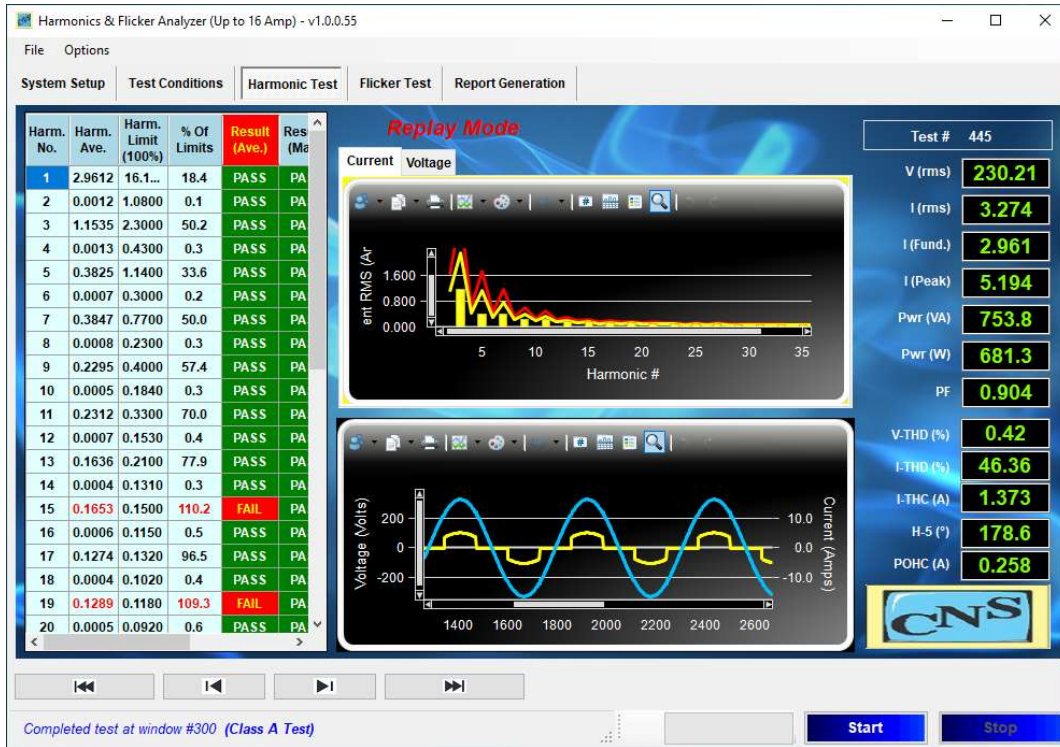


# HFA-16/75 1 & 3 Phase Harmonics & Flicker Analyzer Specifications



IEC 61000-3-2 Ed. 3.2 & Ed. 5.0

IEC 61000-3-3 Ed. 1.2 and 3.0

IEC 61000-3-11 Ed. 1 & 2

IEC 61000-3-12 Ed. 1 & 2

(including GB/T 14549 for China, NMX-J-550/3-2 for Mexico, JIS-C 61000-3-2 : 2019 for Japan and GB 17625.2-2007 for China)

- 16 bit USB based data acquisition – works with Laptops & Desktop PC's
- Very accurate Windows-7, 8, 10 compatible power analyzer with data storage
- Control for most power sources incl. Ametek® Pacific Power® Teseq® etc.
- ISO-17025 Accredited Calibration with detailed data available
- Built-in Reference Impedance per IECTR 60725 available
- Small form factor works with 120 & 220/230 public power supply



## Computer & Networking Services Inc.

Calibration Lab: 12625 Danielson Ct. #112  
Office: 15820 Crystal View Lane  
Poway CA 9206 - USA

Tel: +1-858-486-5432  
Tel: +1-858-486-4707  
[www.cnspoway.com](http://www.cnspoway.com)

Sales Partner:



absolute-emc.com  
Phone: 703-774-7505  
info@absolute-emc.com

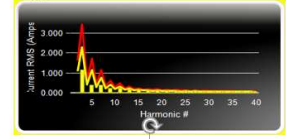
# Advanced reporting, data storage & replay features

Test File: H:20200418\_445  
 EUT: HFC-III  
 Test Standard: Test per IEC 61000-3-2 Ed. 5.0 - 2018  
 Test Class: (Class A Test)  
 Test Result: **FAIL - 100% average**  
 Test Date: 2/28/2018  
 Start Time: 8:56:50  
 Stop Time:  
 Test Duration (min): 1

Source Qualification: Compliance with IEC61000-3-2  
 Power Source Distortion: **OK**  
 Customer: IEC  
 Test By: CNS  
 Comments: Operating

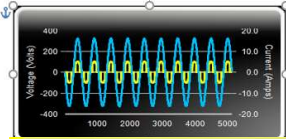
General Test Data: (Phase A)  
 Vrms (Volts): 230.16  
 Lrms (Amps): 2.276  
 Lfund (Amps): 2.861  
 Lpeak (Amps): 5.263  
 V-THD (%): 0.419  
 PTHC (A): 0.258  
 LTHC (A): 1.373

Frequency (Hz): 50.00  
 Power (VA): 754.1  
 Power (W): 681.1  
 Power Factor: 0.903  
 I-THD (%): 46.358  
 PTHC Limit (A): 0.250  
 Meas. Pwr (Min / Max) 680.9W/681.5W

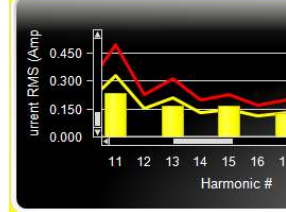


Phase angle of H5 (deg):

Harmonic Spectrum



Voltage & Current Waveform



| Harm.No. | Harm. Ave. | Harm. Limit (100%) | % Of Limits | Result (Ave.) | Result (Max.) | Harm. Win. | Harm. Win. (150%) | % Of Max |
|----------|------------|--------------------|-------------|---------------|---------------|------------|-------------------|----------|
| 2        | 0.0012     | 1.0000             | 0.1         | PASS          | PASS          | 0.0017     | 1.6200            | 0.1      |
| 3        | 1.1535     | 2.3000             | 50.2        | PASS          | PASS          | 1.1538     | 3.4500            | 33.4     |
| 4        | 0.0013     | 0.4300             | 0.3         | PASS          | PASS          | 0.0027     | 0.8400            | 0.3      |
| 5        | 0.2825     | 1.1400             | 24.8        | PASS          | PASS          | 0.2828     | 0.8400            | 33.4     |
| 6        | 0.0007     | 0.3000             | 0.2         | PASS          | PASS          | 0.0016     | 0.3840            | 0.4      |
| 7        | 0.2847     | 0.7700             | 37.0        | PASS          | PASS          | 0.2849     | 0.3840            | 74.2     |
| 8        | 0.0008     | 0.2300             | 0.3         | PASS          | PASS          | 0.0023     | 0.5760            | 0.4      |
| 9        | 0.2295     | 0.4000             | 57.4        | PASS          | PASS          | 0.2297     | 0.5760            | 39.9     |
| 10       | 0.0005     | 0.1840             | 0.3         | PASS          | PASS          | 0.0015     | 0.3840            | 0.4      |
| 11       | 0.2312     | 0.3300             | 70.0        | PASS          | PASS          | 0.2313     | 0.3840            | 59.9     |
| 12       | 0.0007     | 0.1530             | 0.4         | PASS          | PASS          | 0.0022     | 0.3840            | 0.6      |
| 13       | 0.1636     | 0.2100             | 77.9        | PASS          | PASS          | 0.1638     | 0.3840            | 42.6     |
| 14       | 0.0004     | 0.1310             | 0.3         | PASS          | PASS          | 0.0013     | 0.3840            | 0.3      |
| 15       | 0.1653     | 0.1500             | 110.2       | FAIL          | PASS          | 0.1655     | 0.3840            | 43.1     |
| 16       | 0.0006     | 0.1150             | 0.5         | PASS          | PASS          | 0.0021     | 0.3840            | 0.5      |
| 17       | 0.1274     | 0.1320             | 96.5        | PASS          | PASS          | 0.1275     | 0.3840            | 33.2     |
| 18       | 0.0004     | 0.1020             | 0.4         | PASS          | PASS          | 0.0013     | 0.3840            | 0.3      |
| 19       | 0.1228     | 0.1100             | 109.2       | FAIL          | PASS          | 0.1231     | 0.3840            | 31.8     |
| 20       | 0.0005     | 0.0920             | 0.6         | PASS          | PASS          | 0.0021     | 0.3840            | 0.5      |
| 21       | 0.1041     | 0.1070             | 97.3        | PASS          | PASS          | 0.1043     | 0.3840            | 27.1     |
| 22       | 0.0004     | 0.0830             | 0.4         | PASS          | PASS          | 0.0013     | 0.3840            | 0.3      |
| 23       | 0.1058     | 0.0970             | 109.1       | FAIL          | PASS          | 0.1059     | 0.3840            | 27.6     |
| 24       | 0.0005     | 0.0760             | 0.6         | PASS          | PASS          | 0.0021     | 0.3840            | 0.5      |
| 25       | 0.0881     | 0.0900             | 97.8        | PASS          | PASS          | 0.0882     | 0.3840            | 22.8     |
| 26       | 0.0003     | 0.0700             | 0.5         | PASS          | PASS          | 0.0013     | 0.3840            | 0.3      |
| 27       | 0.0897     | 0.0830             | 108.1       | FAIL          | PASS          | 0.0899     | 0.3840            | 23.2     |
| 28       | 0.0005     | 0.0650             | 0.8         | PASS          | PASS          | 0.0021     | 0.3840            | 0.5      |
| 29       | 0.0762     | 0.0770             | 99.0        | PASS          | PASS          | 0.0763     | 0.3840            | 19.9     |
| 30       | 0.0004     | 0.0610             | 0.6         | PASS          | PASS          | 0.0013     | 0.3840            | 0.3      |
| 31       | 0.0780     | 0.0720             | 108.3       | FAIL          | PASS          | 0.0781     | 0.3840            | 20.3     |
| 32       | 0.0005     | 0.0570             | 0.9         | PASS          | PASS          | 0.0021     | 0.3840            | 0.5      |
| 33       | 0.0672     | 0.0680             | 98.9        | PASS          | PASS          | 0.0673     | 0.3840            | 17.8     |
| 34       | 0.0003     | 0.0540             | 0.6         | PASS          | PASS          | 0.0013     | 0.3840            | 0.3      |
| 35       | 0.0690     | 0.0640             | 107.8       | FAIL          | PASS          | 0.0691     | 0.3840            | 18.2     |
| 36       | 0.0005     | 0.0510             | 0.9         | PASS          | PASS          | 0.0020     | 0.3840            | 0.5      |
| 37       | 0.0691     | 0.0600             | 109.2       | FAIL          | PASS          | 0.0692     | 0.3840            | 18.6     |
| 38       | 0.0003     | 0.0480             | 0.7         | PASS          | PASS          | 0.0013     | 0.3840            | 0.3      |
| 39       | 0.0620     | 0.0570             | 108.7       | FAIL          | PASS          | 0.0621     | 0.3840            | 17.2     |
| 40       | 0.0004     | 0.0460             | 0.8         | PASS          | PASS          | 0.0015     | 0.3840            | 0.4      |

• Maximum values in individual 200 ms measurement windows are recorded.

- Power source performance is continually monitored per IEC 61000-3-2 clause A.2
- User can zoom in on any data detail in waveform, current spectrum or voltage spectrum, and copy & paste graphs.
- Power source voltage distortion shown from H3

• The system stores raw data – like a data logger - which can be replayed as if you are doing the test in real time. View any 10/12 cycles of 50/60 Hz and scroll back and forth like a video player.

## Easy setup for power sources & impedance control

Interface Connection :

- Manual Control
- Pacific Power Source**
- Ci / Teseq ( Fw < 3.1 )
- Ci / Teseq ( Fw > 4.0 )
- Other

Pwr Src Control :

Configure

On

Off

Voltage: 230.0    Frequency: 50.00

AFX Power Source is selected

Select the power source and easily configure the interface vis RS232 / USB or GPIB.

Select the impedance type and values for Flicker testing including programmable if the source offers it, or using current

Flicker Settings :

Region :

- European
- Japanese**
- Other

Impedance Selections :

- Bypass
- Z-Ref
- Flicker from current**

|           | Single Phase | Three Phase |
|-----------|--------------|-------------|
| R (mOhms) | 400          | 240         |
| L (uH)    | 796          | 477         |

## Select test standard editions and analysis method

Harmonics & Flicker Analyzer (Up to 16 Amp) - v1.0.0.55

File    Options

System

- Test Standard: IEC61000-3.2 Ed. 5.0
- Language: IEC61000-3.2 Ed. 3.2
- Sound Wave: IEC61000-3-3 Ed. 3.1
- Test Progress: IEC61000-3-3 Ed. 1.2

**Harmonics JIS-C 61000-3.2**    Without Imp.

JIS-C 61000-3.2 Ed. 2.0 - 2011

Select test IEC standard edition or JIS-C 61000-3-2 (some countries still require older editions)

System Configuration :

Harmonics Settings :

Inter-Harmonics  ON

Select inter-harmonics grouping ON or OFF

Sales Partner:



absolute-emc.com  
 Phone: 703-774-7505  
 info@absolute-emc.com

# Harmonics & Flicker test @ 50 Hz and 60 Hz

Select the test class for harmonics. All Class-C and Class-D test requirements are supported.

Select the desired Flicker test. Simplified method for inrush current as well as “24 x dmax” methods are supported.

Set test conditions for voltage & frequency for either harmonics or Flicker testing

Bigger systems – mainly determined by the power source capability, support harmonics & Flicker for up to 75 A/phase. Systems will generally have a separate Impedance Unit, but Flicker can also be calculated from current per IEC 61000-3-3/11

The user selects the Test Table and R<sub>sce</sub> for IEC 61000-3-12 harmonics and the system automatically applies the correct limit table.

## Standards expertise, support & calibration



Certificate 4044.01

CNS Inc. represents 25 years of IEC standards experience, with participation in several IEC working groups since 1995. The calibration methods pioneered by CNS Inc. are reflected in IEC TR 61000-4-37, and IEC 61000-4-38. CNS Inc. has actively participated in the work on IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-7, IEC 61000-4-15 and has been accredited for harmonics – Flicker- and general power source calibration since 2016.

All system come with detailed calibration data, and an optional (accredited) ISO-17025 Certificate. CNS Inc. can also answer your questions regarding standards or test methods.



# Specifications for HFA-1-16S & HFA-1/3-16-19, HFa-3-75

## Electrical

Frequency range of fundamental line component; 45 – 65 Hz

Sampling method; PLL based with 512 samples/cycle (simultaneous per channel), or fixed frequency sampling

Harmonic analysis range; up to harmonic order 200 (10/12 kHz)

Harmonic spectrum display up to harmonic 40, can be expanded to 9 kHz

Voltage input range; 0 – 350 V-rms, + / - 500 Volt peak std, 500 V-rms optional.

Voltage measurement accuracy; 0.1 % + 10 mV, Voltage harmonics; 0.1 % + 0.1 % per 100 Hz + 5 mV

Current input range;

Small form factor; 0 – 20 A-rms.

HFa16 & HFa40; 0 – 36 A-rms (limited by optional Ref. Impedance)

HFa-75; 0 – 120 Amp peak, 0 – 75 A -rms

Current measurement accuracy; 0.1 % + 5 mA in Phase-A, 0.15 % + 5 mA for Phase-B & C of 3 phase units.

Harmonic current accuracy: 0.1 % + 0.02 %/100 Hz+5 mA

Power Factor range & accuracy; -1.000 – 0 - +1.000, +/- 0.003,

Power measurement: 1 – 20000 VA / 1 – 20000 Watt, per phase, measurement accuracy; 0.15% + 0.1 Watt

Phase measurement range; 0 – 360 °, Phase accuracy 50 – 2500 Hz; 0.2° + 0.2° per100 Hz

EUT interface Standard version IEC plug for HFA-1/3S, Schuko and universal plug for HFA-1/3-19, plug-sleeve up to 40 A-rms for HFa75. Rear terminal block for up to 80 A-rms / phase

Optional IEC 60725 Reference Impedance can be built-in (must be ordered separately).

## Mechanical, input power & interface

19" rack version; 16" x 3.5" x 22" ( W x H x D ).

HFa-1S: 7" x 7.5" x 2" ( W x Lx H ) .

Weight; < 20 Lb (9 Kg) without optional Reference Impedance, 40 lb ( 18 Kg) with Reference Impedance

Input power; 100 – 240 Vac 50/60 Hz, max 50 Watt (70 Watt for models with built-in Reference Impedance)

*The small form factor HFA-1S  
Small form factor and  
connection diagram*



The 19" HFa-16-1 with optional built-in Reference Impedance per IEC TR 60725



Sales Partner:



absolute-emc.com  
Phone:703-774-7505  
info@absolute-emc.com