



EC Type Examination Certificate Number: **0120/ SGS0103**

## **EM-Lite Limited**

10 Reynolds Business Park  
Severn Way  
Peterborough  
Cambridgeshire  
PE1 5EL

Instrument Identification:

**ECA2.\***

**Single Phase, Active Import/ Export, Electricity Meter**

Instrument Traceable Number

**0120/ SGS0103**

has been assessed and certified as meeting the requirements of

# **EC Directive 2004/22/EC**

## **on Measuring Instruments Annex B**

It is certified that the manufacturer's technical design and specimen for the above instrument has been examined and, based on the evidence submitted, it is considered that the instrument conforms to the requirements of MI-003 of EC Directive 2004/22/EC

This certificate must be used in conjunction with a certificate covering the product verification as required in Annex D or Annex F.

This certificate is valid from 18<sup>th</sup> June 2012 to 17<sup>th</sup> June 2022  
Issue 3

Certification is based on report number(s)


EMA157563/1

Authorised Signature

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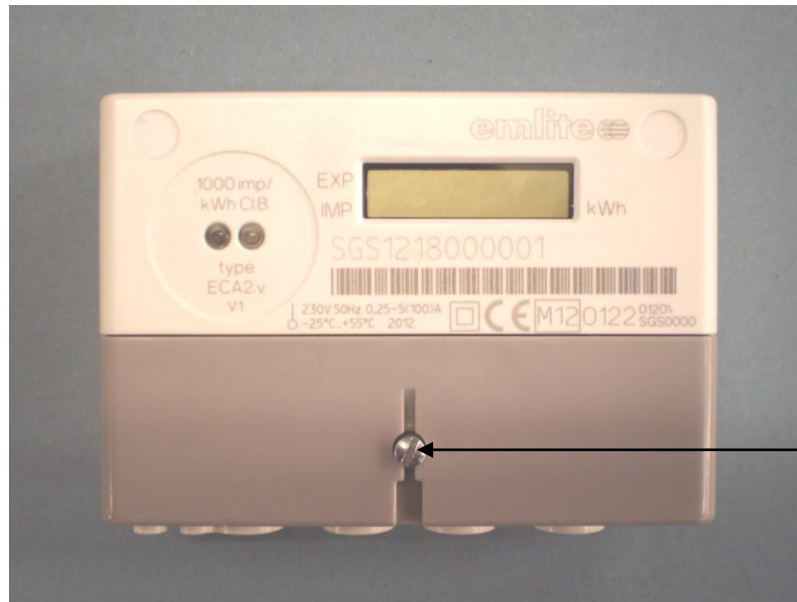
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	Issue Number: 3	Dated: 11 <sup>th</sup> October 2012

## 1. Technical Data

<b>Manufacturer</b>	EM-Lite Ltd
<b>Meter Type</b>	ECA2.*
<b>Voltage Rating (<math>U_n</math>)</b>	220V – 240V
<b>Current Rating (<math>I_{min}</math> – <math>I_{ref}</math> (<math>I_{max}</math>))</b>	0,25-5(100) 0,5-10(100) 0,75-15(100) 1-20(100)
<b>Frequency (<math>F_n</math>)</b>	50Hz
<b>Active Accuracy Class (<math>kWh</math>)</b>	A or B ( $kWh$ )
<b>Type of circuit</b>	1p2w
<b>Temperature Range</b>	-40°C to +70°C
<b>Firmware Version No</b>	V1.01-5 Checksum 50787 V1.01-6 Checksum 50814
<b>Identification Location</b>	LCD
<b>Bill Of Materials Number's</b>	<b>ECA2.z</b> ECA2-4001- 02 REV A <b>ECA2.v</b> ECA2-4002-02 REV A
<b>IP Rating</b>	IP52
<b>Insulation Protective Class</b>	Class II
<b>LED Pulse Constant</b>	1000 imp/kWh
<b>Impulse Voltage Rating</b>	6kV
<b>AC Voltage Rating</b>	4kV
<b>Terminal Cover Sealing Type</b>	Wire & Crimp
<b>Main Cover Sealing Type</b>	Press Fit Non-removable Lasered Plastic Seals
<b>Integrity of meter</b>	Inaccessible without breaking seals
<b>Intended Location of the Meter</b>	Indoor
<b>Type of Register</b>	LCD
<b>Terminal Arrangement(s)</b>	BS

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**2. Photograph of Meter and Sealing Plan**



Utility Seal



Main Cover Seals

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### 3. Calculation of the composite error/ MPE

In addition to the accuracy requirements the composite error  $e_c$  of the meter is shown below

The composite error at a certain load is calculated from the following formula:


$$e_c = \sqrt{e^2(l.\cos\theta) + e^2(T.l.\cos\theta) + e^2(U.l.\cos\theta) + e^2(f.l.\cos\theta)}$$

where

$e^2(l.\cos\theta)$	=	Intrinsic error of meter at a certain load
$e^2(T.l.\cos\theta)$	=	Additional error due to variation of the temperature at the same load
$e^2(U.l.\cos\theta)$	=	Additional error due to variation of the voltage at the same load
$e^2(f.l.\cos\theta)$	=	Additional error due to variation of the frequency at the same load

Ambient Temperature Range 5° to 30° C						
Current	PF Cos	e(lcos)	e(Tlcos)	e(Ulcos)	e(flcos)	%MPE
Imin	1.0	0.04	-0.38	0.40	-0.05	<b>0.56</b>
Itr	1.0	0.02	-0.16	0.21	0.01	<b>0.26</b>
10Itr	1.0	0.13	-0.01	-0.06	0.02	<b>0.14</b>
Imax	1.0	-0.09	0.07	0.06	0.03	<b>0.13</b>
Itr	0.5ind	-0.25	-0.41	0.35	-0.12	<b>0.61</b>
10Itr	0.5ind	0.10	-0.07	-0.09	0.10	<b>0.18</b>
Imax	0.5ind	-0.20	0.11	0.12	0.10	<b>0.28</b>
Itr	0.8cap	0.11	-0.2	0.25	0.05	<b>0.34</b>
10Itr	0.8cap	0.25	0.03	-0.10	-0.02	<b>0.27</b>
Imax	0.8cap	-0.11	0.12	0.13	0.12	<b>0.24</b>


Ambient Temperature Range -10° to 40° C						
Current	PF Cos	e(lcos)	e(Tlcos)	e(Ulcos)	e(flcos)	%MPE
Imin	1.0	0.04	-0.65	0.40	-0.05	<b>0.77</b>
Itr	1.0	0.02	-0.34	-0.18	0.01	<b>0.39</b>
10Itr	1.0	0.13	-0.05	-0.12	0.02	<b>0.18</b>
Imax	1.0	-0.09	-0.1	-0.10	0.03	<b>0.17</b>
Itr	0.5ind	-0.25	-0.75	0.37	-0.12	<b>0.88</b>
10Itr	0.5ind	0.10	-0.13	0.17	0.10	<b>0.26</b>
Imax	0.5ind	-0.20	-0.11	0.26	0.10	<b>0.36</b>
Itr	0.8cap	0.11	-0.29	-0.22	0.05	<b>0.38</b>
10Itr	0.8cap	0.25	-0.03	0.13	-0.02	<b>0.28</b>
Imax	0.8cap	-0.11	0.12	-0.11	0.12	<b>0.23</b>

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### Calculation of the composite error/ MPE (cont)

Ambient Temperature Range -25° to 55° C						
Current	PF Cos	e(lcos)	e(Tlcos)	e(Ulcos)	e(flcos)	%MPE
Imin	1.0	0.04	-0.86	0.40	-0.05	<b>0.95</b>
Itr	1.0	0.02	-0.49	-0.18	0.01	<b>0.52</b>
10ltr	1.0	0.13	-0.12	-0.12	0.02	<b>0.21</b>
I <sub>max</sub>	1.0	-0.09	-0.17	-0.10	0.03	<b>0.22</b>
Itr	0.5ind	-0.25	-0.98	0.37	-0.12	<b>1.08</b>
10ltr	0.5ind	0.10	-0.21	0.17	0.10	<b>0.30</b>
I <sub>max</sub>	0.5ind	-0.20	-0.23	0.26	0.10	<b>0.41</b>
Itr	0.8cap	0.11	-0.52	-0.22	0.05	<b>0.58</b>
10ltr	0.8cap	0.25	-0.11	0.13	-0.02	<b>0.30</b>
I <sub>max</sub>	0.8cap	-0.11	-0.08	-0.11	0.12	<b>0.21</b>

Ambient Temperature Range -40° to 70° C						
Current	PF Cos	e(lcos)	e(Tlcos)	e(Ulcos)	e(flcos)	%MPE
Imin	1.0	0.04	1.29	0.40	-0.05	<b>1.35</b>
Itr	1.0	0.02	-0.6	0.06	0.01	<b>0.60</b>
10ltr	1.0	0.13	-0.18	0.07	0.02	<b>0.23</b>
I <sub>max</sub>	1.0	-0.09	-0.29	0.08	0.03	<b>0.32</b>
Itr	0.5ind	-0.25	1.26	0.01	-0.12	<b>1.29</b>
10ltr	0.5ind	0.10	-0.34	-0.05	0.10	<b>0.37</b>
I <sub>max</sub>	0.5ind	-0.20	-0.36	-0.06	0.10	<b>0.43</b>
Itr	0.8cap	0.11	0.71	0.03	0.05	<b>0.72</b>
10ltr	0.8cap	0.25	-0.17	-0.03	-0.02	<b>0.30</b>
I <sub>max</sub>	0.8cap	-0.11	-0.2	-0.06	0.12	<b>0.26</b>

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#### 4. Annex of Variants

Product Variant Identification Details:

Type Designation	Description of meter
ECA2.z	4 terminal basic variant, no auxiliary connections
ECA2.v	4 terminal with electronic pulsed output variant

Modifications to the meter(s) described according to approval No. **0120/ SGS0103** must be notified to the issuing body to confirm the meter(s) continuing compliance to the relevant pattern approval standard(s).

#### 5. Document Revision History

Issue	Date	Comments
1	18/06/2012	Initial issue
2	17/07/2012	Minor PCB change
3	11/03/2013	Minor software update with checksums included V1.01-5 Checksum 50787 and V1.01-6 Checksum 50814