

# EU-TYPE EXAMINATION CERTIFICATE

**Shenzhen Kaifa Technology (Chengdu) Co., Ltd.**  
No. 99 Tianquan Rd., Hi-Tech Development Zone,  
611730, Chengdu, P.R.C.

EU-Type Examination

Certificate No.

**1608-23**

Revision 2



**Type** MA309M  
**Object** Electronic three-phase four-wire energy and three-phase four-wire meter connected as single-phase two-wire (phase L1) 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: December 11, 2034.

This Certificate comprises 8 pages in total.

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

Alessandro Bertani  
Director,  
Services & Smart Technologies

Arnhem, December 11, 2024



### REVISION OVERVIEW

The highest revision always replaces the earlier issued versions.

Rev. No.	Date of issue	Reason
0	October 11, 2023	First issue
1	August 29, 2024	Report 1651-24 added
2	December 11, 2024	<ul style="list-style-type: none"><li>• Report 1758-24 added</li><li>• Class A added</li></ul>

### REPORT LIST

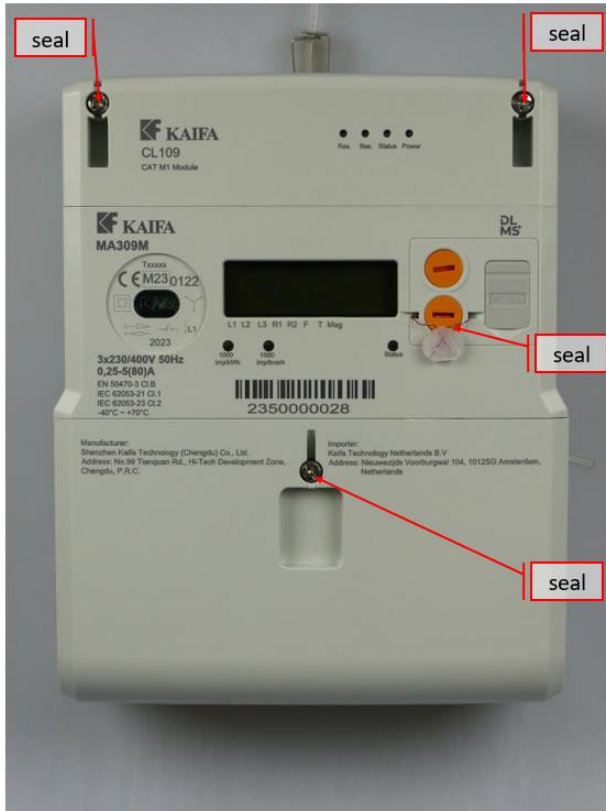
This Certificate is issued based on the following reports.

Report number	Revision	Firmware version
1607-23	R0	010101
1651-24	R0	010101
1758-24	R0	

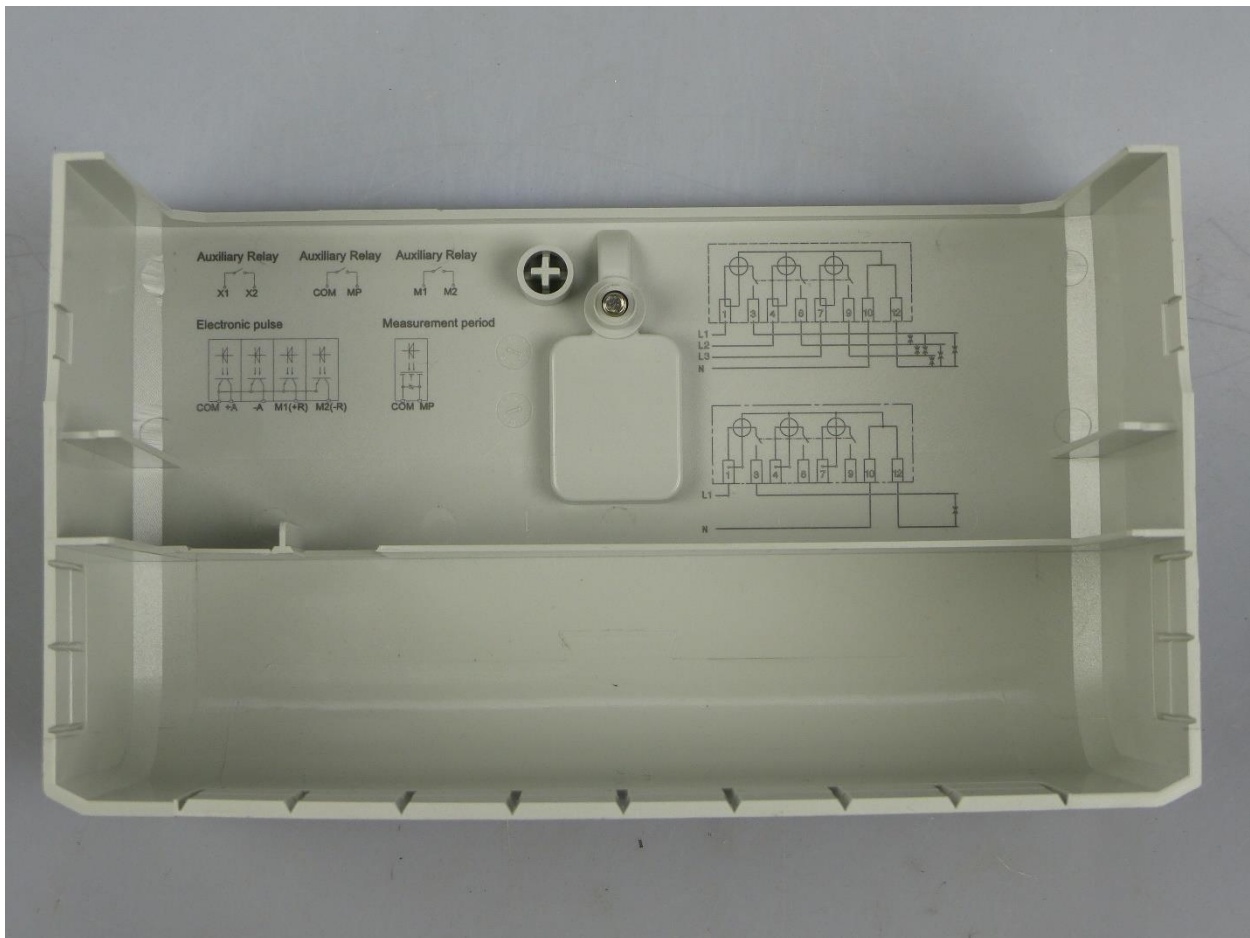
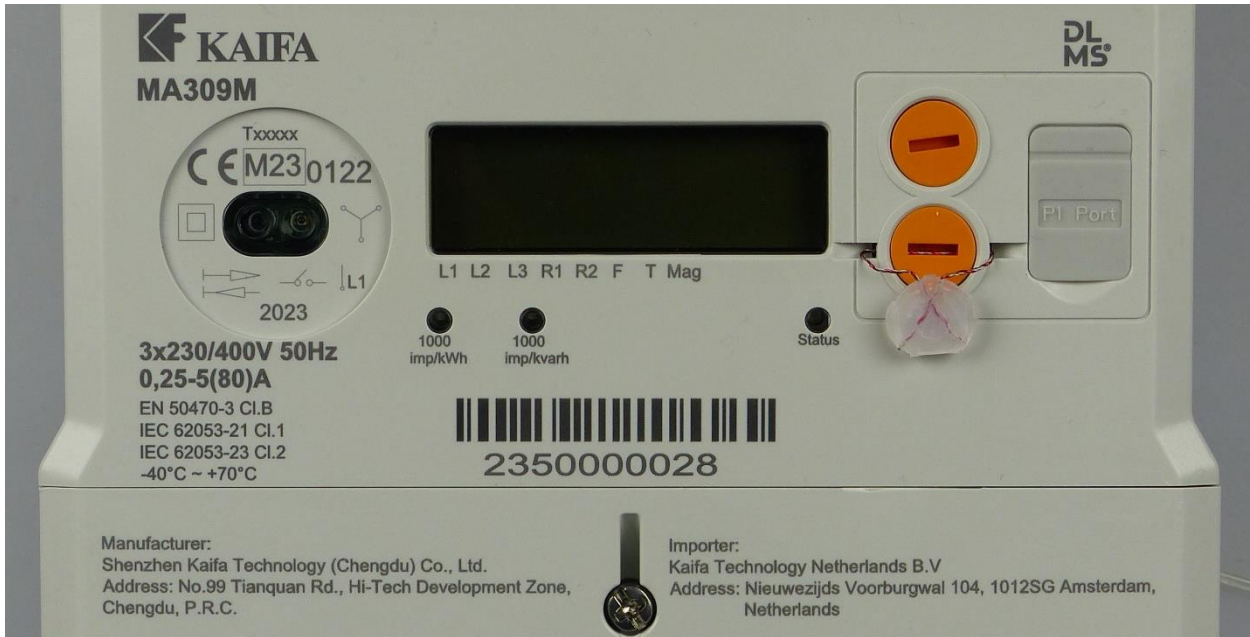
## 1 TECHNICAL DATA

Manufacturer	Shenzhen Kaifa Technology (Chengdu) Co., Ltd., No. 99 Tianquan Rd., Hi-Tech Development Zone, 611730, Chengdu, P.R.C.
Production location	Shenzhen Kaifa Technology (Chengdu) Co., Ltd., No. 99 Tianquan Rd., Hi-Tech Development Zone, 611730, Chengdu, P.R.C.
Type	MA309M
Connection	Direct
Type of circuit	3P4W
Accuracy class Wh	1/A/B
Accuracy class varh	2
Meter constant	Optical Pulse output active: 500 - 10000 imp./kWh Optical Pulse output reactive: 500 - 10000 imp./kvarh
V range	3x230/400 V
I range $I_{min}$ - $I_n$ ( $I_{max}$ )	0,25-5(80) A
Frequency	50 Hz
Temperature range	-40 .. 70 °C
Use	Indoor
IP rating	IP54
Protection Class	II
Impulse voltage	6 kV
Environmental class	M1, M2, E1 and E2, CISPR32 class B
LR Firmware ID	010101
LR Firmware CRC	F6F07633
Register	LCD
Registry method(s):	Bi-directional method separate registers: received- and delivered energy of the whole connection 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:

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

Where

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

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

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

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

Results are in the table below:

As 3P4W

I in % of I <sub>ref</sub>	cos φ	Phase	Composite error %							
			-40 °C	-25 °C	-10 °C	5 °C	30 °C	40 °C	55 °C	70 °C
5	1	RST	0,69%	0,56%	0,37%	0,21%	0,09%	0,15%	0,27%	0,32%
10	1	RST	0,70%	0,55%	0,37%	0,19%	0,07%	0,14%	0,25%	0,32%
10	0,5 ind.	RST	0,79%	0,61%	0,41%	0,25%	0,14%	0,17%	0,24%	0,30%
10	0,8 cap.	RST	0,67%	0,54%	0,37%	0,20%	0,06%	0,14%	0,24%	0,32%
10	1	R	0,63%	0,50%	0,33%	0,16%	0,06%	0,10%	0,16%	0,17%
10	0,5 ind.	R	0,66%	0,52%	0,31%	0,16%	0,07%	0,10%	0,15%	0,17%
10	1	S	0,80%	0,60%	0,39%	0,19%	0,06%	0,18%	0,31%	0,39%
10	0,5 ind.	S	0,92%	0,66%	0,43%	0,25%	0,11%	0,19%	0,28%	0,34%
10	1	T	0,66%	0,57%	0,40%	0,22%	0,05%	0,15%	0,28%	0,39%
10	0,5 ind.	T	0,73%	0,60%	0,43%	0,23%	0,06%	0,15%	0,25%	0,34%
I <sub>max</sub>	1	RST	0,69%	0,54%	0,36%	0,18%	0,07%	0,16%	0,25%	0,33%
I <sub>max</sub>	0,5 ind.	RST	0,77%	0,60%	0,41%	0,22%	0,08%	0,15%	0,23%	0,29%
I <sub>max</sub>	0,8 cap.	RST	0,67%	0,53%	0,36%	0,18%	0,08%	0,16%	0,26%	0,34%
I <sub>max</sub>	1	R	0,79%	0,62%	0,41%	0,24%	0,16%	0,22%	0,31%	0,39%
I <sub>max</sub>	0,5 ind.	R	0,86%	0,64%	0,41%	0,22%	0,11%	0,18%	0,26%	0,32%
I <sub>max</sub>	1	S	0,79%	0,61%	0,42%	0,26%	0,19%	0,23%	0,31%	0,37%
I <sub>max</sub>	0,5 ind.	S	0,66%	0,48%	0,29%	0,14%	0,09%	0,10%	0,13%	0,12%
I <sub>max</sub>	1	T	0,71%	0,51%	0,31%	0,13%	0,05%	0,08%	0,09%	0,08%
I <sub>max</sub>	0,5 ind.	T	0,85%	0,62%	0,41%	0,23%	0,14%	0,20%	0,31%	0,39%

3P4W as 1P2W on phase L1

I in % of I <sub>ref</sub>	cos φ	Composite error %								
		°C	-40	-25	-10	5	30	40	55	70
5	1		0,32%	0,29%	0,23%	0,14%	0,07%	0,10%	0,16%	0,18%
10	1		0,34%	0,31%	0,23%	0,13%	0,05%	0,10%	0,14%	0,19%
10	0,5 ind		0,41%	0,33%	0,28%	0,15%	0,07%	0,10%	0,14%	0,16%
10	0,8 cap		0,30%	0,26%	0,22%	0,10%	0,04%	0,11%	0,18%	0,21%
I <sub>max</sub>	1		0,34%	0,32%	0,23%	0,12%	0,04%	0,09%	0,16%	0,20%
I <sub>max</sub>	0,5 ind		0,40%	0,35%	0,26%	0,13%	0,03%	0,08%	0,13%	0,17%
I <sub>max</sub>	0,8 cap		0,32%	0,29%	0,22%	0,12%	0,04%	0,10%	0,17%	0,21%

## 5 OPTIONS AND VARIANTS

Overview of variants with details

Type designation	Details of the meter
MA309M	<ul style="list-style-type: none"><li>• Communication options:<ul style="list-style-type: none"><li>4G+2G</li><li>CAT M1+NB</li><li>CAT M1</li><li>RS485</li><li>P1 port</li><li>Wired M-Bus</li><li>Optical output</li></ul></li><li>• Pulse output (limited meter constant)</li><li>• Auxiliary relay terminal 3x</li><li>• HAN port</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.