

Report Number	SAF-21295
Customer	Messagemaker Displays Ltd
Contact	Nigel Parke
Product Type	LED Warning Sign (SLS-20/40W-600 x 600)
Test Purpose	UMS Energy Performance Test
Sales Order Ref	Q-LUX15-22517
Works Order Number	WO-1942
Test Item Reference	TI-15376
LAB Test Method Reference	TES-1012
Test Standards	LM-79-08 and AEMO Unmetered Load Guideline V1.0
Lab Location Reference	Safety Lab
Tested By	Steve Hunt
Date of Test	22/06/2018
Analysed by	Gareth Jones
Number of products tested	1

Address: LUX-TSI Ltd.,
Pencoed Technology Park,
Pencoed, Bridgend,
CF35 5AQ, UK
Telephone: +44 (0) 1656 864618
Authorised by: Gareth Jones
Email: gjones@lux-tsi.com
Signed:




LED Warning Sign - 50%

Date: 25/06/2018

Disclaimers

This report is for the exclusive use of LUX-TSI's Customer and is provided pursuant to the agreement between LUX-TSI and its Customer. LUX-TSI's responsibility and reliability are limited to the Terms and Conditions of the agreement. LUX-TSI assumes no liability to any other party, other than the Customer in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Customer is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the LUX-TSI name or one of its marks for the sale or advertisement of the tested material, product or service must be approved in writing by LUX-TSI.

The observations and test results in this report are relevant only to the sample tested. Opinions expressed and data supplied in this report, are given in good faith, and are based on the information provided by the Customer. This report does not remove the requirement for the Customer to obtain further independent advice and in particular to instruct a notified or competent body or person to carry out further evaluation work and/or testing. Accordingly, no warranty is given, nor is any term or condition to be implied, that the product, which is the subject of this report, complies with the requirements of any EU directives.

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° to Base Down
 - H45 - Horizontal to -45° only
 - VBU - Vertical Base Up ±15°
 - VBD - Vertical Base Down ±15°
 - HBU - Base Up +/- 90° (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 +/- 75° (bulb should not be operated within 15° of vertical)
 - U - Universal Burn (burn can be operated in any position)
-

Test Equipment and Description

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



The products under test are connected to the UMS Test system which has full data control and recording using Labview software. This allows full integration of the Test equipment used - Kikusui AC Stable Power Supply , Yokogawa Power Analyser, Pico Temperature Logger and a LUX-TSI distribution control panel



LUX-TSI Ltd., Pencoed Technology Park,
Pencoed, Bridgend, CF35 5AQ, UK
Website: www.lux-tsi.com
E-mail: info@lux-tsi.com
Test Report Number: SAF-21295
Test Item: TI-15376

Product Name	LED Warning Sign - 50%
Part/Serial Number	See (Identifier) below
Type of Product	LED Warning Sign (SLS-20/40W-600 x 600)
Manufacturer	Messagemaker Displays Ltd
Date of Manufacturer	2018
Base Type	N/A
Driver Type	Mains
Driver Model	RS-75-5 Mean well
Light Engine Model	PCB TE15-093
Operating Orientation	Base Up
Test Orientation	Base Up
Ambient Temperature	24.0°C
Humidity	<65% RH
Thermal Management	Passive
Dimmable	Yes
Product Summary	LED Warning sign which displays speed restrictions. The warning sign is made of a square box section metal enclosure coated in a black powder paint.

Dimension	Sample	Luminous Opening
Diameter/Width	600 mm	480 mm
Length	600 mm	480 mm
Height/Depth	152 mm	0 mm

Test Item	Identifier
15376A	18018040240

Test Conditions

	Before Test	After Test
AC Supply Voltage (V)	250.98V	250.96V
AC Supply Frequency (Hz)	50Hz	50Hz
Voltage RMS Summation of the Harmonic Components (THD)	0.07%	0.07%

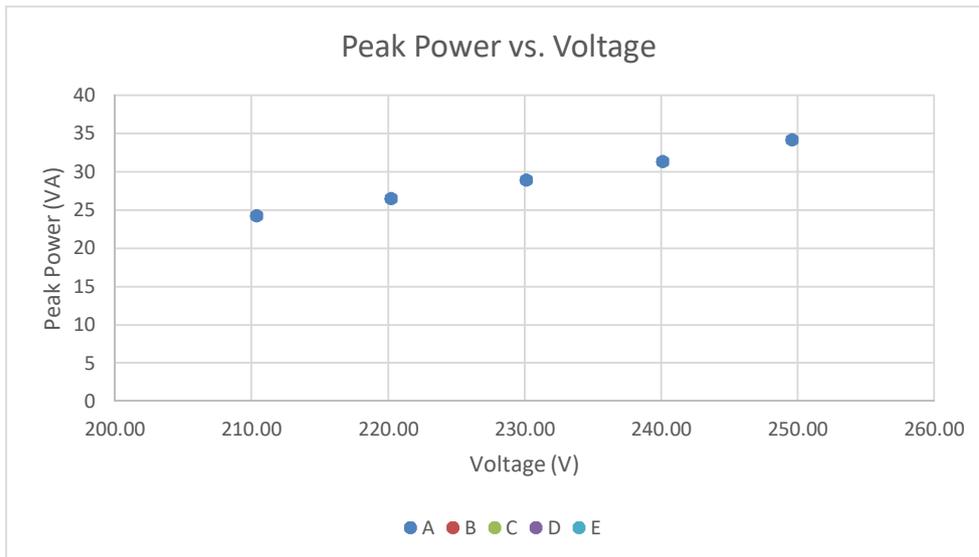
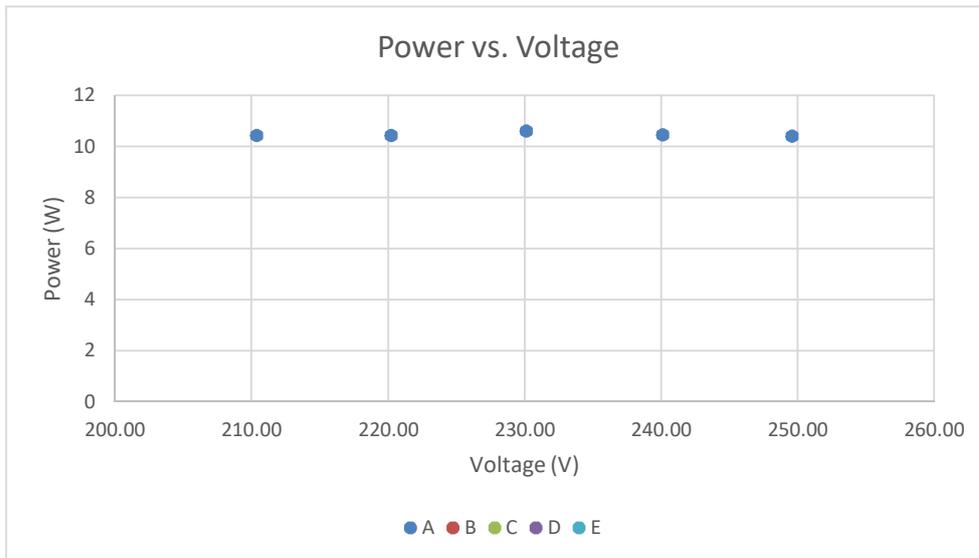
The test items were stabilised according to the electrical power stability of LM79-08. Stabilization is achieved when the difference in electrical power measurement is less than 0.5%. Each test item was stabilised at 250V.

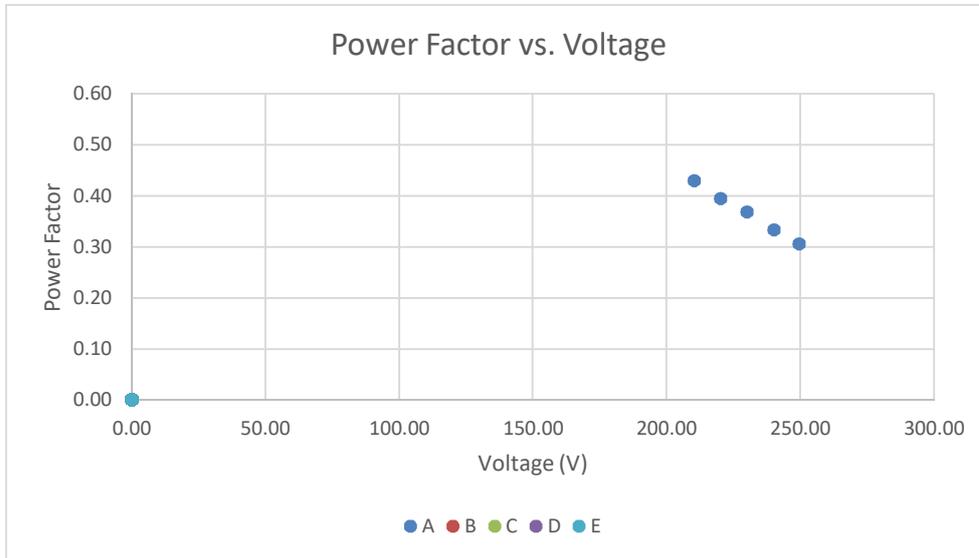
Measurements were made with an ambient temperature of 23°C +/- 2°C. Measurements were taken only after sufficient time for thermal stabilisation has been allowed.



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)	$\pm 0.061 V_{rms}$
Current (200 mA, 50/60Hz)	$\pm 0.07 mA_{rms}$
Current (0.5 A, 50/60Hz)	$\pm 0.16 mA_{rms}$
Current (5 A, 50/60Hz)	$\pm 0.0016 A_{rms}$
Power (300 V, 200 mA, 50/60 Hz)	$\pm 0.032 W_{rms}$
Power (300 V, 0.5 A, 50/60 Hz)	$\pm 0.09 W_{rms}$
Power (300 V, 5 A, 50/60 Hz)	$\pm 0.0009 kW_{rms}$
Frequency (50/60 Hz)	$\pm 0.001 Hz$
Power Factor	$\pm 0.0006 PF$

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.

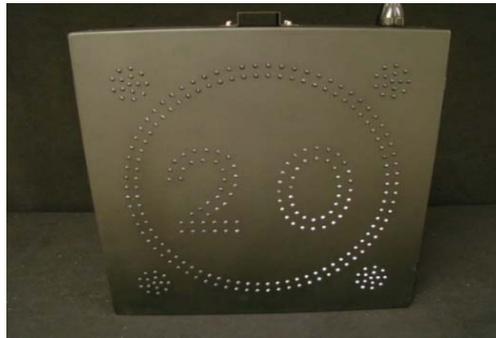
Full Test Results

Test Item	Voltage (V)	Current (mA)	Electrical Power (W)	Ambient Temp (°C)	Peak Power (VA)	Power Factor	Leading / Lagging
A	249.58	136.47	10.39	23.99	34.06	0.305	Leading
A	240.14	130.25	10.43	23.89	31.28	0.333	Leading
A	230.12	125.22	10.59	24.01	28.82	0.368	Leading
A	220.24	119.92	10.40	23.98	26.41	0.394	Leading
A	210.39	115.07	10.41	23.91	24.21	0.430	Leading

Test Item Photographs

TI-15376

Images of Product(s) under test includes (where possible) labelling, Driver and Light engine details

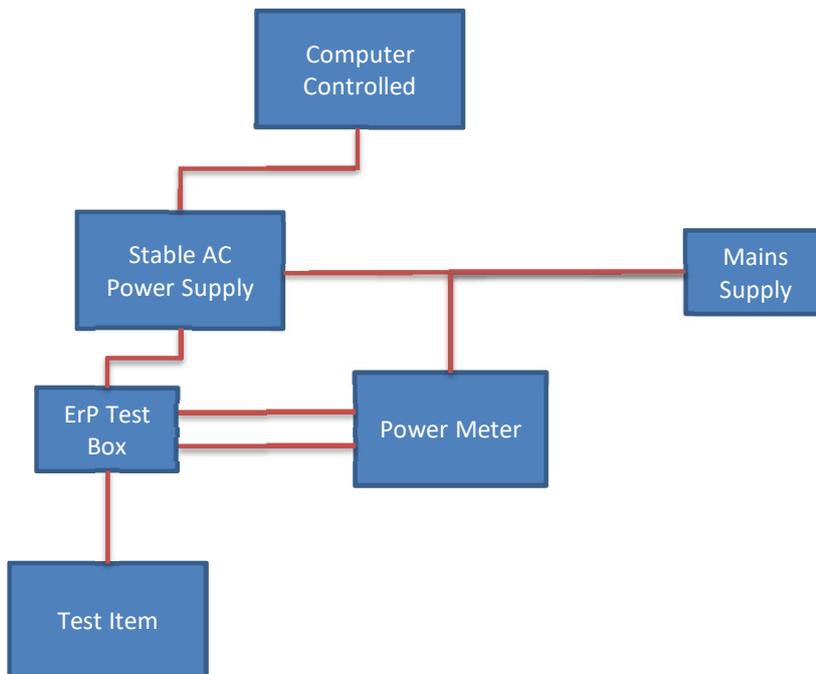


Front and Back View of LED Warning Sign



Representative images of label on Product, LED PCB and Driver

Appendix 1: Test item set-up



----- END OF REPORT -----