

# EU-TYPE EXAMINATION CERTIFICATE

**Ningbo Sanxing Smart Electric Co., Ltd.**  
No.16 Fengwan Road, Cicheng Town, Jiangbei District, Ningbo City,  
Zhejiang Province, 315034  
China

EU-Type Examination

Certificate No.

**1670-22**

Revision 12



**Type** S12U26  
**Object** Electronic single-phase two-wire energy meter.  
Direct connected

The object has been assessed and meets the requirements of

**EU Directive 2014/32/EU,**  
Module B

The energy meter(s) meet(s) the essential requirements of Annex V of EU Directive 2014/32/EU, on the harmonization of the laws of Member States relating to the making available on the market of measuring instruments (recast).

This Certification is based on the report(s) listed in the report list in this Certificate.

This Certificate is valid until: June 3, 2034.

This Certificate comprises 10 pages in total.

Issued by KEMA B.V.  
Klingelbeekseweg 195,  
Arnhem, The Netherlands  
Notified Body 2290

Alessandro Bertani  
Director,  
Services & Smart Technologies

Arnhem, June 3, 2024



## REVISION OVERVIEW

The highest revision always replaces the earlier issued versions.

Rev. No.	Date of issue	Reason
0	October 28, 2022	First issue
1	October 31, 2022	Typos corrected in supporting documentation
2	November 2, 2022	Typos corrected in supporting documentation
3	November 14, 2023	New variant of the meter added
4	November 14, 2023	New variant of the meter added
5	November 27, 2023	<ul style="list-style-type: none"> <li>• Software version corrected (page 3)</li> <li>• Registration method description updated (page 3)</li> </ul>
6	December 4, 2023	<ul style="list-style-type: none"> <li>• Model name added (page 3)</li> <li>• Picture with model name added (page 5)</li> <li>• Revision of report 1665-23 and 1666-23 upgraded</li> </ul>
7	December 22, 2023	Report 1697-23 and 1708-23 added
8	December 22, 2023	Report 1699-23 and 1705-23 added
9	February 16, 2024	<ul style="list-style-type: none"> <li>• Report 1521-24 added</li> <li>• Impulse voltage level increased to 8 kV</li> </ul>
10	March 27, 2024	<ul style="list-style-type: none"> <li>• Typo in report list corrected</li> </ul>
11	May 3, 2024	<ul style="list-style-type: none"> <li>• Report 1598-24 added</li> <li>• Report 1599-24 added</li> </ul>
12	June 3, 2024	<ul style="list-style-type: none"> <li>• Revision of report 1598-24 upgraded</li> <li>• CRC on page 3 updated</li> <li>• Name plate picture added</li> </ul>

## REPORT LIST

This Certificate is issued based on the following reports.

Report number	Revision	Firmware version
1690-22	2	
1691-22	1	
1657-23	0	
1665-23	2	
1666-23	1	
1697-23	0	V0.03.10
1708-23	0	
1699-23	1	V0.02.11
1705-23	0	
1521-24	0	
1598-24	1	V0.02.11
1599-24	0	

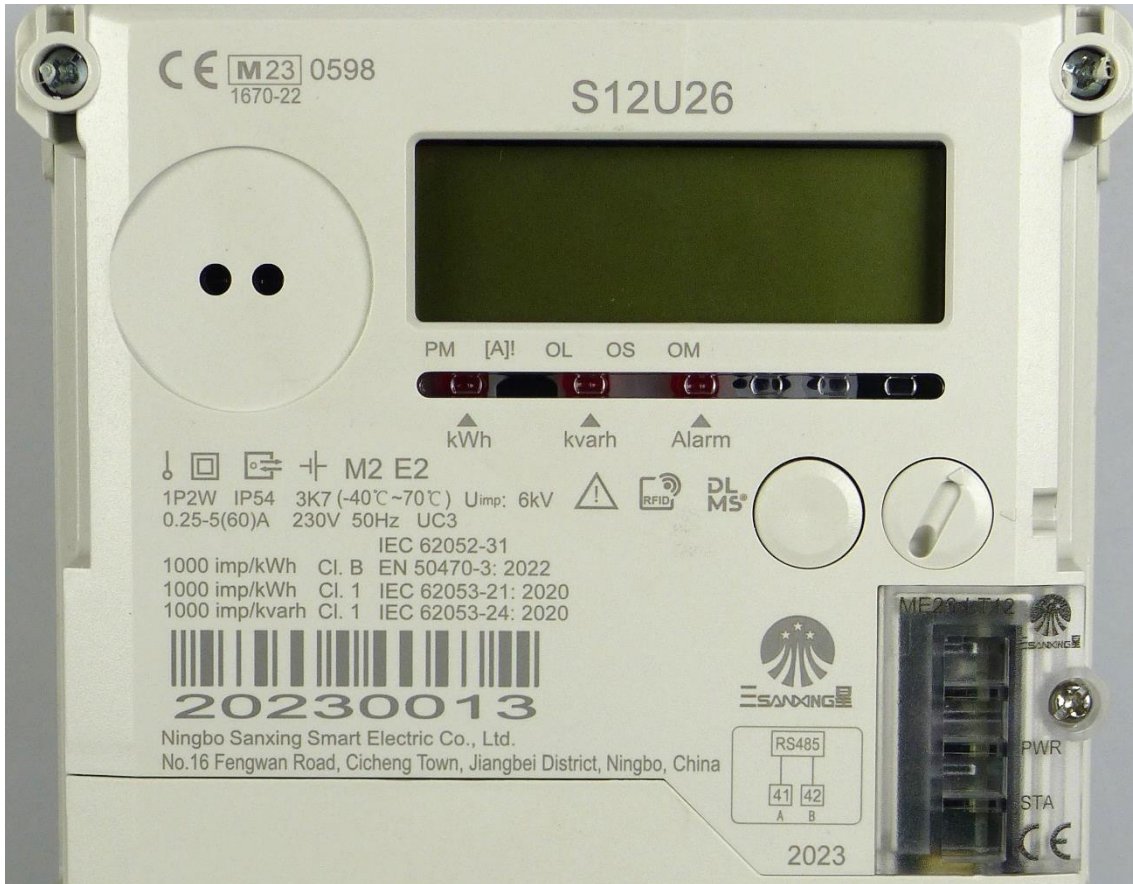
## 1 TECHNICAL DATA

Manufacturer	Ningbo Sanxing Smart Electric Co., Ltd., No.16 Fengwan Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, 315034, China		
Production location	Ningbo Sanxing Smart Electric Co., Ltd., No.16 Fengwan Road, Cicheng Town, Jiangbei District, Ningbo City, Zhejiang Province, 315034, China		
Type	S12U26	Pre-payment	
Model	SX601		
Connection	Direct		
Type of circuit	1P2W		
Accuracy class Wh	1/B		
Accuracy class varh	1 and 2		
Meter constant	1000 imp/kWh 1000 imp/kvarh		
V range	230 V		
I range $I_{min}$ - $I_n$ ( $I_{max}$ )	0,25-5(40) A and 0,25-5(60) A and 0,25-5(80) A	Pre-payment Pre-payment	
Frequency	50 Hz		
Temperature range	-40 ..70 °C		
Use	Indoor		
IP rating	IP54		
Protection Class	II		
Impulse voltage	8 kV		
Internal clock	Crystal controlled		
Environmental class	M1, M2, E1 and E2, CISPR32 class B		
Utilisation category	UC3		
LR Firmware ID	V0.02.11		
LR Firmware CRC	78EF		
Register	LCD		
Registry method(s):	bi-directional method with separate registers: received- and delivered energy is added in separate registers		

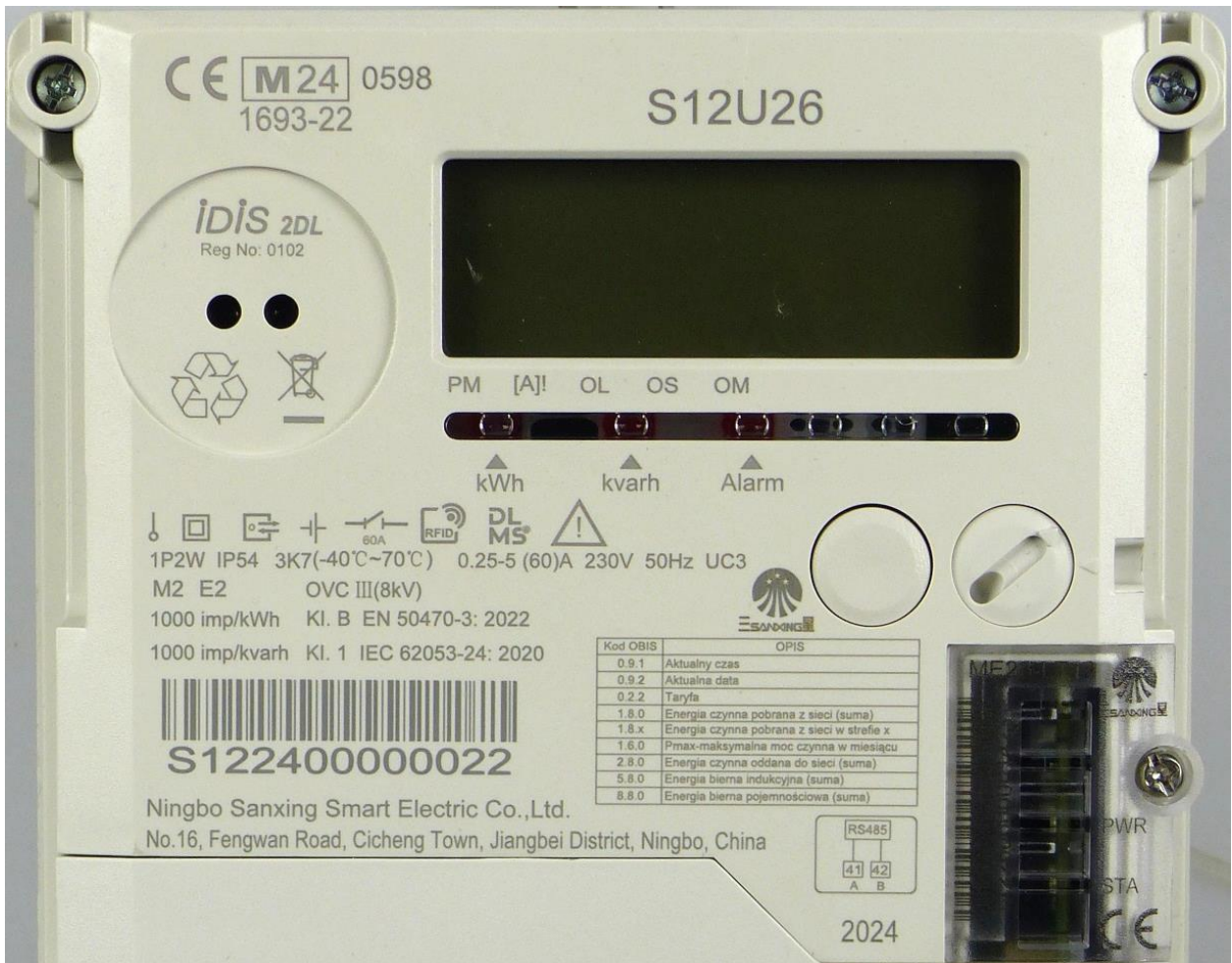
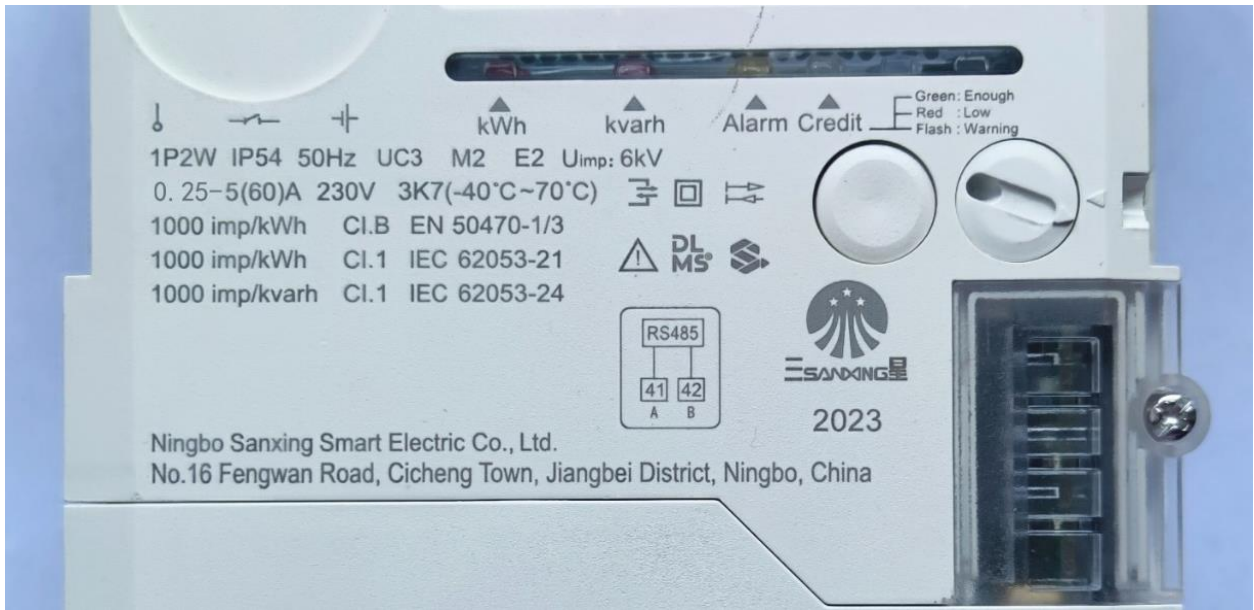
**2 PHOTOGRAPHS AND SEALING**



**3 EXAMPLES OF NAME PLATES**









#### 4 CALCULATION OF THE COMPOSITE ERROR / MPE

During the type approval test the intrinsic errors for temperature, voltage and frequency variation are determined per load point. The composite error is determined with the following formula:

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

Where

$\varepsilon^2(I, \cos\phi)$  = Intrinsic error of the meter at a certain load

$\delta^2(T, I, \cos\phi)$  = Additional error due to the variation of the temperature at the same load

$\delta^2(U, I, \cos\phi)$  = Additional error due to the variation of the voltage at the same load

$\delta^2(f, I, \cos\phi)$  = Additional error due to the variation of the frequency at the same load

Results are in the table below:

		Additional % error due to temperature variation							
Current	cosφ	-40°C	-25°C	-10°C	5°C	30°C	40°C	55°C	70°C
I <sub>min</sub>	1	- 0,74%	- 0,47%	- 0,22%	- 0,07%	0,05%	0,05%	- 0,08%	- 0,26%
I <sub>tr</sub>	1	- 0,75%	- 0,49%	- 0,25%	- 0,12%	0,01%	0,01%	- 0,09%	- 0,29%
I <sub>tr</sub>	0,5i	- 0,78%	- 0,50%	- 0,25%	- 0,09%	0,01%	- 0,01%	- 0,19%	- 0,39%
I <sub>tr</sub>	0,8c	- 0,77%	- 0,48%	- 0,27%	- 0,10%	0,00%	0,01%	- 0,09%	- 0,25%
I <sub>n</sub>	1	- 0,73%	- 0,45%	- 0,23%	- 0,09%	0,01%	0,00%	- 0,10%	- 0,28%
I <sub>n</sub>	0,5i	- 0,73%	- 0,45%	- 0,24%	- 0,10%	0,01%	- 0,03%	- 0,18%	- 0,40%
I <sub>n</sub>	0,8c	- 0,73%	- 0,45%	- 0,23%	- 0,09%	0,00%	0,00%	- 0,08%	- 0,24%
I <sub>max</sub>	1	- 0,58%	- 0,35%	- 0,17%	- 0,06%	- 0,01%	- 0,02%	- 0,14%	- 0,34%
I <sub>max</sub>	0,5i	- 0,51%	- 0,31%	- 0,14%	- 0,06%	- 0,01%	- 0,07%	- 0,25%	- 0,49%
I <sub>max</sub>	0,8c	- 0,48%	- 0,28%	- 0,12%	- 0,03%	0,00%	- 0,03%	- 0,14%	- 0,33%
<b>Requirements</b>									
Any	1	3,10%	2,40%	1,60%	0,90%	0,90%	1,60%	2,40%	3,10%
Any	0,5/0,8	4,40%	3,40%	2,30%	1,30%	1,30%	2,30%	3,40%	4,40%



## 5 OPTIONS AND VARIANTS

Overview of options and variants with details

Type designation	Details of the meter
S12U26	<ul style="list-style-type: none"><li>• Pre-payment version</li><li>• Communication options:<ul style="list-style-type: none"><li>optical port</li><li>RS485</li><li>PLC</li><li>4G module</li></ul></li><li>• Supply control switch</li></ul>

## END OF DOCUMENT

The laboratories of KEMA Labs are:

- CESI S.p.A., Milan, Italy.
- FGH Engineering & Test GmbH, Mannheim, Germany.
- IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH, Berlin, Germany.
- KEMA B.V., Arnhem, The Netherlands.
- KEMA Labs, Zkušebnictví, a.s., Prague, the Czech Republic.
- KEMA-Powertest, LLC, Chalfont, United States.