

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 1



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: April 26, 2034.

1927
Gold

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, April 26, 2024



REVISION OVERVIEW

The edition with the highest revision number always replaces the earlier issued editions.

Rev. No.	Date of issue	Reason
0	October 11, 2023	First issue
1	April 26, 2024	Report 1568-24 added

REPORT LIST

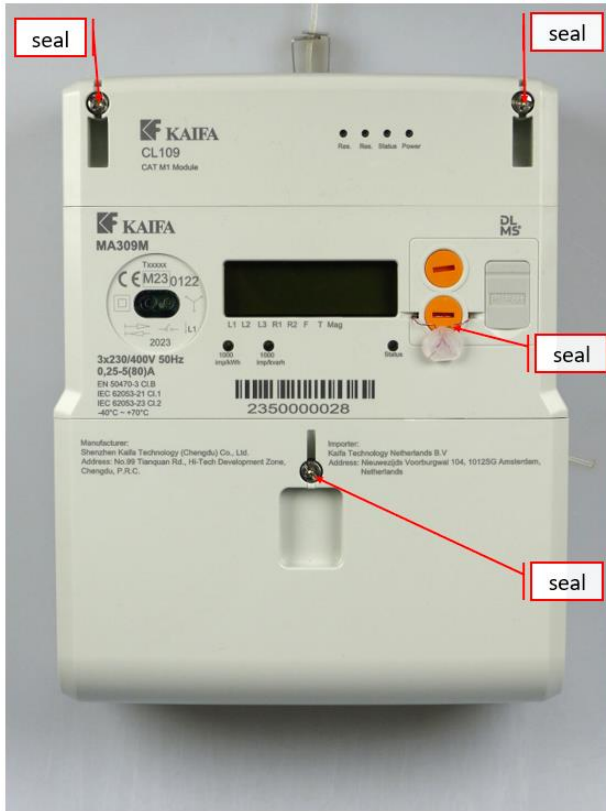
This Certificate is issued based on the following reports.

Report number	Revision	Firmware version
1607-23	0	010101
1568-24	0	010101

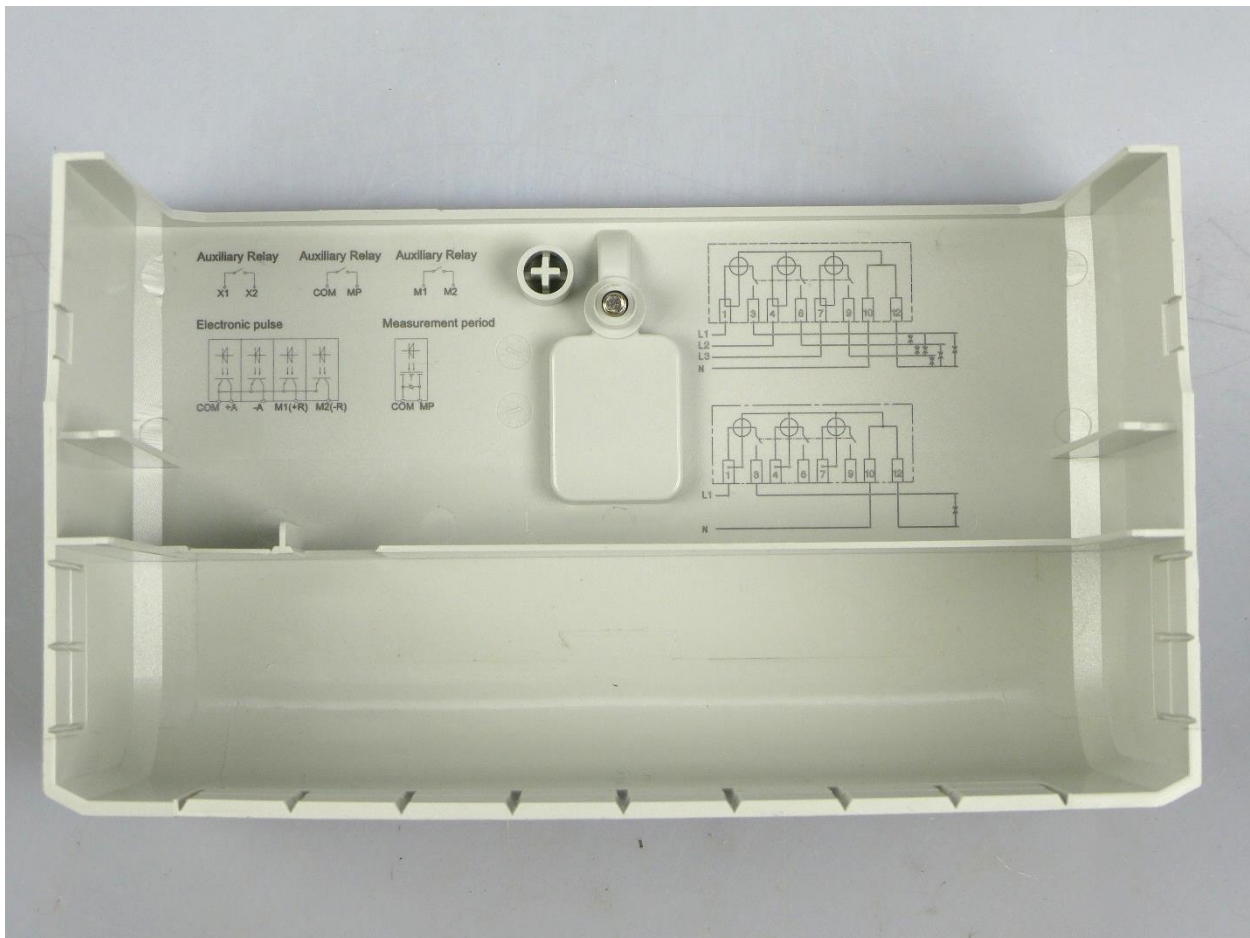
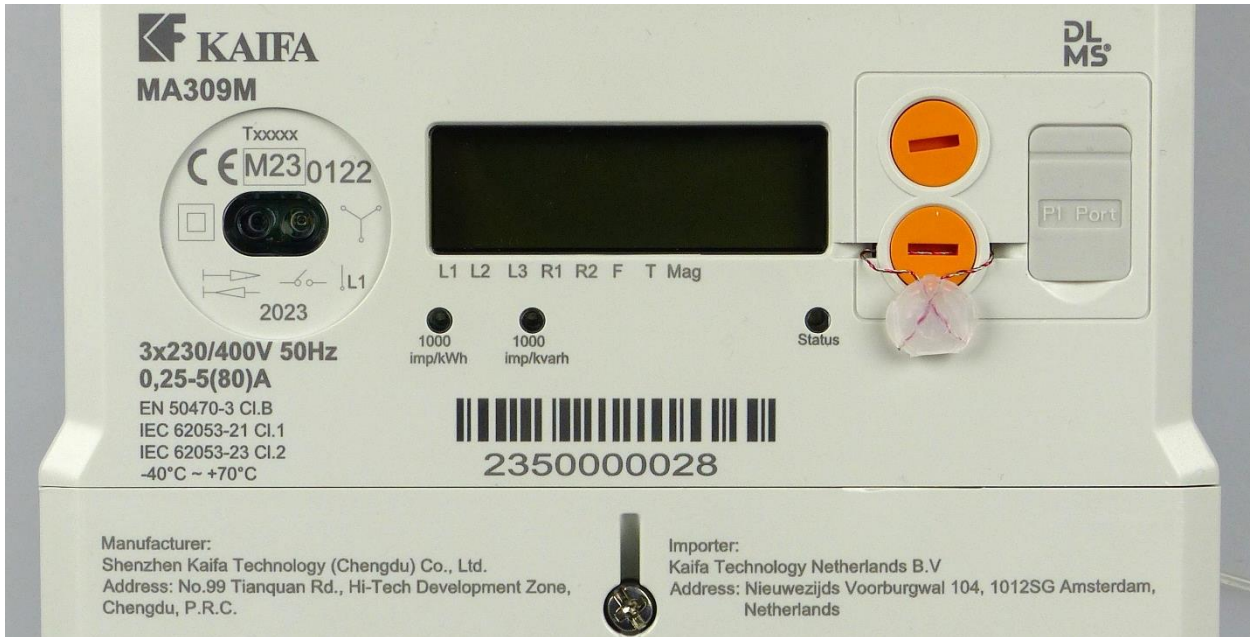
1 TECHNICAL DATA

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 or 1P2W (phase L1)
Accuracy class Wh	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	8 kV
Environmental class	M1, M2, E1 and E2, CISPR32 class B
LR Firmware ID	010101
LR Firmware CRC	6F7721D5
Register	LCD
Registry method(s):	Vectoral computation method

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 _{ref}	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 _{max}	1	RST	0,69%	0,54%	0,36%	0,18%	0,07%	0,16%	0,25%	0,33%
I _{max}	0,5 ind.	RST	0,77%	0,60%	0,41%	0,22%	0,08%	0,15%	0,23%	0,29%
I _{max}	0,8 cap.	RST	0,67%	0,53%	0,36%	0,18%	0,08%	0,16%	0,26%	0,34%
I _{max}	1	R	0,79%	0,62%	0,41%	0,24%	0,16%	0,22%	0,31%	0,39%
I _{max}	0,5 ind.	R	0,86%	0,64%	0,41%	0,22%	0,11%	0,18%	0,26%	0,32%
I _{max}	1	S	0,79%	0,61%	0,42%	0,26%	0,19%	0,23%	0,31%	0,37%
I _{max}	0,5 ind.	S	0,66%	0,48%	0,29%	0,14%	0,09%	0,10%	0,13%	0,12%
I _{max}	1	T	0,71%	0,51%	0,31%	0,13%	0,05%	0,08%	0,09%	0,08%
I _{max}	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 _{ref}	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 _{max}	1		0,34%	0,32%	0,23%	0,12%	0,04%	0,09%	0,16%	0,20%
I _{max}	0,5 ind		0,40%	0,35%	0,26%	0,13%	0,03%	0,08%	0,13%	0,17%
I _{max}	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">- Communication options:<ul style="list-style-type: none">4G+2GCAT M1+NBCAT M1PLCRS485P1 portWired M-BusOptical output- Pulse output (limited meter constant)- Auxiliary relay terminal 3x- HAN port

END OF DOCUMENT

The laboratories of KEMA Labs are:

- CESI S.p.A., Milan, Italy, accredited by ACCREDIA in accordance with ISO/IEC 17025:2017 under no. 0030L.
- FGH Engineering & Test GmbH, Mannheim, Germany, accredited by DAkkS in accordance with DIN EN ISO/IEC 17025:2018 under no. D-PL-12110-01-00.
- IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH, Berlin, Germany accredited by DAkkS in accordance with DIN EN ISO/IEC 17025:2018 under nos. D-PL-12107-01-00 and D-K-12107-01-00.
- KEMA B.V., Arnhem, The Netherlands, accredited by RvA in accordance with EN ISO/IEC 17025:2017 under nos. L020, L218 and K006 and with EN ISO/IEC 17065:2012 under no. C685.
- KEMA Labs, Zkušebnictví, a.s., Prague, the Czech Republic, testing laboratory no. 1035 accredited by CAI in accordance with ČSN EN ISO/IEC 17025:2018.
- KEMA-Powertest, LLC, Chalfont, United States, accredited by A2LA in accordance with ISO/IEC 17025:2017 under no. 0553.01.

Tests are carried out under the scope of accreditation, unless otherwise indicated in the chapter 'Tests carried out'.