

AC & DC POWER GROUPS Rev E, Rev G

Important Benefits:

- Comprehensive RTCA/DO160, Section 16 Compliance test sequence suite saves months of test development time
- Includes both AC and DC power groups (Rev G) for maximum test coverage
- Available for all AFX Series models at power levels from 6kVA to 150kVA for AC and DC testing
- Supports both Single and Three phase AC power groups (Rev E, G)
- Supports DC power groups (Rev G)
- Comprehensive Test Reports to document compliance
- Revisions E and G available
- Test Sequences can be customized as needed to meet changing requirements
- VISA Calls and VB Script support allows other test equipment integration into tests
- LAN, USB, RS232 and GPIB Support
- PPSC Test Manager Software Required to execute test sequences



RTCA/DO160, Section 16 Power Input Scope

Founded as the Radio Technical Commission for Aeronautics in 1935, RTCA has provided the foundation for virtually every modern technical advance in aviation. RTCA performance standards form the basis for FAA regulatory requirements for all commercial aircraft. The power input tests covered by Section 16 simulate conditions of aircraft power from before engine start to after landing including emergencies. Currently at revision G, the DO160 test option is also available to support legacy avionics systems that were placed in operation under revision E. Both versions can be installed on the same PC.

Comprehensive Coverage & Convenience

Using our extensive library of test sequences and the PPSC Test Manager Windows software, the AFX Power source turns into a powerful and easy to use compliance test system. No need to spend weeks developing your own test procedures, just connect you EUT and select what test to run. User observation of EUT behavior and additional measurement equipment to monitor EUT output is required in addition to the AFX power source.

Extensive Coverage

The ability of the AFX Series to provide both AC, DC, AC+DC and DC+AC output reduces the amount of additional test equipment and coupling devices needed to perform most tests. It also provides great test coverage for EMC Test labs to meet client's test requirements.



THE POWER OF EXPERTISE



Supported Power Groups

The following power groups are included in the RTCA/DO-160 test option.

| Power Group | Description | Nominal Voltage | Nominal Frequency | Phase Modes |
|---------------|-------------------------------------|-----------------|-------------------|---------------------|
| ACF | AC Power, Constant Frequency | 115Vrms L-N | 400Hz | 1 Phase and 3 Phase |
| | | 230Vrms L-N | | |
| ANF | AC Power, Narrow Variable Frequency | 115Vrms L-N | 360 – 800Hz | |
| | | 230Vrms L-N | | |
| AWF | AC Power, Wide Variable Frequency | 115Vrms L-N | 360 – 800Hz | |
| | | 230Vrms L-N | | |
| Cat.A, 28Vdc | DC Power Test | 28 Vdc | n/a | n/a |
| Cat B, 14Vdc | DC Power Test | 14 Vdc | n/a | n/a |
| Cat B, 28Vdc | DC Power Test | 28 Vdc | n/a | n/a |
| Cat Z, 28Vdc | DC Power Test | 28 Vdc | n/a | n/a |
| Cat D, 270Vdc | DC Power Test | 270 Vdc | n/a | n/a |

AC Power Test Execution Samples – DO160

The following screens provide some typical captured output voltage waveforms from the AC Power Source during

RTCA/DO-160 Test Sequence execution. Samples shown reflect two different test conditions from Section 16.5.1.4, Momentary Power Interruptions.

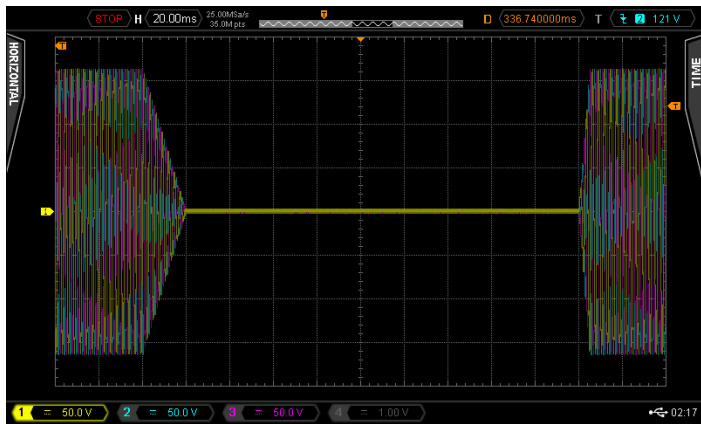


Figure 1: DO-160G Section 16.5.1.4 b Test Condition 7

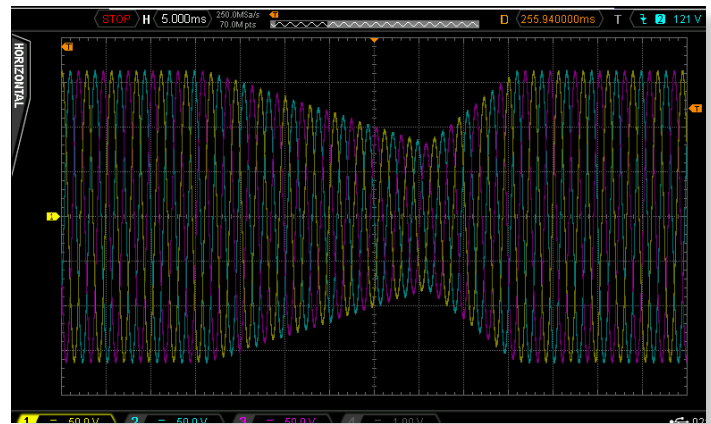


Figure 2: DO-160G Section 16.5.1.4 b-Test Condition 9

DC Power Test Execution Samples – DO160

The following screens provide some typical captured output voltage waveforms from the DC Power Source during

DO160 Test Sequence execution. Samples shown reflect two different test conditions, 16.6.2.4d Cat B, 28Vdc (Figure 3) and 16.6.1.4c Cat D, 270Vdc (Figure 4).

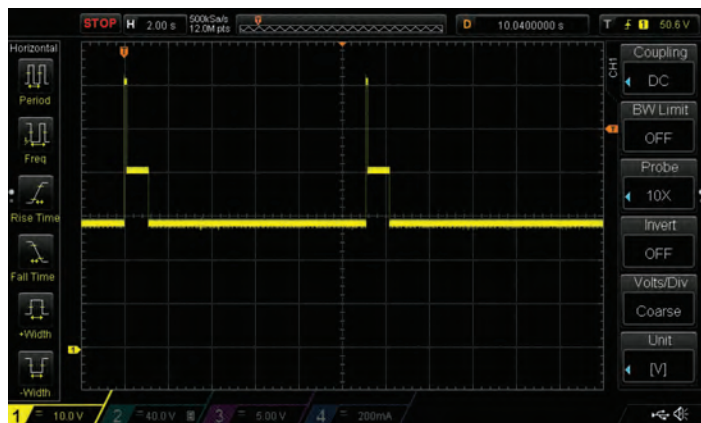


Figure 3: DO160G_AFX_16.6.2.4d_catB_28V_Abnormal_Surges

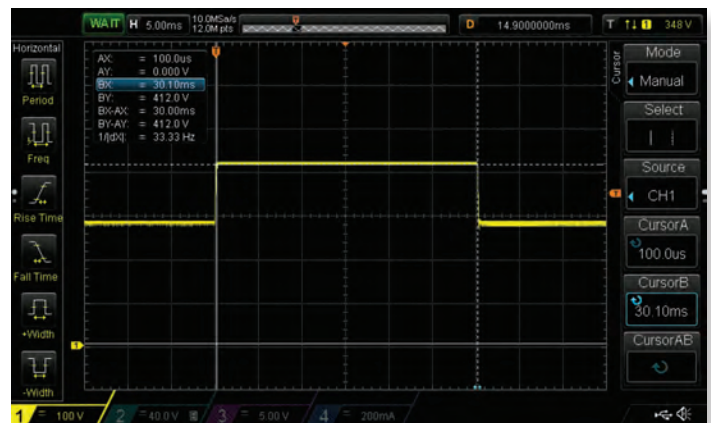


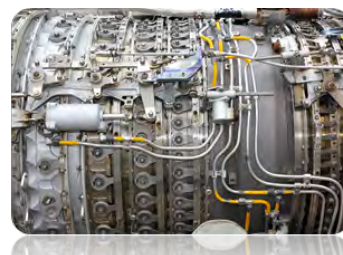
Figure 4: DO160G_AFX_16.6.1.4c_catZ_270V_Normal_Surge

Compliance Matrix RTCA/DO-160

| Phases | Section | Description | ACF | ANF | AWF | Notes |
|--------------|-------------------------------|---|-----|-----|-----|---|
| Single Phase | 16.5.1.1.b1 | Normal Voltage & Frequency | Y | Y | Y | |
| | 16.5.1.2 | Normal Voltage Modulation | Y | Y | Y | |
| | 16.5.1.3 | Normal Frequency Modulation | Y | Y | Y | |
| | 16.5.1.4.b | Normal Momentary Power Interruptions - Test 1 | Y | Y | Y | |
| | 16.5.1.4.c | Normal Momentary Power Interruptions - Test 2 | Y | Y | Y | |
| | 16.5.1.5.1.b | Normal Surge Voltage | Y | Y | Y | Vnom 230Vac requires Transformer (XFMR) for 320Vac surge. |
| | 16.5.1.6.b | Normal Frequency Variations | Y | Y | Y | |
| | 16.5.1.7 | Normal Voltage DC Content | Y | Y | Y | AFX in AC+DC Mode |
| | 16.5.1.8.2 | Normal Total Harmonic Distortion | Y | Y | Y | Specification allows either clipped waveform or full-wave bridge rectifier load |
| | 16.5.2.1.b | Abnormal Volt/Freq Limit Steady State | Y | Y | Y | |
| | 16.5.2.2 | Momentary Undervoltage Operation | Y | Y | Y | |
| | 16.5.2.3.1 | Abnormal Surge Voltage | Y | Y | Y | Vnom 230Vac requires Transformer (XFMR) for 360Vac surge. |
| 16.5.2.3.2 | Abnormal Frequency Transients | Y | Y | Y | | |
| Three Phase | 16.5.1.1.c | Normal Voltage & Frequency | Y | Y | Y | |
| | 16.5.1.1.ce | Emergency Voltage & Frequency | Y | Y | Y | |
| | 16.5.1.2 | Normal Voltage Modulation | Y | Y | Y | |
| | 16.5.1.3 | Normal Frequency Modulation | Y | Y | Y | |
| | 16.5.1.4.b | Normal Momentary Power Interruptions - Test 1 | Y | Y | Y | |
| | 16.5.1.4.c | Normal Momentary Power Interruptions - Test 2 | Y | Y | Y | |
| | 16.5.1.5.1.b | Normal Surge Voltage | Y | Y | Y | Vnom 230Vac requires Transformer (XFMR) for 320Vac surge. |
| | 16.5.1.6.b | Normal Frequency Variations | Y | Y | Y | |
| | 16.5.1.7 | Normal Voltage DC Content | Y | Y | Y | AFX in AC+DC Mode |
| | 16.5.1.8.2 | Normal Total Harmonic Distortion | Y | Y | Y | Specification allows either clipped waveform or full-wave bridge rectifier load |
| | 16.5.2.1.c | Abnormal Volt/Freq Limit Steady State | Y | Y | Y | |
| | 16.5.2.2 | Momentary Undervoltage Operation | Y | Y | Y | |
| | 16.5.2.3.1 | Abnormal Surge Voltage | Y | Y | Y | Vnom 230Vac requires Transformer (XFMR) for 360Vac surge. |
| | 16.5.2.3.2 | Abnormal Frequency Transients | Y | Y | Y | |
| | 16.5.2.4.ab | Loss Of Phase Input | N/A | Y | Y | |
| 16.5.2.4.cd | Loss Of Phase Input | N/A | Y | Y | | |

| DC Test | Description | B.14V | A.28V | B.28V | Z.28V | D.270V | Notes |
|----------|---|-------|-------|-------|-------|--------|-----------------------|
| 16.6.1.1 | Normal Voltage, Ripple, Interrupts, Surge | Y | Y | Y | Y | Y | |
| 16.6.1.2 | Ripple | Y | Y | Y | Y | Y | |
| 16.6.1.3 | Power Interrupts | Y | Y | Y | Y | Y | |
| 16.6.1.4 | Surge Voltage | Y | Y | Y | Y | Y | |
| 16.6.1.5 | Engine Starting Under Voltage | Y | N/A | Y | Y | N/A | |
| 16.6.1.6 | Exposed Voltage Decay Time | N/A | N/A | N/A | N/A | Y | Test is not supported |
| 16.6.2.1 | Voltage Steady State | Y | Y | Y | Y | Y | |
| 16.6.2.2 | Low Voltage Conditions | Y | N/A | Y | N/A | N/A | |
| 16.6.2.3 | Momentary Under Voltage | Y | Y | Y | Y | Y | |
| 16.6.2.4 | Abnormal Surge Voltage | Y | Y | Y | Y | Y | |

Notes: Y = Full support. No additional equipment is needed to perform the required AC stimulus
 R = Requires additional equipment. See notes for details
 N = Not supported
 N/A = Not Applicable - No Test required
 Z = Prog-Z option required



Test Executive

Rather than being fixed with no ability for customizing or enhancements, Pacific Power Source's Test Sequences are developed within its PPSC Test Manager test executive environment. The PPSC Test Manager is a plug-in to the standard Pacific Power Source PPSC Manager windows software and provides complete access to the underlying Test Sequence implementation.

It also provides powerful tools for controlling test execution, collecting measurement data from the AC Power Source and or the unit under test and integration of other aspects of compliance testing such as temperature environment control capability into provided test routines.

Other instruments can be controlled through the PPSC Test Manager executive using VISA drivers and VB Scripting, thus providing powerful tools to test engineers. Alternatively, the Test Sequences can be run as provided, controlling just the Pacific Power Source AC Source with no further customization required. Test Sequence libraries can be password protected by the user to prevent unauthorized modifications. Revision control of test procedures is built into the PPSC Test Manager executive.

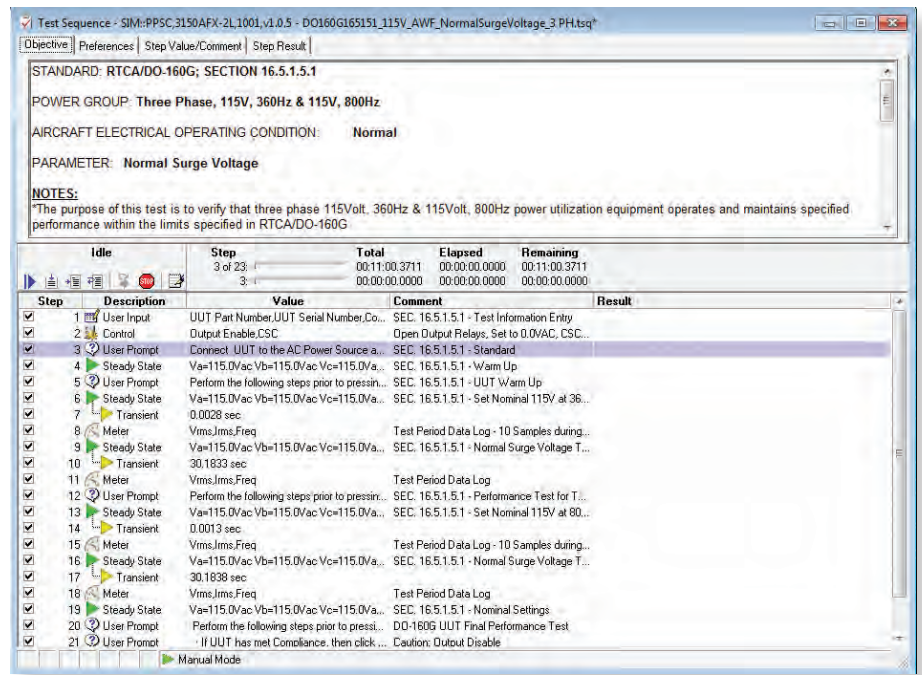


Figure 5: DO160G_Test 16.5.1.5.1 Normal Surge Voltage Test Screen

Ordering Information

| Option | Description | Part Number |
|-------------------|---|---|
| RTCA/DO160G | Provides Test Sequences for RTCA/DO-160, Section 16, Revision G, Dated December 2010, Environmental Conditions and Test Procedures for Airborne Equipment, Section 16, Power Input. AC Power groups ACF, ANF and AWF for both Single and Three phase equipment at both 115V and 230V nominal are provided. DC power groups included are Cat B (14Vdc), Cat A (28Vdc), Cat B (28Vdc), Cat Z (28Vdc) and Cat D (270Vdc). Distribution revision 1.3 or higher required for AFX Series. | 149124 |
| RTCA/DO160E | Provides Test Sequences for RTCA/DO-160, Issue E, Dated December 2004, for both Single and Three phase equipment are provided. AC Only. | 149100 |
| PPCS Manager | Basic PPSC Manager functions (PPSC Control, Output Sequence Browser, Waveform Editor) . Does not include PPSC Test Manager license for access to Test Sequences and Test Plans. No cost license. | Free license with registration |
| PPCS Test Manager | Registration and access to PPSC Test Manager Software. Create, Open, and Edit Output Test Sequences using PPSC Manager Features | Separate License required for each power source |

Deliverables

- Test Sequence Installer Download Link
- User Documentation PDF Download Link