

Report Number	TRN-15170-2
Customer	G.E.M UK LTD
Contact	Gavin MacGregor
Product Type	Street Light
Test Purpose	UMS Energy Performance Test
Sales Order Ref	Q-LUX2014-2553
Works Order Number	WO-5514b
Test Item Reference	TI-4608
LAB Test Method Reference	TES-2012
Test Standards	LM-79-08 and UMS charge code process v4.0
Lab Location Reference	UMS
Tested by	Steve Hunt
Date of Test	23/06/2015
Analysed by	Steve Hunt
Number of products tested	5

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Signed:




Arc 80 Polycarbonate Bowl with LED Lamp

Date: 25/06/2015

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Nomenclature

Lamp Orientation described below relates to the position in which a lamp is designed to operate for maximum performance and safety, these include:

- BD - Base Down (bulb is vertically positioned with the metal base at the bottom, glass up)
- BU - Base Up (bulb is vertically positioned with the metal base at the top, glass hanging down)
- HBD - Horizontal $+15^{\circ}$ to Base Down
- H45 - Horizontal to -45° only
- VBV - Vertical Base Up $\pm 15^{\circ}$
- VBD - Vertical Base Down $\pm 15^{\circ}$
- HBU - Base Up $\pm 90^{\circ}$ (bulb can be operated in a base up or horizontal position)
- HOR - Horizontal Burn (bulb is positioned with the metal base parallel to the ground)
- H75 - Horizontal $\pm 75^{\circ}$ (bulb should not be operated within 15° of vertical)
- U - Universal Burn (burn can be operated in any position)

Test Conditions

Measurements were made with an ambient temperature of $10^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Measurements were taken only after sufficient time for thermal stabilisation has been allowed.

Test Equipment

Yokogawa WT210 Power Analyzer. Kikusui PCR2000M Stable AC Power Supply
with PC control and data recording



Full data control and recording
using Labview software and full
integration of the AC Stable Power
Supply and Power Analyser

Product Name	Arc 80 Polycarbonate Bowl with LED Lamp
Part/Serial Number	See (Identifier) below
Type of Product	Street Light
Base Type	N/A
Driver Type	Mains
Driver Model	N/A
Light Engine Model	N/A
Operating Orientation	Base Up
Test Orientation	Base Up
Ambient Temperature	11.1°C
Manufacturer	G.E.M UK LTD
Date of Manufacturer	2015
Thermal Management	Passive
Dimmable	Yes
Humidity	<65% RH

Dimension	Sample	Luminous Opening
Diameter/Width	310 mm	240 mm
Length	620 mm	315 mm
Height/Depth	240 mm	60 mm

Test Item	Identifier
TI-4608A	1
TI-4608B	2
TI-4608C	3
TI-4608D	4
TI-4608E	5

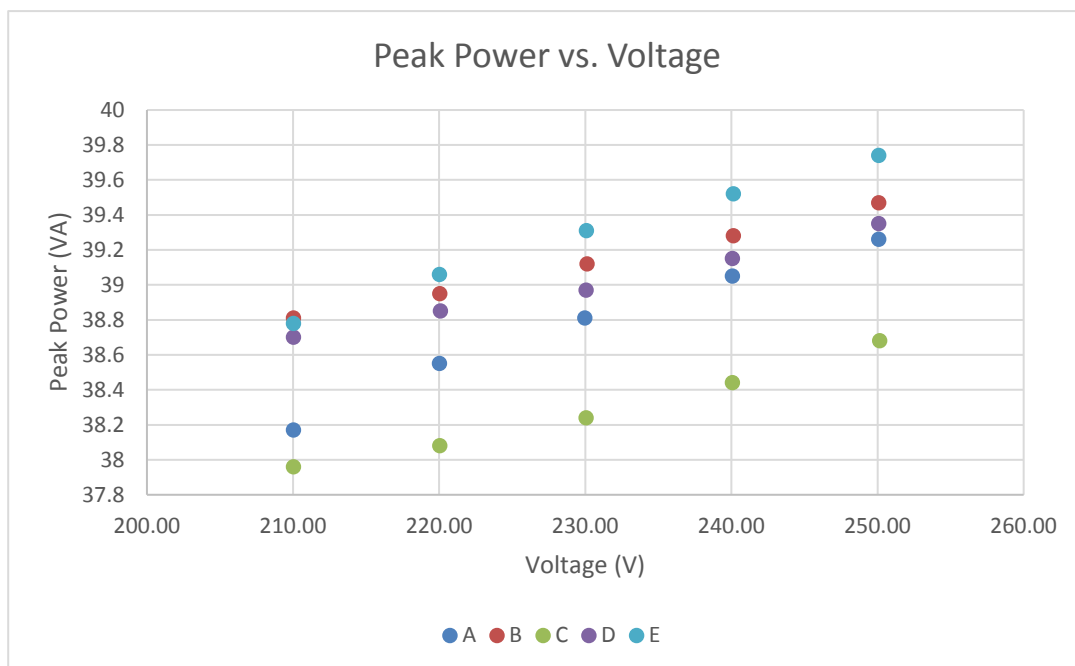
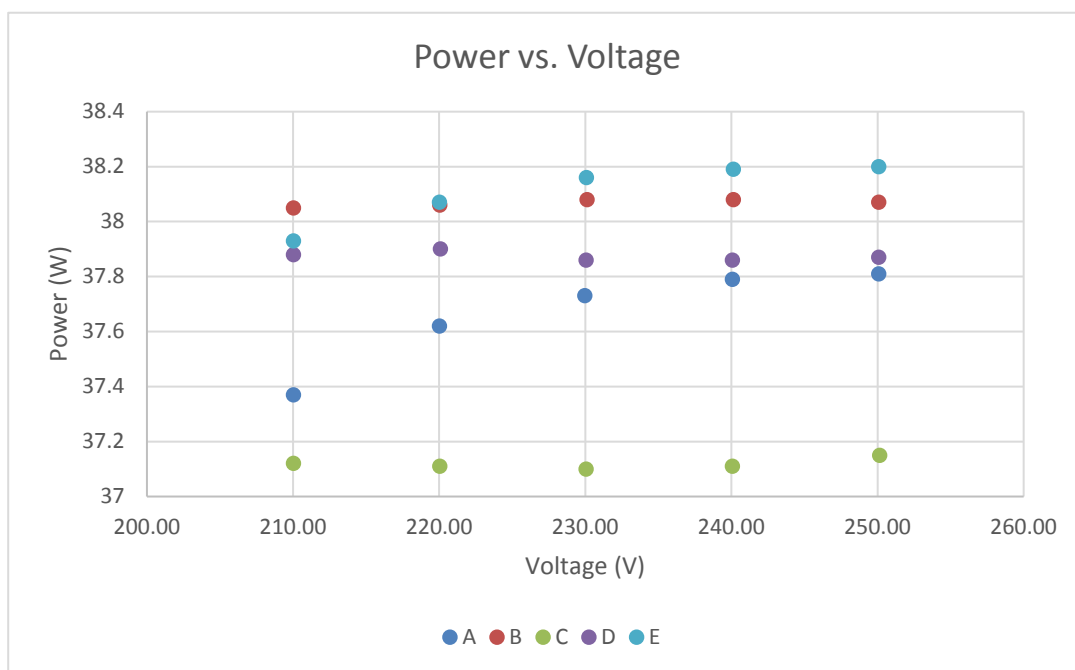
Test Conditions

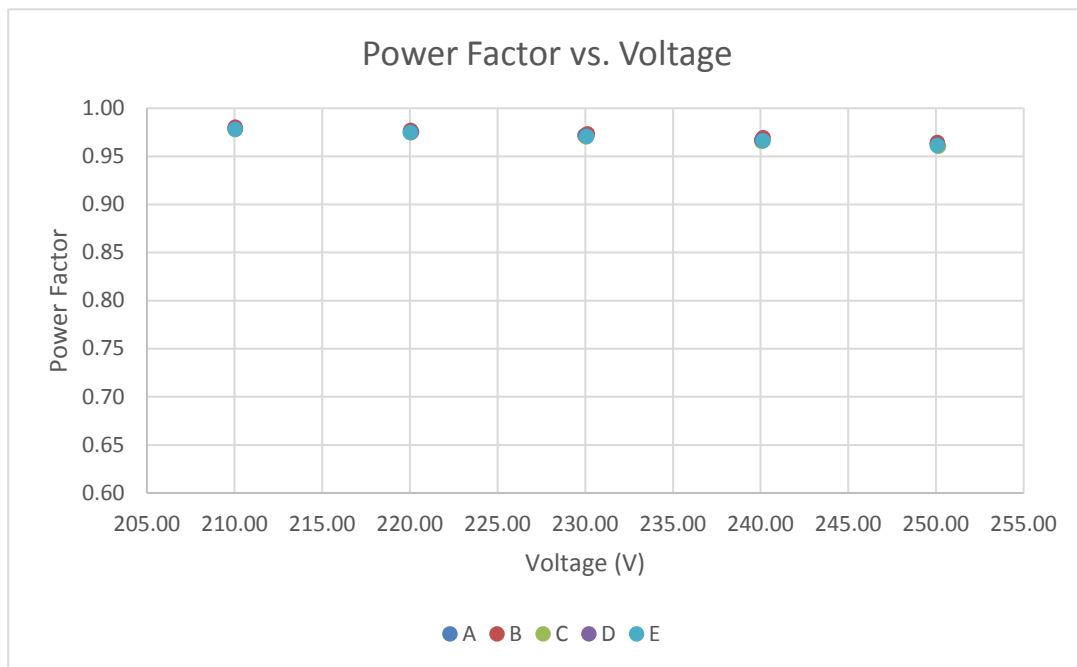
	Before Test	After Test
AC Supply Voltage (V)	250.07V	250.05V
AC Supply Frequency (Hz)	50Hz	50Hz
Voltage RMS Summation of the Harmonic Components (THD)	0.07%	0.06%

The test items were stabilised according to the electrical power stability of LM79-08. Stabilization is achieved when the difference in electrical power measurement is less than 0.5%. Each test item was stabilised at 250V.

Test Results Summary

These are the summary graphs of the test results for all products tested. The raw results are on page 6 of this test report.





Power factors measured have a Leading phase angle and therefore the driver has capacitive properties.

Measurement Uncertainty

Parameter	Uncertainty
Voltage (300 V, 50/60 Hz)	$\pm 0.061 \text{ V}_{\text{rms}}$
Current (200 mA, 50/60Hz)	$\pm 0.07 \text{ mA}_{\text{rms}}$
Current (0.5 A, 50/60Hz)	$\pm 0.16 \text{ mA}_{\text{rms}}$
Current (5 A, 50/60Hz)	$\pm 0.0016 \text{ A}_{\text{rms}}$
Power (300 V, 200 mA, 50/60 Hz)	$\pm 0.032 \text{ W}_{\text{rms}}$
Power (300 V, 0.5 A, 50/60 Hz)	$\pm 0.09 \text{ W}_{\text{rms}}$
Power (300 V, 5 A, 50/60 Hz)	$\pm 0.0009 \text{ kW}_{\text{rms}}$
Frequency (50/60 Hz)	$\pm 0.001 \text{ Hz}$
Power Factor	$\pm 0.0006 \text{ PF}$

Measurements of power of 0.50W or greater are made with an uncertainty of less than or equal to 2% at the 95% confidence level. Measurements of power less than 0.50W are made with an uncertainty of less than or equal to 0.01W at the 95% confidence level.

Full Test Results

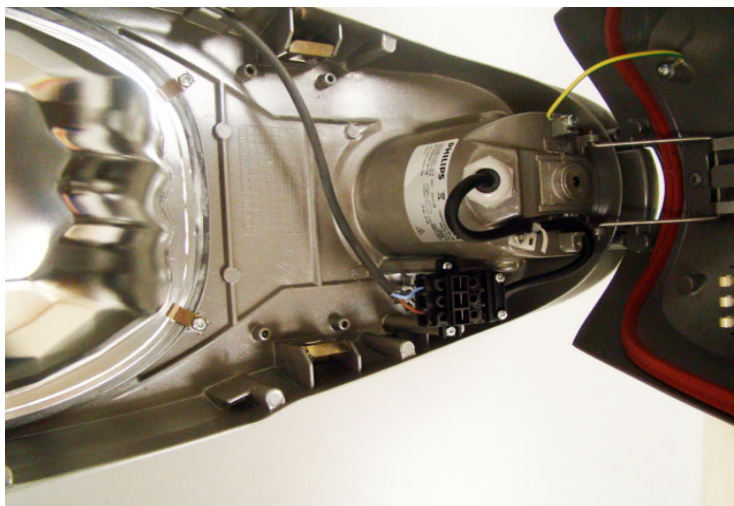
Test Item	Voltage (V)	Current (mA)	Electrical Power (W)	Ambient Temp (°C)	Peak Power (VA)	Power Factor	Leading / Lagging
A	250.07	156.99	37.81	11.10	39.26	0.963	Leading
B	250.07	157.82	38.07	11.09	39.47	0.965	Leading
C	250.14	154.64	37.15	11.10	38.68	0.961	Leading
D	250.08	157.36	37.87	11.10	39.35	0.962	Leading
E	250.07	158.91	38.20	11.09	39.74	0.961	Leading
A	240.06	162.67	37.79	11.17	39.05	0.968	Lagging
B	240.13	163.59	38.08	11.18	39.28	0.969	Leading
C	240.06	160.11	37.11	11.17	38.44	0.966	Leading
D	240.06	163.10	37.86	11.17	39.15	0.967	Leading
E	240.13	164.58	38.19	11.18	39.52	0.966	Leading
A	229.97	168.78	37.73	11.22	38.81	0.972	Lagging
B	230.11	170.00	38.08	11.24	39.12	0.974	Leading
C	230.04	166.23	37.10	11.29	38.24	0.970	Leading
D	230.04	169.41	37.86	11.26	38.97	0.971	Leading
E	230.08	170.84	38.16	11.29	39.31	0.971	Leading
A	220.01	175.22	37.62	11.30	38.55	0.976	Lagging
B	220.03	177.01	38.06	11.30	38.95	0.977	Lagging
C	220.03	173.07	37.11	11.28	38.08	0.974	Leading
D	220.08	176.52	37.90	11.33	38.85	0.975	Leading
E	220.02	177.53	38.07	11.29	39.06	0.975	Leading
A	210.03	181.75	37.37	11.35	38.17	0.979	Lagging
B	210.02	184.80	38.05	11.33	38.81	0.980	Lagging
C	210.02	180.74	37.12	11.29	37.96	0.978	Leading
D	210.03	184.24	37.88	11.34	38.70	0.979	Leading
E	210.02	184.63	37.93	11.35	38.78	0.978	Leading

Ave data	230.06	169.62	37.77	11.23	38.89	0.97	
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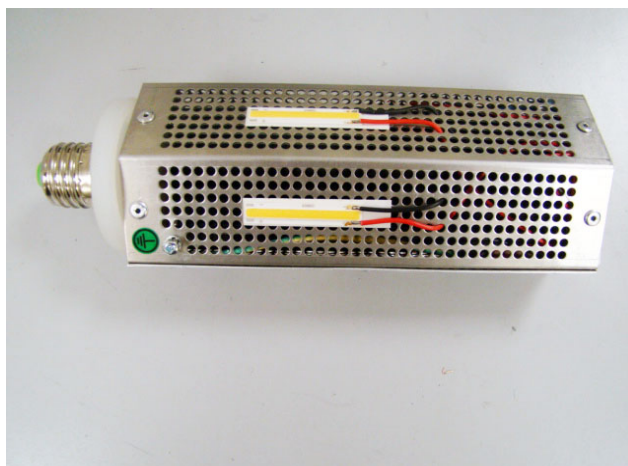
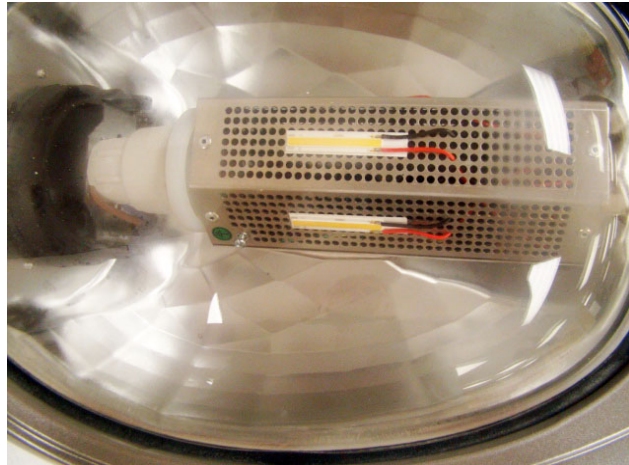
Test Item Photographs



Luminaire - Enclosure with retrofit self driven LED Lamp

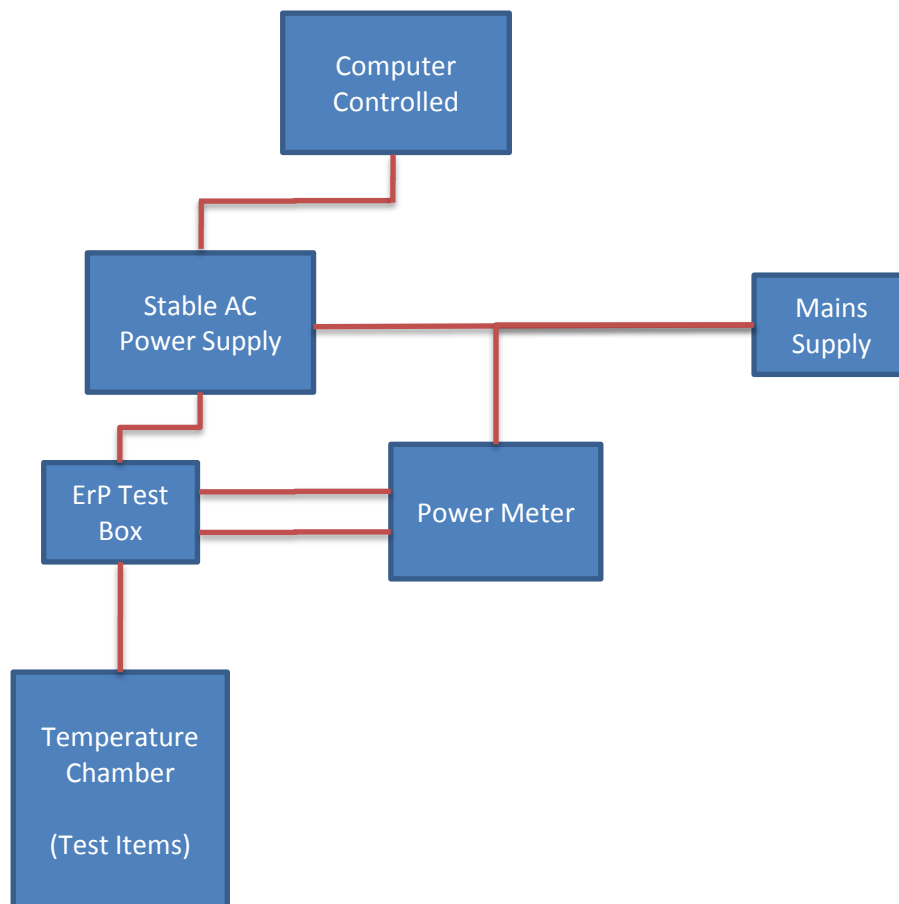


Driverless enclosure for retrofit LED Lamp



LED Retrofit Lamp with inbuilt driver

Appendix 1: Test item set-up



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