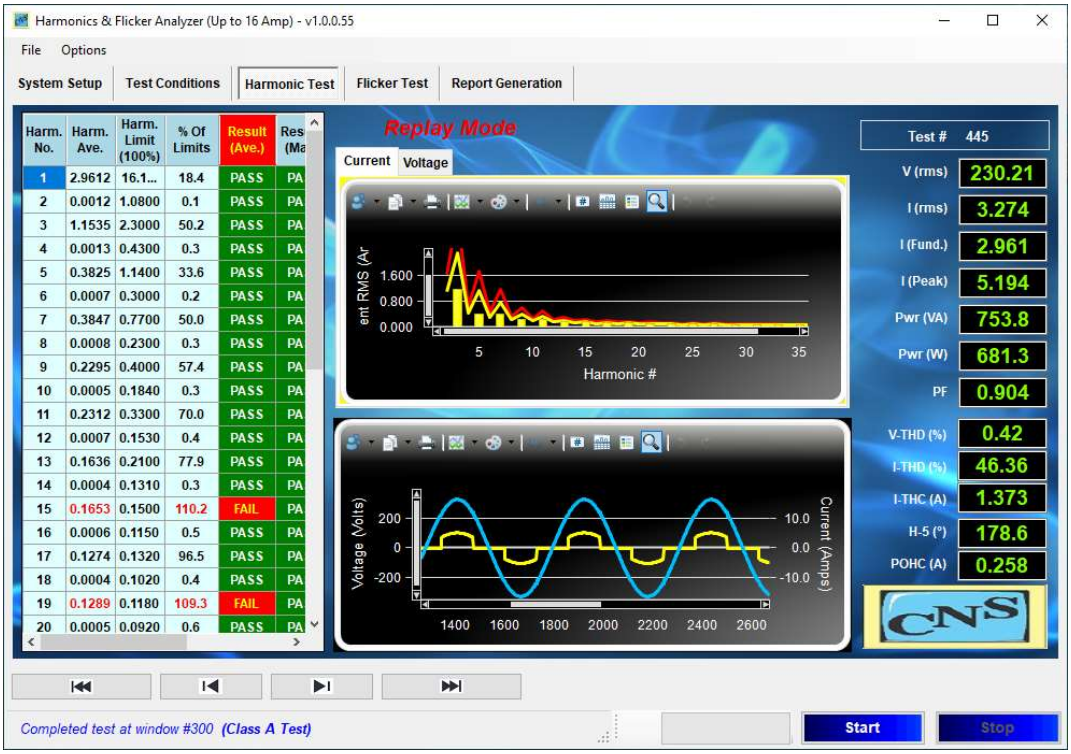
HFA-16/75 1 & 3 Phase
Harmonics & Flicker Analyzer Specifications

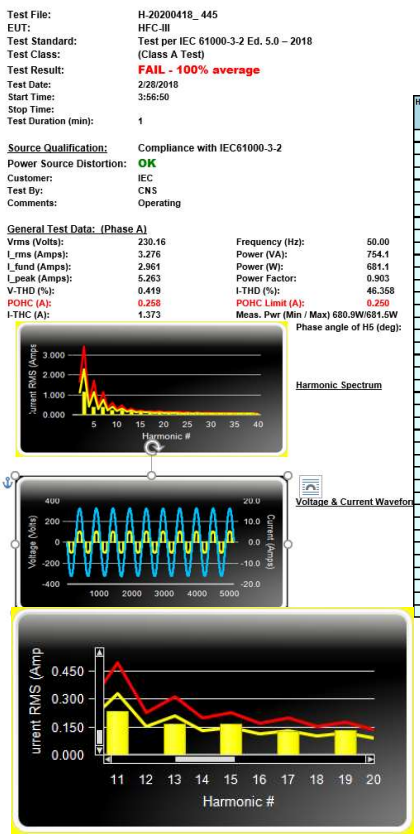


IEC 61000-3-2 Ed. 3.2 & Ed. 5.0 **IEC 61000-3-3 Ed. 1.2 and 3.0**
IEC 61000-3-11 Ed. 1 & 2 **IEC 61000-3-12 Ed. 1 & 2**
(including GB/T 14549 for China, NMX-J-550/3-2 for Mexico, JIS-C 61000-3-2 : 2019 for Japan and GB 17625.2-2007 for China)

- **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 *Tel: +1-858-486-5432*
Office: 15820 Crystal View Lane *Tel: +1-858-486-4707*
Poway CA 9206 - USA *www.cnspoway.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: 3:56:50
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	Frequency (Hz):	50.00
I_rms (Amps):	3.276	Power (VA):	754.1
I_fund (Amps):	2.961	Power (W):	681.1
I_peak (Amps):	5.263	Power Factor:	0.903
V-THD (%):	0.419	I-THD (%):	46.358
POHC (A):	0.258	POHC Limit (A):	0.250
I-THC (A):	1.373	Meas. Pwr (Min / Max) 680.9W/681.5W	
		Phase angle of H5 (deg):	

Harmonic Spectrum

Voltage & Current Waveform

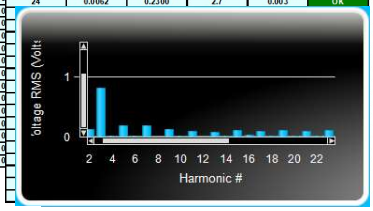
Zoomed current harmonics showing H15 just over the imit

- **Easy to understand reports in RTF, can be opened by any Windows program, no need for Word©. Parameters exceeding limits are identified**

Harm No.	Harm. Ave.	Harm. Limit (100%)	% Of Limits	Result (Ave.)	Result (Max.)	Harm. Win.	Harm. Win. (150%)	% Of Max
2	0.0012	1.0800	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	0.6450	0.4
5	0.3825	1.1400	33.6	PASS	PASS	0.3828		
6	0.0007	0.3000	0.2	PASS	PASS	0.0016		
7	0.3847	0.7700	50.0	PASS	PASS	0.3849		
8	0.0008	0.2300	0.3	PASS	PASS	0.0023		
9	0.2295	0.4000	57.4	PASS	PASS	0.2297		
10	0.0005	0.1840	0.3	PASS	PASS	0.0015		
11	0.2312	0.3300	70.0	PASS	PASS	0.2313		
12	0.0007	0.1530	0.4	PASS	PASS	0.0022		
13	0.1636	0.2100	77.9	PASS	PASS	0.1638		
14	0.0004	0.1310	0.3	PASS	PASS	0.0013		
15	0.1653	0.1500	110.2	FAIL	PASS	0.1655		
16	0.0006	0.1150	0.5	PASS	PASS	0.0021		
17	0.1274	0.1320	96.5	PASS	PASS	0.1275		
18	0.0004	0.1020	0.4	PASS	PASS	0.0013		
19	0.1289	0.1180	109.3	FAIL	PASS	0.1291		
20	0.0005	0.0920	0.6	PASS	PASS	0.0021		
21	0.1041	0.1070	97.3	PASS	PASS	0.1043		
22	0.0004	0.0830	0.4	PASS	PASS	0.0013		
23	0.1058	0.0970	109.1	FAIL	PASS	0.1059		
24	0.0005	0.0760	0.6	PASS	PASS	0.0021		
25	0.0881	0.0900	97.8	PASS	PASS	0.0882		
26	0.0003	0.0700	0.5	PASS	PASS	0.0013		
27	0.0897	0.0830	108.1	FAIL	PASS	0.0899		
28	0.0005	0.0650	0.8	PASS	PASS	0.0021		
29	0.0762	0.0770	99.0	PASS	PASS	0.0763		
30	0.0004	0.0610	0.6	PASS	PASS	0.0013		
31	0.0780	0.0720	108.3	FAIL	PASS	0.0781		
32	0.0005	0.0570	0.9	PASS	PASS	0.0021		
33	0.0672	0.0680	98.9	PASS	PASS	0.0673		
34	0.0003	0.0540	0.6	PASS	PASS	0.0013		
35	0.0690	0.0640	107.8	FAIL	PASS	0.0691		
36	0.0005	0.0510	0.9	PASS	PASS	0.0020		
37	0.0601	0.0600	100.2	FAIL	PASS	0.0602		
38	0.0003	0.0480	0.7	PASS	PASS	0.0013		
39	0.0620	0.0570	108.7	FAIL	PASS	0.0621		
40	0.0004	0.0460	0.8	PASS	PASS	0.0015		

- **Maximum values in individual 200 ms measurement windows are recorded.**

Harm No.	Harm. Value	Harm. Limit	% Of Limits	% Of Vfund	Result
2	0.1413	0.4600	30.7	0.061	OK
3	0.8237	2.0700	39.8	0.358	OK
4	0.0384	0.4600	8.4	0.017	OK
5	0.1991	0.9200	21.6	0.087	OK
6	0.0279	0.4600	6.1	0.012	OK
7	0.1862	0.6900	27.0	0.081	OK
8	0.0135	0.4600	2.9	0.006	OK
9	0.1249	0.4600	27.2	0.054	OK
10	0.0219	0.4600	4.8	0.010	OK
11	0.1073	0.2300	46.6	0.047	OK
12	0.0106	0.2300	4.6	0.005	OK
13	0.0877	0.2300	38.1	0.038	OK
14	0.0196	0.2300	8.5	0.009	OK
15	0.1127	0.2300	49.0	0.049	OK
16	0.0312	0.2300	13.6	0.014	OK
17	0.1048	0.2300	45.6	0.046	OK
18	0.0237	0.2300	10.3	0.010	OK
19	0.1076	0.2300	46.8	0.047	OK
20	0.0231	0.2300	10.0	0.010	OK
21	0.1004	0.2300	43.7	0.044	OK
22	0.0105	0.2300	4.6	0.005	OK
23	0.1097	0.2300	47.7	0.048	OK
24	0.0062	0.2300	2.7	0.003	OK



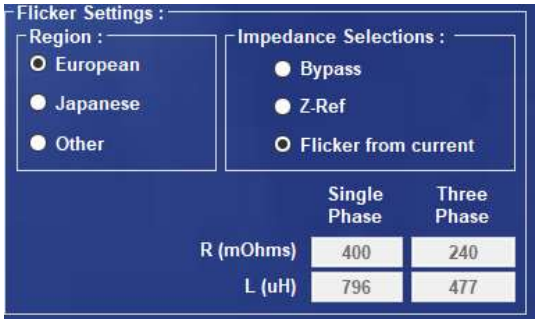
- **Power source performance is continually monitored per IEC 61000-3-2 clause A.2**
- **User can zoom in on any data detail in waveform, current spectrum or voltage spectrum, and copy & paste graphs.**
- **Power source voltage distortion shown from H3**

- **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.**

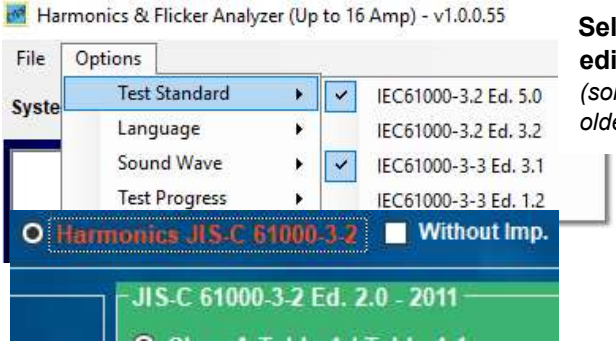
Easy setup for power sources & impedance control

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

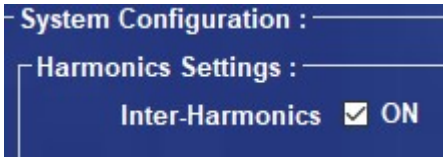
Select the impedance type and values for Flicker testing including programmable if the source offers it, or using current



Select test standard editions and analysis method

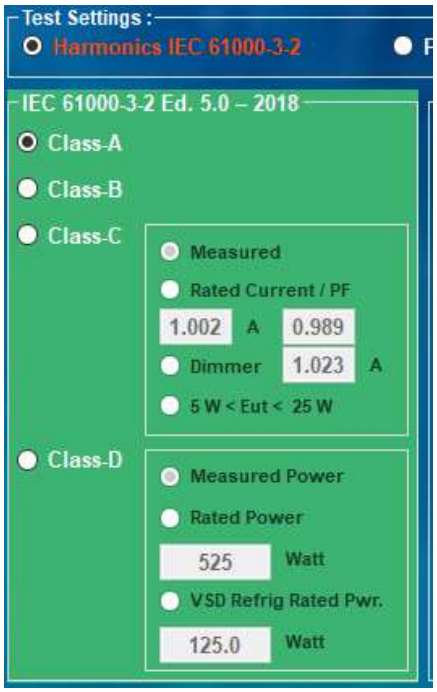


Select test IEC standard edition or JIS-C 61000-3-2
(some countries still require older editions)



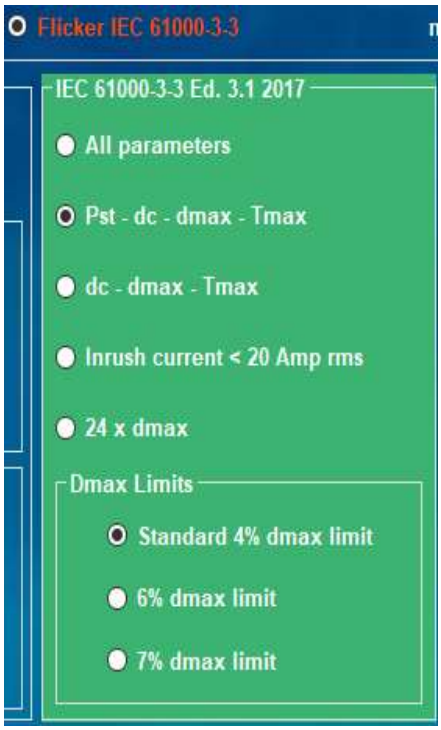
Select inter-harmonics grouping ON or OFF

Harmonics & Flicker test @ 50 Hz and 60 Hz



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

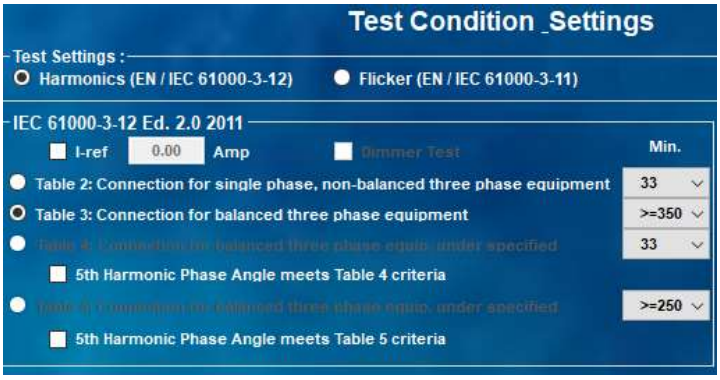
Select the desired Flicker test. Simplified method for inrush current as well as "24 x dmax" methods are supported.



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 Rsce 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.

e-mail your questions to mathieu@cnspoway.com

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

Computer & Networking Services Inc.
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