

**NEW**

# HFG02 Harmonics and Flicker Generator



# Product Technical Information

## Harmonics and Flicker Generator: HFG02

The Harmonics & Flicker Generator (HFG02) is a multifunction electronic load for the purpose of verifying harmonic and flicker test equipment. It provides an easy and reliable way to externally check the performance of the measurement system to the EN/IEC 61000-3-2 harmonics and interharmonics and EN/IEC 61000-3-3 flicker standards. A reference source is particularly useful where there is little intuitive sense of the expected response and the tests rely on software control and calculation to produce a result.

The HFG02 provides a range of harmonic and flicker disturbances of a nominal but stable level. This allows the user to periodically verify their test equipment, helping maintain compliance with standards and laboratory quality procedures. Alternatively, due to its stability, it may be used as a transfer standard from a known, calibrated test system.



The HFG02 is a standalone device that connects directly to the test equipment and simulates the equipment under test (EUT), generating known, repeatable levels of harmonic and flicker disturbance.

## Features

- **Stable load simulation**
  - Repeatable measurements for test system verification
- **Injects harmonics and interharmonics to EN 61000-3-2 and flicker to EN 61000-3-3**
  - Evaluation of test systems specified to EN standards
- **Harmonic test modes**
  - Steady-state harmonic-rich load current, representing a fixed load
  - Harmonic-rich load currents fluctuating between two load conditions
  - Interharmonic load currents at 5 Hz and 10 Hz rates
  - Harmonic and interharmonic-rich load current
- **Flicker test modes**
  - Fixed level of mains disturbance at 1 Hz rate
  - Fixed level of mains disturbance at 8.33 Hz (50 Hz supply) or 8.6 Hz rates (60 Hz supply)
- **EUT modes**
  - Simulates waveforms generated by several different types of equipment:
    - Half-wave rectifier
    - Analogue dimmer
    - Intermittent flicker

- **Compact and portable**
- **Dual supply operation**
  - Automatically detects 115 Vac and 230 Vac systems and adjusts its output to match
  - Test supply voltage and frequency indication
- **Independent power supply**
  - Separate power supply to the HFG02, to avoid contamination of the test signals

## Applications

- **Harmonics and flicker measurement systems validation and verification**
- **Reference source for:**
  - Daily pre-test verification checks, if required by accreditation authorities
  - Long term performance monitoring of the test system
- **Comparison of different harmonics and flicker measurement systems**

## Manufacturer's calibrations

- CAL22** Measurement of harmonic and flicker disturbance generated:
- Harmonics
    - Measurement of load current according to EN 61000-3-2 in Fixed, Fluctuating and Interharmonic modes. Fundamental to 40<sup>th</sup> harmonic, 115 Vac/60 Hz and 230 Vac/50 Hz test supply
  - Flicker
    - Measurement of short term flicker ( $P_{st}$ ) according to EN 61000-3-3 with disturbance at 1 Hz and 8.33 Hz/8.6 Hz rates. 115 Vac/60 Hz and 230 Vac/50 Hz test supply
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## Specifications

<b>Test supply</b>	Voltage: 115 Vac (nominal), 230 Vac (nominal) Frequency: 50 Hz, 60 Hz Power: 500 W (maximum)
<b>Disturbances generated</b>	Up to 40 <sup>th</sup> harmonic: 50 Hz to 2 kHz (50 Hz), 60 Hz to 2.4 kHz (60 Hz)
<b>Dimensions</b>	330 mm × 320 mm × 170 mm (not including test supply connector)
<b>Weight</b>	8 kg
<b>Power supply</b>	External power supply, 24 Vdc, 2 A maximum
<b>Power supply connector</b>	2.1 mm DC power socket
<b>Ext. PSU input rating</b>	100 – 240 Vac, 50-60 Hz, 50 W (maximum)
<b>Test supply connector</b>	1.3 m captive lead with BS 1363 3-pin UK mains plug, for connection to test equipment. Adapters for EU and US style mains connectors included.
<b>Indicators</b>	Test supply voltage, test supply frequency, test enabled, alarm (thermal overload, system error)
<b>Harmonic current</b>	(see graphs)
<b>Flicker disturbance</b>	(see graphs)

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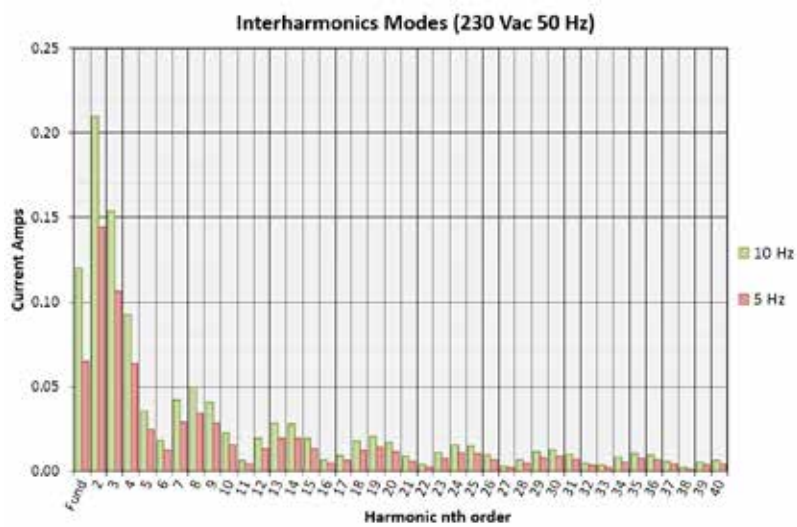
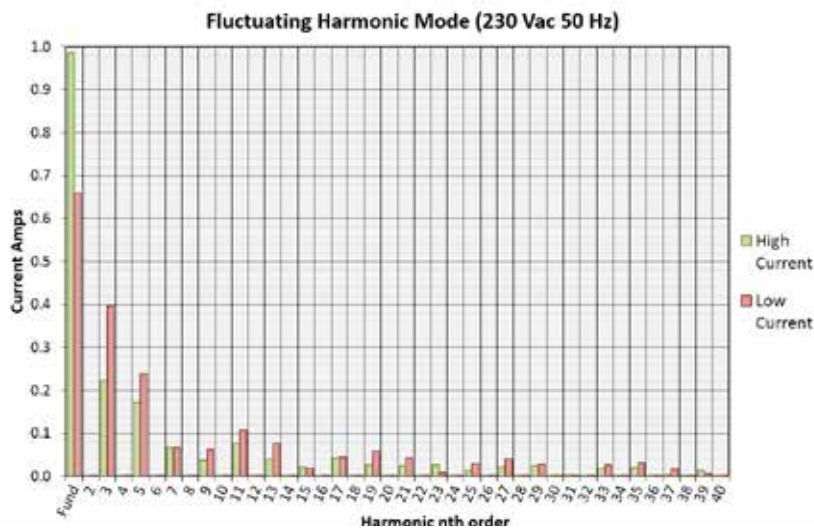
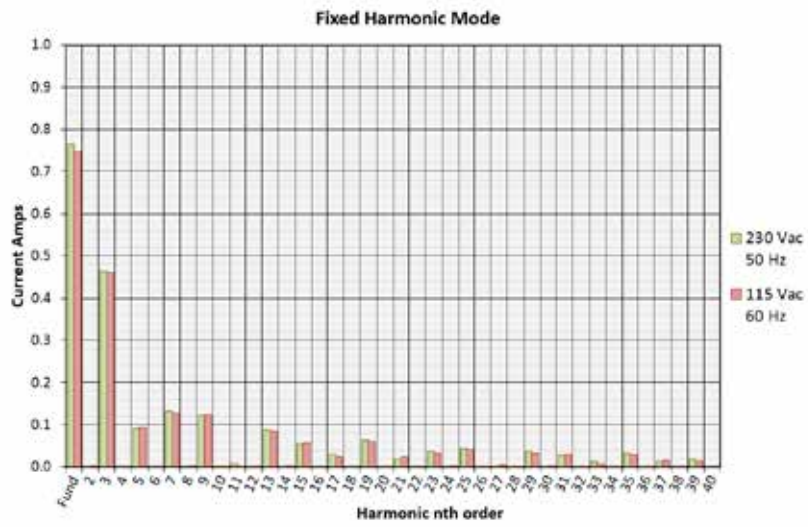
## Standard kits

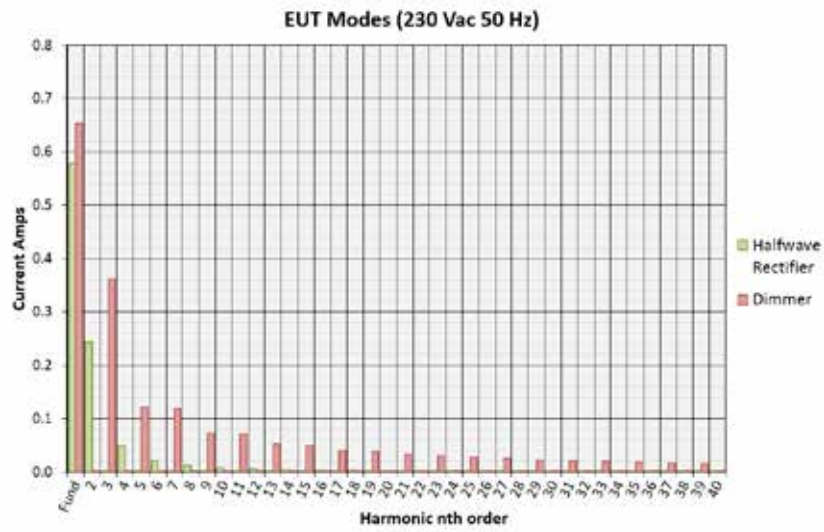
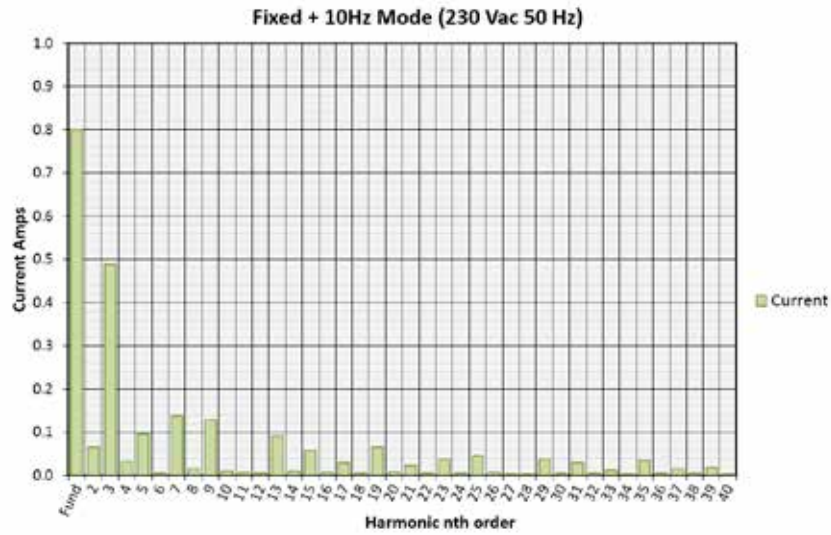
Part Number	Description	Parts included
<b>HFG02KIT01</b>	Standard HFG02 harmonics and flicker generator kit	<ul style="list-style-type: none"><li>• HFG02 harmonic and flicker generator</li><li>• CAL22 – measurement of harmonics, interharmonics and flicker generated</li><li>• US and EU mains plug adapters</li><li>• External power supply</li><li>• CDROM containing User Manual, Test Certificate and Tabulated Results</li></ul>

# Harmonics and Flicker Generator: HFG02

## Typical output measurement results

### Typical harmonic output levels





**Typical flicker disturbance results**

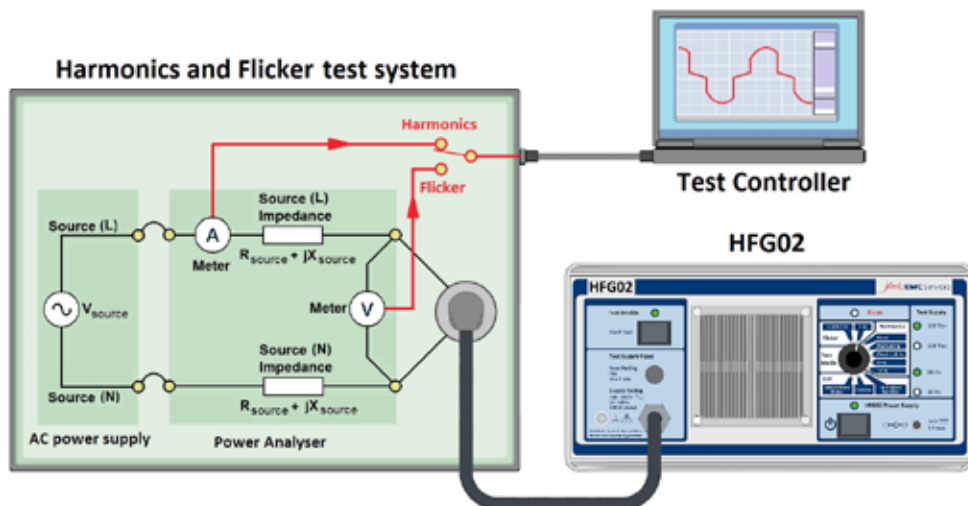
**115 V, 60 Hz:**

Rate	$P_{st}$	$d_{max}$ (absolute) %
1.0 Hz	0.451	0.22
8.6 Hz	1.061	0.21

**230 V, 50 Hz:**

Rate	$P_{st}$	$d_{max}$ (absolute) %
1.0 Hz	0.451	0.19
8.33 Hz	1.095	0.20

**Example of a typical test setup**





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