

Report Number	SAF-21296
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-1943
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 - 100%

Date: 25/06/2018

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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° 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)
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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-21296
Test Item: TI-15376

Product Name	LED Warning Sign - 100%
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	23.2°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

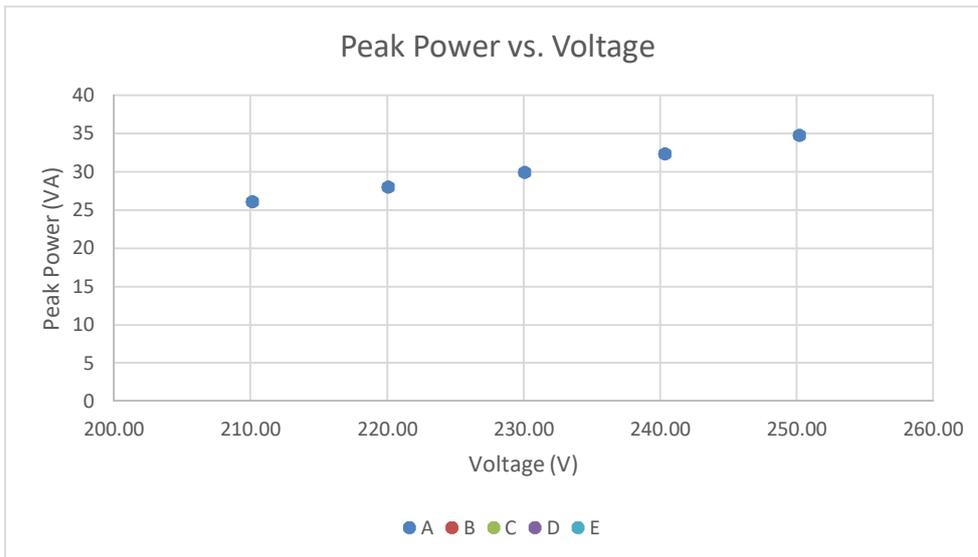
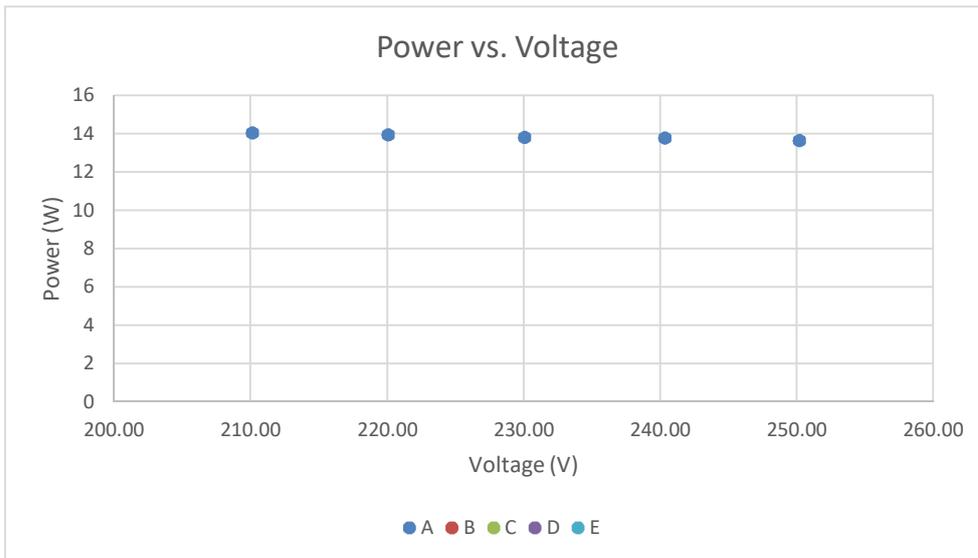
	Before Test	After Test
AC Supply Voltage (V)	250.29V	250.29V
AC Supply Frequency (Hz)	50Hz	50Hz
Voltage RMS Summation of the Harmonic Components (THD)	0.08%	0.07%

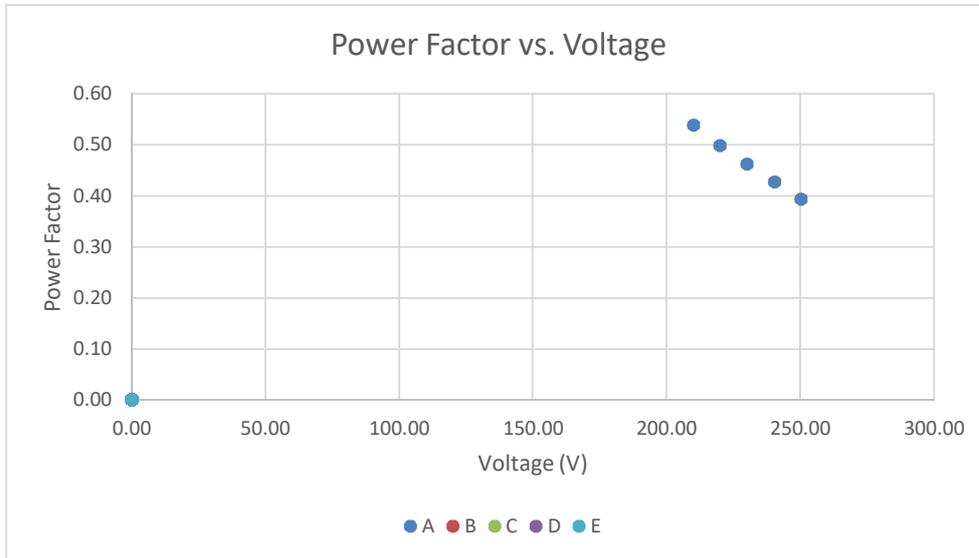
The test items were stabilised according to the electrical power stability of LM79-08. Stabilization is achieved when the difference in electrical power measurement is less than 0.5%. Each test item was stabilised at 250V.

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.

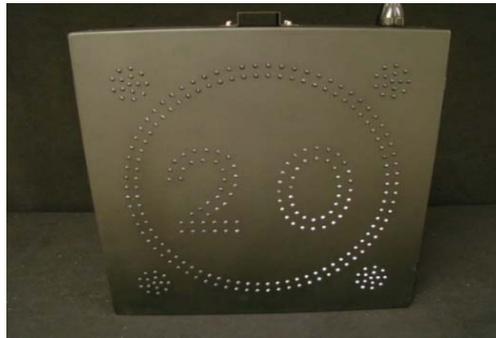
Full Test Results

Test Item	Voltage (V)	Current (mA)	Electrical Power (W)	Ambient Temp (°C)	Peak Power (VA)	Power Factor	Leading / Lagging
A	250.23	138.56	13.62	23.22	34.67	0.393	Leading
A	240.35	134.09	13.74	23.32	32.23	0.426	Leading
A	230.09	129.56	13.76	23.43	29.81	0.461	Leading
A	220.07	127.05	13.92	23.60	27.96	0.498	Leading
A	210.15	123.90	14.02	23.51	26.04	0.538	Leading

Test Item Photographs

TI-15376

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

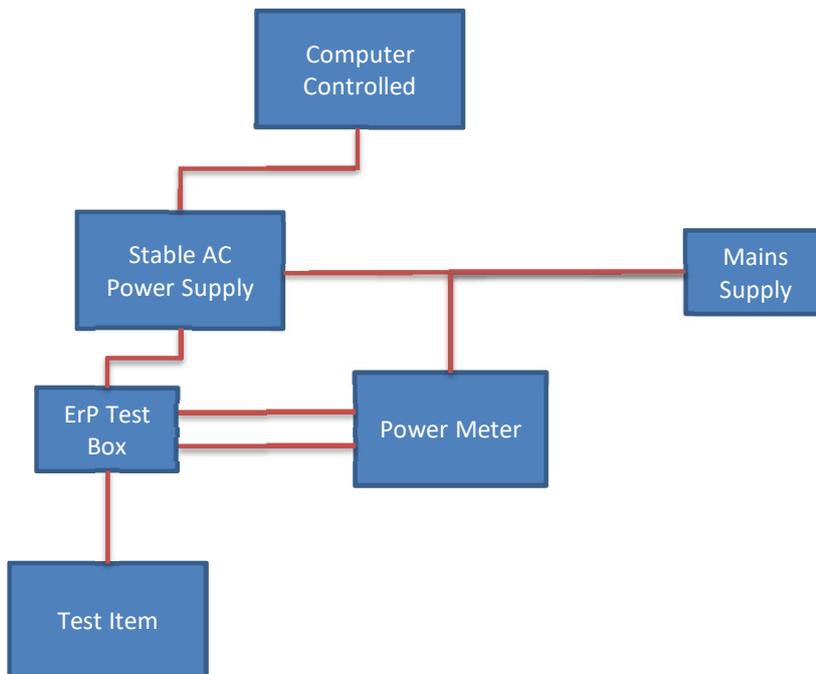


Front and Back View of LED Warning Sign



Representative images of label on Product, LED PCB and Driver

Appendix 1: Test item set-up



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