

## Single and Three Phase AC or DC Power Testing Simplified...



AC Power



DC Power

CFS330	CFS360
3 kVA	6 kVA
AC Mode: 40 - 1000 Hz 5 - 300 V <sub>LN</sub> / 8.6 - 520 V <sub>LL</sub>	
DC Mode: 5 - 420Vdc	



**Look no further** for cost effective AC or DC power test solutions than the CFS300 Series programmable power sources. Designed to perform a wide range of AC and/or DC tests with good performance and excellent reliability, the APS CFS300 units are industry work horses.

Available in two distinct power levels of 3 kVA and 6 kVA, a wide range of commercial, industrial and aviation type equipment testing is covered by either model. Model CFS330 can be operated using single phase AC utility input power. Model CFS360 can be operated from either single phase or three phase 208V or 400V utility power.

### CFS300 Series Key Features

The CFS300 Models come loaded with Features such like:

- Choice of Power Levels to fit your Requirements
- Single, Split and Three phase AC Output Modes
- Both AC and DC Output Capability
- Wide AC Frequency Range of 40 Hz to 1,000 Hz covers both industrial/commercial and avionics/defense applications
- Complete range of Measurements
- Fifty Memory Locations with Nine Test Steps for Pass/Fail Measurements against pre-set Limits
- Voltage Drop-out Test Capability built-in
- Programmable Start/Stop Phase Angle
- Standard USB and RS232 Remote Control Interfaces
- Optional Ethernet / LAN Interface or GPIB interface for ATE Test System Use
- Single Phase AC Input (Model CFS330) or Single and Three Phase AC Input (Model CFS360)
- CE Mark

## EASY POWER TESTING OF AC OR DC PRODUCTS

Testing both AC and DC powered products for performance to specifications and proper operation has never been easier or more cost effective than with the CFS300 Series programmable power sources. These floor standing and rack mountable units make it easy to test both single, split and three phase AC products or DC products, all with the same instrument.

Available in two power levels, the CFS300 units feature an intuitive menu driven user interface with a large backlit LCD display that shows settings and measurements.

Two modes of operation are available to the user:

- **Manual Mode** - Allows manual settings of all output parameters
- **Program Mode** - Allows sequencing through up to 9 test steps, each having distinct output settings and measurement pass/fail test limits

### Manual Mode or Pass / Fail Limit Testing

Auto Run	MANUAL	F Lo-Lmt	40.0Hz	^
PLC Remote	OFF	Start Angle	0°	
Alarm	5	End Angle	0°	↓
Contrast	5	Results	LAST	
Power Up	OFF	OC Fold	OFF	Edit
V Hi-Lmt	300.0V	Transient	OFF	
V Lo-Lmt	5.0V	Lock	OFF	Exit
F Hi-Lmt	1000Hz		<more>	

Manual Mode Setup Screen

**Manual Mode** allows setting individual output parameter settings and limits. By setting limits on voltage and frequency, accidental output settings that could damage an EUT can be avoided. When the Test Output button is pushed, power is applied to the EUT and the LCD screen displays all measurement values. Large characters are used for Voltage and one other parameter selected from the available measurements in the upper half of the display.

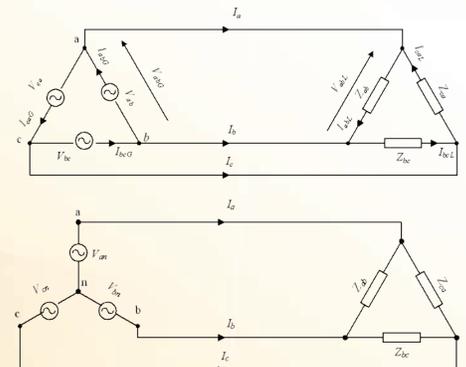
M 1-1	60.0s	F: 60.0Hz	CF: 0.00	Result
Set		A: 9.00A	Ap: 0.0	System
		P: 0W	VA: 0	
		Q: 0VAR	PF: 0.000	ENET
100.0 V				9.00 A
				<top>

Program Mode Step Metering Display

### AC Delta / Wye Connections



**All load connections** are made at the rear panel. Both delta and Wye three phase loads are supported using the Phase A, B, C and Neutral terminal posts. Connections for single and split phase or DC loads are indicated on the rear panel as well. A safety cover is provided. For higher power loads, external voltage sense is available to compensate for load wire drops.



Programs can be stored in the 50 available non-volatile memory locations for quick recall. Each program memory can be assigned a name for easy reference to a test requirement or EUT. For quick setups of lab work, Manual mode is an easy way to change output values and observe measurement data without any limit testing.

Auto Run	PROGRAM	OC Fold	OFF	^
PLC Remote	OFF	Lock	OFF	
Single Step	OFF	Mem Lock	ON	↓
Alarm	5	Volt Sense	INT	
Contrast	5			Edit
Power Up	OFF			
Loop Cycle	1			Exit
Results	LAST			

Program Mode Setup Screen

**Program Mode** allows a sequence of up to nine timed test steps to be applied to the EUT. At each step, measurements are taken and compared to pre-set pass/fail limits. If all selected measurements pass, the output proceeds to the next test step once the programmed dwell time has expired. If not, an alarm sounds and the power to the EUT is cut. This mode is ideal for production test and pass fail testing without the need to develop test software.

A	Lo-Lmt	0.00A	PF Lo-Lmt	0.000	^
P	Hi-Lmt	0W	VA Hi-Lmt	0VA	
P	Lo-Lmt	0W	VA Lo-Lmt	0VA	↓
Ap	Hi-Lmt	0.0A	Q Hi-Lmt	0VAR	
Ap	Lo-Lmt	0.0A	Q Lo-Lmt	0VAR	Edit
CF	Hi-Lmt	0.00	Prompt		
CF	Lo-Lmt	0.00	Ext Trig.	OFF	
PF	Hi-Lmt	0.000	Connect	OFF	Exit

Test Limits Setup Screen

## Instrument Specifications

MODEL		CFS330	CFS360
<b>OUTPUT SPECIFICATIONS - AC MODE</b>			
Phase Modes		1 $\phi$ /2W, 3 $\phi$ /3W & 3 $\phi$ /4W	
Power Rating	Total Power	3 kVA	6 kVA
	3 & 4W/Phase	1 kVA	2 kVA
	2W	3 kVA	6 kVA
Voltage Auto Range High/Low	1 $\phi$ /2W (single)	5 - 150V <sub>LN</sub> / 5 - 300V <sub>LL</sub>	
	1 $\phi$ /3W (split)	5 - 300V <sub>LL</sub> / 5 - 600V <sub>LL</sub>	
	3 $\phi$ /4W (three)	8.6 - 260V <sub>LL</sub> / 8.6 - 520V <sub>LL</sub>	
	Resolution	0.1 V	
	Accuracy	$\pm$ ( 0.2% setting + 0.3 V )	
Current-2W	0-150V	27.6 A	55.2 A
	0-300V	13.8 A	27.6 A
Current-3W /4W	0-150V	9.2 A	18.4 A
	0-300V	4.6 A	9.2 A
OC Fold-back Response		< 1.4 secs	
Peak Cur. 2W	0-150V	110.4 A	220.8 A
	0-300V	55.2 A	110.4 A
Peak Cur. 3W /4W	0-150V	36.8 A	73.6 A
	0-300V	18.4 A	36.8 A
Crest Factor		$\geq$ 3 to 1	
Frequency	Range	40 - 1000 Hz	
	Resolution	0.1 Hz from 40.0-99.9 Hz 1 Hz from 100 - 1000 Hz	
	Accuracy	$\pm$ 0.03% Setting	
Start/Stop Phase	Range	0 - 359°	
	Accuracy	$\pm$ 1%, 45- 65 Hz	
Harmonic Distortion (Full Resistive Load)		< 0.5% 40-70 Hz, 80-140V <sub>LN</sub> on Low Range or 160-280V <sub>LN</sub> on High Range < 1.0% > 70 Hz, 80-140V <sub>LN</sub> on Low Range or 160-280V <sub>LN</sub> on High Range	
Line Regulation		$\pm$ 0.1 V for a 10% Line Change	
Load Regulation		$\pm$ 1.0% Range + 1V, R Load	
Response time		< 400 usec	
Protection		Over Current, Short Circuit, Over Voltage, Under Voltage, Over Temperature	

MODEL		CFS330	CFS360
<b>MEASUREMENT SPECIFICATIONS - SINGLE PHASE MODE</b>			
Current RMS	Range	0.05 - 39.00 A	0.05 - 78.00 A
	Accuracy	$\pm$ (1% of reading + 0.05 A) CF < 1.5 and Current (peak) $\leq$ 82.8 A	$\pm$ (1% of reading + 0.05 A) CF < 1.5 and Current (peak) $\leq$ 165.6 A
Current Peak	Range	0.0 - 114.0 A	0.0 - 228.0 A
	Accuracy	$\pm$ (1% of reading + 0.5A @ 40.0-70.0 Hz $\pm$ (1.5% of reading + 1A @ 70.1 - 500 Hz $\pm$ (1.5% of reading + 1A @ 501 - 1000 Hz and CF<1.5	
Power	Range	0 - 3900 W	0 - 7800 W
	Accuracy	$\pm$ (2% of reading+5 W) @ 40.0-500Hz, PF>0.2 $\pm$ (2% of reading+15 W) @ 501-1000Hz, PF>0.5	
App. Power	Range	0 - 3900 VA	0 - 7800 VA
	Accuracy	V x A, Calculated	
React. Power	Range	0 - 3900 VAR	0 - 7800 VAR
	Accuracy	Sqrt(VA <sup>2</sup> x W <sup>2</sup> ), Calculated	
Freq, Voltage, Power & Crest Factor Measurement specs:		See Three & Two Phase Mode	

MODEL		CFS330	CFS360	
<b>MEASUREMENT SPECIFICATIONS - THREE &amp; TWO PHASE MODE</b>				
Frequency	Range	0.0 - 1000.0 Hz		
	Resolution	0.1 Hz		
	Accuracy	$\pm$ 0.1Hz < 500Hz, $\pm$ 0.2Hz > 500Hz		
Voltage AC	Range	0 - 420 Vrms		
	Resolution	0.1 V		
	Accuracy	$\pm$ (0.2% of reading + 3 counts)		
Current RMS	Range	L	0.005 - 1.200 A	0.005 - 2.400 A
		H	1.00 - 13.00 A	2.00 - 26.00 A
	Accuracy	L	$\pm$ (1% of reading + 0.005 A) CF < 1.5 and Current (peak) $\leq$ 3.6 A	$\pm$ (1% of reading + 0.005 A) CF < 1.5 and Current (peak) $\leq$ 7.2 A
		H	$\pm$ (1% of reading + 0.05 A) CF < 1.5 and Current (peak) $\leq$ 27.6 A	$\pm$ (1% of reading + 0.05 A) CF < 1.5 and Current (peak) $\leq$ 55.2 A
	Range		0.0 - 38.0 A	0.0 - 76.0 A
	Accuracy		$\pm$ (1% of reading + 0.5A @ 40.0-70.0 Hz $\pm$ (1.5% of reading + 1A @ 70.1 - 500 Hz $\pm$ (1.5% of reading + 1A @ 501 - 1000 Hz and CF<1.5	
Power	Range	L	0.0 - 120.0 W	0.0 - 240.0 W
		H	100 - 1300 W	200 - 2600 W
	Accuracy	L	$\pm$ (2% of reading+1.5 W) @ 40.0-500Hz, PF>0.2 $\pm$ (2% of reading+3 W) @ 501-1000Hz, PF>0.5	
	H	$\pm$ (2% of reading+5 W) @ 40.0-500Hz, PF>0.2 $\pm$ (2% of reading+15 W) @ 501-1000Hz, PF>0.5		
Power Factor		Range Accuracy		
		0.000 - 1.000 W / VA, Calculated to 3 digits		
App. Power	Range	L	0.0 - 120.0 VA	0.0 - 240.0 VA
		H	100 - 1300 VA	200 - 2600 VA
		Accuracy V x A, Calculated		
React. Power	Range	L	0.0 - 120.0 VAR	0.0 - 240.0 VAR
		H	100 - 1300 VAR	200 - 2600 VAR
	Accuracy		Sqrt(VA <sup>2</sup> x W <sup>2</sup> ), Calculated	
Crest Factor	Range	0.00 - 10.00		
	Accuracy	Ap / A, Calculated to 2 digits		

MODEL		CFS330	CFS360
<b>OUTPUT SPECIFICATIONS - DC MODE</b>			
Power Rating		3 kW	6 kW
DC Voltage Ranges		5 - 210Vdc / 5 - 420Vdc	
	Resolution	0.1 Vdc	
	Accuracy	$\pm$ ( 0.2% Setting + 0.3V )	
Ripple & Noise RMS		210 Rng <700 mV, 420 Rng <1100 mV	
Ripple & Noise p-p		< 4.0 Vpp	
Max. Current	210V Rng	14.4 A	28.8 A
	420V Rng	7.2 A	14.4 A
Accuracy		$\pm$ ( 2.0% Setting + 0.2 A )	

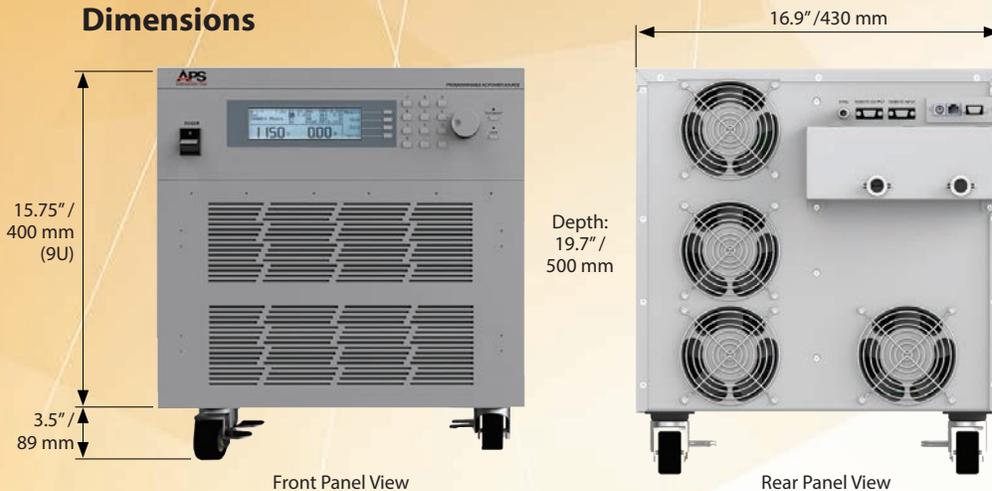
MODEL		CFS330	CFS360
<b>MEASUREMENT SPECIFICATIONS -DC MODE</b>			
Voltage DC	Range	0.0 - 420.0 Vdc	
	Accuracy	$\pm$ ( 0.2% Setting + 0.3V )	
Current DC	Range	0.05 - 19.50 Adc	0.05 - 39.00 Adc
	Accuracy	$\pm$ ( 1.0% Setting + 0.05 Adc )	
Power	Range	0 - 3900 W	0 - 7800 W
	Accuracy	$\pm$ ( 2.0% Setting + 5 W )	

## Instrument Specifications - Continued

MODEL	CFS330	CFS360
<b>AC INPUT SPECIFICATIONS</b>		
Input Phases	1 $\emptyset$	1 $\emptyset$ or 3 $\emptyset$
Input Voltage	1 $\emptyset$ Input	200-240Vac $\pm$ 10%
	3 $\emptyset$ Input, 3W	200-240Vac $\pm$ 10%
	3 $\emptyset$ Input, 4W	346-416Vac $\pm$ 10%
Max. Input Current	23A	1 $\emptyset$ : 45A
		3 $\emptyset$ , 3W: 26A
		3 $\emptyset$ , 4W: 15A
Max. VA Input Power	4 kVA	8 kVA
Frequency	47 - 63 Hz	
Input Power Factor	PFC, > 0.97 @ Full Load	
Efficiency	> 78% @ Full Load	

MODEL	CFS330	CFS360
<b>MECHANICAL &amp; ENVIRONMENTAL SPECIFICATIONS</b>		
Dimensions (WxHxD)	430 x 400 x 500 mm	
	16.9" x 15.75" x 19.7"	
Caster Height	89 mm / 3.5"	
Rack Mount	Handle & Rack Ear Kit included	
Weight	48 Kg / 105.8 lbs	57 Kg / 125.6 lbs
<b>Operating Environment</b>		
Temperature	0 - 40° C / 32 - 104° F	
Humidity	20 - 80% R.H. Non-condensing	
<b>Regulatory</b>		
Safety & EMC	CE	

## Dimensions



MODEL	CFS330	CFS360
<b>INTERFACES AND I/O</b>		
Remote Control	RS232, USB	
LAN / Ethernet <sup>1</sup>	Option -LAN	
GPIO Interface	Option 606	
Output Sync Signal	+5Vdc Out, BNC connector, rear panel	

Note 1: LAN option includes RS232 but deletes USB interface.

Note 2: GPIO option replaces RS232, USB std. I/F

## Ordering Information

MODEL	DESCRIPTION	AC INPUT CONFIGURATION
CFS330-230	AC&DC Power Source, 3kVA, USB/RS232	Single Phase, 200 - 240 Vac
CFS330-230-LAN	AC&DC Power Source, 3kVA, LAN/RS232	
CFS360	AC&DC Power Source, 6kVA, USB/RS232	Specify: Single Phase 230V, Three Phase 208V or Three Phase 400V/3 $\emptyset$ on PO
CFS360-LAN	AC&DC Power Source, 6kVA, LAN/RS232	

## Service and Support

Adaptive Power Systems' customer support is second to none. Our Customer Support Program provides the training, repair, calibration, and technical support services that our customers value. So, 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.

**New Product Warranty:** AC Sources & Loads: 1 year, DC Power Supplies: 2 years.

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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