



EU Type Examination Certificate Number: **0120/SGS0325**

**COMADAN A/S**

Messingvej 60  
Randers SV  
8940  
Denmark

Instrument Identification:  
**EM3-100, EM3-100-R, EM3-100-Bi**

**Poly phase, Active Import/Export (kWh), Electricity Meter**

Instrument Traceable Number  
**0120/SGS0325**

has been assessed and certified as meeting the requirements of

**EU Directive 2014/32/EU**  
**on Measuring Instruments Annex II, Module 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 Annex V of EU Directive 2014/32/EU

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


This certificate is valid until 20<sup>th</sup> April 2026  
Issue 1

Certification is based on report number(s) SHES151000648101 dated 19<sup>th</sup> April 2016  
EMA242783

Authorised Signature


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	Issue Number: 1	Dated: 3 <sup>rd</sup> October 2017

## 1. Technical Data

<b>Manufacturer</b>	COMADAN A/S
<b>Meter Type</b>	EM3-100, EM3-100-R, EM3-100-Bi
<b>Voltage Rating (<math>U_n</math>)</b>	3 x 230/400V
<b>Current Rating (<math>I_{min}</math> – <math>I_{ref}</math> (<math>I_{max}</math>))</b>	0,5-10(100)A
<b>Frequency (<math>F_n</math>)</b>	50Hz
<b>Active Accuracy Class (<math>kWh</math>)</b>	B ( $kWh$ )
<b>Type of circuit</b>	3p4w
<b>Temperature Range</b>	-25°C to +55°C
<b>Software/ Firmware Version No</b>	1.1
<b>CRC Checksum</b>	EM3-100: 0x001134D7 EM3-100-R: 0x001134D9 EM3-100-Bi: 0x001516EC
<b>Identification Location</b>	LCD
<b>Bill Of Materials Number</b>	EM3-100 V1.1, EM3-100-R V1.1, EM3-100-Bi V1.1
<b>IP Rating</b>	IP51
<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>Main Cover Sealing Type</b>	Wire & Crimp on terminal cover Meter case sealed with screws
<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>	DIN
<b>Location of Manufacturers Address</b>	Side of meter

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## 2. Photograph of Meters and Sealing Plans



Photograph of EM3-100




Photograph of EM3-100-R

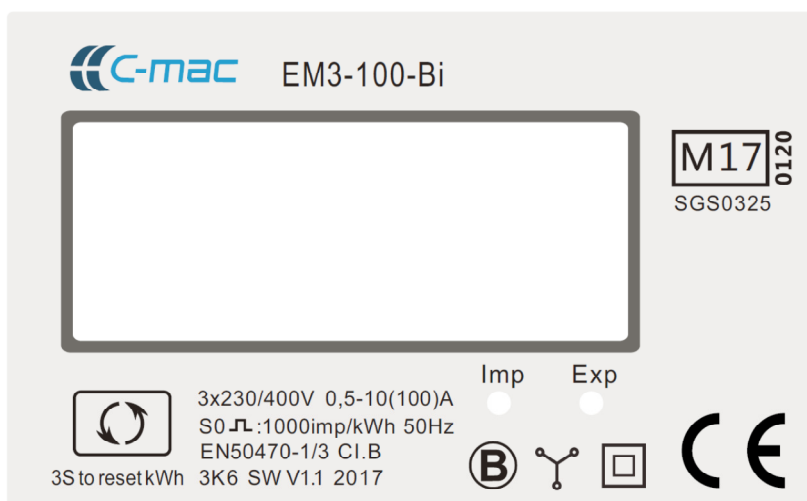
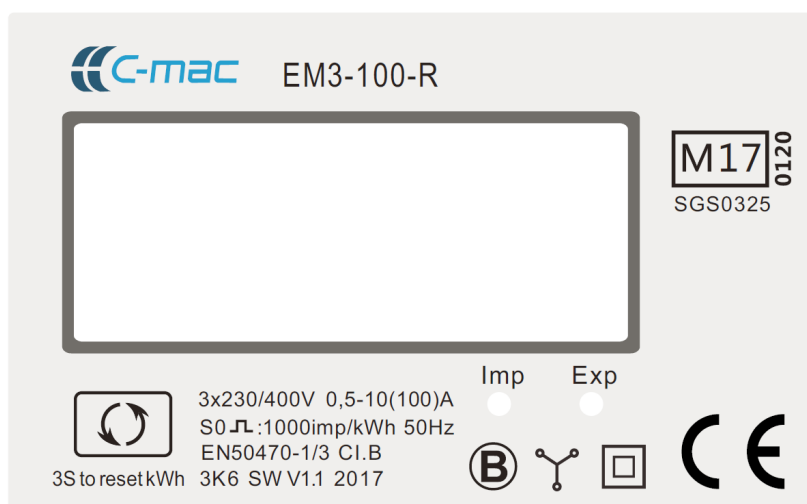
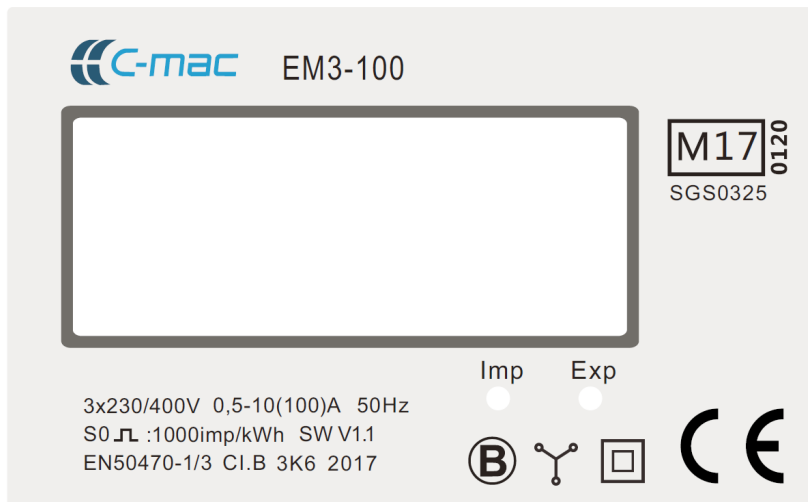
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**Photograph of EM3-100-Bi**

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### 3. Examples of Nameplates



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

During the type approval examination the influence factors for temperature, frequency and voltage are determined per load point. The table below represents the sum of the square values per load, determined via the following formula:-


$$\delta e(T, U, f) = \sqrt{(\delta e^2(T, I, \cos\phi) + \delta e^2(U, I, \cos\phi) + \delta e^2(f, I, \cos\phi))}$$

where

$\delta e(T, I, \cos\phi)$	=	Additional error due to variation of the temperature at the same load
$\delta e(U, I, \cos\phi)$	=	Additional error due to variation of the voltage at the same load
$\delta e(f, I, \cos\phi)$	=	Additional error due to variation of the frequency at the same load

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		Influence Factors for Temperature. Frequency & Voltage					
Current	PF Cos	-25°C	-10°C	5°C	30°C	40°C	55°C
I <sub>min</sub>	1.0	<b>0.32</b>	<b>0.24</b>	<b>0.15</b>	<b>0.12</b>	<b>0.15</b>	<b>0.26</b>
I <sub>tr</sub>	1.0	<b>0.34</b>	<b>0.24</b>	<b>0.15</b>	<b>0.10</b>	<b>0.15</b>	<b>0.30</b>
10I <sub>tr</sub>	1.0	<b>0.37</b>	<b>0.28</b>	<b>0.17</b>	<b>0.10</b>	<b>0.15</b>	<b>0.28</b>
I <sub>max</sub>	1.0	<b>0.30</b>	<b>0.24</b>	<b>0.19</b>	<b>0.15</b>	<b>0.17</b>	<b>0.24</b>
I <sub>tr</sub>	0.5ind	<b>0.51</b>	<b>0.45</b>	<b>0.37</b>	<b>0.30</b>	<b>0.30</b>	<b>0.36</b>
10I <sub>tr</sub>	0.5ind	<b>0.40</b>	<b>0.32</b>	<b>0.25</b>	<b>0.18</b>	<b>0.22</b>	<b>0.32</b>
I <sub>max</sub>	0.5ind	<b>0.66</b>	<b>0.62</b>	<b>0.58</b>	<b>0.52</b>	<b>0.51</b>	<b>0.50</b>
I <sub>tr</sub>	0.8cap	<b>0.44</b>	<b>0.34</b>	<b>0.26</b>	<b>0.16</b>	<b>0.17</b>	<b>0.24</b>
10I <sub>tr</sub>	0.8cap	<b>0.37</b>	<b>0.25</b>	<b>0.15</b>	<b>0.09</b>	<b>0.15</b>	<b>0.27</b>
I <sub>max</sub>	0.8cap	<b>0.48</b>	<b>0.42</b>	<b>0.38</b>	<b>0.33</b>	<b>0.31</b>	<b>0.32</b>
L1							
I <sub>tr</sub>	1.0	<b>0.37</b>	<b>0.33</b>	<b>0.29</b>	<b>0.26</b>	<b>0.28</b>	<b>0.38</b>
10I <sub>tr</sub>	1.0	<b>0.30</b>	<b>0.21</b>	<b>0.15</b>	<b>0.10</b>	<b>0.17</b>	<b>0.29</b>
I <sub>max</sub>	1.0	<b>0.23</b>	<b>0.18</b>	<b>0.17</b>	<b>0.11</b>	<b>0.14</b>	<b>0.23</b>
I <sub>tr</sub>	0.5ind	<b>0.44</b>	<b>0.38</b>	<b>0.35</b>	<b>0.34</b>	<b>0.38</b>	<b>0.44</b>
10I <sub>tr</sub>	0.5ind	<b>0.31</b>	<b>0.24</b>	<b>0.22</b>	<b>0.19</b>	<b>0.26</b>	<b>0.38</b>
I <sub>max</sub>	0.5ind	<b>0.29</b>	<b>0.26</b>	<b>0.25</b>	<b>0.22</b>	<b>0.24</b>	<b>0.34</b>
L2							
I <sub>tr</sub>	1.0	<b>0.61</b>	<b>0.61</b>	<b>0.61</b>	<b>0.61</b>	<b>0.61</b>	<b>0.61</b>
10I <sub>tr</sub>	1.0	<b>0.19</b>	<b>0.19</b>	<b>0.19</b>	<b>0.19</b>	<b>0.19</b>	<b>0.20</b>
I <sub>max</sub>	1.0	<b>0.16</b>	<b>0.14</b>	<b>0.12</b>	<b>0.12</b>	<b>0.12</b>	<b>0.12</b>
I <sub>tr</sub>	0.5ind	<b>0.76</b>	<b>0.77</b>	<b>0.77</b>	<b>0.76</b>	<b>0.77</b>	<b>0.77</b>
10I <sub>tr</sub>	0.5ind	<b>0.31</b>	<b>0.30</b>	<b>0.30</b>	<b>0.30</b>	<b>0.31</b>	<b>0.32</b>
I <sub>max</sub>	0.5ind	<b>0.30</b>	<b>0.28</b>	<b>0.27</b>	<b>0.27</b>	<b>0.27</b>	<b>0.27</b>
L3							
I <sub>tr</sub>	1.0	<b>0.80</b>	<b>0.52</b>	<b>0.38</b>	<b>0.27</b>	<b>0.37</b>	<b>0.54</b>
10I <sub>tr</sub>	1.0	<b>0.86</b>	<b>0.64</b>	<b>0.50</b>	<b>0.42</b>	<b>0.48</b>	<b>0.63</b>
I <sub>max</sub>	1.0	<b>1.09</b>	<b>0.97</b>	<b>0.90</b>	<b>0.87</b>	<b>0.89</b>	<b>0.95</b>
I <sub>tr</sub>	0.5ind	<b>1.04</b>	<b>0.92</b>	<b>0.82</b>	<b>0.79</b>	<b>0.82</b>	<b>0.92</b>
10I <sub>tr</sub>	0.5ind	<b>1.03</b>	<b>0.88</b>	<b>0.78</b>	<b>0.74</b>	<b>0.78</b>	<b>0.88</b>
I <sub>max</sub>	0.5ind	<b>1.02</b>	<b>0.92</b>	<b>0.92</b>	<b>0.83</b>	<b>0.87</b>	<b>0.94</b>


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## 5. Annex of Variants

Product Variant Identification Details:

Type Designation	Description of meter
EM3-100	3x230/400V, 0.5-10(100)A, 1000imp/kWh Shows only total active energy, without resettable kWh
EM3-100-R	3x230/400V, 0.5-10(100)A, 1000imp/kWh Shows total active energy, resettable kWh, total active power
EM3-100-Bi	3x230/400V, 0.5-10(100)A, 1000imp/kWh Shows total active energy, total active power, import and export energy, resettable import and export energy

Modifications to the meter(s) described according to approval No.**0120/SGS0325** must be notified to the issuing body to confirm the meter(s) continuing compliance to the relevant pattern approval standard(s).

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## 6. Document Revision History

Issue	Date	Comments
1	03/10/2017	Initial Issue

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**END OF CERTIFICATE**