

# EU-TYPE EXAMINATION CERTIFICATE

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

EU-Type Examination

Certificate No.

**1573-21**

Revision 4



**Type** MA109H  
**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: May 29, 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, May 29, 2024



### REVISION OVERVIEW

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

| Rev. No. | Date of issue     | Reason                                        |
|----------|-------------------|-----------------------------------------------|
| 0        | 16 November 2021  | First issue                                   |
| 1        | 17 January 2022   | Technical changes                             |
| 2        | 26 September 2022 | Technical changes                             |
| 3        | 26 June 2023      | Technical changes                             |
| 4        | May 29, 2024      | Legally non-relevant software version changed |

### REPORT LIST

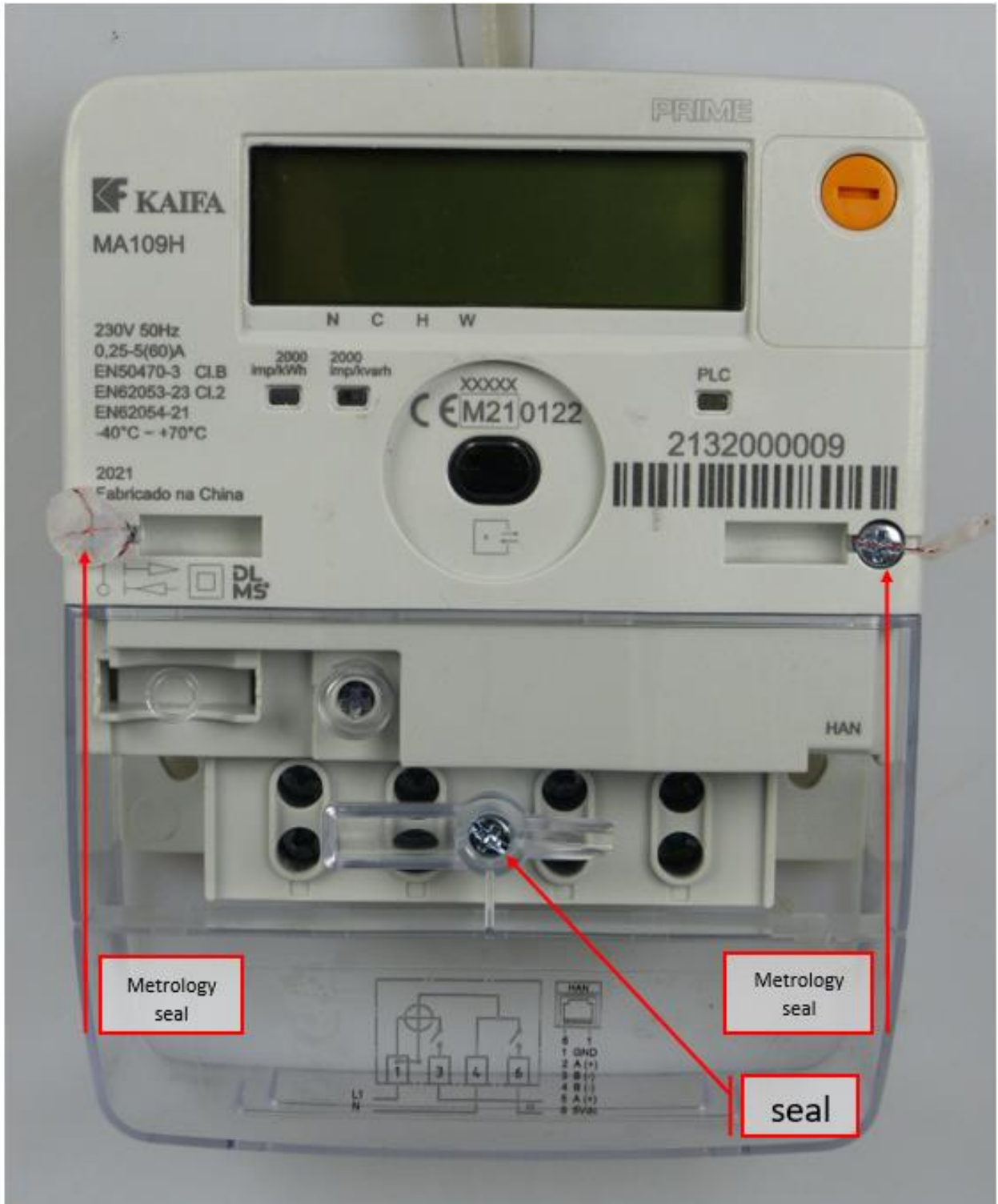
This Certificate is issued based on the following reports.

| Report number | Revision |
|---------------|----------|
| 1557-23       | 0        |
| 1609-24       | 0        |

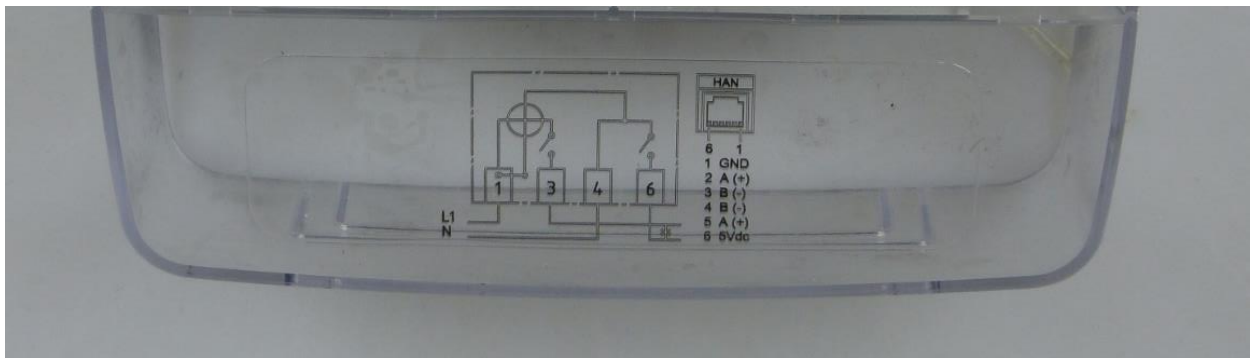
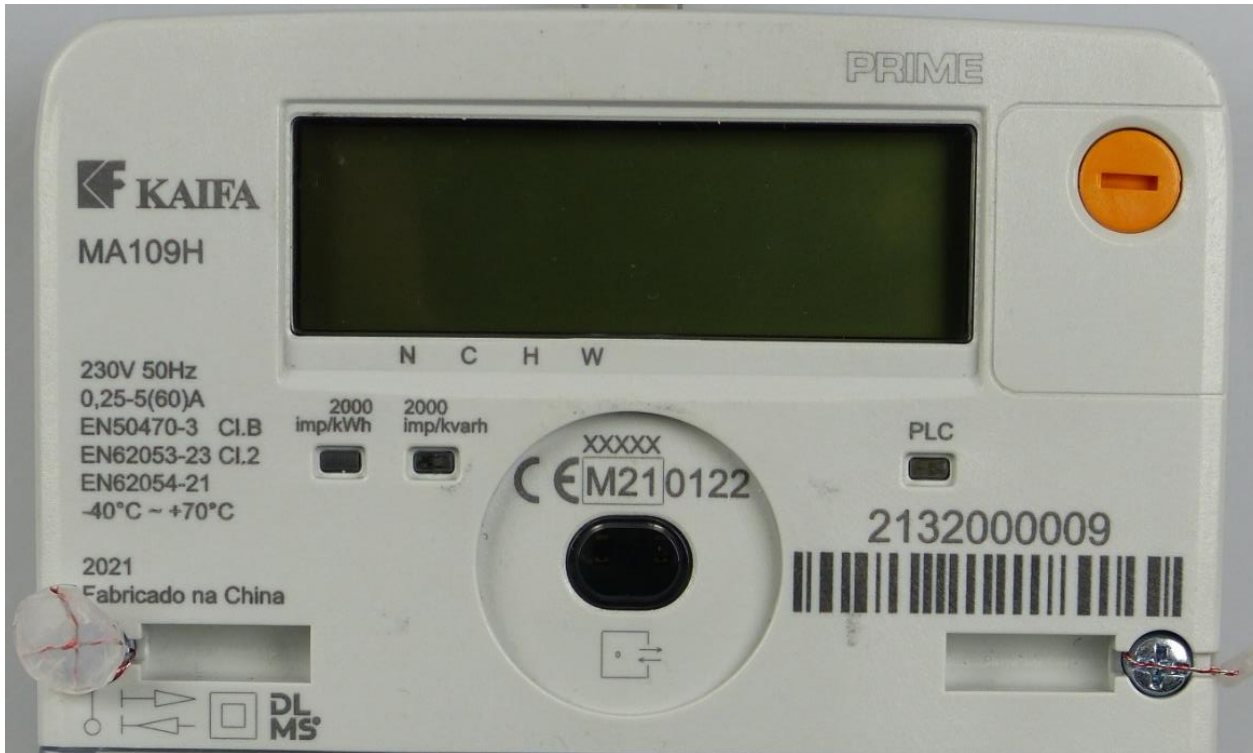
## 1 TECHNICAL DATA

|                                         |                                                                                                                                    |  |  |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Manufacturer                            | Shenzhen Kaifa Technology (Chengdu) Co., Ltd.,<br>No. 99 Tianquan Rd., Hi-Tech Development Zone,<br>611730, Chengdu, P.R.C., China |  |  |
| Production location                     | Shenzhen Kaifa Technology (Chengdu) Co., Ltd.,<br>No. 99 Tianquan Rd., Hi-Tech Development Zone,<br>611730, Chengdu, P.R.C., China |  |  |
| Type                                    | MA109H                                                                                                                             |  |  |
| Connection                              | Direct                                                                                                                             |  |  |
| Type of circuit                         | 1P2W                                                                                                                               |  |  |
| Accuracy class Wh                       | 1/B                                                                                                                                |  |  |
| Meter constant                          | 2000 imp/kWh                                                                                                                       |  |  |
| V range                                 | 230 V                                                                                                                              |  |  |
| I range $I_{min}$ - $I_n$ ( $I_{max}$ ) | 0,25-5(60) 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,<br>CISPR32 class B                                                                                              |  |  |
| LR Firmware ID                          | V3001                                                                                                                              |  |  |
| LR Firmware CRC                         | 859DBC5EA7                                                                                                                         |  |  |
| Register                                | LCD                                                                                                                                |  |  |
| Registry method(s):                     | Bi-directional method<br>with separate registers:<br>received- and delivered<br>energy is added in<br>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:

| I in %<br>of I <sub>ref</sub> | cos φ    | Composite error % |       |       |       |       |       |       |       |       |
|-------------------------------|----------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|                               |          | °C                | -40   | -25   | -10   | 5     | 30    | 40    | 55    | 70    |
| 5                             | 1        |                   | 0,27% | 0,23% | 0,15% | 0,10% | 0,09% | 0,10% | 0,15% | 0,17% |
| 10                            | 1        |                   | 0,25% | 0,21% | 0,14% | 0,09% | 0,05% | 0,08% | 0,11% | 0,16% |
| 10                            | 0,5 ind. |                   | 0,29% | 0,25% | 0,20% | 0,14% | 0,12% | 0,12% | 0,14% | 0,15% |
| 10                            | 0,8 cap. |                   | 0,28% | 0,22% | 0,14% | 0,08% | 0,05% | 0,07% | 0,13% | 0,17% |
| I <sub>max</sub>              | 1        |                   | 0,41% | 0,33% | 0,25% | 0,18% | 0,15% | 0,17% | 0,21% | 0,25% |
| I <sub>max</sub>              | 0,5 ind. |                   | 0,39% | 0,32% | 0,24% | 0,15% | 0,10% | 0,11% | 0,15% | 0,20% |
| I <sub>max</sub>              | 0,8 cap. |                   | 0,47% | 0,36% | 0,28% | 0,21% | 0,18% | 0,21% | 0,25% | 0,30% |

## 5 OPTIONS AND VARIANTS

Overview of variants with details

| Type designation | Details of the meter                                                                                                                  |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------|
|                  | <ul style="list-style-type: none"><li>• Communication options:<br/>optical port<br/>PLC</li><li>• HAN port</li><li>• Button</li></ul> |

## 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'.