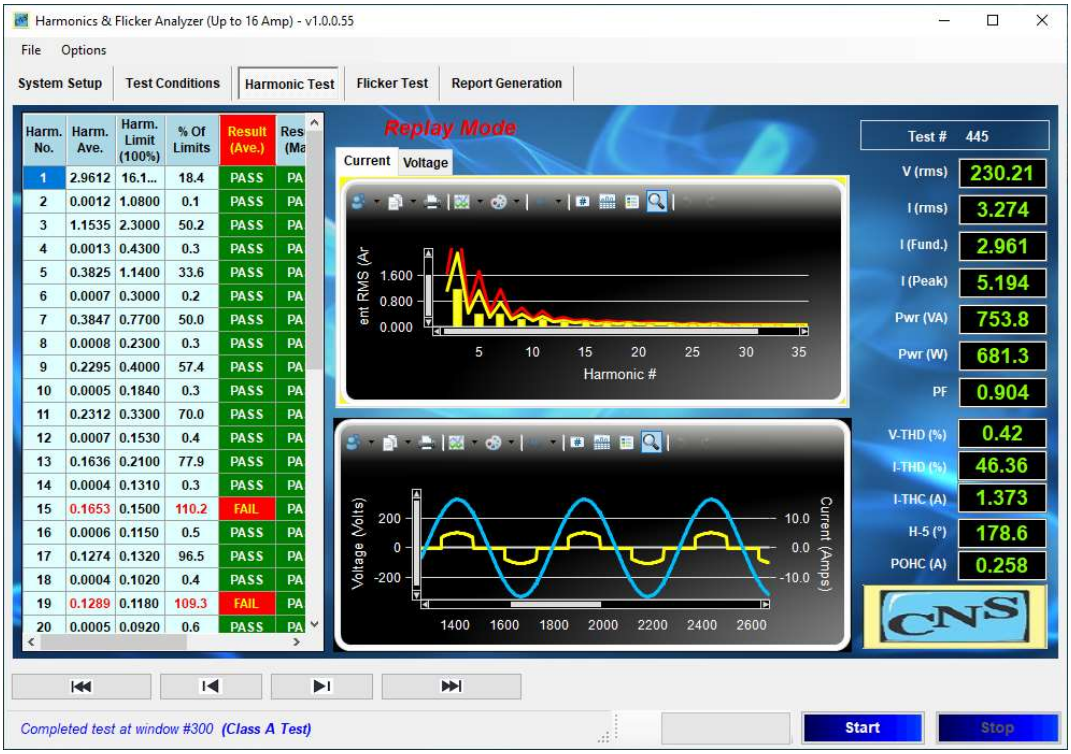
HFA-16/75 1 & 3 Phase
Harmonics & Flicker Analyzer Specifications

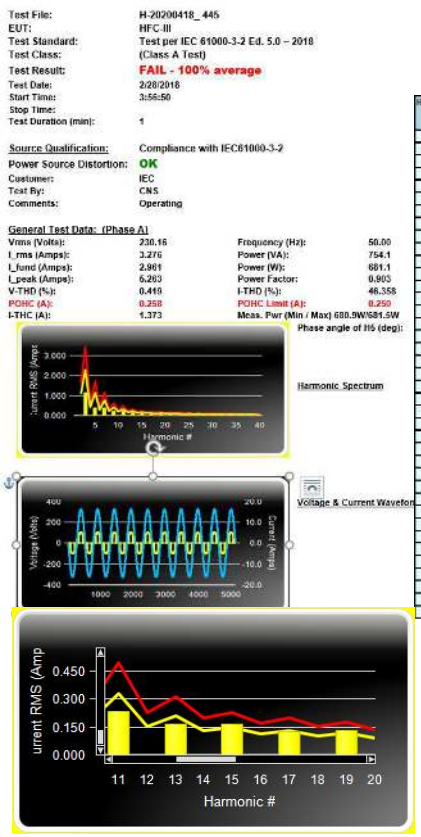


IEC 61000-3-2 Ed. 3.2 & Ed. 5.0 **IEC 61000-3-3 Ed. 1.2 and 3.0**
IEC 61000-3-11 Ed. 1 & 2 **IEC 61000-3-12 Ed. 1 & 2**
(including GB/T 14549 for China, NMX-J-550/3-2 for Mexico, JIS-C 61000-3-2 : 2019 for Japan and GB 17625.2-2007 for China)

- **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**

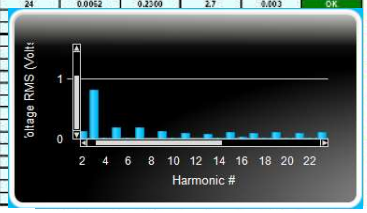
Computer & Networking Services Inc.
Calibration Lab: 12625 Danielson Ct. #112 *Tel: +1-858-486-5432*
Office: 15820 Crystal View Lane *Tel: +1-858-486-4707*
Poway CA 9206 - USA *www.cnspoway.com*

Advanced reporting, data storage & replay features



Harm No.	Harm. Ave.	Harm. Limit (100%)	% Of Limits	Result (Ave.)	Result (Max.)	Harm. Min.	Harm. Min. (150%)	% Of Max
2	0.0012	1.0800	0.1	PASS	PASS	0.0017	1.6200	0.1
3	1.1036	2.3000	50.2	PASS	PASS	1.1036	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	0.3826	1.7100	22.4
6	0.0007	0.3000	0.2	PASS	PASS	0.0016	0.4500	0.4
7	0.3847	0.7700	50.0	PASS	PASS	0.3849	1.1550	33.3
8	0.0008	0.2300	0.3	PASS	PASS	0.0023	0.3450	0.7
9	0.2295	0.4000	57.4	PASS	PASS	0.2297	0.6000	38.3
10	0.0005	0.1840	0.3	PASS	PASS	0.0015	0.2760	0.5
11	0.2312	0.3300	70.0	PASS	PASS	0.2313	0.4950	46.7
12	0.0007	0.1530	0.4	PASS	PASS	0.0022	0.2300	1.0
13	0.1836	0.2100	87.4	PASS	PASS	0.1838	0.3150	58.3
14	0.0004	0.1310	0.3	PASS	PASS	0.0013	0.1970	0.7
15	0.1653	0.1500	110.2	FAIL	PASS	0.1655	0.2250	73.5
16	0.0005	0.1150	0.5	PASS	PASS	0.0021	0.1730	1.2
17	0.1274	0.1320	96.5	PASS	PASS	0.1275	0.1980	64.4
18	0.0004	0.1020	0.4	PASS	PASS	0.0013	0.1530	0.8
19	0.1285	0.1180	109.1	FAIL	PASS	0.1291	0.1770	72.9
20	0.0005	0.0920	0.6	PASS	PASS	0.0021	0.1380	1.5
21	0.1041	0.1070	97.3	PASS	PASS	0.1043	0.1605	65.0
22	0.0004	0.0838	0.4	PASS	PASS	0.0013	0.1260	1.0
23	0.1058	0.0970	109.1	FAIL	PASS	0.1059	0.1455	72.8
24	0.0005	0.0769	0.6	PASS	PASS	0.0021	0.1154	1.8
25	0.0881	0.0900	97.8	PASS	PASS	0.0882	0.1350	65.3
26	0.0003	0.0700	0.5	PASS	PASS	0.0013	0.1050	1.2
27	0.0897	0.0830	108.1	FAIL	PASS	0.0899	0.1245	72.2
28	0.0005	0.0650	0.8	PASS	PASS	0.0021	0.0975	2.2
29	0.0762	0.0770	99.0	PASS	PASS	0.0763	0.1155	66.1
30	0.0004	0.0610	0.8	PASS	PASS	0.0013	0.0915	1.4
31	0.0780	0.0720	108.3	FAIL	PASS	0.0781	0.1080	72.3
32	0.0005	0.0670	0.9	PASS	PASS	0.0021	0.1005	2.1
33	0.0672	0.0680	98.9	PASS	PASS	0.0673	0.1020	65.9
34	0.0003	0.0640	0.5	PASS	PASS	0.0013	0.0960	1.4
35	0.0690	0.0640	107.8	FAIL	PASS	0.0691	0.0960	72.0
36	0.0005	0.0610	0.9	PASS	PASS	0.0020	0.0915	2.2
37	0.0691	0.0600	115.2	FAIL	PASS	0.0692	0.0900	76.9
38	0.0003	0.0480	0.7	PASS	PASS	0.0013	0.0720	1.8
39	0.0620	0.0570	108.7	FAIL	PASS	0.0621	0.0855	72.5
40	0.0004	0.0460	0.8	PASS	PASS	0.0016	0.0690	2.3

Harm No.	Harm. Value	Harm. Limit	% Of Limits	% Of Vfund	Result
2	0.1413	0.4600	30.7	0.061	OK
3	0.8237	2.3700	34.8	0.368	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	0.1062	0.6900	27.0	0.001	OK
8	0.0136	0.4600	2.9	0.006	OK
9	0.1349	0.4600	27.2	0.064	OK
10	0.0219	0.4600	4.8	0.010	OK
11	0.1103	0.2300	48.8	0.047	OK
12	0.0106	0.2300	4.6	0.005	OK
13	0.0077	0.2300	33.1	0.030	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	45.8	0.048	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	0.0106	0.2300	4.6	0.005	OK
23	0.1057	0.2300	47.7	0.048	OK
24	0.0062	0.2300	2.7	0.003	OK



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

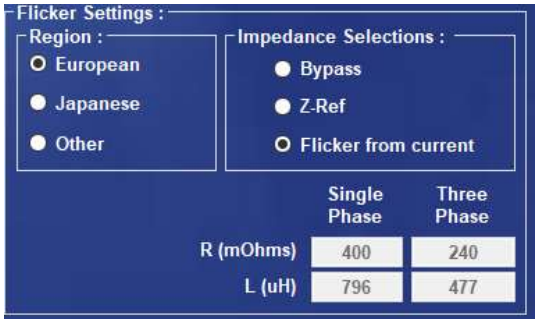
Zoomed current harmonics showing H15 just over the imit

- **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.**

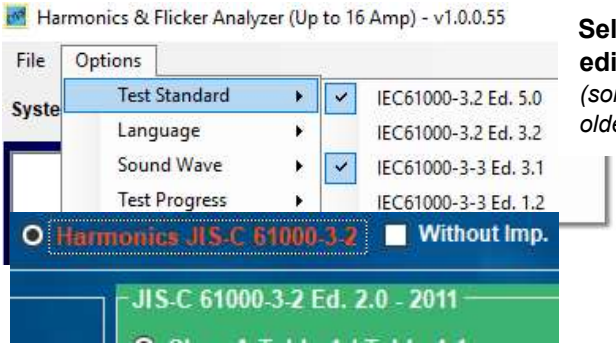
Easy setup for power sources & impedance control

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

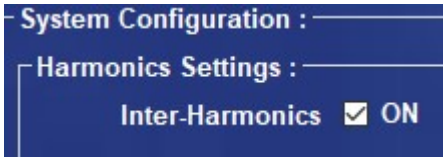
Select the impedance type and values for Flicker testing including programmable if the source offers it, or using current



Select test standard editions and analysis method

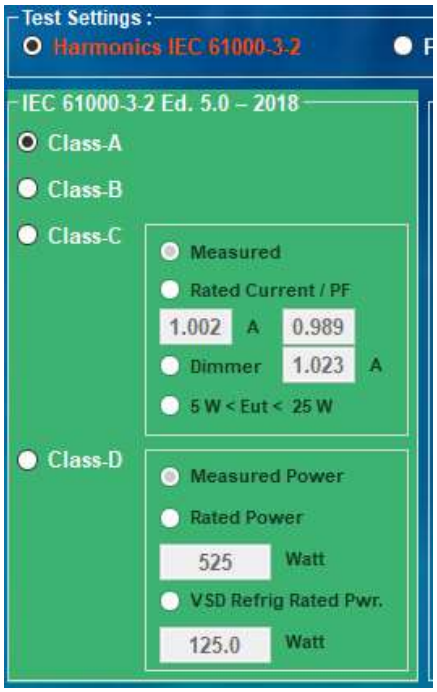


Select test IEC standard edition or JIS-C 61000-3-2
(some countries still require older editions)



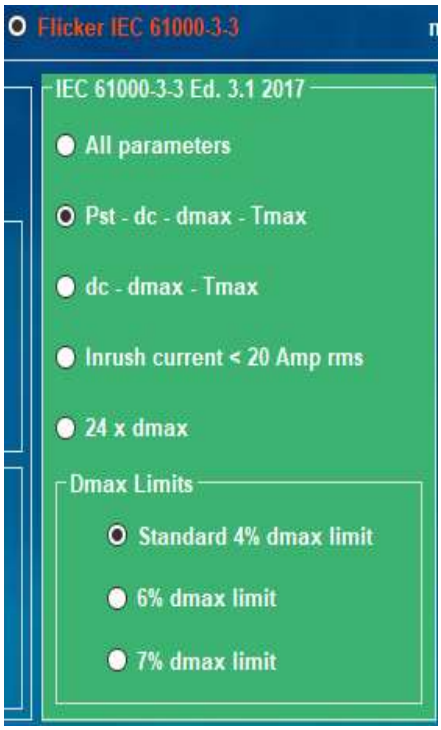
Select inter-harmonics grouping ON or OFF

Harmonics & Flicker test @ 50 Hz and 60 Hz



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

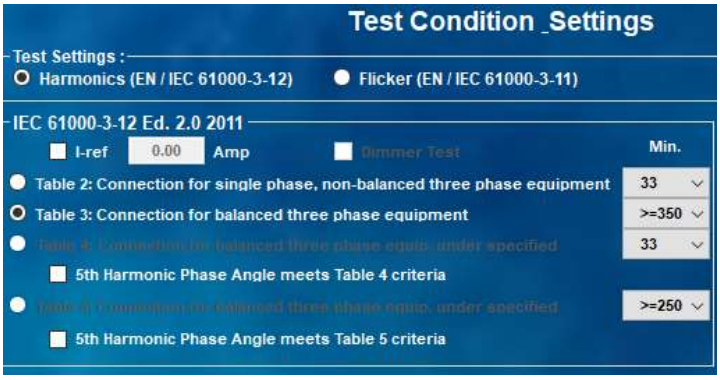
Select the desired Flicker test. Simplified method for inrush current as well as "24 x dmax" methods are supported.



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

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