



# ADF Series

## AC Power Sources

Single or Three Phase AC Power Sources

All Digital Power Conversion Technology

### Extensive Features:

- Single Phase or Three Phase Models
- AC Output Capability
- Constant Power Mode Voltage Range to 300Vac L-N/520Vac L-L. (Optional 333Vac L-N/576Vac L-L with V Option)
- No need to switch between high and low voltage ranges
- Frequency range 45-500Hz (Optional 15-1200Hz with F Option)
- Active Three Phase PFC input with Inrush Current Limiting
- Precise Output Voltage and Load Regulation
- Metering of Volts, RMS Current, Peak Current, Apparent Power & True Power on all Phases
- Unique Sleep Modes Save Energy, Reduces needless Heat Generation and Extends the Life of the Power Source
- Standard USB, LAN & RS232, GPIB Interfaces
- Compact size, 15kVA in 4U Rack space
- Light weight, only 51Kg per chassis
- Modular Parallel Master/Slave Systems for higher power requirements
- Energy Saving Stand-by Mode

### 15kVA to 90kVA

AC: 0-300 V<sub>AC</sub> L-N / 0-520 V<sub>AC</sub> L-L

Frequency: 45 - 500 Hz



Single Phase



Three Phase



## "Cost Effective Solutions for Production Power Testing"



### Patented Technology

THE POWER OF EXPERTISE



FREQUENCY CONVERSION



AEROSPACE



R & D



MILITARY



MANUFACTURING



CUSTOM

# Total Control, Metering and Analysis of AC Power. Simple

## Control

**PROGRAM**

Settings: 3ph | Measurements: A, B, C

Freq.	50.01	50.01			Hz
Volt. AC	230.0	230.0	230.0	230.0	V <sub>RMS</sub>
Curr. lim.	41.7	34.7	34.3	34.8	A <sub>RMS</sub>
Pow. lim.	5.00	7.58	7.61	7.84	kW
kVA lim.	5.00	7.98	7.89	8.00	kVA

Buttons: Apply All, Protection, Peak Control, More

Status: Enabled | Prog. MAN | V/M REM 3ph

## Metering

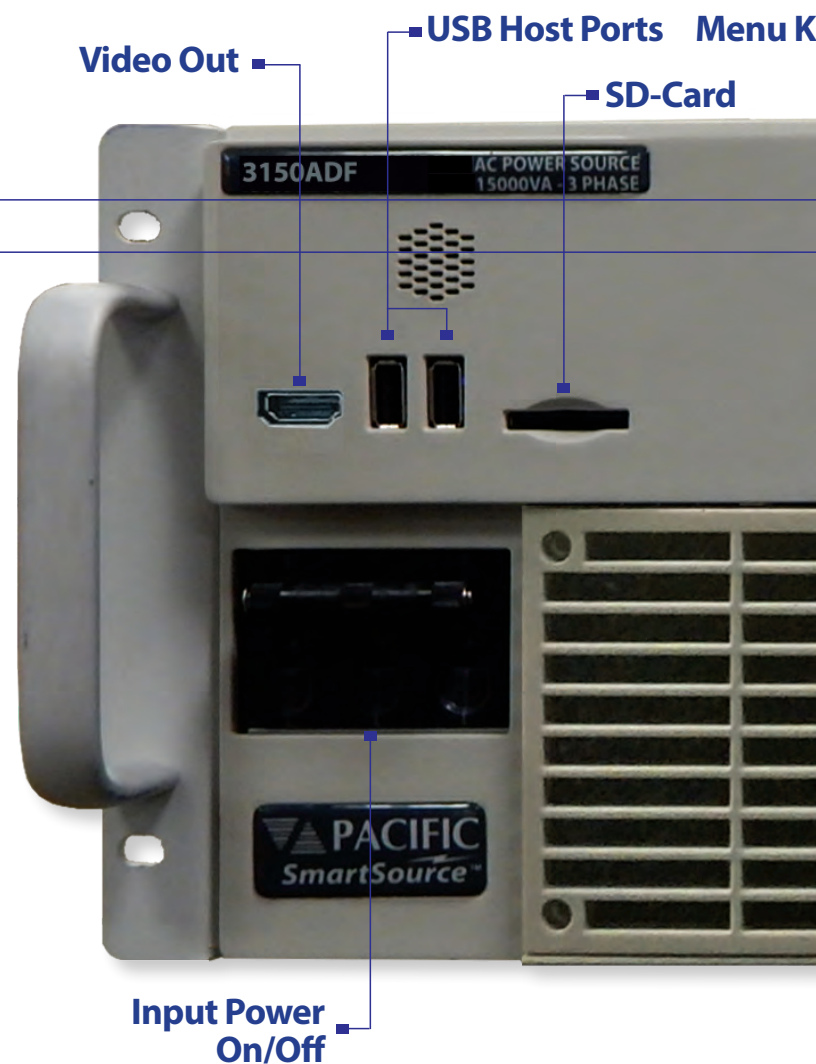
**MEASUREMENTS 1 OF 2**

Freq.: 400.00 Hz

Volt. L-N	115.00	115.00	115.00	V <sub>RMS</sub>
Current	25.67	25.67	25.67	A <sub>RMS</sub>
Power	2.655	2.555	2.655	kW
Volt. L-L	199.20	199.19	199.20	V <sub>RMS</sub>

Buttons: Meas. Page 2, Fault Status, Error and Event, Real Time Plot, Individual Phase

Status: Ready | Prog. MAN | LOC 3ph



## Industrial and Consumer Product Test

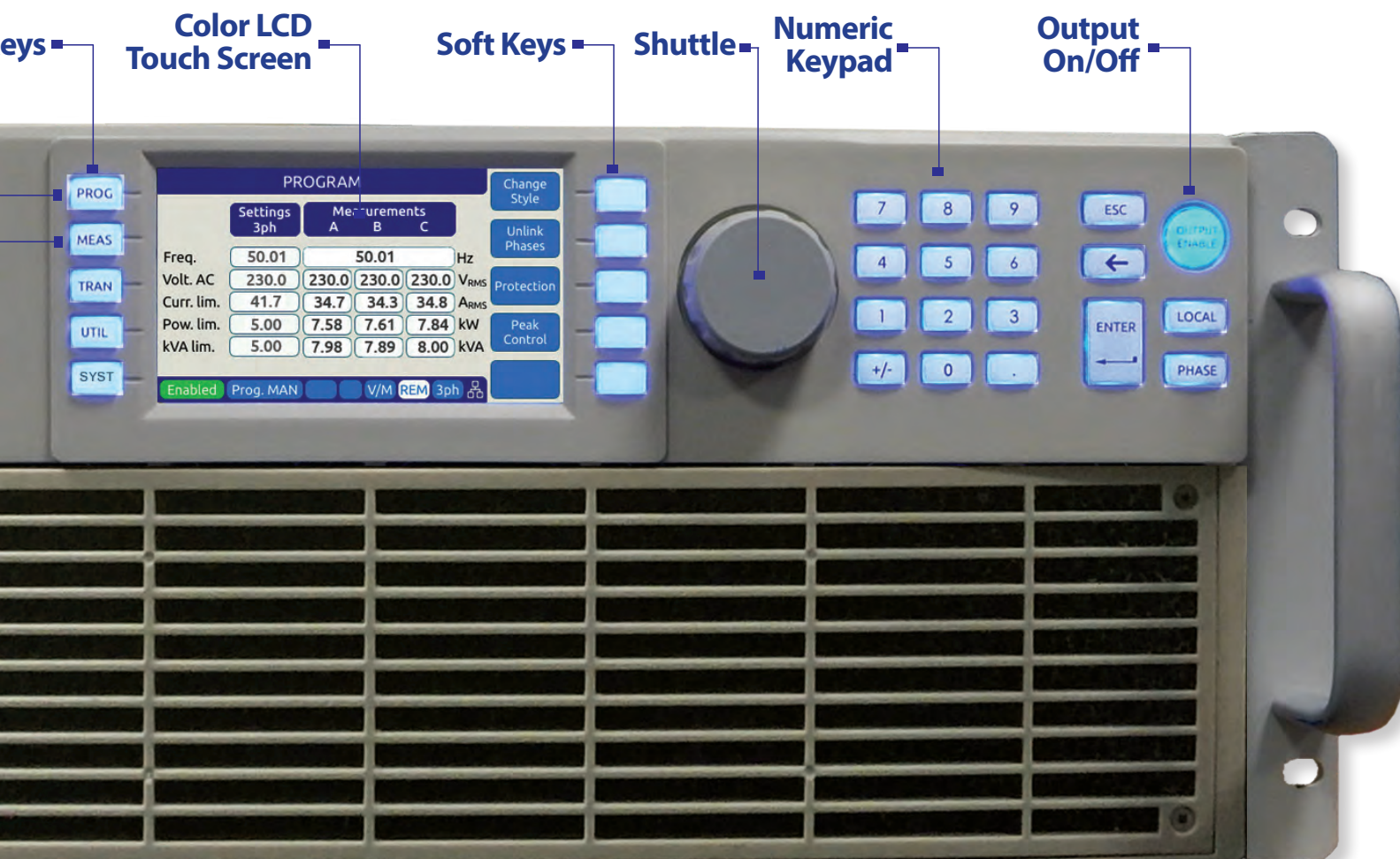
Growing demand for power to support increasingly complex consumer products and appliances as well as UPS, Electric Vehicle (EV) Chargers and AC/DC power supplies means more power is needed in often limited amounts of space. The ADF Series addresses this need by offering power density three times higher than its nearest competitor.

With extensive control over voltage, current and frequency, the ADF series is capable of handling demanding production test requirements with minimal programming effort.





# Simple, Intuitive Operation



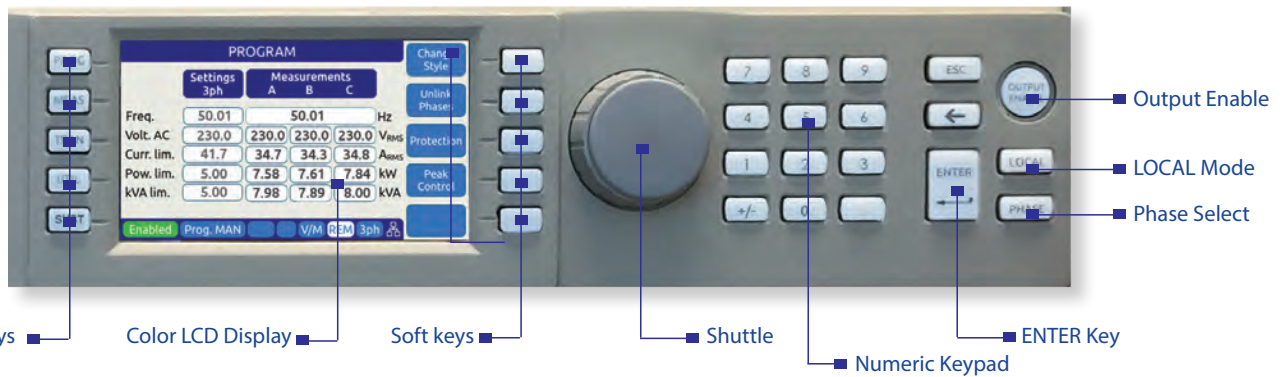
## Avionics Power Test

The advanced digital power conversion technology used in the ADF Series Power Source results in higher power density than any other offering. A standard frequency range of 45Hz to 500Hz supports both 400Hz fixed frequency avionics applications. For more demanding avionics testing, the F option extends output frequency to 1200Hz to support 360Hz to 800Hz wild frequency development and test as well.

High power, three-phase power configurations are available to match ever increasing power test demands of larger aircraft. As needs change over time, additional auxiliary units can be added easily to keep up with your test needs while protecting your original investment.



## Powerful yet Easy to Use

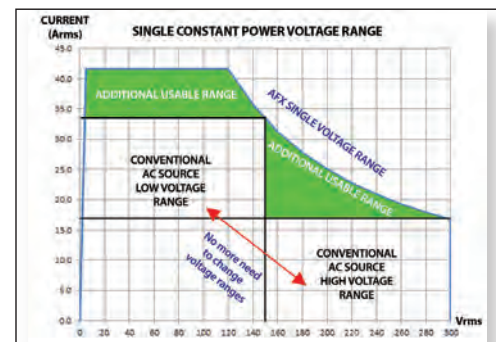


Although ADF Series power sources offer a wide range of operating modes and features, they are easy to operate through a large full color LCD display and soft key driven menus. Top level menus are always available directly by pressing any of the five menu keys on the left of the

display. Entering setup data is accomplished using the numeric keypad or the shuttle. Operating status is shown on screen using various colors to distinguish between setting, measurements and operator warnings, or error messages.

## Constant Power Voltage Range

Traditional AC power sources use two voltage ranges to provide either high voltage or high current. By contrast, the ADF Series uses a unique single voltage range that operates along a constant power curve. This provides more current at low voltages, eliminating the need to switch between voltage ranges and provides a much wider operating range (demonstrated as green in the figure to the right).



## Available Options Extended Application Coverage

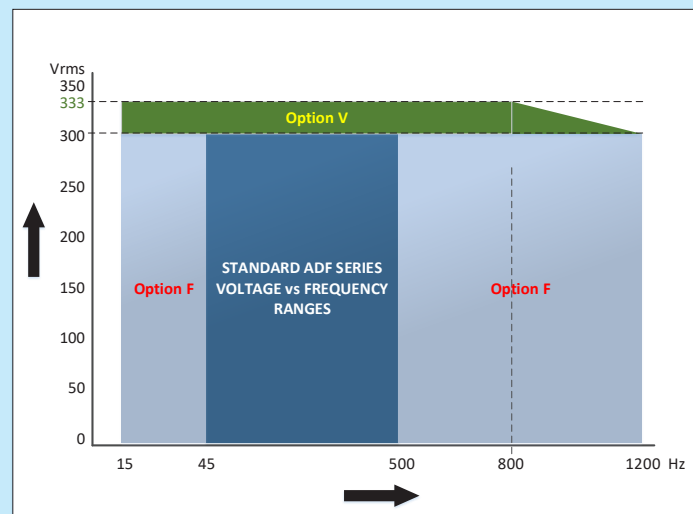
Voltage and Frequency ranges of the ADF Series can be extended if needed using the available "V" and/or "F" options.

### Option V:

The extended voltage range capability allows the standard ADF power source to address additional high voltage test requirements. This extended range increases the maximum output voltage to 333Vac L-N / 576Vac L-L. This supports over voltage testing up to 20% for 480V nominal powered equipment. It also allows testing of single phase universal 90V ~ 265V AC input products to 120% of their maximum nominal input specification.

### Option F:

The extended frequency range option supports testing electrical railway equipment (16.6Hz) or testing wild frequency avionics equipment (360Hz-800Hz) by extending the standard ADF Series frequency range to 15Hz-1200Hz.





## Available Standard Model Configurations

ADF Series AC Sources are available with either single phase output up to 45kVA or with three phase output up to 90kVA. Models listed in the table below are rack mount or bench units. Cabinet systems are pre-wired for

both input and output power. For other configurations or power levels and cabinet options, contact factory. All models shown here require three phase AC input power.

MODEL	Phase Mode	Rated Power <sup>1</sup> AC mode	Voltage Ranges Vac L-N	Max. AC Current 3 Phase Mode	Max. AC Current 1 Phase Mode	AC Input -2 or -4	Form Factor
<b>1150ADF</b>	1 Phase	15 kVA	0-150V / 0-300 V	n/a	125 Arms	-2 or -4	4U Chassis, Bench or Rackmount
<b>3150ADF</b>	3 Phase	15 kVA	0-150V / 0-300 V	41.7 Arms	n/a		
<b>1300ADF</b>	1 Phase	30 kVA	0-150V / 0-300 V	n/a	250 Arms		
<b>3300ADF</b>	3 Phase	30 kVA	0-150V / 0-300 V	83.3 Arms	n/a	-2 or -4	Fully wired 18U Cabinet power system or -KIT w/o 19" rack
<b>1450ADF</b>	1 Phase	45 kVA	0-150V / 0-300 V	n/a	370 Arms		
<b>3450ADF</b>	3 Phase	45 kVA	0-150V / 0-300 V	125.0 Arms	n/a		
<b>3600ADF</b>	3 Phase	60 kVA	0-150V / 0-300 V	166.7 Arms	n/a		
<b>3750ADF</b>	3 Phase	75 kVA	0-150V / 0-300 V	208.3 Arms	n/a	-4 Only	Fully wired 28U Cabinet power system or -KIT w/o 19" rack
<b>3900ADF</b>	3 Phase	90 kVA	0-150V / 0-300 V	250.0 Arms	n/a		
<b>Higher</b>	For configurations up to 150kVA/kW, contact factory						

Note 1: Rated power shown is for Three Phase or Single Phase mode operation. For Split Phase mode, rated power is 2/3.

Note 2: AC input ratings: -2 = 208Vac Nominal, 3 $\phi$  or -4 = 380~480Vac Nominal, 3 $\phi$ . See specifications section for AC current requirements.

## Cabinet Systems

The wide range of available power levels combined with the small form factor of the ADF Series allows these power systems to be deployed in small spaces if needed. This feature reduces required floor space and eliminates most load bearing floor issues that can be associated with raised floors. Systems above a 15 kVA power level can be shipped pre-installed and pre-wired in standard 19" heavy duty steel cabinets with casters and levelers for ease of mobility. Cabinet options such as Outlet sockets and Emergency Power Off (EPO) buttons can be ordered as options. These parallel configurations are also available in **kit form** for system integrators that are planning on using their own cabinets.

## ADF User Benefits

The ADF Series is based on a truly revolutionary technology platform that enables functionality not previously found on programmable AC power sources. This results in the following user benefits:

- Small size, 15kVA/kW in 4U rack space.
- Light Weight. Easy to install, inexpensive to ship.
- Modular high power systems. Even if one power module fails, system continues to operate at reduced power.
- Multiple protections for the unit under test. Limit settings for Voltage, RMS Current, Peak Current, Power and apparent Power.
- Dual stage energy savings mode. Saves on energy cost, extends equipment lifespan.



## Technical Specifications

OUTPUT	Specification
<b>Voltage</b>	
Output Mode	AC
1150ADF	Single Phase
3150ADF	Three Phase or Split Phase
Standard Range	0-300 Vac LN / 0-520 Vac LL
Extended Voltage Range <sup>1</sup> (Option V)	Increases max output voltage to 333Vac LN / 576Vac LL
Programming Resolution	0.01 V
Accuracy	± 0.25% F.S.
Output Waveform	Sine
DC Offset	< 20 mV
Harmonic Distortion (Vthd) (full, resistive load, up to 300Vrms L-N)	< 400 Hz, < 0.5% 400 to 500 Hz, < 1.0% (Option F: > 500 Hz, < 1.5%)
Output Noise (DC to 300kHz)	< 150 mV RMS
Load Regulation	± 0.02% (CSC Mode)
Line Regulation	< 0.1% for 10% Line Change
Voltage Sense	External Sense, max. voltage drop 5% F.S.
Voltage Slew Rate	AC > 1.0V/us
Output Isolation	550Vac
<b>Frequency</b>	
Standard Range	45.00 – 500.0 Hz
Extended Frequency Range (Option F)	15.00 – 1200.0 Hz
Programming Resolution	0.01 Hz
Accuracy	± 0.01%
<b>Current Limit - RMS and Peak Modes</b>	
RMS Range	See model table page 5
Crest Factor	
1150ADF	2.5:1@41.67A to 6.3:1@16.67A (104Apk/phase)
3150ADF	2.5:1@125A to 6.3:1@50A (312Apk/phase)
Programming Resolution	0.01 Arms
Accuracy	± 0.5% F.S.
Current Protection Modes	Constant Current (CC) or Output Trip (CV)
Current Overload Mode	Allows 130% of max. RMS current for up to 2.0 secs before CP is triggered when enabled
<b>Phase Angle (3 Phase ADF Models only)</b>	
Phase Settings	Three Phs Mode: A = 0°, B = 120°, C = 240° Split Phs Mode: A = 0°, B = 180°, C = 0°

**Note 1:** Supplemental specifications apply for Extended Voltage (Option V).


PROTECTION	Specification
Available Protections	Over Current fold-back or trip
	Prog. Peak Current Limit
	Power fold-back or trip
	App.Power fold-back or trip
	Over Voltage trip
	Over Temperature trip
OVP Programming Range	0 ~ 105% of voltage range
AC Input Voltage	Over and Under Voltage, 15%

MEASUREMENTS	Specification
<b>Voltage (Vrms)</b>	
Range	0 – 350 VLN / 0-600 VLL
Resolution	0.01 V
Accuracy	± 0.25% F.S.
<b>Current (Arms)</b>	
Range	See model table page 5
Resolution	0.01 Arms
Accuracy <sup>1</sup>	± 0.5% F.S.
<b>Current Crest Factor</b>	
Range	1.00 - 5.00
Resolution	0.01
Accuracy <sup>1</sup>	± 2.0% F.S.
<b>Power (W)</b>	
Range	See model table page 5
Resolution	0.01 W
Accuracy <sup>2</sup>	± 1.5 % F.S.
<b>Apparent Power (VA)</b>	
Range	See model table page 5
Resolution	0.01 VA
Accuracy <sup>2</sup>	± 1.5 % F.S.
<b>Power Factor</b>	
Range <sup>2</sup>	0.00 - 1.00
Resolution	0.01

**Footnotes:**

1: For RMS Currents above 2.0 A

2: For Power levels above 100 W

INTERFACES	Description
<b>Remote Control</b>	
USB	Device Type B
RS232	1200 - 921600 baud
LAN	LXI compliant, Ethernet, RJ45, TCP/IP Protocol, Telnet Protocol Command Line
LXI Compliant	 LAN eXtensions for Instrumentation
GPIB	IEEE488.1, IEEE488.2 (2003 incl., NI HS488) IEC 60488-1, IEC 60488-2 (2004) Functions: SH1, AH1, T6, L3, SR1, RL1, DC1, DT1
WiFi	Optional USB WiFi adaptor

SYSTEM FEATURES	Description
<b>DISPLAY</b>	
Type	Full Color, Touch LCD Display
Size	4.3" Diagonal
Resolution	480 x 272 pixels
USB Ports	2 Front Panel, 1 Rear Panel, Type A
SD Card	32 GB max. Capacity
Video Output	Monitor Out, Front Panel

## Technical Specifications (continued)

AC INPUT		15 kVA Models <sup>5</sup>
Mains Voltage Form	4 Wire, L1, L2, L3 and PE	
Frequency	47 - 63 Hz	
<b>-2 AC Input Versions</b> (Available for systems up to 45kVA only)		
Input Voltage Range	208Vac – 240Vac ± 10%	
Nominal Phase Current <sup>1</sup>	54 Arms	
Peak Inrush Current <sup>2</sup>	< 1.5 x Irms	
Input Power Factor	> 0.9	
Efficiency	> 85%	
<b>-4 AC Input Versions</b> (Available for all power levels)		
Input Voltage Range	380Vac – 480Vac ± 10%	
Nominal Phase Current <sup>3</sup>	30 Arms	
Nominal Phase Current <sup>4</sup>	24 Arms	
Peak Inrush Current <sup>2</sup>	< 1.5 x Irms	
Input Power Factor	> 0.9	
Efficiency	> 85%	

### Footnotes:

1: Per ADF unit, 3ø, 208V nom. input voltage    3: Per ADF unit, 380V nom. input voltage  
 2: Irms = Max. peak inrush current per unit    4: Per ADF unit, 480V nom. input voltage  
 5: For parallel systems above 15 kVA, input current is multiplied by the number of units

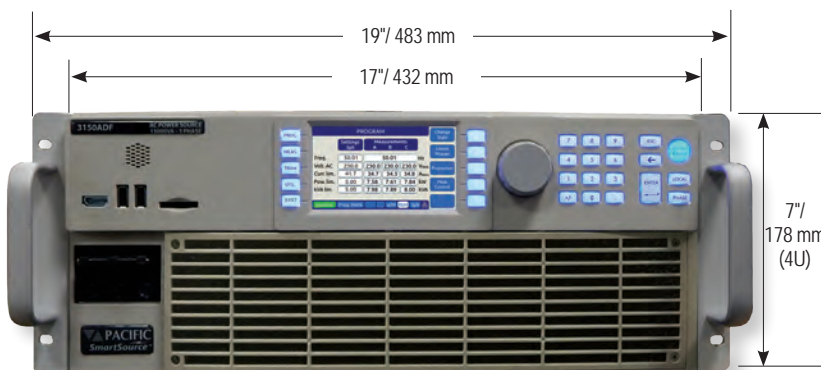
ANALOG & DIGITAL I/O		Specification
<b>Analog Inputs (4)</b>		Set Voltage phs A, B, C, Freq
Range	0 - 10 Vdc for 0 - F.S.	
Accuracy	± 0.1% F.S.	
<b>Analog Outputs (4)</b>		Meas. phs A, B, C, Power
Range	0 - 10Vdc for 0 - F.S.	
Accuracy	± 0.1% F.S. into > 5 kOhm load	
<b>Digital Inputs (6)</b>		Remote Inhibit, Trigger, Sync
Input Levels	Low < 0.4V, High > 2.0V	
<b>Digital Outputs (6)</b>		Output Relay, /Function Strobe, Phase Sync
Output Levels	Low < 0.4V, High > 4.6V	
Connector Type	DB25, Rear Panel	

DIMENSIONS / WEIGHT	Specification
<b>Dimensions Bench 15kVA Models (4U)</b>	
H x W x D	7.0" x 17.0" x 25.0" 178 x 432 x 635 mm See Note 1 below
Shipping H x W x D	20" x 27" x 38" 508 x 686 x 965 mm
<b>Weight Models up to 15 kVA</b>	
Net	111.2 lbs. / 50.4 kg
Shipping	151 lbs / 68.5 kg
<i>Note 1: Units can be zero-stacked in 19" EIA cabinet when using optional rack-slides. When using L-brackets, allow 1U space between units.</i>	

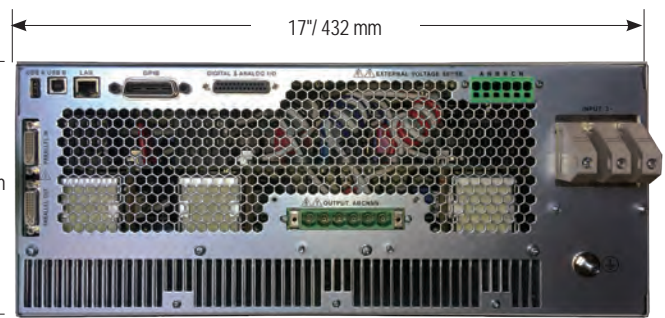
ENVIRONMENTAL	Specification
Cooling	Variable speed fan cooled, front intake with dust filter, rear exhaust
Audible Noise: At 1 meter distance	Standby: 46 dBA Full power: 85 dBA typical
Sleep Modes	Standby, All Power Stages off
<b>Temperature</b>	
Operating	0 to 40 °C / 32 to 104 °F
Storage	-20 to 70 °C / -4 to 158 °F
Humidity	< 80%, non-condensing
Altitude	2000 m / 6500 feet

REGULATORY	Specification
<b>Safety</b>	
Standard	IEC 61010-1:2010 (Edition 3)
<b>EMC</b>	
Emissions Standard	EN 55011:2009+A1:2010
Immunity Standard	EN 61000-4-2, -3, -4, -5, -6, -8, -11
Product Category	EN 61326-1:2013 (Measurement, Laboratory and Control Equipment)
Approvals	CE Mark, NTRL Nemko US/Canada
<b>RoHS (DIRECTIVE 2011/65/EU)</b>	
Product Category	EN50581:2012

## Unit Dimensions<sup>1</sup>



The ADF is designed for bench top or 19" equipment rack operation. Shown with included rack mount handles.



The ADF Rear Panel provides connections for AC Input, AC Output, External Sense, Aux I/O and remote control interfaces.

**Note 1:** Units can be zero-stacked in 19" EIA cabinet when using optional rack-slides. When using L-brackets, allow 1U space between units.

## Ordering Information

### Standard Models and Cabinet Systems

<b>Bench Models</b> <input type="checkbox"/> 1150ADF <input type="checkbox"/> 3150ADF	<b>Cabinet Systems<sup>1</sup></b> <input type="checkbox"/> 1300ADF <input type="checkbox"/> 3600ADF <input type="checkbox"/> 3300ADF <input type="checkbox"/> 3750ADF <input type="checkbox"/> 1450ADF <input type="checkbox"/> 3900ADF <input type="checkbox"/> 3450ADF	<b>Cabinet KIT Systems<sup>1</sup> (x = 2 or 4)</b> <input type="checkbox"/> 1300ADF-xG-KIT <input type="checkbox"/> 3600ADF-4G-KIT <input type="checkbox"/> 3300ADF-xG-KIT <input type="checkbox"/> 3750ADF-4G-KIT <input type="checkbox"/> 1450ADF-xG-KIT <input type="checkbox"/> 3900ADF-4G-KIT <input type="checkbox"/> 3450ADF-xG-KIT	<b>Available Options</b> <input type="checkbox"/> F Extended Frequency Range <input type="checkbox"/> V Extended Voltage Range <input type="checkbox"/> O Output control switch
<b>Auxiliary Models (No controller)</b> <input type="checkbox"/> 1150ADF-2NC / 1150ADF-4NC <input type="checkbox"/> 3150ADF-2NC / 3150ADF-4NC	<b>Input Voltage (V<sub>IN</sub>)</b> <input type="checkbox"/> -2 208V - 240Vac, 3Ø ± 10%, 47-63Hz <input type="checkbox"/> -4 380V - 480Vac, 3Ø ± 10%, 47-63Hz	<b>Export Version</b> <input type="checkbox"/> E Append "E" postfix or none	

**Note 1:** Cabinet systems consist of one master unit and one or more auxiliary units integrated into a 19 inch EIA instrument grade cabinet. Includes input and output wiring to rear mounted compression terminal blocks. Other cabinet options available. Customers that require the use of their own cabinets can order system packages without cabinet (-KIT). Contact factory for ordering information.

### Order Example

3150ADF-4G  
 Bench Model, 15 kVA, 3-Phase, AC Power Source with USB, RS232, LAN, GPIB & AUX I/O, 380~480Vac 3 Phase AC Input Voltage

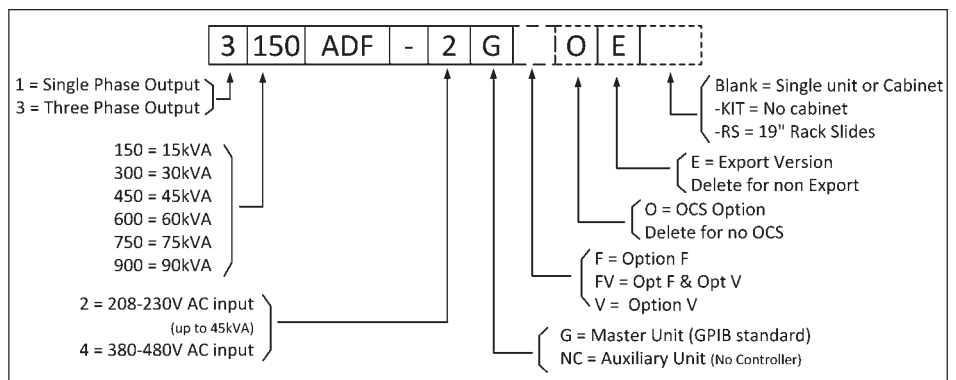
### Typical Delivery Items

- AC Power Source
- English Manuals in PDF Format
- Rack Mount Handles
- Certificate of Compliance

### Available Accessories

- Paralleling Cable, 1 Ft. (Included with Aux models). P/N 778036
- Rack slides. P/N 703251

### ADF Model Number Encoder:



## Service and Support

Pacific Power Source's customer support is second to none. Our Customer Support Program provides the training, repair, calibration, and technical support services that our customers value. In addition to receiving the right test equipment, our customers can also count on excellent support before, during and after the sale. With company owned support and service centers around the world, support is never far away. Complete calibration and repair services are offered at our US, European and Chinese manufacturing facilities (see contact info below). Calibrations are to original factory specifications and are traceable to NIST (National Institute of Standards and Technology).

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