# CFS 300 Series

# 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<br>5 - 300 $V_{LN}$ / 8.6 - 520 $V_{LL}$ | |
| DC Mode: 5 - 420Vdc | |

CE  USB UNIVERSAL SERIAL BUS  RS232  LAN

***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 for ATE Test System Use
- Single Phase AC Input (Model CFS330) or Single and Three Phase AC Input (Model CFS360)
- CE Mark

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## 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.

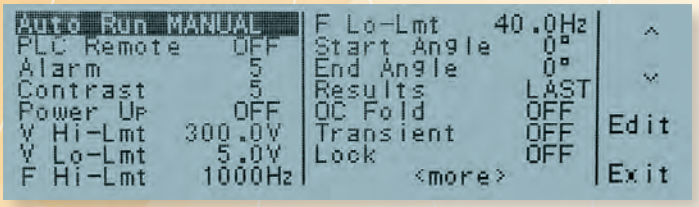
Available in two power levels, the CFS300 units feature an intuitive menu driven user interface with a large backlit LCD display that shows settings and measurements.

Two modes of operation are available to the user:

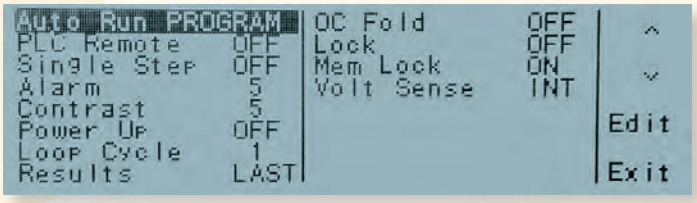
- **Manual Mode** - Allows manual settings of all output parameters
- **Program Mode** - Allows sequencing through up to 9 test steps, each having distinct output settings and measurement pass/fail test limits


Programs can be stored in the 50 available non-volatile memory locations for quick recall. Each program memory can be assigned an 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.

### Manual Mode or Pass / Fail Limit Testing



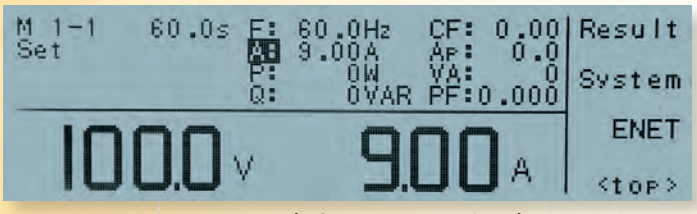

*Manual Mode Setup Screen*



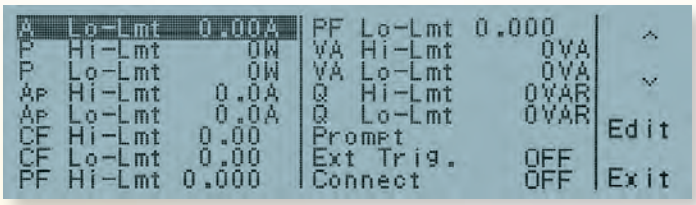

*Program Mode Setup Screen*

***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.

***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.



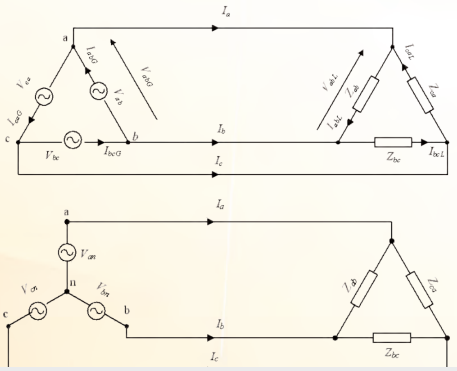

*Program Mode Step Metering Display*




*Test Limits Setup Screen*

### 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.



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## Instrument Specifications

| MODEL | | CFS330 | CFS360 |
|---|---|---|---|
| **OUTPUT SPECIFICATIONS - AC MODE** | | | |
| Phase Modes | | 1ø/2W, 3ø/3W & 3ø/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 | 1ø/2W (single) | 5 - 150$V_{LN}$ / 5 - 300$V_{LL}$ | |
| | 1ø/3W (split) | 5 - 300$V_{LL}$ / 5 - 600$V_{LL}$ | |
| | 3ø/4W (three) | 8.6 - 260$V_{LL}$ / 8.6 - 520$V_{LL}$ | |
| | Resolution | 0.1 V | |
| | Accuracy | ± ( 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 | | ≥ 3 to 1 | |
| Frequency | Range | 40 - 1000 Hz | |
| | Resolution | 0.1 Hz from 40.0-99.9 Hz<br>1 Hz from 100 - 1000 Hz | |
| | Accuracy | ± 0.03% Setting | |
| Start/Stop Phase | Range | 0 - 359° | |
| | Accuracy | ±1%, 45- 65 Hz | |
| Harmonic Distortion (Full Resistive Load) | | < 0.5% 40-70 Hz, 80-140$V_{LN}$ on Low Range or 160-280$V_{LN}$ on High Range | |
| | | < 1.0% > 70 Hz, 80-140$V_{LN}$ on Low Range or 160-280$V_{LN}$ on High Range | |
| Line Regulation | | ± 0.1 V for a 10% Line Change | |
| Load Regulation | | ± 1.0% Range + 1V, R Load | |
| Response time | | < 400 usec | |
| Protection | | Over Current, Short Circuit, Over Voltage, Under Voltage, Over Temperature | |

| MODEL | | CFS330 | CFS360 |
|---|---|---|---|
| **MEASUREMENT SPECIFICATIONS -SINGLE PHASE MODE** | | | |
| Current RMS | Range | 0.05 - 39.00 A | 0.05 - 78.00 A |
| | Accuracy | ± (1% of reading + 0.05 A)<br>CF < 1.5 and Current (peak) ≤ 82.8 A | ± (1% of reading + 0.05 A)<br>CF < 1.5 and Current (peak) ≤ 165.6 A |
| Current Peak | Range | 0.0 - 114.0 A | 0.0 - 228.0 A |
| | Accuracy | ± (1% of reading + 0.5A @ 40.0-70.0 Hz<br>± (1.5% of reading + 1A @ 70.1 - 500 Hz<br>± (1.5% of reading + 1A @ 501 - 1000 Hz and CF<1.5 | |
| Power | Range | 0 - 3900 W | 0 - 7800 W |
| | Accuracy | ±(2% of reading+5 W) @ 40.0-500Hz, PF>0.2<br>±(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($VA^2$ x $W^2$), Calculated | |
| Freq, Power & Crest Factor | | See Three & Two Phase Mode | |

| MODEL | | | CFS330 | CFS360 |
|---|---|---|---|---|
| **MEASUREMENT SPECIFICATIONS - THREE & TWO PHASE MODE** | | | | |
| Frequency | Range | | 0.0 - 1000.0 Hz | |
| | Resolution | | 0.1 Hz | |
| | Accuracy | | ± 0.1Hz < 500Hz, ± 0.2Hz > 500Hz | |
| 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 | ± (1% of reading + 0.005 A)<br>CF < 1.5 and Current (peak) ≤ 3.6 A | ± (1% of reading + 0.005 A)<br>CF < 1.5 and Current (peak) ≤ 7.2 A |
| | | H | ± (1% of reading + 0.05 A)<br>CF < 1.5 and Current (peak) ≤ 27.6 A | ± (1% of reading + 0.05 A)<br>CF < 1.5 and Current (peak) ≤ 55.2 A |
| Current Peak | Range | | 0.0 - 38.0 A | 0.0 - 76.0 A |
| | Accuracy | | ± (1% of reading + 0.5A @ 40.0-70.0 Hz<br>± (1.5% of reading + 1A @ 70.1 - 500 Hz<br>± (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 | ±(2% of reading+1.5 W) @ 40.0-500Hz, PF>0.2<br>±(2% of reading+3 W) @ 501-1000Hz, PF>0.5 | |
| | | H | ±(2% of reading+5 W) @ 40.0-500Hz, PF>0.2<br>±(2% of reading+15 W) @ 501-1000Hz, PF>0.5 | |
| Power Factor | Range | | 0.000 - 1.000 | |
| | Accuracy | | 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($VA^2$ x $W^2$), Calculated | |
| Crest Factor | Range | | 0.00 - 10.00 | |
| | Accuracy | | Ap / A, Calculated to 2 digits | |

| MODEL | | CFS330 | CFS360 |
|---|---|---|---|
| **OUTPUT SPECIFICATIONS - DC MODE** | | | |
| Power Rating | | 3 kW | 6 kW |
| DC Voltage Ranges | | 5 -210Vdc / 5 - 420Vdc | |
| | Resolution | 0.1 Vdc | |
| | Accuracy | ± ( 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 | ± ( 2.0% Setting + 0.2 A ) | |

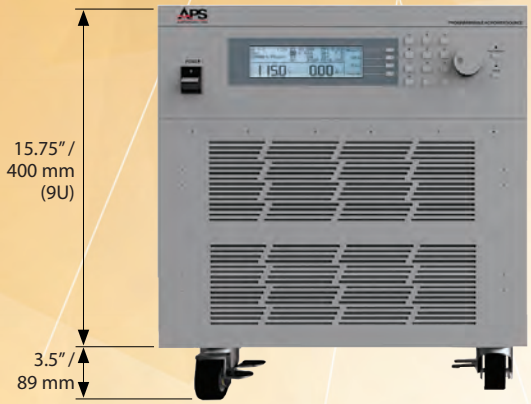
| MODEL | | CFS330 | CFS360 |
|---|---|---|---|
| **MEASUREMENT SPECIFICATIONS -DC MODE** | | | |
| Voltage DC | Range | 0.0 - 420.0 Vdc | |
| | Accuracy | ± ( 0.2% Setting + 0.3V ) | |
| Current DC | Range | 0.05 - 19.50 Adc | 0.05 - 39.00 Adc |
| | Accuracy | ± ( 1.0% Setting + 0.05 Adc ) | |
| Power | Range | 0 - 3900 W | 0 - 7800 W |
| | Accuracy | ± ( 2.0% Setting + 5 W ) | |

## Instrument Specifications - Continued

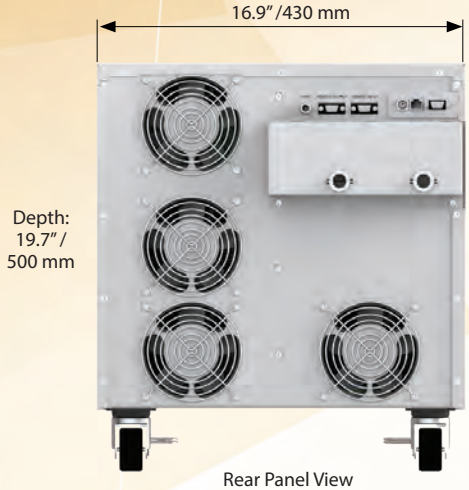
| MODEL | | CFS330 | CFS360 |
|---|---|---|---|
| **AC INPUT SPECIFICATIONS** | | | |
| Input Phases | | 1ø | 1ø or 3ø |
| Input Voltage | 1ø Input | 200-240Vac±10% | 200-240Vac±10% |
| | 3ø Input, 3W | | 200-240Vac±10% |
| | 3ø Input, 4W | | 346-416Vac±10% |
| Max. Input Current | | 23A | 1ø: 45A |
| | | | 3ø, 3W: 26A |
| | | | 3ø,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 |
|---|---|---|
| **MECHANICAL & ENVIRONMENTAL SPECIFICATIONS** | | |
| 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 |
| **Operating Environment** | | |
| Temperature | 0 - 40° C / 32 - 104° F | |
| Humidity | 20 - 80% R.H. Non-condensing | |
| **Regulatory** | | |
| Safety & EMC | CE | |

## Dimensions



Front Panel View



Rear Panel View

| MODEL | CFS330 | CFS360 |
|---|---|---|
| **INTERFACES AND I/O** | | |
| Remote Control | RS232, USB | |
| LAN / Ethernet[1] | Option -LAN | |
| Output Sync Signal | +5Vdc Out, BNC connector, rear panel | |

*Note1: LAN option includes RS232 but deletes USB interface.*

## 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/3ø 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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