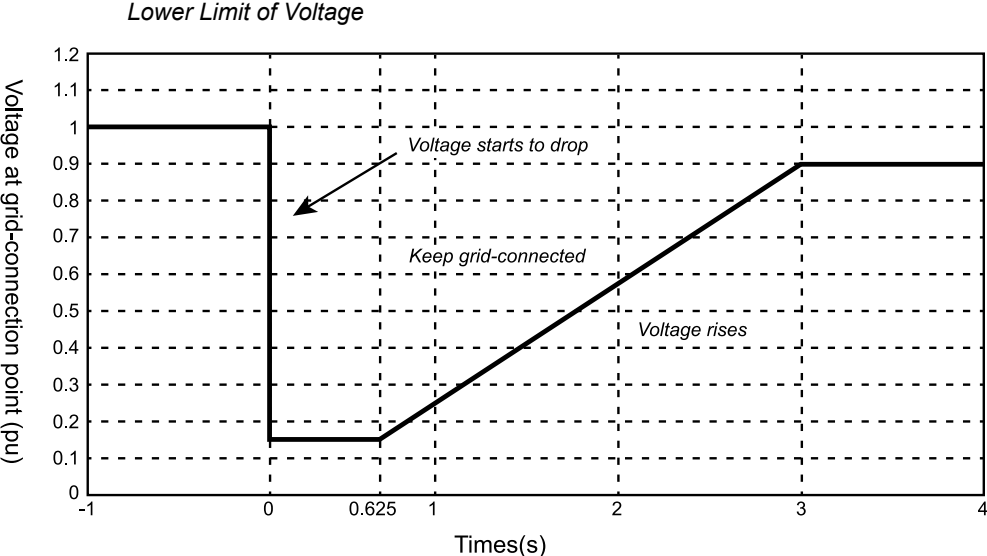
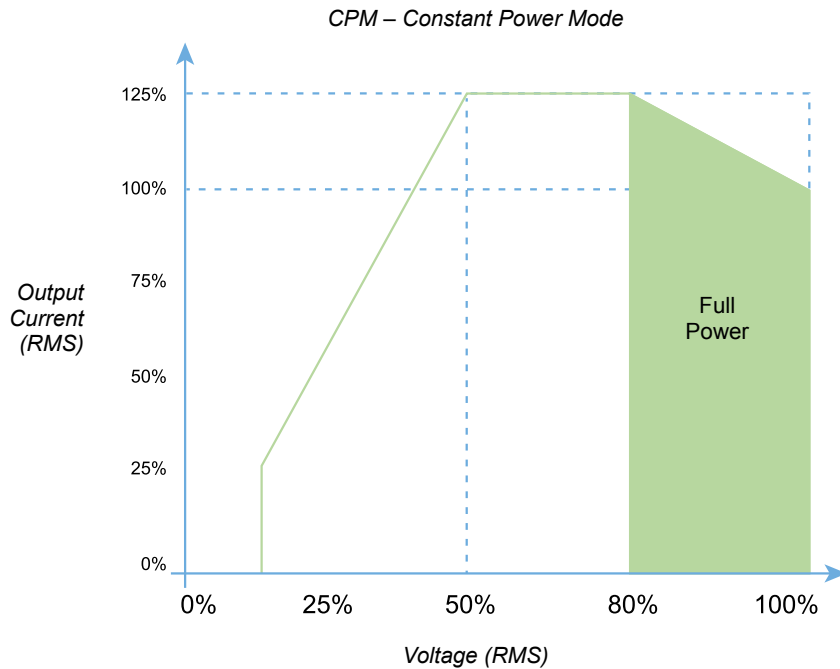


Diagram of standard test for low-voltage ride-through

Supplemental Specifications

Constant Power Mode (CMP) maximizes output power at typical operating voltages. As output voltage is reduced from full scale the available output current automatically increases to as much as 125%. Please note this chart details performance against guaranteed specifications. Below 50% of full scale voltage the source delivers full current and some specifications may not be met. Performance degradation such as load regulation and THD at <1% of full scale voltage could be slightly higher. For questions regarding performance, please contact us for further clarification.



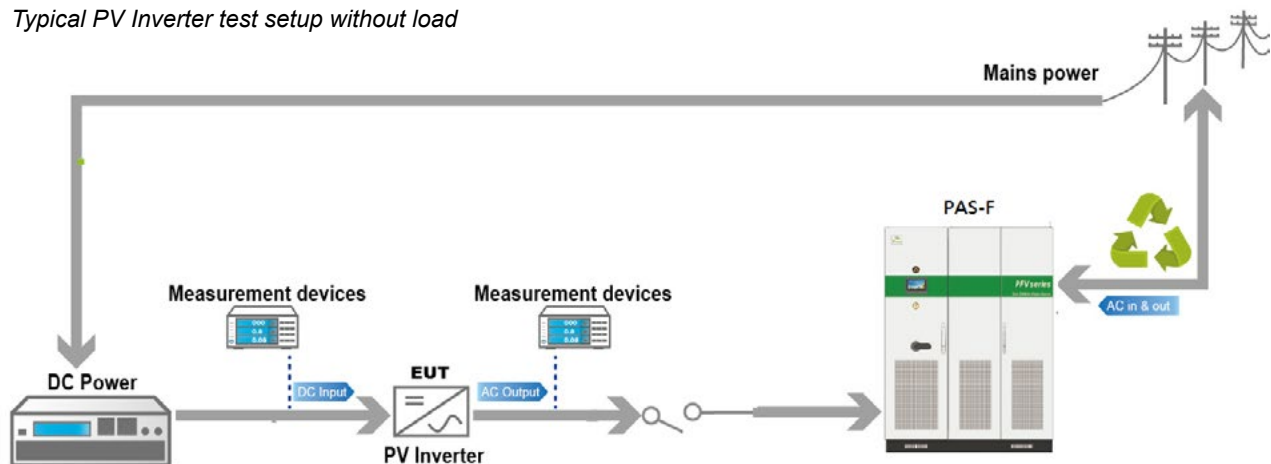
Featured Benefits

- Four quadrant amplifier type operation
- Regenerates up to 92% of energy to the grid
- Embedded LVRT test set up program
- Sinks 100% reactive power (kVAR)
- Voltage and frequency transient generation
- Built in power measurement system
- Independent phase control
- Low output distortion
- Compact design that minimizes floor space requirements
- Integrated high accuracy measurements

Why choose PAS-F?

When testing dispersed energy products such as PV inverters, Energy Storage systems and wind turbines the traditional test setup requires a load in parallel with the EUT and AC source. As a result energy from the DUT is burned into the load creating lost energy in the form of heat. The heat often means building infrastructure like HVAC systems must be updated to cool the laboratory or production floor. The PAS-F does not require the parallel load and instead full EUT current is sunk into the AC source and 92% of the power is regenerated back to the utility grid. The PAS-F lowers the total cost of ownership and costly infrastructure upgrades.

Typical PV Inverter test setup without load



Options

Series Options

- *40-70Hz Frequency Range*

Remote Options

- *Webcomm Ethernet Connection*

Best-in-Class

PAS-F solutions are easily serviced by Intepro Systems, LP, an ISO 9001 certified company. Intepro prides itself on best-in-class service support by minimizing the pains associated with system failure and maximizing uptime of our products. In the unfortunate and rare event of failure, the standard one year warranty includes ON-SITE repair. Returning high power products back to the factory is expensive, impacts development schedules and furthers risk associated with lengthy transit times. Extended service level agreements and yearly calibrations are available for up to five years.

Model		PAS-F-33045	PAS-F-33060	PAS-F-33075	PAS-F-33100	PAS-F-33120	PAS-F-33150	PAS-F-33200
Capacity (kVA)		45	60	75	100	120	150	200
Circuit Type		IGBT/PWM						
Input (Utility Grid Connector)	Phase	Three						
	Voltage	120V/208V, 220V/380V, or 277V/480V						
	Voltage Range	±15%						
	Frequency	47~63Hz						
	Power Factor	0.99						
	iTHD	≤3%						
	Max Input Current	72.5	96.7	120.9	161.2	193.4	241.8	322.4
Output (UUT or Load Connector)	Phase	Three						
	Waveform	Sine						
	Voltage Range	0V ~ 300.0V (L-N)						
	Frequency Range	45~65Hz (Optional 40~70Hz)						
	Frequency Stability	<0.01%						
	Max Current (A) Per Phase	62.5	83.3	104.2	138.9	166.7	208.3	277.8
Performance	Line Regulation	<1% (linear load)						
	Load Regulation	<0.5% (linear load)						
	Output THD	<1% (linear load)						
	Efficiency	≥92%						
	Response Time	<2ms						
	Crest Factor	3:1						
Protection		Input circuit breaker, Output Over/Low Voltage, Over Current, Over Load, Over Temperature, Short Circuit, Input Over/Low Voltage, Reverse Current Protection and Alarm System						
Regenerative Function to Grid Line	Current Harmonic Distortion	≤3%						
	Power Factor	0.99						
	Regenerative Efficiency	≥92%						
Measurements	Type	Touch Panel Screen						
	Voltage	Accuracy: 0.2V+0.1%FS; Resolution: 0.1V						
	Current	Accuracy: 0.2A+0.1%FS; Resolution: 0.1A						
	Frequency	Accuracy: 0.01Hz+0.01%FS; Resolution: 0.01Hz						
	Real Power (kW)	Accuracy: 0.2kW+0.1%FS; Resolution: 0.1kW						
	Reactive Power (kVA)	Accuracy: 0.2kVA+0.1%FS; Resolution: 0.1kVA						
	Input Power Factor	Accuracy: ±0.01; Resolution: 0.01						
Communication	RS485 (RS232)	Standard						
	Ethernet	Optional						
	GPIB	Optional						
	USB	Optional						
Environment	Isolation Resistance	>DC500V 10MΩ						
	Isolation Voltage	AC 2000V 10mA/ 1min						
	Cooling Method	Fan Cooling						
	Temperature	0°C to 45°C						
	Humidity	0~95% (Non-Condense)						
	Altitude	<1500m						
Dimensions (in/mm)		1					2	
Weight (lb/kg)		2722.71/1235						
Consult factory for power levels exceeding 200kVA								

Case Dimensions

(width x depth x height)

1 47.5 x 31.5 x 82.7 (in) / 1200 x 800 x 2100 (mm)

2 63.0 x 31.5 x 82.7 (in) / 1600 x 800 x 2100 (mm)

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