

EC Type Examination Certificate Number: **0120/SGS0007**

## **Elster Metering Systems**

Tollgate Business Park  
Beaconside  
Stafford  
ST16 3HS

Instrument Identification:  
**A1120, A1140, A1160 Electricity Meter, LM\*\*\*\*\*\_\*\*  
Poly Phase, Credit, Active Import/ Export, Multi-rate, Direct Connected/  
Transformer Operated, Electricity Meter**

Instrument Traceable Number  
**0120/SGS0007**

has been assessed and certified as meeting the requirements of

### **EC Directive 2004/22/EC 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 until 17<sup>th</sup> August 2017  
Issue 14


Certification is based on report number(s) EMA106670/ 1/ CT dated 13<sup>th</sup> August 2007  
EMA106670/ 1/ WC dated 13<sup>th</sup> August 2007  
EMA130853 dated 26<sup>th</sup> November 2009  
EMA137547 dated 18<sup>th</sup> August 2010  
EMA180052/1 dated 19<sup>th</sup> September 2013  
EMA180052/1/IEC dated 4<sup>th</sup> April 2014  
EMA180052/2 dated 18<sup>th</sup> August 2014  
EMA198098/1 dated 6<sup>th</sup> February 2015

Authorised Signature




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## 1. Technical Data

<b>Manufacturer</b>	Elster Metering Systems
<b>Meter Type(s)</b>	A1120, A1140, A1160
<b>Voltage Rating (<math>U_n</math>)</b>	<p><b>A1120 &amp; A1140 Direct Connection</b>  220-240V (L-N), 380-415V (L-L)  127-139V (L-N), 220-240V (L-L)  105-127V (L-N), 180-220V (L-L)  105-127V (L-L) (LM2***** only)</p> <p><b>A1160 Direct Connection</b>  220-240V (L-N), 380-415V (L-L)</p> <p><b>A1120 &amp; A1140 Transformer Operated</b>  220-240V (L-N), 380-415V (L-L)  127-139V (L-N), 220-240V (L-L)  105-127V (L-N), 180-220V (L-L)  105-127V (L-L) (LM2***** only)</p>
<b>Current Rating (<math>I_{min} - I_{ref} (I_{max})</math>)</b>	<p><b>A1120 &amp; A1140 Direct Connection</b>  0.25-5(100)A  (Any multiple of <math>I_{ref}</math> up to <math>I_{max}</math>)</p> <p><b>A1160 Direct Connection</b>  1-20(160)A  (Any multiple of <math>I_{ref}</math> up to <math>I_{max}</math>)</p> <p><b>A1120 &amp; A1140 Transformer Operated</b>  0.01-1(10)A  (Any combination of <math>I_n</math> at 1, 1.5, 2, 2.5, 5 with <math>I_{max}</math> of meter at <math>1.2I_n</math>, <math>1.5I_n</math> and <math>2I_n</math>)</p>
<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>	<p><b>A1120, A1140</b>  1p2w, 1p3w, 1p4w, 2p of 3p4w, 2p3w, 3p3w, 3p4w.</p> <p><b>A1160</b>  3p4w</p>
<b>Temperature Range</b>	<p>-25°C to +55°C  or  -40°C to +60°C*</p> <p>(* = 10-100A Current Range Option P Only)</p>
<b>Software Version No.'s</b>	<p>2-01178J, 2-01178L, 2-01178M, 2-01178N,  2-01178P, 2-01178Q</p> <p>2-01322E, 2-01322G, 2-01322H, 2-01322J, 2-01322K</p> <p>2-01340-A, 2-01340-D, 2-01397-E, 2-01397-F,  2-01397-G</p>
<b>Identification Location</b>	Nameplate
<b>Bill Of Materials No.'s</b>	Drawing JG0524 Sheets 1,2,3,4,12,13,14

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### Technical Data (cont)

<b>IP Rating</b>	IP54
<b>Insulation Protective Class</b>	Class II
<b>LED Pulse Constant</b>	1000imp/ kWh
<b>Impulse Voltage Rating</b>	6kV
<b>AC Voltage Rating</b>	4kV
<b>Main Cover Sealing Type</b>	2 x shearhead screws
<b>Terminal Cover Sealing Type</b>	2 x wire and crimp
<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

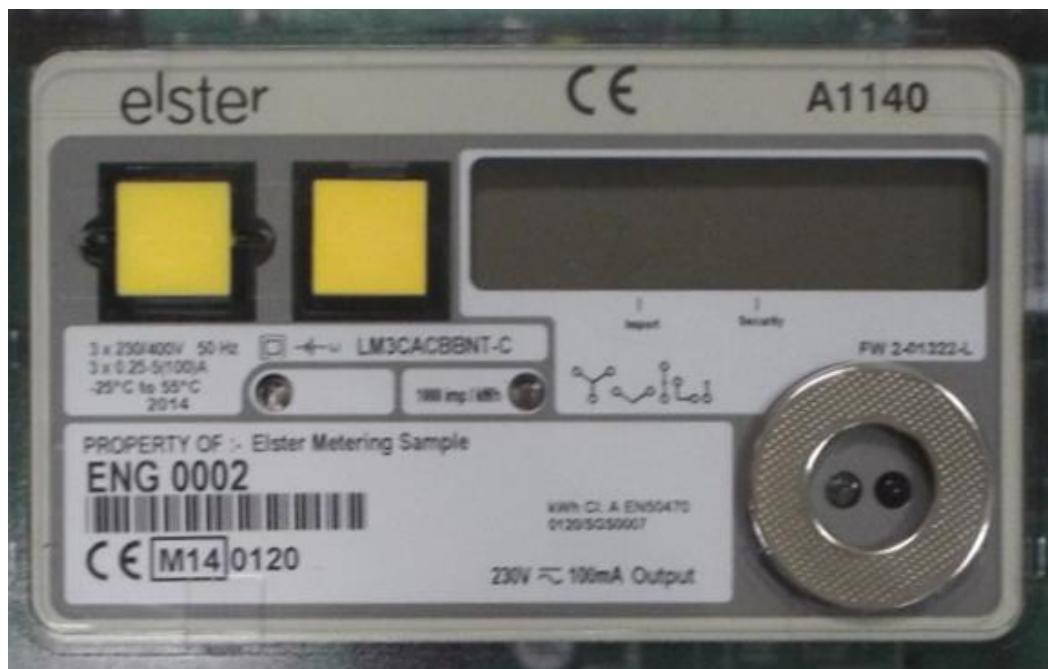
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### 3. Photographs of Meter Name Plates

**A1120**




**A1140**



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**A1160**



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#### 4. Influence factors for temperature, frequency and voltage

During the type approval examination the influence factors for temperature, frequency and voltage are determined per load point. The table 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 and voltage (cont)**

		Influence Factors for Temperature, Frequency & Voltage					
Current	PF Cos	-25	-10	5	30	40	55
I <sub>min</sub>	1.0	1.03	0.79	0.44	0.93	0.34	0.50
I <sub>tr</sub>	1.0	0.80	0.62	0.35	0.46	0.23	0.45
10I <sub>tr</sub>	1.0	0.76	0.56	0.36	0.13	0.16	0.34
I <sub>max</sub>	1.0	0.78	0.57	0.37	0.17	0.16	0.29
I <sub>tr</sub>	0.5ind	1.37	0.66	0.18	0.36	0.60	0.99
10I <sub>tr</sub>	0.5ind	1.06	0.46	0.34	0.26	0.31	0.50
I <sub>max</sub>	0.5ind	0.55	0.23	0.24	0.17	0.18	0.31
I <sub>tr</sub>	0.8cap	1.76	1.10	0.39	0.49	0.17	0.32
10I <sub>tr</sub>	0.8cap	1.47	0.89	0.34	0.08	0.10	0.28
I <sub>max</sub>	0.8cap	1.26	0.80	0.39	0.15	0.15	0.28
L1							
I <sub>tr</sub>	1.0	0.82	0.64	0.22	0.64	0.62	0.78
10I <sub>tr</sub>	1.0	0.76	0.54	0.33	0.12	0.16	0.35
I <sub>max</sub>	1.0	0.73	0.53	0.34	0.14	0.14	0.28
I <sub>tr</sub>	0.5ind	0.48	0.48	0.55	0.54	0.67	1.08
10I <sub>tr</sub>	0.5ind	0.99	0.35	0.44	0.33	0.38	0.60
I <sub>max</sub>	0.5ind	0.50	0.19	0.32	0.18	0.21	0.35
L2							
I <sub>tr</sub>	1.0	0.83	0.64	0.20	0.69	0.37	0.62
10I <sub>tr</sub>	1.0	0.74	0.52	0.32	0.11	0.14	0.33
I <sub>max</sub>	1.0	0.71	0.50	0.31	0.13	0.13	0.27
I <sub>tr</sub>	0.5ind	1.50	0.48	0.27	0.66	1.10	1.36
10I <sub>tr</sub>	0.5ind	1.22	0.50	0.32	0.27	0.34	0.58
I <sub>max</sub>	0.5ind	0.72	0.27	0.18	0.12	0.16	0.32
L3							
I <sub>tr</sub>	1.0	1.06	0.79	0.41	0.34	0.34	0.60
10I <sub>tr</sub>	1.0	0.79	0.58	0.35	0.10	0.15	0.38
I <sub>max</sub>	1.0	0.78	0.57	0.36	0.14	0.15	0.30
I <sub>tr</sub>	0.5ind	0.82	0.34	0.29	0.67	0.69	1.25
10I <sub>tr</sub>	0.5ind	0.92	0.34	0.19	0.20	0.22	0.43
I <sub>max</sub>	0.5ind	0.46	0.15	0.25	0.00	0.13	1.16



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## 5. Annex of Variants

Product Variant Identification Details:

### POLYPHASE (A1120/A1140) MODEL CODE

V <sub>ref</sub>		I <sub>b</sub>	I <sub>max</sub>
L-L	L-N		

MODEL

TYPE (nameplate)

example: L M 3 A A B N N B B N N B - A N N N

#### PRODUCT/TERMINATION

Polyphase, BS/DIN termination

#### SERVICE TYPE

3Ph 4W for use on: (Not 3Ph 3W)

3Ph 3W Direct Connected and 5-10A CT versions only

#### CURRENT RANGE

Direct Connected 20A – \* (\* is any multiple of I<sub>b</sub> up to 100A maximum)

Direct Connected 10A – \* (\* is any multiple of I<sub>b</sub> up to 100A maximum)

Direct Connected 5A – \* (\* is any multiple of I<sub>b</sub> up to 100A maximum)

CT Operated 1A – 2A

CT Operated 5A – 6/10A

CT Operated 1A – 10A

Direct Connected (10A – 100A ) -40<sup>o</sup>C to 60<sup>o</sup>C operation

#### VOLTAGE

220 – 240V (L – N) (See note 2 for Ref voltage ranges)

220 – 240V (L – L) (See note 2 for Ref voltage ranges) (LM2\*\*\*\*\* variants only)

105 – 127V (L – N) (See note 2 for Ref voltage ranges)

105 – 127V (L – L) (See note 2 for Ref voltage ranges) (LM2\*\*\*\*\* variants only)

#### ACCURACY CLASS

50 Hz Cl.0.5 kWh, Cl.2 kvarh (IEC 62053-22, 23 see note 1) Cl.C kWh,(EN 50470-3)

Note:- Class 0.5 or Class C is applicable to 5-6/10A \*3Ph 4W and 3Ph3W variant only

50 Hz Cl.1 kWh, Cl.2 kvarh (IEC 62053-21, 23 see note 1) Cl.B kWh,(EN 50470-3)

50 Hz Cl.2 kWh, Cl.3 kvarh (IEC 62053-21, 23 see note 1) Cl.A kWh,(EN 50470-3)

60 Hz Cl.1 kWh, Cl.2 kvarh (IEC 62053-21, 23 see note 1) Not OFGEM / MID Approved

60 Hz Cl.2 kWh, Cl.3 kvarh (IEC 62053-21, 23 see note 1) Not OFGEM / MID Approved

#### HARDWARE – SWITCHES

No tamper detect switches

Two tamper detect switches

Terminal cover tamper detect switch and CT ratio programming protection switch.

#### HARDWARE – BUTTONS

No buttons

Two buttons

Backlit LCD, with No buttons

Backlit LCD, with Two buttons

#### HARDWARE – BATTERY

No external battery connection

External 9V Battery connection. Note! External battery module cannot be fitted when an RS232 comms module is fitted.

Supercapacitor/External battery/ RS485 module connection.(Iranian orders only)

#### OPERATIONAL MODES

Import kWh only

Import kWh, Q1 and Q4 kvarh

Import kWh, Q1, Q2, Q3, Q4 kvarh and Imp kVAh

Imp/Exp kWh

Imp/Exp kWh, Q1, Q2, Q3, and Q4 kvarh

Imp/Exp kWh and Imp/Exp kVAh

Imp/Exp kWh, Q1, Q2, Q3, Q4 kvarh and Imp/Exp kVAh

Import kWh only (Power Flow Insensitive)

Import kWh, Q1 and Q4 kvarh (Power Flow Insensitive)

Import kWh, Q1, Q2, Q3, Q4 kvarh and Imp kVAh (Power Flow Insensitive)

Import kWh only (Theft Resistant Measurement) – 3Ph 4W variants only

Import kWh, Q1 and Q4 kvarh (Theft Resistant Measurement) – 3Ph 4W variants only

Import kWh, Q1, Q2, Q3, Q4 kvarh and Imp kVAh (Theft Resistant Measurement) – 3Ph 4W variants only

#### TARIFFS

A1120 Multi Rate


A1140 Multi Rate (with load profile)

A1120 Multi Rate with Password Protected Register Zeroing and Zero Level Time Shift (Not for MID use)

MID-B-06E Rev 5

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**AUXILIARY OUTPUT**

No Output

SO output, floating, 2 aux terminals. 12 kV isolation (Configurable pulse duration/value) 27V DC only

SO output, floating, 2 aux terminals. 12 kV isolation, replicating centre LED (kWh) 27V DC only

SO output, floating, 2 aux terminals. 12 kV isolation, replicating left hand LED (kvarh) 27V DC only

100mA Relay output, floating, 2 aux terminals. 12 kV isolation (Configurable pulse duration/value) 230V AC, DC

100mA Relay output, floating, 2 aux terminals. 12 kV isolation, replicating centre LED (kWh) 230V AC, DC

100mA Relay output, floating, 2 aux terminals. 12 kV isolation, replicating left hand LED (kvarh) 230V AC, DC

300 mA Relay output, floating, 2 aux terminals, 12kV isolation, indicating tariff/MD state, 230V AC only (Not pulsing)

**COMMUNICATIONS**

No Serial Comms.

RS232 Serial Comms Note! An RS232 comms module cannot be fitted when an external battery module is fitted.

**OTHER OPTIONS**

Standard (Extended) Terminal cover

Standard (Extended) Terminal cover with cut-out

Standard (Extended) Terminal cover plus 9.0mm main terminal bores

Short Terminal Cover

Standard (Extended) Terminal cover with additional voltage terminals

Standard (Extended) Terminal cover with cut-out and additional voltage terminals

Standard (Extended) Terminal cover plus 9.0mm main terminal bores and additional voltage terminals

Standard (Extended) Terminal cover plus 9.5mm main terminal bores. RS232 connection is via flying leads

Standard (Extended) Terminal cover and main cover with voltage disconnect protection

A Cover Plate cannot be fitted to this variant – seek approval if RS232 or battery module is also required

Standard (Extended) Terminal cover with slotted head screws

Standard (Extended) Terminal cover with cut-out and slotted head screws

Short Terminal Cover with slotted head screws

Standard (Extended) Terminal cover with cut-out plus 9.0mm main terminal bores

Standard (Extended) Terminal cover with cut out and main cover with voltage disconnect protection

A Cover Plate cannot be fitted to this variant – seek approval if RS232 or battery module is also required

Short (clear with smoked tint) Terminal Cover and main cover with voltage disconnect protection

A Cover Plate cannot be fitted to this variant – seek approval if RS232 or battery module is also required

**FEATURE SET**

8 TOU Registers, 4 MD Registers, 15 Historical Registers, DSM. See Note 4 for scheme compatibility

8 TOU Registers, 4 MD Registers, 15 Historical Registers, DSM, DLS time stamps and 12 external registers. Note! All new customers from November 2007. See Note 4 for scheme compatibility

8 TOU Registers, 4 MD Registers, 24 Historical Registers, DSM, DLS time stamps 12 external registers, tamper flag in Load Profile, daily billing and per phase registration. See Note 4 for scheme compatibility. **Note!** This feature set requires the use of PMU version **3.1.4666** or later

8 TOU Registers, 4 MD Registers, 15 Historical Registers, DSM, DLS time stamps and 12 external registers. Note! Register zeroing by use of the "Register Zeroing Tool" is NOT available in this option. See Note 4 for scheme compatibility

8 TOU Registers, 4 MD Registers, 15 Historical Registers, DSM, DLS time stamps, 12 external registers and tamper flag in Load Profile. See Note 4 for scheme compatibility

8 TOU Registers, 4 MD Registers, 15 Historical Registers, DSM, DLS time stamps, 12 external registers and tamper flag in Load Profile. Low level password access to register and load profile data. See Note 4 for scheme compatibility

**REVISION SUFFIX**

Firmware 2-01178-Q (Feature set A only). Enhanced GPRS & COP 10

Firmware 2-01322-L (Feature set C and H). Enhanced GPRS & COP 10

Firmware 2-01340-G (Feature set F). Daily billing & per phase registration & tampers (**Note!** Requires PMU version **3.1.4666** or later).

Firmware 2-01398-A (Feature set K). Enhanced GPRS & COP 10 and low level password access to register and load profile data

Firmware 2-01345-A (Feature set G). Enhanced GPRS & COP 10 – No register zeroing

**SPECIAL ADDITIONS – FIRMWARE**

None

Phase angle definition as A1700i

**SPECIAL ADDITIONS – HARDWARE**

None



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**POLYPHASE A1160 MODEL CODE**

V <sub>ref</sub>		I <sub>b</sub>	I <sub>max</sub>
L-L	L-N		

MODEL

TYPE (nameplate)

example: L P 3 A A B N B N H M V R B - A H N N

**PRODUCT/TERMINATION**

Polyphase, BS/DIN termination

**SERVICE TYPE**

3Ph 4W for use on: Direct Connected only

**CURRENT RANGE**

Direct Connected 20A – \* (\* is any multiple of I<sub>b</sub> up to 160A maximum)

**VOLTAGE**

220 – 240V (L – N) (See note 2 for Ref voltage ranges)

**ACCURACY CLASS**

50 Hz Cl.1 kWh, Cl.2 kvarh (IEC 62053-21, 23 see note 1) Cl.B kWh,(EN 50470-3)

**HARDWARE – SWITCHES**

No tamper detect switches

Two tamper detect switches (Terminal Cover & Main Cover)

**HARDWARE – BUTTONS**

Two buttons

**HARDWARE – BATTERY**

No external battery connection

External 9V Battery connection. Note! An external battery module cannot be fitted when a comms module is fitted.

**OPERATIONAL MODES**

Imp/Exp kWh, Q1, Q2, Q3, Q4 kvarh and Imp/Exp kVAh

Import kWh, Q1, Q2, Q3, Q4 kvarh and Imp kVAh (Theft Resistant Measurement)

**TARIFFS**

A1160 Multi Rate – with load profile

A1160 Multi Rate with load profile and Password Protected Register Zeroing and Zero Level Time Shift (Not for MID use)

A1160 Multi Rate – with load profile and instrumentation profile

A1160 Multi Rate with load profile and Instrumentation profile and Password Protected Register Zeroing and Zero Level Time Shift (Not for MID use)

**Auxiliary Outputs**

No Output

100mA Relay output, floating, 2 aux terminals. 12 kV isolation (Configurable pulse duration/value) 230V AC, DC

100mA Relay output, floating, 2 aux terminals. 12 kV isolation (Configurable pulse duration/value) 230V AC, DC. Auxiliary 230V output (Phase 'C' + Neutral)

**COMMUNICATIONS**

No Serial Comms.

RS232 Serial comms. Note! A comms module cannot be fitted when an external battery module is fitted.

**OTHER OPTIONS**

Short Terminal Cover

Short Terminal Cover and Main Cover with voltage disconnect protection

Standard (Extended) Terminal Cover

Standard (Extended) Terminal Cover with cut-out

Standard (Extended) Terminal Cover and Main Cover with voltage disconnect protection

Standard (Extended) Terminal Cover with cut out and Main Cover with voltage disconnect protection

**FEATURE SET**

8 TOU Registers, 4 MD Registers, 24 Historical Registers, DSM, DLS time stamps, 12 external registers, daily billing, per phase registration, tamper flag in Load Profile. **Note!** This feature set requires the use of SmartSet version 1.1 or later

8 TOU Registers, 4 MD Registers, 24 Historical Registers, DSM, DLS time stamps, 12 external registers, daily billing, per phase registration, tamper flag in Load Profile. **Note!** This feature set requires the use of SmartSet version 1.1 or later. **(For multi-drop applications)**

**REVISION SUFFIX**

Firmware 2-01397-E (Feature set A)

Firmware 2-01397-F

**SPECIAL ADDITIONS – FIRMWARE**

None

Additional Firmware Function (Phase angle definition as A1700i)


**SPECIAL ADDITIONS – HARDWARE**

None (Socket Head M8 main terminal screws and shear head main cover screws)

Slotted Head M8 main terminal screws and shear head main cover screws

Socket Head M8 main terminal screws sealed main cover screws

Slotted Head M8 main terminal screws sealed main cover screws

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Modifications to the meter(s) described according to approval No.**UK/ 0120/ SGS0007** must be notified to the issuing body to confirm the meter(s) continuing compliance to the relevant pattern approval standard(s).