

## HFG01 – Harmonics and Flicker Generator



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The Harmonics & Flicker Generator (HFG01) has been designed by York EMC Services Ltd for the purpose of verifying harmonic and flicker test equipment. Until now there has been no easy and reliable way to externally check the performance of the measurement system to the EN/IEC 61000-3-2 harmonics and EN/IEC 61000-3-3 flicker standards.

The HFG01 allows the user to periodically verify their test equipment, ensuring compliance with standards and laboratory quality procedures. The unit provides a series of harmonic and flicker disturbances of a nominal but stable level. The generator may therefore be used to verify the stability of a measurement system. Alternatively due to its stability it may be used as a transfer standard from a calibrated system.

- Stable load simulation
  - ✓ Repeatable measurements
- Injects harmonics to EN61000-3-2 and flicker to EN61000-3-3
  - ✓ Evaluation of test systems specifically to EN standards
- Compact and Portable
  - ✓ Comparisons between multi-site test environments

### Operation

The unit is a standalone device and requires no additional equipment. A four way rotary switch selects the mode of operation. The modes are defined by firmware running on a micro controller. This will enable the characteristics of the generator to be reprogrammed in line with future changes to the standards.

The HFG01 simulates equipment under test (EUT), generating known, repeatable levels of harmonic and flicker disturbance in one of four modes of operation.

- In Steady State harmonics (SS) mode, a harmonic-rich current waveform is generated, allowing the harmonic measurement system to be verified. In this mode the generator simulates Class D equipment and produces harmonic levels that will fail the EN/IEC61000-3-2 (pre A14 and post A14) Class D limits. This mode will pass EN/IEC61000-3-2 (pre A14 and post A14) Class A limits.
- Fluctuating harmonics (FL) mode alternates between two distinct current waveforms over a 10s cycle. This mode again fails the EN/IEC61000-3-2 pre A14 Class D limits but passes the A14 Class D limits.
- In flicker test mode, a fixed level of mains disturbance is generated at a rate of 8.33Hz or 1Hz.
  - When tested to EN/IEC61000-3-3, the 8.33Hz rate produces a Pst value >1, which lies above the limit line.
  - The 1Hz setting produces a Pst value <1, which falls below the same limit.



### Applications

- Harmonics and flicker measurement systems validation and verification
- Reference source for:
  - Daily pre-test check
  - Long-term performance monitoring
- Comparison of different harmonics and flicker measurement systems

## Specifications

Frequency Range	50Hz to 2kHz (40th harmonic) direct connection
Output connector	Standard mains plug to mate with local test equipment
Dimensions	330mm x 320mm x 170mm
Weight	4kg
Power supply:	230Vac, 50Hz, 400W (maximum)
Indicators	Thermal shutdown – red LED

## Standard Order Kits

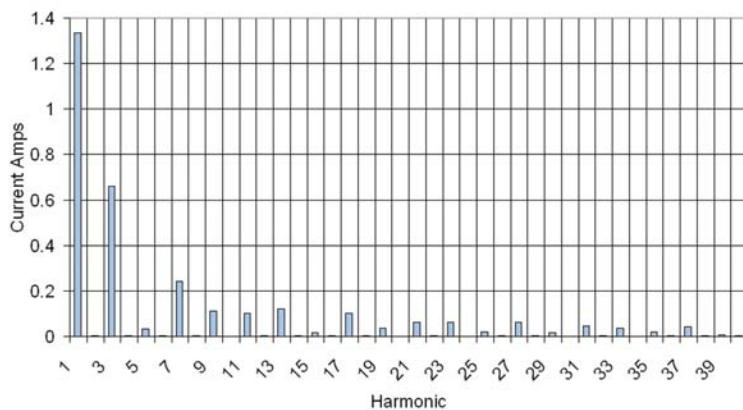
Part Number	Description	Parts Included
HFG01KIT01	Standard HFG01 harmonics and flicker generator kit	<ul style="list-style-type: none"> <li>● HFG01 harmonic and flicker generator</li> <li>● Standard test CAL12</li> </ul>

## Output Measurement Results

CAL12	Harmonics	Measurement of load current made according to EN61000-3-2 in Steady State and Fluctuating Harmonics modes. Fundamental (50Hz) to 40th harmonic.
	Flicker	Measurements of short term flicker (Pst) made according to EN61000-3-3 with disturbance at 1Hz and 8.33Hz rates

## Typical Output Measurement Results

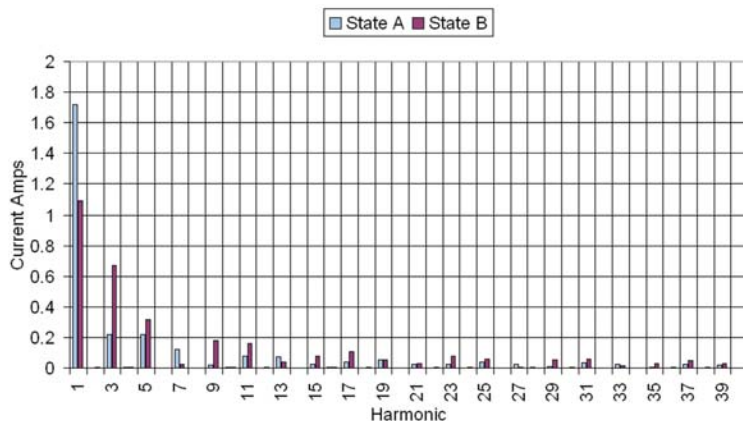
Steady State Harmonics



## Flicker

<b>Rate</b>	<b>Pst</b>
1.0Hz	0.462
8.333Hz	1.235

Fluctuating Harmonics



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