ELEXON TEST PROCEDURE FOR THE UNMETERED SUPPLY CHARGE CODE PROCESS

SCOPE

This procedure details the correct method for measuring and reporting the circuit watts and Volt Ampere (VA) for INDO products. This is a standard test procedure and under no circumstances should there be any deviation from this process.

DESCRIPTION OF ITEMS COVERED BY THIS PROCEDURE

INDO Induction Lamps and Gear (Fixed or Dimming)

INDO Retrofit LED lamps

TEST PARAMETERS / QUANTITIES / RANGES

Measurements to be taken at:
210V, 220V, 230V, 240V, 250V

Voltage Frequency:
50Hz

Minimum Accuracy:
±2% of the recorded value

Sample Quantity:
1% of the first year's production subject to a minimum of 5 and a maximum of 50

APPARATUS AND EQUIPMENT

The equipment required for this test procedure consists of the following items:

AC Power Source Manufacturer: Lisun Group Model: LSP-1KVA Serial #: 90011162 Calibration Required? : No Specifications: Output: 0-300V Frequency:45 – 400Hz Power: 1kVA	
Programmable Power Meter Manufacturer: Hameg Instruments Model: HM8115-2 Serial #: 061080009 Calibration Required? : Yes Specifications: Refer to the operating manual: Y:\QMS\Equipment\Hameg\hm8115-2_man.pdf	

REFERENCE STANDARDS AND REFERENCE MATERIALS

ISO/IEC 17025:2005

http://www.elexon.co.uk_wp-content_uploads_2013_11_ums_charge_code_process_v4.0_cgi.pdf

ENVIRONMENTAL CONDITIONS

The environmental conditions of the tests should match the conditions stated on the calibration certificate of the power meter. Refer to the latest calibration certificate which is stored in the folder:

Y:\QMS\Equipment\Hameg

Tests will be stopped if the ambient conditions fall outside acceptable limits. The acceptable limits are the tolerances defined on the calibration certificate.

STABILISATION

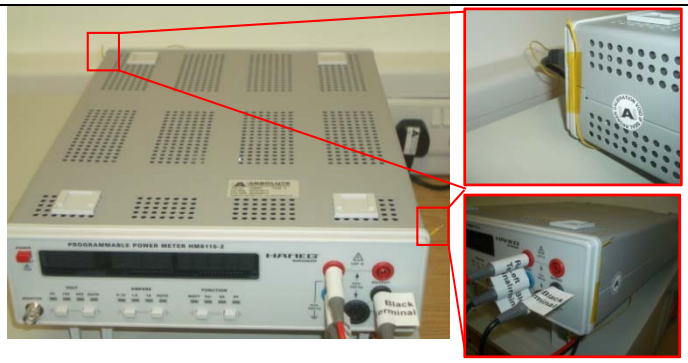
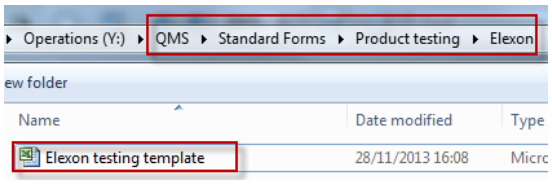
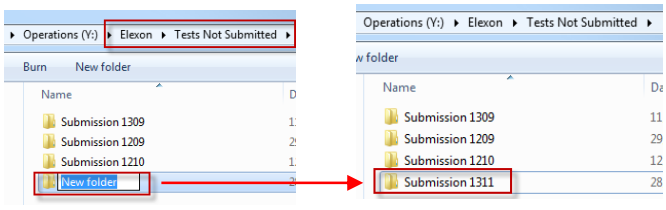
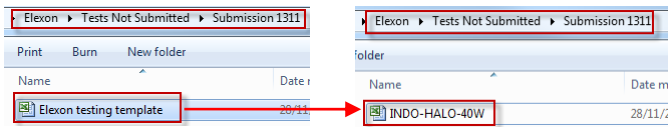
Before any readings can be taken, the measuring equipment and the products being measured must run for an initial minimum stabilisation period. After each voltage adjustment the stabilisation times in the table below must be observed.

It should be noted that the times below are recommended minimums. Before any readings are taken the values observed should be checked to ensure any fluctuation in readings does not exceed ±0.02 of the median value observed on the Hameg Power Meter. If there are excessive fluctuations in the readings then the stabilisation period will be extended.

Item	**Minimum Time**	**Maximum Fluctuation**
Test Equipment:	30 minutes (Time from initial start up)	
Test Sample		
1st Reading	30 minutes	Median value ± 0.02
2nd Reading	10 minutes	Median value ± 0.02
3rd Reading	10 minutes	Median value ± 0.02
4th Reading	10 minutes	Median value ± 0.02
5th Reading	10 minutes	Median value ± 0.02

Every time a new product from the sample batch is placed on test the above times must be observed.

TEST PROCEDURE

1. Initial Checks	
Check lab temperature using the thermocouples attached to the power meter and TECPEL Thermometer Check the relative humidity using the HOBO data logger	
Check test equipment has a valid calibration certificate Confirm the measured temperature and humidity is within the tolerances stated on the certificate	
2. Set Up	
Pick Stock Before setting up the test ensure the whole sample batch has been picked and is in the immediate vicinity of the test area	
Set up Test Form Copy the test form from the QMS folder: \QMS\Standard Forms\Product testing\Elexon Into the 'Tests Not Submitted' folder under the current month. Where necessary create a folder for the current month if necessary. Folder name format: 'Submission ***YYMM***' Rename the file with the product name. Filename format: 'INDO-***LAMP TYPE-WATTAGE***' eg: INDO-HALO-40W If applicable add the dimming profile description 'INDO-***LAMP TYPE-WATTAGE***	  

DIMMING PROFILE'
eg: INDO-HALO-40W-Dimmed 70%

Fill out the date, temperature and humidity information recorded in step 1.

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Date:		Calibration Date Check:	25/02/2013	25/02/2014
Temperature:		Temperature Check:	20°C	3°C
Relative Humidity %:		Humidity Check:	55.00	20.00
Product:		Wattage Uncertainty:		0.50%
Operative:		VA Uncertainty:		0.50%
Test Equipment:	Lisun AC Power source LSP-1KVA	Serial #:		90011162
	Hameg Power Meter HM8115-2	Serial #:		061080009

If the data is valid the boxes will be highlighted in green

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Date:	28/11/2013	Calibration Date Check:	25/02/2013	25/02/2014
Temperature:	20.50	Temperature Check:	20°C	3°C
Relative Humidity %:	50	Humidity Check:	55.00	20.00
Product:		Wattage Uncertainty:		0.50%
Operative:		VA Uncertainty:		0.50%
Test Equipment:	Lisun AC Power source LSP-1KVA	Serial #:		90011162
	Hameg Power Meter HM8115-2	Serial #:		061080009

If any of the data is invalid the box will be highlighted in red. Do NOT proceed with the test.

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Date:	28/11/2013	Calibration Date Check:	25/02/2013	25/02/2014
Temperature:	16.00	Temperature Check:	20°C	3°C
Relative Humidity %:	50	Humidity Check:	55.00	20.00
Product:		Wattage Uncertainty:		0.50%
Operative:		VA Uncertainty:		0.50%
Test Equipment:	Lisun AC Power source LSP-1KVA	Serial #:		90011162
	Hameg Power Meter HM8115-2	Serial #:		061080009

Enter the Product information and Operator

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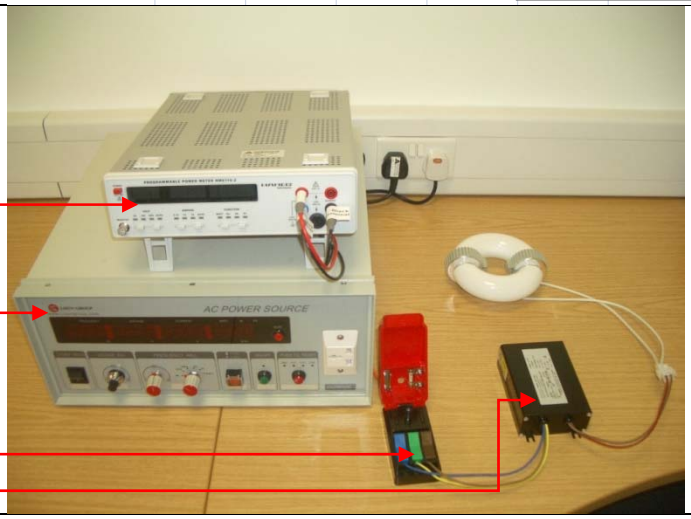
Date:	28/11/2013	Calibration Date Check:	25/02/2013	25/02/2014
Temperature:	20.50	Temperature Check:	20°C	3°C
Relative Humidity %:	50	Humidity Check:	55.00	20.00
Product:	**INDO-HALO-40W**	Wattage Uncertainty:		0.50%
Operative:	Nim Faldu	VA Uncertainty:		0.50%
Test Equipment:	Lisun AC Power source LSP-1KVA	Serial #:		90011162
	Hameg Power Meter HM8115-2	Serial #:		061080009

Connect the lamp or lamp/gear combination to be tested to the apparatus via the 'Quick Connect'.



Power Meter

Power Source

Quick Connect

Test sample

3. Stabilization

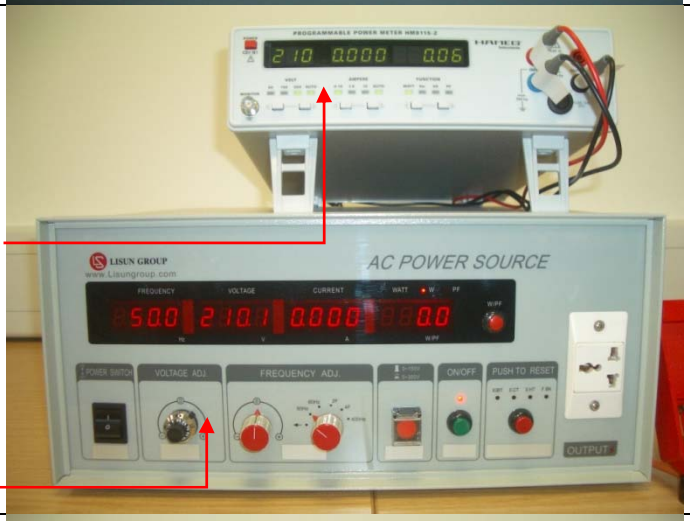
Switch on the Power Source

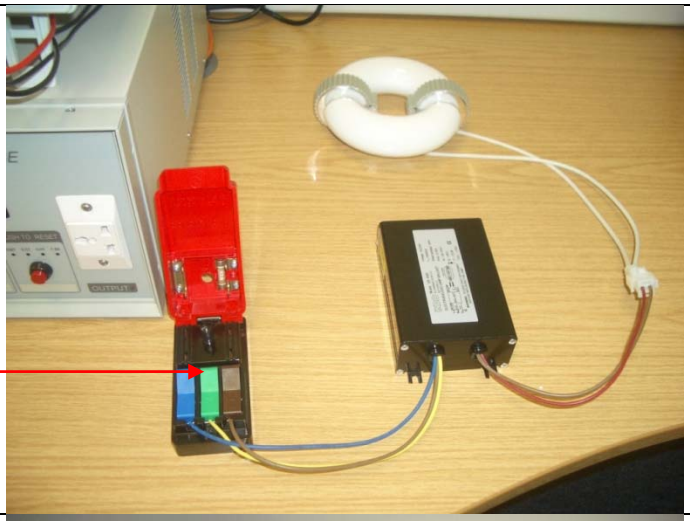
Set the Frequency to 50Hz

Set the Voltage Range to 0-300V by ensuring the button is depressed and illuminated

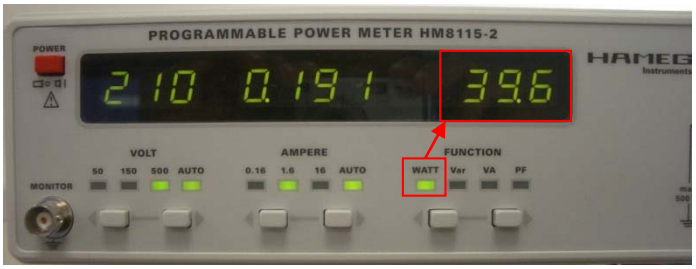
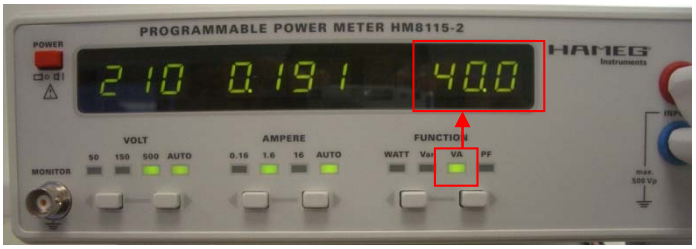
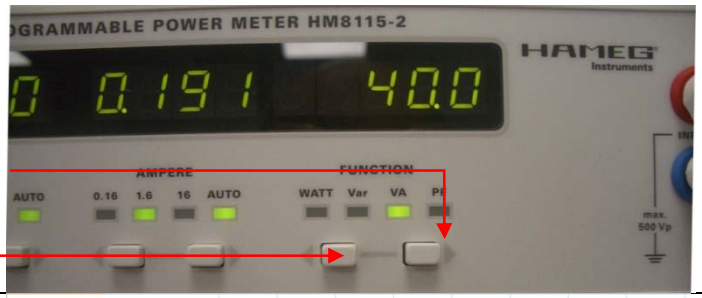
Press the ON/OFF switch

Switch on the Power Meter

	
Set the Voltage on the AC power source by using the Voltage Adj. dial to the first reading value of 210V. **Always use the Volt readout from the power meter to set the value as this is the calibrated unit**. Voltage Adj. dial	
	

Switch on the lamp by closing the 'Quick Connect'	
Allow the test equipment, lamp and gear to stabilise and for each subsequent voltage adjustment using the table below for the stabilization times.	

Item	Minimum Time	Maximum Fluctuation
Test Equipment:	30 minutes (Time from initial start up)	
Test Sample		
1st Reading @ 210V	30 minutes	Median value ± 0.02
2nd Reading @ 220V	10 minutes	Median value ± 0.02
3rd Reading @ 230V	10 minutes	Median value ± 0.02
4th Reading @ 240V	10 minutes	Median value ± 0.02
5th Reading @ 250V	10 minutes	Median value ± 0.02

4. Record Results	
For each Voltage value, the following readings must be taken from the Power Meter: **Watts**	
VA	
This is done by toggling between values using the left and right buttons	
Enter the values into the spreadsheet against the correct voltage The 'Adjusted' values will be automatically calculated with the uncertainty factors	**INDO Lighting Ltd** Date: 28/11/2013 — Calibration Date Check: 25/02/2013 25/02/2014 Temperature: 20.50 — Temperature Check: 20°C 3°C Relative Humidity %: 50 — Humidity Check: 55.00 20.00 **Product:** INDO-HALO-40W — Wattage Uncertainty: 0.50% Operative: Nim Faldu — VA Uncertainty: 0.50% Test Equipment: Lisun AC Power source LSP-1KVA — Serial #: 90011162 Hameg Power Meter HM8115-2 — Serial #: 061080009 N.B. If more than one power level is used, i.e. there is dimming involved, please use a separate tab for each power level. **Watts** **VA** Voltage | Sample - Measured Values (1–5) | Sample - Adjusted Values (1–5) 210 | 39.60 | 39.80 220 | 0.00 230 | 0.00 240 | 0.00 250 | 0.00 Voltage | Sample - Measured Values (1–5) | Sample - Adjusted Values (1–5) 210 | 40.00 | 40.20 220 | 0.00 230 | 0.00 240 | 0.00 250 | 0.00

Change the voltage to the next level and after observing the stabilization record the values as detailed above

INDO Lighting Ltd

Date:	28/11/2013	Calibration Date Check:	25/02/2013 / 25/02/2014
Temperature:	20.50	Temperature Check:	20°C / 3°C
Relative Humidity %:	50	Humidity Check:	55.00 / 20.00
Product:	INDO-HALO-40W	Wattage Uncertainty:	0.50%
Operative:	Nim Faldu	VA Uncertainty:	0.50%
Test Equipment:	Lisun AC Power source LSP-1KVA	Serial #:	90011162
	Hameg Power Meter HM8115-2	Serial #:	061080009

N.B. If more than one power level is used, i.e. there is dimming involved, please use a separate tab for each power level.

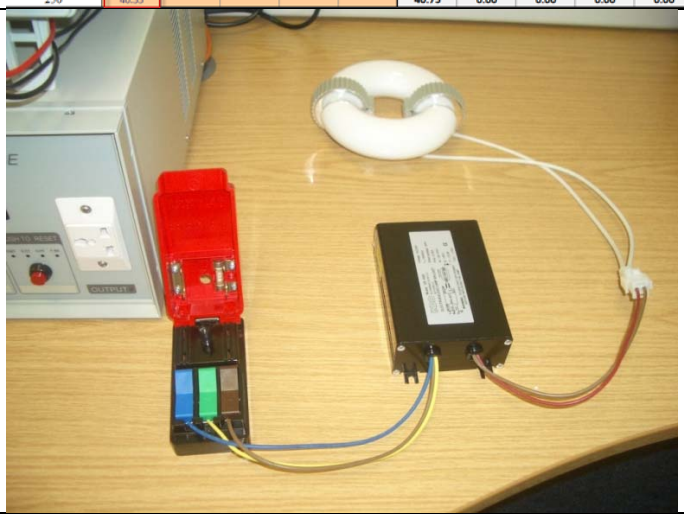
Watts

Voltage	Sample - Measured Values					Sample - Adjusted Values				
	1	2	3	4	5	1	2	3	4	5
210	39.60					39.80	0.00	0.00	0.00	0.00
220	39.80					40.00	0.00	0.00	0.00	0.00
230	39.80					40.00	0.00	0.00	0.00	0.00
240	40.10					40.30	0.00	0.00	0.00	0.00
250	40.15					40.35	0.00	0.00	0.00	0.00

VA

Voltage	Sample - Measured Values					Sample - Adjusted Values				
	1	2	3	4	5	1	2	3	4	5
210	40.00					40.20	0.00	0.00	0.00	0.00
220	40.05					40.25	0.00	0.00	0.00	0.00
230	40.05					40.25	0.00	0.00	0.00	0.00
240	40.50					40.70	0.00	0.00	0.00	0.00
250	40.55					40.75	0.00	0.00	0.00	0.00

When all readings from 210V to 250V have been taken. Switch off the lamp by opening the 'Quick Connect'. Connect the next sample and repeat the above steps until the whole sample batch has been tested.



CALCULATION OF UNCERTAINTY OF MEASUREMENT

As the measured values are entered into the spreadsheet the readings are automatically adjusted to include the uncertainty of measurement and displayed in the 'Adjusted Values' section for both Wattage and VA. The 'Adjusted Value' is the worst case scenario.

The Wattage and VA uncertainty factors are displayed on the Test form:

Wattage Uncertainty:		0.50%
VA Uncertainty:		0.50%

These values are taken from the calibration certificate and are updated in the master template every time a new calibration certificate is received.

Adjusted Value = Measured Value x Uncertainty Factor
Uncertainty Factor = 1+0.5% = 1.005

Example Calculation for Wattage:
Measured Value: 10W
Adjusted Value = 10 x 1.005 = 10.05W