

**ES certifikat o pregledu zasnove /
EC Design Examination Certificate**

Pregled zasnove merila v skladu s Pravilnikom o merilnih instrumentih /
Design examination according to EC Directive on Measuring Instruments

Št. / No.: 14MID005

Ime in naslov proizvajalca / Name and address of the manufacturer :

Proizvajalec / Manufacturer : **MIKROELEKTRONIKA A.D.**
Naslov / Address : **Blagoja Parovića bb, 78000 Banja Luka, Bosna i Hercegovina**

Podatki o merilu / Description of the measuring instrument :

Merilo / Measuring instrument: **Monofazni statični multifunkcijski števec električne energije /
Mono-phase static multifunction electricity meter**

Tip / Type: **MEM500**
Referenčne napetosti / Reference voltages: **230 V**
Referenčni tokovi / Reference currents: **5 A**
Nazivni tokovi / Rated currents: **/**
Referenčna frekvenca / Reference frequency: **50 Hz**
Razred točnosti / Accuracy class: **B**

V skladu s Pravilnikom o merilnih instrumentih (UL RS št. 42/2006, 97/2010, 16/2013), poglavje MI-003 – Števci delovne električne energije, dodatek H1, člen 4, je naročnik predložil vlogo, tehnično dokumentacijo in dokazila o ustreznosti zasnove v pregled zasnove merila za zgoraj navedeni proizvod, z namenom, da se preveri ali zasnova proizvoda ustreza zahtevam tega pravilnika. / *In accordance with the Directive on Measuring Instruments 2004/22/EC including Amendment 1137/2008, Annex MI-003 – Active Electrical Energy Meters, Annex H1, article 4, the applicant has submitted the application, technical documentation and the supporting evidence for the adequacy of the technical design for the above mentioned measuring instrument for the purpose of design examination. This is to certify, that the design of the measuring instrument meets the provisions laid down in the Directive.*

V skladu s Pravilnikom o merilnih instrumentih mora naročnik obvestiti priglašeni organ o vsaki narejeni ali načrtovani spremembi. / *In accordance with the above mentioned Directive the applicant has to inform the notified body of any already performed or planned modifications.*

Pregledana tehnična mapa se shrani pri priglašenem organu za dobo 10 let po izdelavi zadnjega primerka merila. Na željo naročnika se mapa predmeta po tem obdobju vrne naročniku ali uniči. / *The examined technical file will be stored by the notified body for 10 years after the last measuring instrument has been manufactured. On request of the applicant, it will then be returned or destroyed.*

Opomba / Remark:

Ta ES certifikat o pregledu zasnove velja do 2024-12-15 /
This EC Design Examination Certificate valid till 2024-12-15

Certifikat ima prilogo, ki vsebuje 6 strani. / The certificate has an Annex, which includes 6 pages.

Ljubljana, 2014-12-15



Podpis pooblaščenice osebe / *Authorised signature*

Zoran Svetik



Priloga k certifikatu št. / Annex to the Certificate No.: 14MID005

1. Metrological characteristics of the measuring instrument:

- Reference Voltage : **230 V**
- Reference Currents: **5 A**
- Rated Currents : **/**
- Reference Frequency : **50 Hz**
- Climatic Environments : **from -40 °C to +70 °C,
non-condensing humidity
outdoor location**
- Mechanical Environments : **M1**
- Electromagnetic Environments : **E2**
- Software Version : **V014101.0k**
- Accuracy Class : **B**

Percentage error due to variation of the voltage, frequency and temperature:

$$\text{Influence Factor: } IF = \sqrt{\delta_T^2(T, I, \cos\varphi) + \delta_U^2(U, I, \cos\varphi) + \delta_f^2(f, I, \cos\varphi)}$$

Direct connected polyphase meter with balanced loads:

Reference voltage: Uref = 230 V, f = 50 Hz, I_{max} = 80 A

I	I [A]	PF	IF [%]
Active energy – reception			
I _{min}	0.25	1	0,02
I _{tr}	0.5	1	0,01
I _{tr}	0.5	0.5L	0,03
I _{tr}	0.5	0.8C	0,01
I _{ref}	5	1	0,02
I _{ref}	5	0.5L	0,01
I _{ref}	5	0.8C	0,03
I _{max}	80	1	0,01
I _{max}	80	0.5L	0,03
I _{max}	80	0.8C	0,02
Active energy – generation			
I _{min}	0.25	1	0,05
I _{tr}	0.5	1	0,03
I _{tr}	0.5	0.5L	0,14
I _{tr}	0.5	0.8C	0,10
I _{ref}	5	1	0,05
I _{ref}	5	0.5L	0,21
I _{ref}	5	0.8C	0,05
I _{max}	80	1	0,03
I _{max}	80	0.5L	0,25
I _{max}	80	0.8C	0,08



Priloga k certifikatu št. / Annex to the Certificate No.: 14MID005

1.2. Front plate

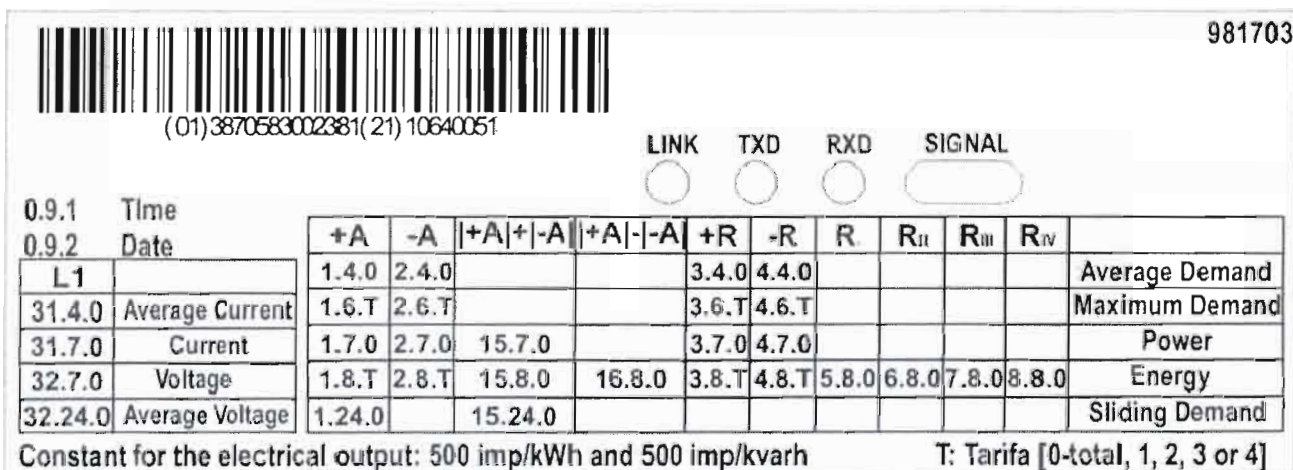
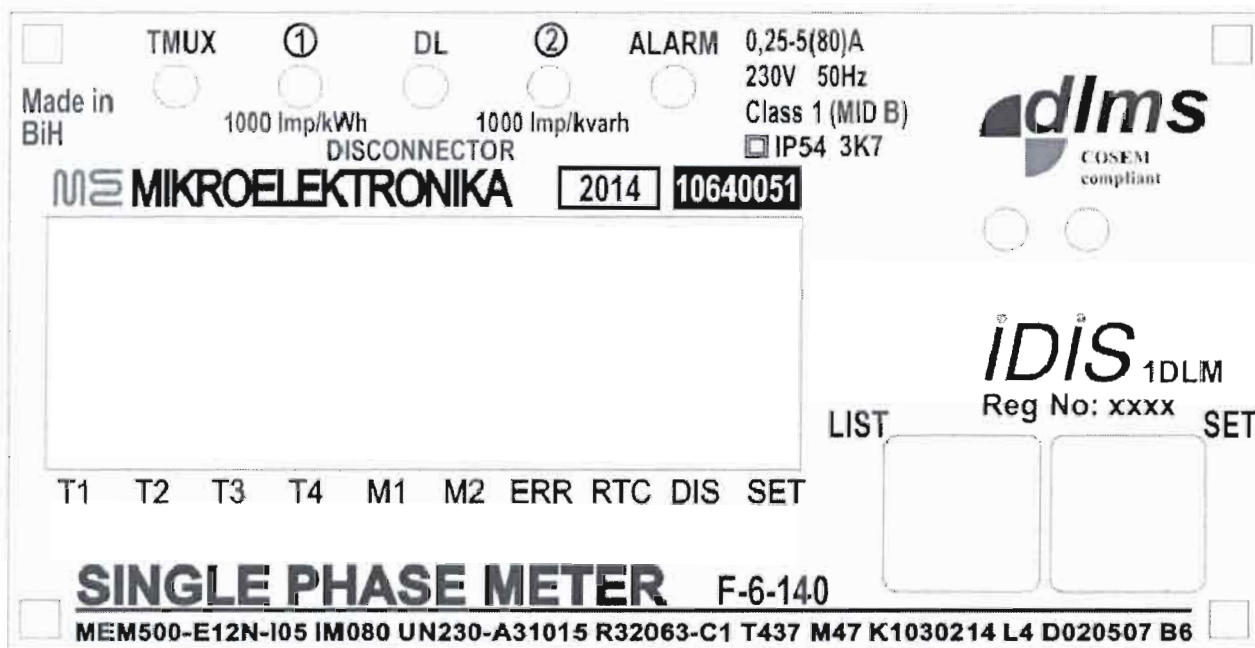


Figure 2: Front plate of MEM500



Priloga k certifikatu št. / Annex to the Certificate No.: 14MID005

1.3. Essential parts

- 1.3.1. Measurement system is described in 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 7.
- 1.3.2. Printed circuit boards are described in documents 1078-981689 (module MEM500-SB-V19), 1078-981690 (module MEM500-MB-V21) and 1078-981683 (module MEM500-IB-V08).
- 1.3.3. The front plate bears the complete, well legible, legally required information as mentioned in the regulations on the energy meters. An example of the markings is shown in paragraph 1.2.

1.4. Essential characteristics

- 1.4.1. See paragraph 1 and the characteristics mentioned below.
- 1.4.2. Approved meter type: MEM500
A complete type designation is given in the document 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 11.
- 1.4.3. Frequency: 50 Hz
- 1.4.4. Meter constant: 1.000 impulses/kWh (optical output)
500 impulses/kWh (electrical output)
- 1.4.5. Number of registers: List of registers is given in the 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 5.1 and 10.
- 1.4.6. Error register: Information is given in the 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 5.11.
- 1.4.7. Exported energy: The meter is capable of measuring energy in two directions and has two types of measurements ('+A' with return stop, '-A' with return stop). Import and export energy are presented in separate registers.
- 1.4.8. Software specification (refer to WELMEC guide 7.2):

Identification number of the Core	Remarks
MEM500: V014101.0k CHKSUM number: 01.0k	All changes to the software will lead to an increment of the version number. This is assured by the Quality Management System of the manufacturer. The software checksum can be displayed on LCD or sent as part of sequence via the optical communications ports.

- 1.4.8.1. Software type: P
- 1.4.8.2. Software functions: Extensions L and T

1.5. Conditional parts

- 1.5.1. Terminals block

The connections for the current cables on the terminals block allow a cable cross-section up to 35 mm² (main terminals) and up to 1,5 mm² (auxiliary terminals). The cables are each fastened to the terminals with M5 screws.



Priloga k certifikatu št. / Annex to the Certificate No.: 14MID005

1.5.2. Housing

The meter has a housing resistant to the penetration of dust, water IP54 and to the UV light. The housing is made of self-extinguishing isolative material.

1.5.3. Terminals cover

The meter has a separated terminals cover, made of self-extinguishing UV stabilized isolative material.

1.5.4. Data display

The quantity of measured energy is presented by means of a liquid crystal display (LCD). The list of the displayed signals and alarms is given in the 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 4.5.

1.5.5. Communication interface

Meter supports the following communication interfaces: IC port, MBus, RS232, RS485, Radio modem, Ethernet, PLC, GSM and GPRS. Meter supports encrypting of data transmission between user and AMR center. For further information see 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 2 and 8.

1.6. Conditional characteristics

1.6.1. Maximum current: 80 A

1.7. Non-essential parts

1.7.1. Inputs and outputs

Meter supports one relay outputs. For further information see 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 5.8.2.

1.7.2. Bi-stable disconnecter

Meter has integrated bi-stable disconnecter. For further information see 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 5.8.1.

2. Measures required for ensuring the integrity of the measuring instrument:

- Sealing: 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 3.2.
- The meter is sealed with two seals: first wire seal for upper cover of the housing (sealed by manufacturer) to prevent access to internal electronics of the electricity meter and second wire seal for lower cover of the housing (sealed by electrical distribution company) to prevent access to terminals of the electricity meter. The housing cannot be opened without visible mechanical deterioration.
- The MEM500 meters are equipped with a terminal cover opening detector and a meter cover opening detector. The meter registers if and when the terminal or meter covers were opened in a special memory location (see 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 5.5 and 5.12).
- The MEM500 meters are equipped with a detector of external magnetic field. Events are recorded in the special memory location (see 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014, Chapter 5.5 and 5.12).



Priloga k certifikatu št. / Annex to the Certificate No.: 14MID005

3. Information on other elements necessary to identify the measuring instrument and to check its visual external conformity to the design:

- All information on other elements necessary to identify the measuring instrument and to check its visual external conformity to the design are presented in the document 1551-234-MEM500 Technical description (Tehnički opis), Rev B, 20.11.2014.

4. Information to verify the characteristics of manufactured measuring instruments (if necessary):

- Manufacturer provides a software tool "µMETER" which allows reading of all data and configuration of the registers of the meter. To use the "µMETER" a personal computer is needed.

5. Assessment of compliance with the essential requirements stated in Annex I and specific requirements stated in Annex MI-003 of the Directive on Measuring Instruments 2004/22/EC:

- The measuring instrument fulfills the above-mentioned requirements.
- The use of harmonized standards (EN 50470-1 and EN 50470-3) is appropriate and a presumption of conformity is established.
- The content of the technical file is in conformity with the above-mentioned requirements.

The documentation is kept in the technical file No.:

14TF005

Examined by




Mag. Matjaž Lindič