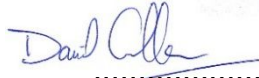


# HFG02 Operation Manual

Document number Y0321/DOC/024 Rev. 3

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Products User Manual Template – Issue 2



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HFG02  
Operation Manual

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Date	Issue	Pag/Para	Description
17/02/2017	1.0	-	1st issue
20/03/2017	2.0	p19	EUT graphs added
07/02/2018	3.0		Safety instructions updated

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Users should satisfy themselves that they are in possession of the most up to date version of this manual by calling +44 (0) 330 4303456 or by emailing enquiry@yorkemc.com

### **Limited Warranty**

York EMC Services warrants each HFG02 to be free from defects in material and workmanship for a period of one year from the date of shipment to the purchaser. This warranty extends to the original purchaser only. It does not apply to any product or parts subject to misuse, neglect, accident, unauthorised service or abnormal conditions of operation.

In the event a product covered by this warranty fails, York EMC Services, will, without charge, repair and recalibrate the instrument if returned to their test laboratory within one year of the original purchase – provided that York EMC Services examination discloses, to its satisfaction, that the product is defective. York EMC Services may, at its option, replace the product in lieu of repair. If the defect was caused by misuse, neglect, accident, unauthorised service or abnormal conditions of operation, repairs will be billed at a nominal cost. In such cases, an estimate will be provided before work is started, if requested by the purchaser.

For warranty service, contact York EMC Services. Provide the serial number of the equipment and complete details regarding the failure. You will then be given shipping instructions. Return the instrument to the factory. Repairs will be made and the equipment will be returned to you. York EMC Services assumes no responsibility for loss of, or damage to, products in transit.

## DISCLAIMER

THE HFG02 HAS BEEN DESIGNED TO PRODUCE HARMONIC AND FLICKER DISTURBANCES TO THE POWER SUPPLY TO WHICH THE TEST PORT HAS BEEN CONNECTED, AND AS SUCH IT IS ONLY INTENDED TO BE CONNECTED TO SUITABLE TEST EQUIPMENT. CONNECTION TO THE PUBLIC MAINS DISTRIBUTION NETWORK IS NOT PERMITTED.

YORK EMC SERVICES LTD ASSUMES NO LIABILITY FOR ANY DAMAGE THAT MAY RESULT FROM THE USE OF THIS EQUIPMENT OUTSIDE ITS RECOMMENDED OPERATING CONDITIONS.

## PRECAUTIONS

THE HFG02 MUST NOT BE OPERATED WITH THE **TEST SUPPLY INPUT** PLUGGED DIRECTLY INTO A PUBLIC MAINS SUPPLY SYSTEM.

WHEN OPERATED, THE HFG02 WILL CAUSE HARMONIC AND FLICKER EMISSIONS TO THE SUPPLY CONNECTED TO THE TEST SUPPLY INPUT.

<b>1</b>	<b>INTRODUCTION</b>	<b>6</b>
<b>2</b>	<b>DESCRIPTION</b>	<b>7</b>
<b>4</b>	<b>DESCRIPTION OF SYMBOLS</b>	<b>8</b>
<b>5</b>	<b>SPECIFICATION</b>	<b>9</b>
5.1	OPERATING MODES	9
5.2	HARMONICS AND FLICKER MEASUREMENT SYSTEM TEST SUPPLY	9
5.3	OPERATOR INDICATORS	9
5.4	POWER REQUIREMENTS	10
5.5	ENCLOSURE	10
5.6	COMPLIANCE	10
5.7	ENVIRONMENT	10
<b>6</b>	<b>OPERATION</b>	<b>11</b>
6.1	CONTROLS AND INDICATORS	11
6.2	SUPPLYING POWER TO THE HFG02	12
6.3	OPERATING MODES	12
6.4	ENABLING THE TEST	13
6.5	TEST SUPPLY INDICATORS	13
6.6	PERFORMING A TEST.	14
6.7	TROUBLESHOOTING A TEST	15
<b>7</b>	<b>OUTPUT PERFORMANCE</b>	<b>17</b>
7.1	FLICKER LOAD OPERATION	17
7.2	HARMONICS LOAD OPERATION	17
7.3	EUT LOAD OPERATION	19
7.4	CALIBRATION	21
<b>8</b>	<b>SAFETY</b>	<b>22</b>
<b>9</b>	<b>ELECTROMAGNETIC COMPATIBILITY</b>	<b>23</b>
9.1	GENERAL	23
9.2	EMISSIONS	23
9.3	IMMUNITY	23
9.4	NON-APPLICABILITY	23
<b>10</b>	<b>MAINTENANCE AND CALIBRATION</b>	<b>24</b>
10.1	DISPOSAL	24

## 1 INTRODUCTION

The Harmonics & Flicker Generator 02 (HFG02) has been designed by York EMC Services for the purpose of providing an easy and reliable way to externally check the performance of measurement systems used for testing against the EN/IEC 61000-3-2 harmonics and interharmonics and EN/IEC 61000-3-3 flicker standards.

The HFG02 allows the user to periodically verify their test equipment and its operation together, helping to ensure compliance with standards and laboratory quality procedures.

The HFG02 provides a series of harmonic and flicker disturbances of a nominal but stable level. The HFG02 may therefore be used to verify the stability of a measurement system. Additionally, due to its own stability it may be used as a transfer standard from a calibrated system, or be used as a repeatable source of interference for diagnostic and/or development design work.

## 2 DESCRIPTION

The HFG02 simulates equipment under test (EUT), generating known, repeatable levels of harmonic and flicker disturbance in one of ten modes of operation. These modes are divided into flicker, harmonics and EUT profiles.

The flicker test modes generate a fixed level of mains disturbance at a rate of 1 Hz and 8.33/8.6 Hz, depending on the frequency of the Test Supply under test. These modes support verification of the test systems used for EUT flicker disturbance measurements as described in the EN/IEC 61000-3-3 test standards.

The harmonics test modes are designed to produce a variety of harmonic and/or interharmonic-rich current waveforms. These current waveforms support verification of the test systems used for mains-powered equipment load current testing as described in the EN/IEC 61000-3-2 test standards.

A selection of EUT modes is also provided. These modes generate disturbances which simulate certain types of real-world EUT not covered by the generalised harmonics and flicker modes.







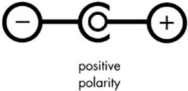

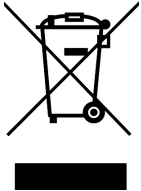
The HFG02 can be used with test systems operating at both 110 Vac and 230 Vac (nominal) supply voltages, and with either 50 Hz or 60 Hz supply frequencies. The HFG02 constantly monitors the Test Supply under test and adjusts itself automatically, indicating the detected voltage and frequency to the operator. Connection to the test system is by a captive lead pre-fitted with a CEE 7/7 European style plug that fits directly with power outlet used by a wide range of harmonics and flicker equipment.

The HFG02 itself is powered by a wide-input range AC/DC power supply unit that is powered separately from the Test Supply under test. This ensures that the disturbance signals generated by the HFG02 are not affected by the need to derive the HFG02's own supply needs from the Test Supply under test.

For ease of access all connections, user controls, and indicators are located on the front panel of the HFG02. The HFG02 is supplied with the external power unit with mains cable, manufacturer's test certificate, and a CDROM containing digital copies of the manual, test certificate, and files of the tabulated certificate data.

### 3 DESCRIPTION OF SYMBOLS

Symbols displayed on the product are listed below:

	<p>Caution</p>
	<p>Protective Earth Terminal</p>
	<p>Alternating current</p>
	<p>HFG02 power supply on</p>
	<p>HFG02 power supply off</p>
	<p>Direct current</p>
 <p>positive polarity</p>	<p>DC connector polarity</p>
	<p>ESD handling precaution</p>
	<p>Separate collection for WEEE- Waste Electrical and Electronic Equipment</p>



## 4 SPECIFICATION

### 4.1 Operating modes

(See Section 5. Output Performance for details of typical measurement results)

#### 4.1.1 Current harmonics

Frequency range	5 Hz to 2.0 kHz	(50 Hz Test Supply)
	5 Hz to 2.4 kHz	(60 Hz Test Supply)
	Depending upon mode selection	
Stability	< 5% of the test limit in EN 61000-3-2 standard	

#### 4.1.2 Flicker disturbance

Flicker rate	1 Hz	(50 Hz and 60 Hz Test Supply)
	8.3 Hz	(50 Hz Test Supply only)
	8.6 Hz	(60 Hz Test Supply only)
Stability	< 5% of the reading	

#### 4.1.3 EUT profiles

Half-wave rectifier	Load current is drawn every alternate half-cycle	
Dimmer	Load current is drawn at every cycle between 90°-180° and 270°-360° phase angles.	
Intermittent flicker	Load current is drawn for varying length periods over a 20 minute recurring cycle	

### 4.2 Harmonics and flicker measurement system test supply

#### 4.2.1 Test Supply ratings

Voltage	80 Vac to 130 Vac	(110 Vac nominal input)
	200 Vac to 253 Vac	(230 Vac nominal input)
Current	3 A (peak)	
Frequency	50 Hz or 60 Hz	
Power rating	500 W max	
Connector	CEE 7/7 European style plug for connecting the HFG02 to the Test Supply under test.	
Insulation rating	3000 Vrms	

### 4.3 Operator indicators

(See Section 4. Operation for a full description of the control and indicator functions)

4.3.1 Test Supply indicators	Measured voltage	< 80 Vac to >253 Vac
	Measured frequency	< 40 Hz to > 61 Hz

## HFG02 Operation Manual

4.3.2 Operation indicators      Test enabled / running  
System alarm

### 4.4 Power requirements

HFG02	
Input connector	2.1 mm DC power jack (inner conductor +ve)
Voltage input	24 Vdc
Power consumption	24 W max
Power supply unit	
Input connector	IEC plug
Voltage input	100 Vac to 240 Vac (nominal)
Power consumption	50 W max

### 4.5 Enclosure

Overall dimensions (not including captive leads):	
Length	330 mm
Width	320 mm
Height	170 mm
Weight	8 kg

### 4.6 Compliance

Safety	Low Voltage Directive, 2014/35/EU
EMC	EMC Directive, 2014/30/EU

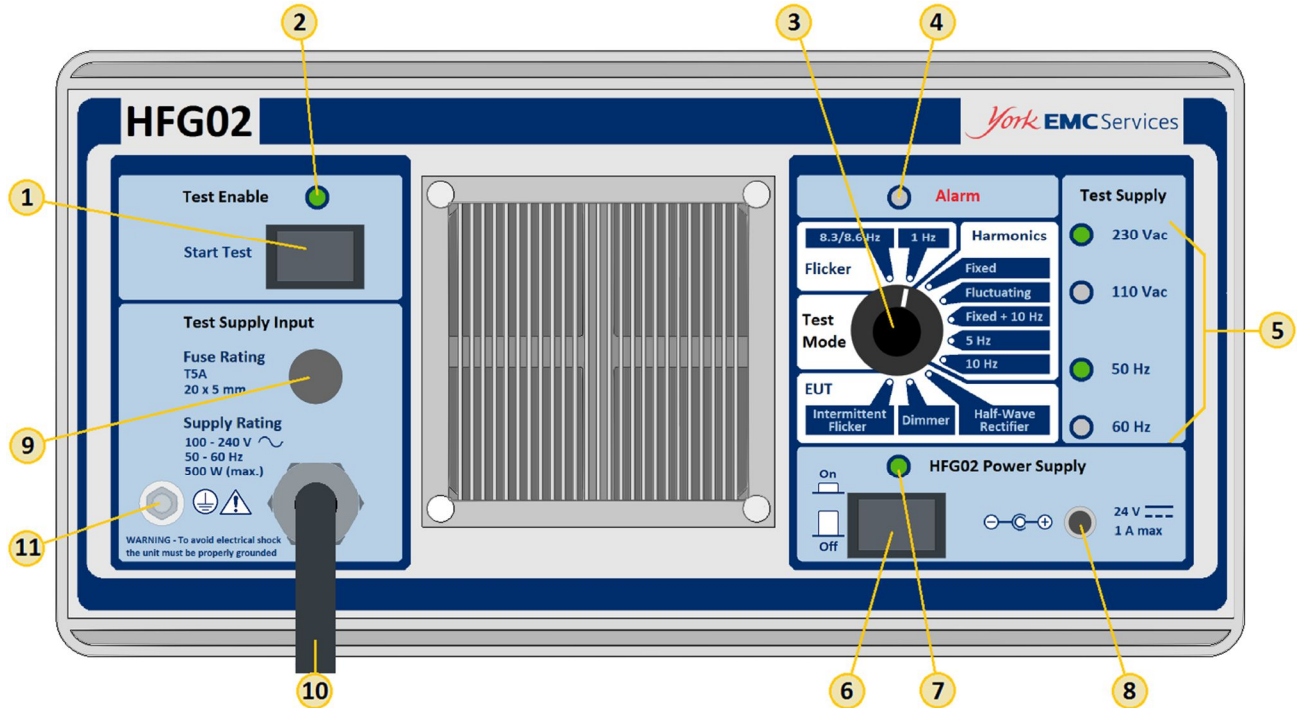
### 4.7 Environment

4.7.1 Operating Temperature Range	
Recommended Ambient	10°C to 30°C
Maximum Ambient	5°C to 40°C
4.7.2 Humidity	
Relative humidity:	20% to 80% (non-condensing)
4.7.3 Protection	
IP rating	IP10

**NOTE. Do not allow any obstructions to interfere with the operation of the fans, or site the HFG02 such that airflow is restricted. Doing so will cause the equipment to run at an increased temperature and in so doing may affect its operation.**

## 5 OPERATION

### 5.1 Controls and indicators



Identifier	Description	
1	Start Test	Pressing this switch enables the test mode, and applies the chosen load profile to the measurement system, as appropriate for the test supply detected. Pressing this switch again whilst the test is running disables the test mode.
2	Test enabled indicator	Indicates that the test mode is running.
3	Test Mode selector	This switch selects one of ten load profile test modes available to be used. Changing this setting whilst a test is running will automatically disable the current test mode.
4	Alarm indicator	This indicator flashes if the temperature within the enclosure exceeds the preset limit. In this state the test mode will be disabled and the HFG02 will wait until the temperature has dropped sufficiently before the test can be resumed. A steady indicator warns of a system failure, which will need to be cleared by fully restarting the HFG02 (refer to Section 4.7).
5	Test Supply indicators	These indicators display the frequency and RMS voltage of the Test Supply. Section 5.5. gives details of the ranges indicated.
6	HFG02 power switch	Main On/Off switch for the HFG02.
7	HFG02 power indicator	Indicates that the HFG02 is on.
8	HFG02 power connector	HFG02 power supply input socket (24 Vdc).
9	Test supply fuse	Protective fuse for the Test Supply input
10	Test supply cable	Captive lead connector for the Test Supply input
11	Chassis earth	Additional earthing point for the HFG02 enclosure

Figure 1: HFG02 front panel and controls

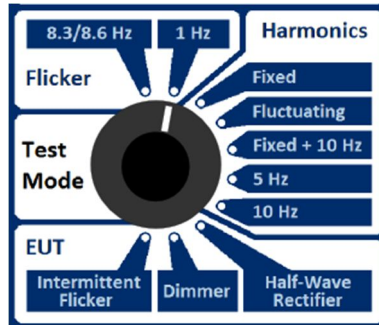
## 5.2 Supplying power to the HFG02



**Figure 2: HFG02 power supply**

The HFG02 is powered by an external 24 Vdc power supply unit which connects to the input socket on the front panel **8**. Pressing the power switch **6** with the 24 Vdc unit connected will turn the HFG02 on, which will be confirmed by the green indicator **7**. Pressing the power switch again will turn the HFG02 off.

## 5.3 Operating modes



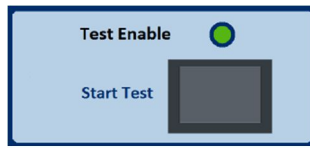
**Figure 3: HFG02 mode selection**

The operating mode is selected using the Test Mode switch **3**. The operation of each test mode is described in Table 1 below. Note that if the Test Mode switch is changed whilst a test is running, the test is automatically disabled.

Mode	Test Mode Setting	Load Profile Description
Flicker	8.3/8.6 Hz	Produces Pst value of > 1 (above the pass limit defined in EN/IEC61000-3-3)
	1 Hz	Produces Pst value of < 1 (below the pass limit defined in EN/IEC61000-3-3).
Harmonics	Fixed	Single repetitive harmonic-rich current waveform
	Fluctuating	Repeating current profile alternating between two distinct waveforms over a 10 second cycle
	Fixed + 10 Hz	Fixed harmonic waveform with additional 10 Hz interharmonics
	5 Hz	Fixed interharmonics at frequency steps of 5 Hz
	10 Hz	Fixed interharmonics at frequency steps of 10 Hz
EUT	Half-wave rectifier	Simulates the effect of a half-wave rectified mains input
	Dimmer	Simulates the waveform of an analogue dimmer switch
	Intermittent flicker	Simulates the effect of a varying duty cycle load

**Table 1: HFG02 load operation test modes**

### 5.4 Enabling the test



**Figure 4: Test Enable switch and indicator**

The selected test mode is enabled by pressing the Start Test switch <sup>1</sup> and the indicator <sup>2</sup> displays the running test status.

### 5.5 Test Supply Indicators

The HFG02 monitors the input from the Test Supply under test and displays the voltage and frequency measurements on the front panel indicators <sup>5</sup> as shown in Table 2.

Test Supply monitoring is continuous and automatic, and does not require a test mode to be enabled. Tests are automatically disabled if the Test Supply voltage or frequency are outside their permitted ranges.

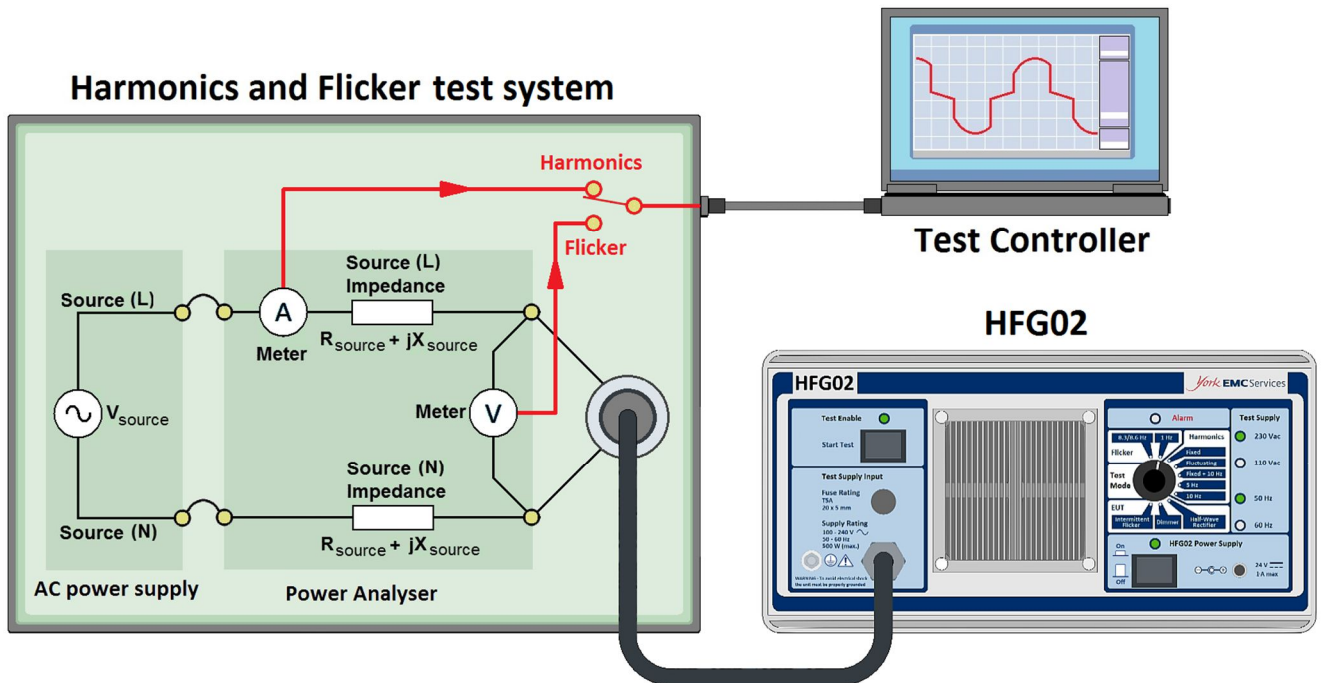
Test Supply Voltage	Voltage measured	Display Indication	
		110 VAC LED	230 VAC LED
Supply voltage not detected	Below detection range		
Invalid voltage – too low	< 80 VAC		
110 Vac range	80 to 130 VAC		
Invalid voltage – mid range	130 to 200 VAC		
230 Vac range	200 to 253 VAC		
Invalid voltage – too high	> 253 VAC		

Test Supply Frequency	Frequency measured	Display Indication	
		50 Hz LED	60 Hz LED
Supply input not detected	Below detection range		
Invalid frequency – too low	< 49 Hz		
50 Hz range	49 to 51 Hz		
Invalid frequency – mid range	51 to 59 Hz		
60 Hz range	59 to 61 Hz		
Invalid frequency – too high	> 61 Hz		

**Table 2: Test Supply measurement indicators**

## 5.6 Performing a test.

The HFG02 acts as the equipment under test in the harmonics and flicker test system, and should be connected to the single-phase test power supply as per the typical test setup used (Figure 5 for example).



**Figure 5: Example of a typical test setup**

Connect the HFG02 power supply **8** and turn the HFG02 on by pressing the power switch **6**. The power supply indicator **7** should be illuminated green to indicate the HFG02 is operating correctly.

The Test Supply Input cable **10** can be plugged into the Test Supply power output socket. Note that if the Test Supply does not provide a safety earth connection as one of the conductors (e.g. 2-pin Live and Neutral only) then the Chassis Earth wiring stud **11** on the front of the HFG02 must be connected to a suitable earth first (not shown). A suitable earth point may be provided elsewhere on the Harmonics and Flicker test system.

Configure the Harmonics and Flicker Test System to measure harmonic or flicker disturbance as per the system instructions, with the Test Supply configured to provide the required voltage and frequency.

Once the Test Supply has been safely connected, the Harmonics and Flicker Test Supply can be enabled. The HFG02 Test Supply indicators **5** should show confirmation of the selected Test Supply output voltage and frequency.

Select the required test load operation using the Test Mode switch **3**.

The chosen test load operation can be enabled before or after the Harmonics and Flicker Test System has started the test routine. When ready to enable the load operation, press the Start Test switch ①. The Test Enable display ② should indicate that the test is running.

Pressing the Start Test switch ① again will disable the running test. Changing the Test Mode selection switch ③ will also disable the running test. The new selected test will need to be started by pressing the Start Test switch ① again.

### Note:

If the HFG02 test has been running for more than 2 hours continuously it is recommended that it is allowed to cool down before power is finally removed, to reduce any latent heat build-up. To do this, leave the HFG02 turned on but with no running test for approximately 10 to 15 minutes before fully powering down.

## 5.7 Troubleshooting a test

The HFG02 monitors the Test Supply input from the Harmonics and Flicker Test System and reports the measured voltage and frequency on the front panel display (see Table 2). If an invalid voltage or frequency is detected, the test load operation will be disabled (Test Enable display ② will be OFF).

The test load operation will also be disabled if the HFG02 detects too many dropped voltage cycles or interruptions from the Test Supply.

If the HFG02 load exceeds its recommended operating temperature, the test load operation will be disabled (Test Enable display ② will be OFF) and the Alarm indicator ④ will flash at a steady rate. Once the temperature has returned to normal the Alarm indicator will turn off and the test can be resumed.

If the HFG02 detects a system error, the Alarm indicator ④ will fully turn on without flashing. The system error will need to be cleared by removing all power from the HFG02 before fully restarting. If fully restarting the device fails to clear the error, the HFG02 may require servicing.

The Alarm indicator will also fully turn on if a serious error has been detected with the Test Supply voltage e.g. surge or transient overvoltages sufficient to cause damage to the HFG02 itself. This error can be cleared by disconnecting the Test Supply and restarting the HFG02.

A flowchart for troubleshooting if the test cannot be enabled is shown in Figure 6. In the case of other problems, please contact your supplier for advice.

# HFG02 Operation Manual

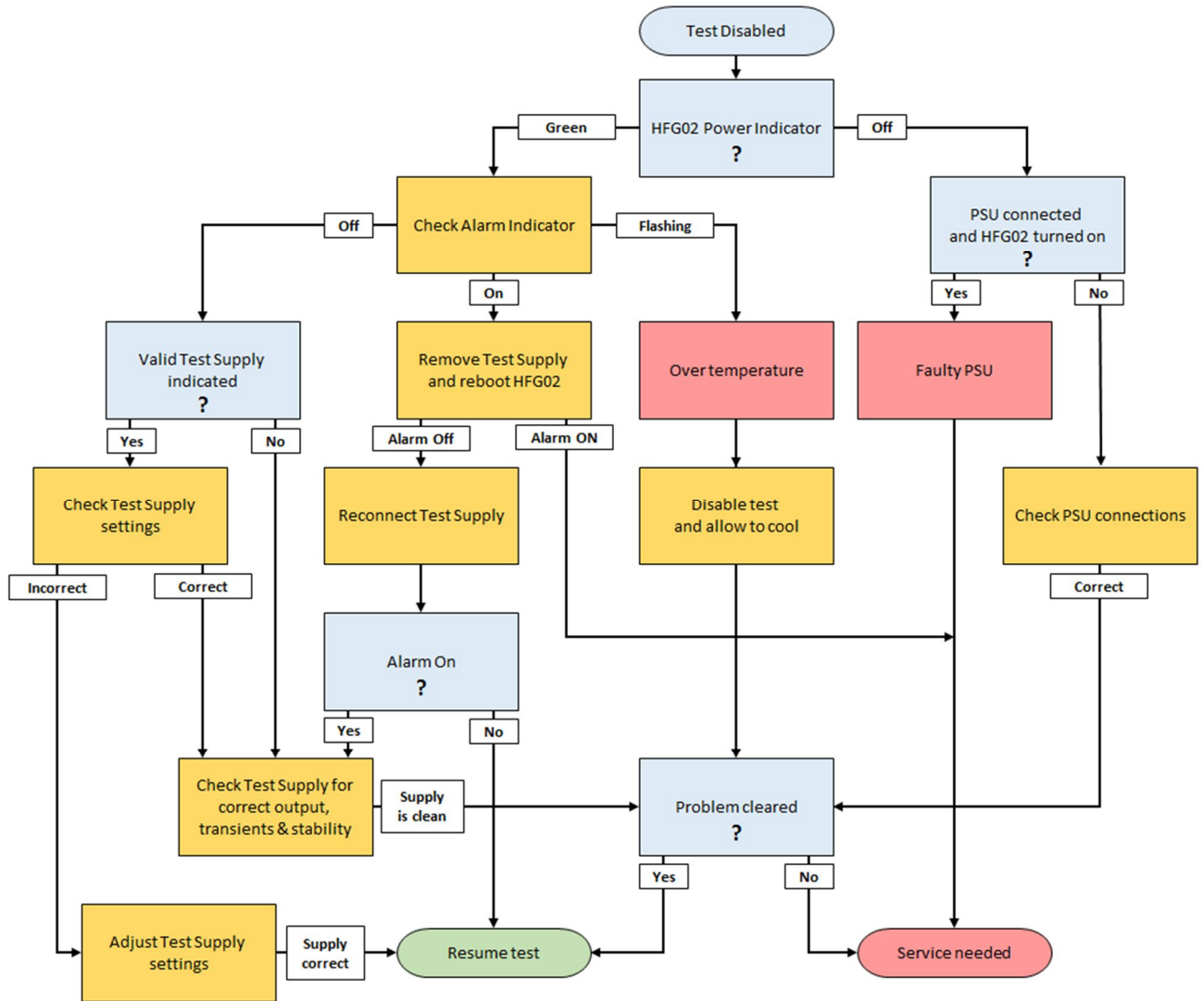


Figure 6: Troubleshooting flowchart



## 6 OUTPUT PERFORMANCE

Please refer to the test results supplied with the unit for its unique performance. Typical performance results are shown in the sections below.

### 6.1 Flicker Load Operation

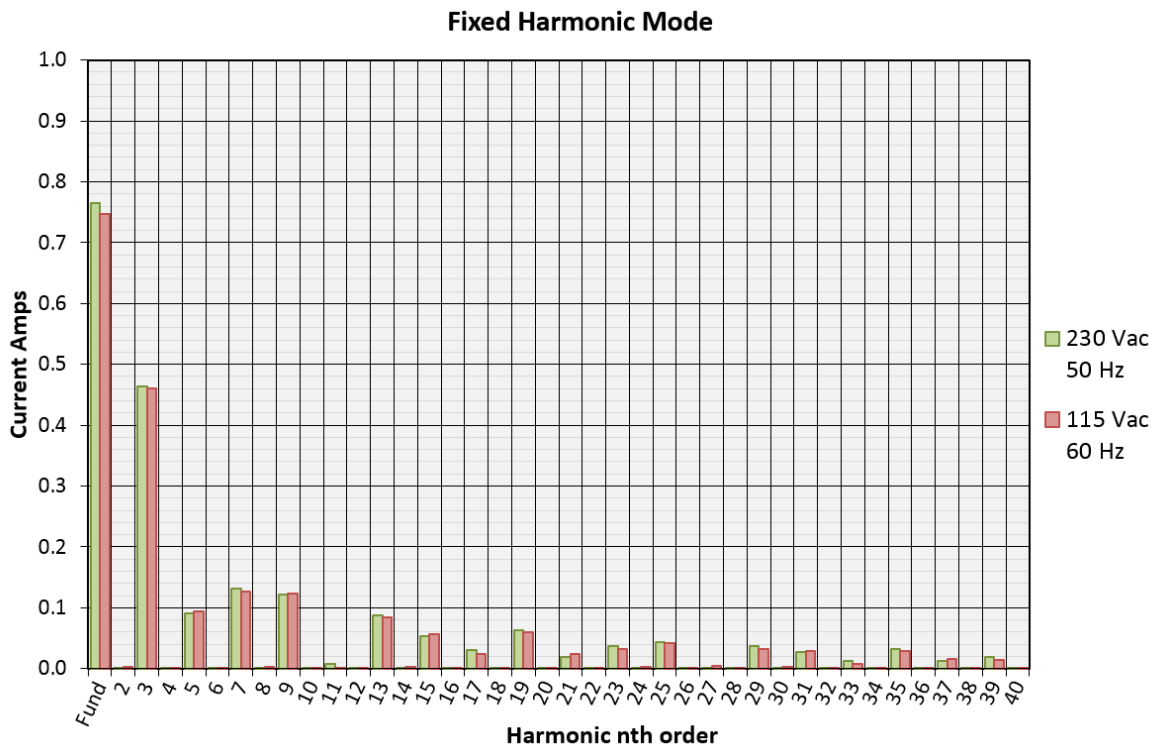
The typical flicker disturbance generated by the HFG02 in each of the steady flicker modes when tested according to EN/IEC 61000-3-3 is shown in Table 3.

Flicker Mode Setting	Load Operation	Pst	Plt
8.3/8.6 Hz	8.33 Hz flicker (50 Hz Test Supply detected)	1.10	1.10
	8.6 Hz flicker (60 Hz Test Supply detected)	1.06	1.06
1 Hz	1 Hz flicker (50 Hz or 60 Hz Test Supply detected)	0.45	0.45

**Table 3: Typical Pst results measured to EN/IEC 61000-3-3**

### 6.2 Harmonics Load Operation

The typical current harmonics disturbance generated by the HFG02 in each of the harmonics modes when tested according to EN/IEC 61000-3-2 is shown below:



**Figure 7: Disturbances generated in Fixed Harmonic mode**

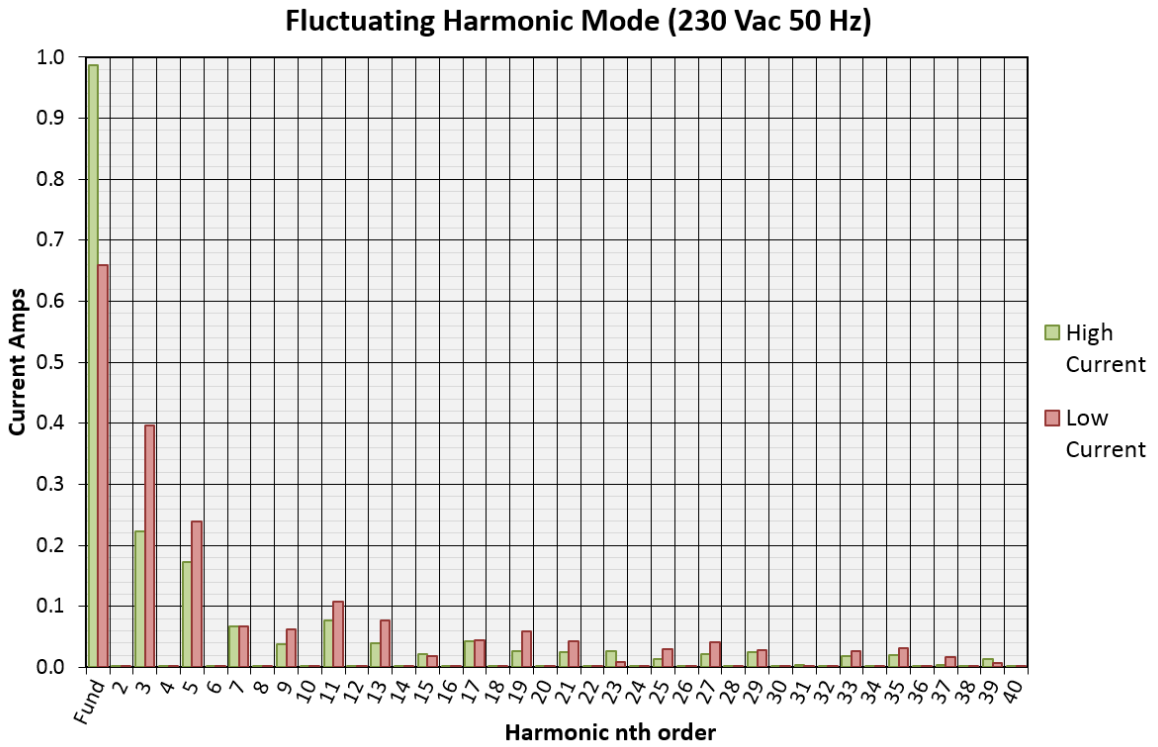


Figure 8: Disturbances generated in Fluctuating Harmonics mode

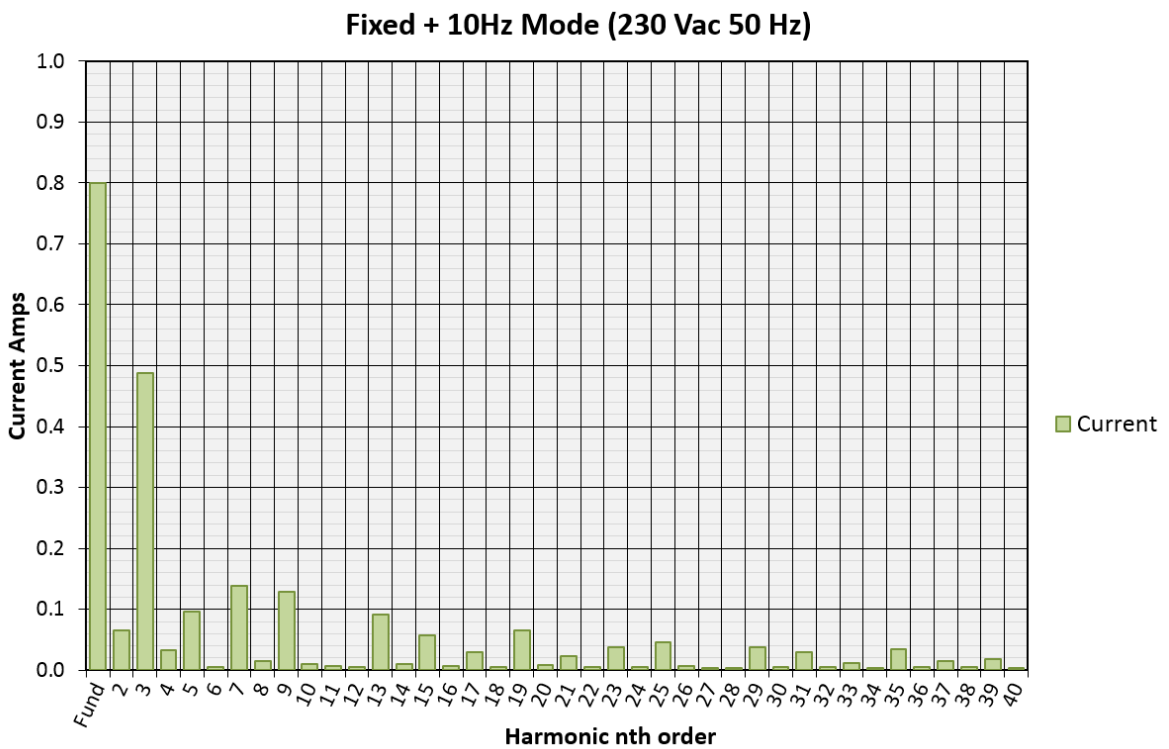


Figure 9: Disturbance generated in Fixed + 10 Hz Interharmonics mode

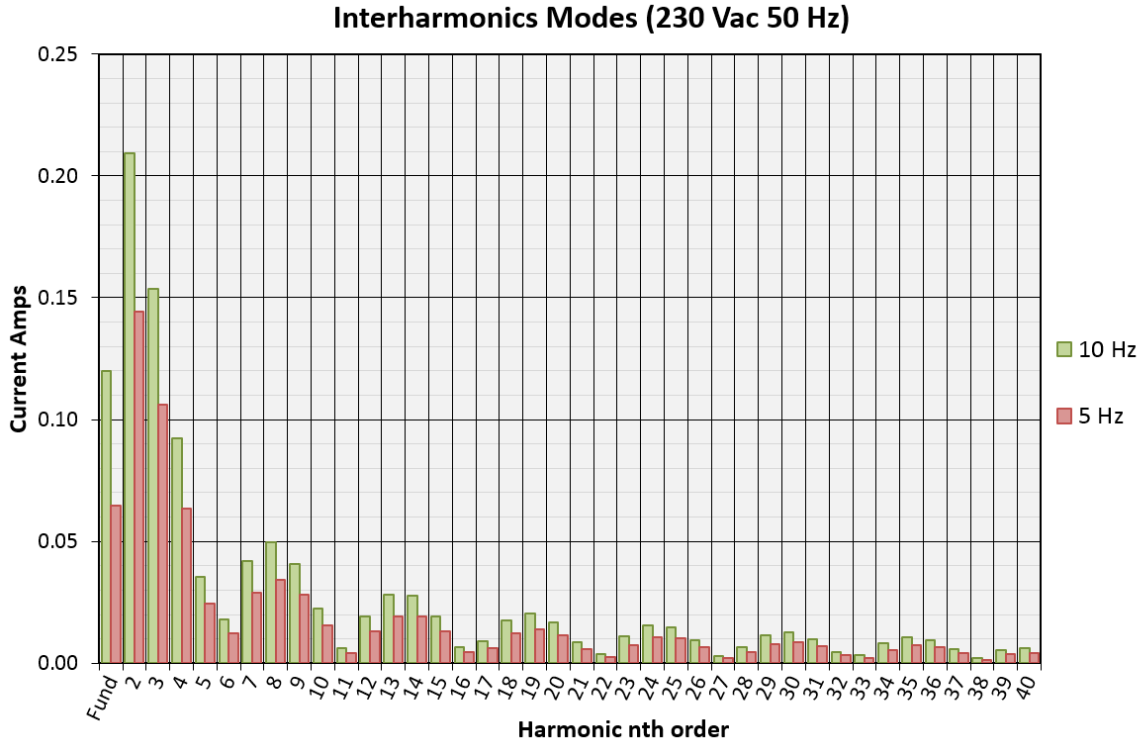


Figure 10: Disturbances generated in 5 Hz and 10 Hz Interharmonics modes

### 6.3 EUT Load Operation

The typical disturbances generated by the HFG02 in each of the EUT modes is shown below:

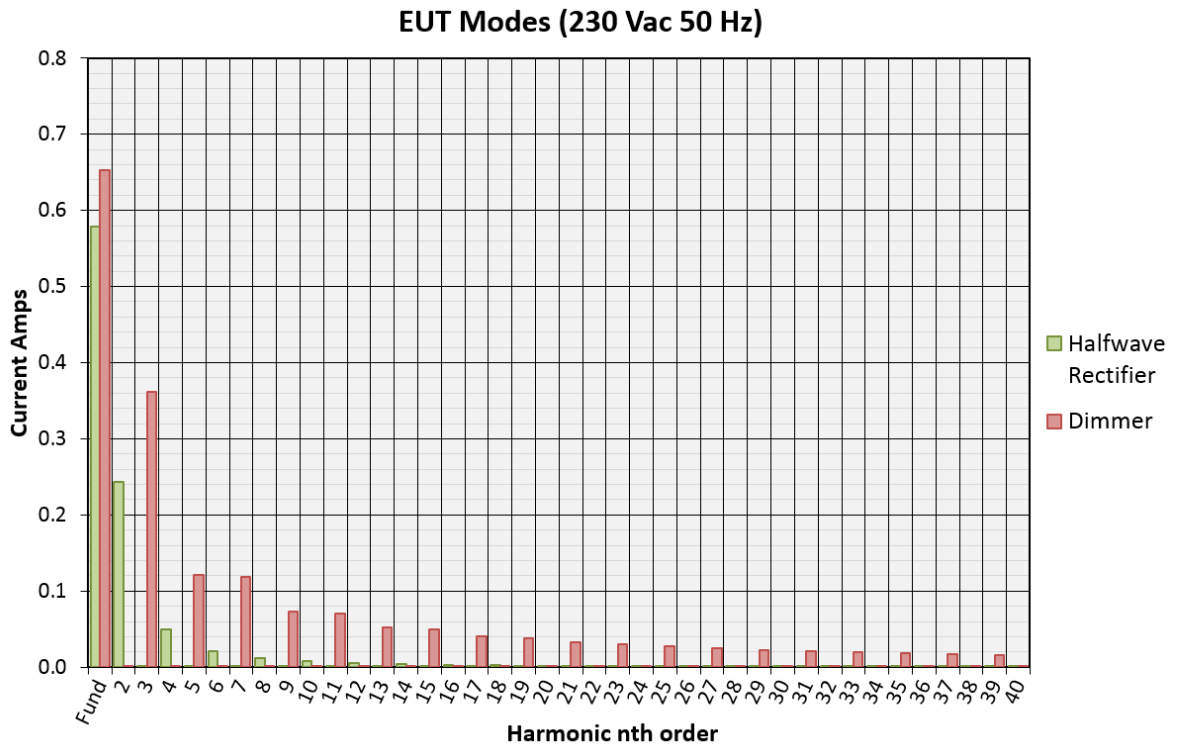


Figure 11: Disturbances generated in Dimmer and 1/2 wave rectifier modes

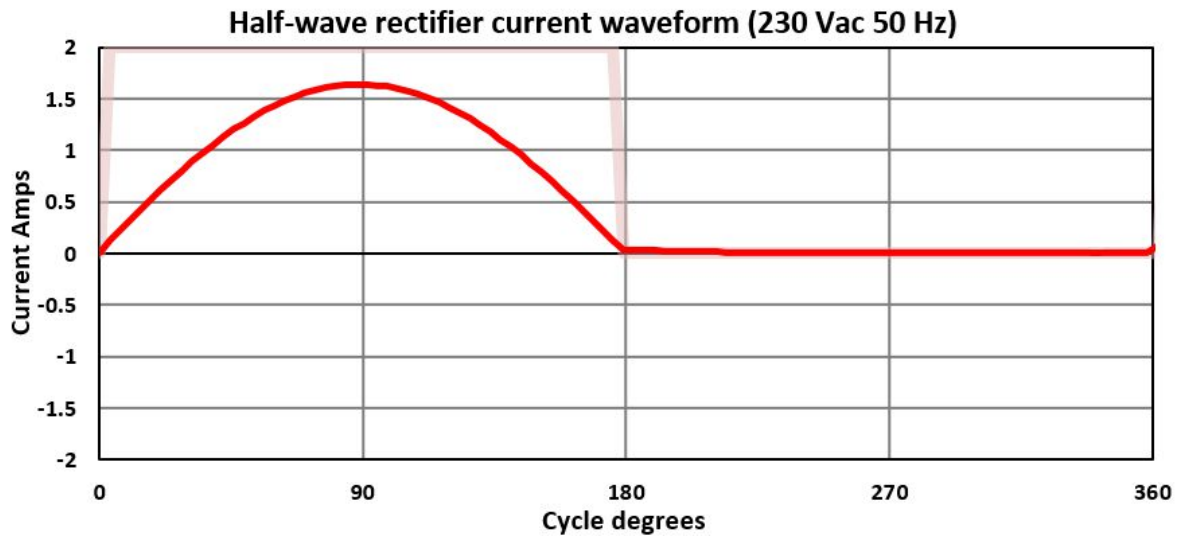


Figure 12: Half-wave rectifier current profile

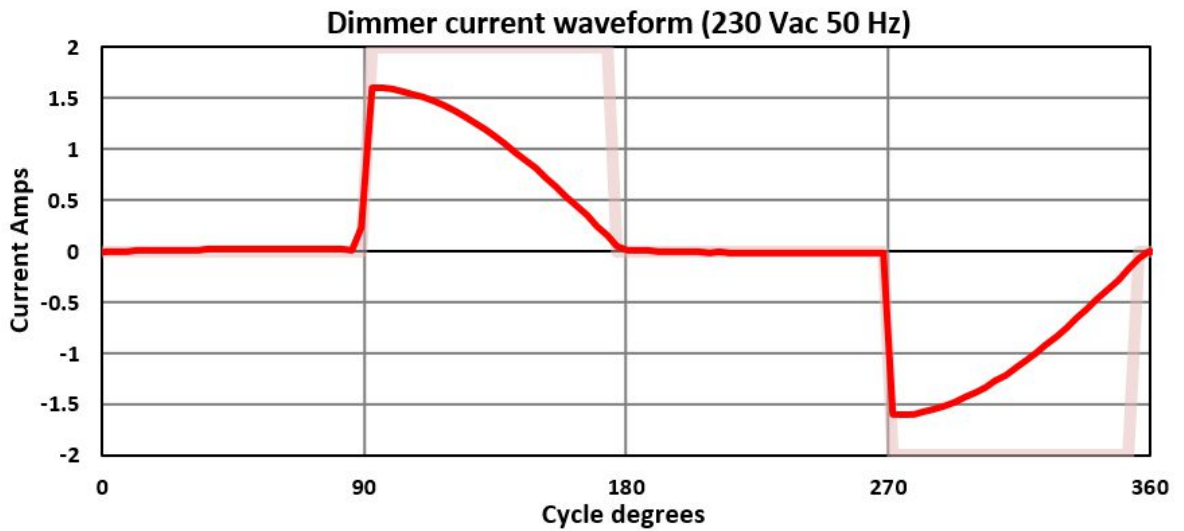


Figure 13: Dimmer current profile

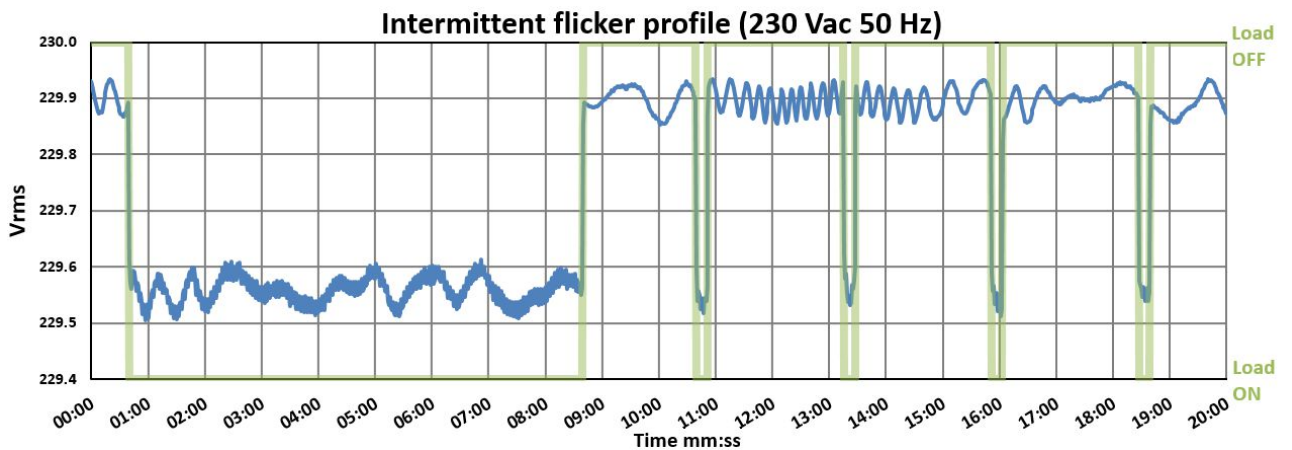


Figure 14: Intermittent flicker voltage profile

EUT Mode Setting	Load Operation	Pst	Plt
Intermittent flicker	8.33 Hz flicker (50 Hz Test Supply detected)	1.07/0.74	0.94

**Table 4: Typical Pst and Plt results measured to EN/IEC 61000-3-3**

#### 6.4 Calibration

The HFG02 is supplied with a manufacturer’s calibration certificate.

It is recommended that the HFG02 should be periodically checked to ensure damage or long-term changes have not altered the output. The periodicity of these checks is typically determined by the quality assurance regime employed by the user, however it is recommended that the HFG02 output be retested annually. This service is available from York EMC Services and can be arranged through your supplier.

## 7 SAFETY

**WARNING! The HFG02 must be earthed.**

Any interruption of the mains earth conductor inside or outside the HFG02 case may make the instrument electrically dangerous. If the Test Supply does not present an earth connection to the Test Supply Cable, then the external earth connector on the front of the HFG02 must be connected to a safety earth.

The HFG02 is classified as IEC Safety Class 1. It has been designed to meet the requirements of EN/IEC/UL 61010, Safety requirements for Electrical Equipment for Measurement, Control and Laboratory Use.

The HFG02 has been tested in accordance with EN/IEC/UL 61010 and has been supplied in a safe condition. This instruction manual contains information and warnings that have to be followed by the user to ensure safe operation and to retain the instrument in a safe condition.

The HFG02 has been designed for indoor use only in a Pollution Degree 2 environment within the temperature range 5°C to 40°C and 20% to 80% Relative Humidity (non- condensing). Do not operate whilst condensation is present.

Use of the HFG02 in a manner not specified by these instructions may impair the safety protection provided. Do not use the HFG02 outside its rated supply voltage or environmental ranges.

The HFG02 must be positioned in a way that allows full access to any on/off switch on the Test Supply or Mains Supply.

Ensure that fuses with the required rated current and specified type are used for replacement. The use of makeshift fuses and the short-circuiting of fuse holders is dangerous and must be prohibited.

The mains cord included with the Power Supply Unit must only be replaced with an adequately-rated cord

If the HFG02 is clearly defective, has been subject to mechanical damage, excessive moisture or chemical corrosion the safety protection may be impaired. In this situation the HFG02 should be withdrawn from use and returned to York EMC Services for assessment and repair.

This equipment cannot be repaired by the user. DO NOT attempt to remove the covers, open the case or otherwise disassemble the equipment. Only York EMC Services trained service personnel with knowledge of fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal shock to untrained personnel.

Do not wet the case of the HFG02 when cleaning it, for example by using a wet cloth or aerosol cleaning fluid. If the case has become wet through any circumstances then it MUST be dried before being connected to a power supply.

## 8 ELECTROMAGNETIC COMPATIBILITY

### 8.1 General

The HFG02 has been designed to meet the requirements of EU Directive 2014/30/EU. Compliance was demonstrated by testing to the requirements of the following standards: -

### 8.2 Emissions

EN61326-1 (2013) consisting of

- EN55011 (2009) + A1 (2010) Radiated RF emissions (Enclosure) and Conducted RF emissions (applies to the HFG02 supply adapter), Class A

### 8.3 Immunity

#### Enclosure:

EN61326-1 (2013) consisting of

- EN61000-4-2 (2009) Electrostatic Discharge immunity, 4 kV Air & Contact Discharge.
- EN61000-4-3 (2006) + A1 (2008) + A2 (2010) Radiated RF immunity (Enclosure), 3 V/m.

#### AC power:

These apply to the HFG02 supply adapter only:

EN61326-1 (2013) consisting of

- EN61000-4-11 (2004) Voltage dips/short interruptions
- EN61000-4-4 (2004) + A1 (2010) Fast Transient common mode (AC mains port)
- EN61000-4-5 (2006) Surge (AC mains port)
- EN61000-4-6 (2009) Conducted RF immunity (AC mains port)
- EN61000-3-2 (2006) Harmonic emission (AC mains port)
- EN61000-3-3 (2013) Voltage fluctuation (AC mains port)

### 8.4 Non-Applicability

EN61326-1 (2013) consisting of

- EN61000-4-4 (2004) Fast Transient common mode (signal ports)
- EN61000-4-5 (2006) Surge (signal ports)
- EN61000-4-6 (2009) Conducted RF immunity (signal ports)

These phenomena are deemed non applicable on the basis that the HFG02 has no relevant signal ports. The AC test port of the HFG02 may be looked upon as a signal port but the captive lead is less than 3m in length hence the tests do not apply.

The test port is not connected directly to the public low voltage supply network and so tests relating to AC ports are only applicable to the AC/DC adapter used for the HFG02 supply input.

## **9 MAINTENANCE AND CALIBRATION**

Ensure that the airflow through the fan and ventilation duct areas remains unobstructed, and that the HFG02 is in good condition.

For all maintenance and calibration procedures, the HFG02 should be returned to York EMC Services for servicing by authorized personnel.

This equipment cannot be repaired by the user. DO NOT attempt to open the case or disassemble the equipment. Only York EMC Services trained service personnel with knowledge of fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal shock to untrained personnel.

### **9.1 Disposal**

Should the equipment require disposal, please contact your supplier for details on returning the equipment for disposal/recycling.



## General Information

### Ordering Information

Standard Order Kits are listed for each product in the YES Products Brochure. Please refer to the appropriate part number when requesting a quote for a test instrument or accessory.

If you require a non-standard instrument kit or accessory, or if you would like further information before making your choice, please contact our Sales or Products staff, or your local representative.

### Hire of Test Instruments

Hire of our test instruments can be arranged, subject to availability. Hire terms are typically on a weekly basis. Please contact our Sales staff or your local representative for details on pricing and availability.

### Test and repair service

Where applicable, test instruments are shipped with performance test results. Details of the tests performed are listed with each product. No expiry date is issued with these results. York EMC Services provides a retest service, if the customer requires updated performance data. Please refer to the order codes when requesting a quotation for this service.

A repair service covering faulty or damaged York EMC Services test instruments is available. Each case is examined individually, with quotations for repair and retest issued as appropriate. Please contact our Sales or Products staff or your local representative in the first instance.

### Sales Office Hours

Our UK head office hours are 9:00 – 17:00 Monday to Thursday, 9:00 – 16:00 Friday.

Tel: +44 0330 430 3456

Email: [enquiry@yorkemc.com](mailto:enquiry@yorkemc.com)

A current list of York EMC Services representatives around the world can be found on the Test Instrumentation pages of our website: <http://www.yorkemc.com>

Please see your nearest representative for details of their opening times.

### Quotations

All quotations issued directly by York EMC Services are in GBP.

Unless otherwise stated, our quotations are valid for 30 days.

VAT will be charged at the standard rate applicable at the time of invoice.

### Orders

Orders are accepted with an accompanying Purchase Order Number.

### Stocks

Stock availability and delivery times may fluctuate with market conditions, production capacity and any additional test results requirements. Please check with our sales team for an update.

### Delivery

Standard delivery is 28 days from receipt of order unless otherwise specified.

Orders are normally shipped by courier at the rate stated on the quotation. Alternatively the customer may arrange for their own pick-up service.

### Payment Methods

We can accept payment in GBP, US dollars or Euros by bank transfer, UK-drawn cheque or credit card. New customers may be asked for payment in advance. Existing customers are eligible for credit terms.

### Warranty

All products are supplied with a one-year return-to-base-warranty as standard, unless otherwise stated.

Extended warranty terms may be arranged, please ask our sales team for details.

### Terms and Conditions

All our orders are subject to our terms and conditions. Please ask our sales team for full details.

### Technical Data

We have endeavoured to ensure the information in this manual is accurate at the time of publication. However, in the interests of product advancement, we reserve the right to improve, refine and otherwise modify specifications without notice. E&OE.

### Online Brochure

Our website is the definitive source for information regarding new products, updated specifications, application notes and more. Please visit <http://www.yorkemc.com> for information regarding our Test Instrumentation, as well as for details of our accredited EMC Test laboratories, Consultancy and Research operations and Training courses.