

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.: 10MID002

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 : Trofazno brojilo električne energije / Three phase static electricity meter
Tip / Type : MET410
Referenčne napetosti / Reference voltages : 3 x 230 / 400 V, 3 x 58 / 100 V
Referenčni tokovi / Reference currents : 5 A, 10 A
Nazivni tokovi / Nominal currents : 5 A
Razred točnosti / Accuracy class : B, C

V skladu s Pravilnikom o merilnih instrumentih (UL RS št. 42/2006), 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, 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.

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

Ljubljana, 2010-05-12



Podpis pooblaščenice osebe / Authorised signature

Alja Pregl

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Priloga k certifikatu št. / Annex to the Certificate No.: 10MID002

1. Metrological characteristics of the measuring instrument:

- Reference voltage : 3 x 230 / 400 V, 3 x 58 / 100 V
- Reference currents : 10 A, 5 A
- Nominal currents : 5 A
- Climatic environments : from -25 °C to +55 °C, non-condensing humidity, closed location
- Mechanical Environments : M1
- Electromagnetic Environments : E2
- Software version : VER 4.17
- Accuracy class : B, C
- Percentage error due to variation of the voltage, frequency and temperature:

$$\text{Influence Factor : } IF = \delta^2_T (T, I, \cos\varphi) + \delta^2_U (U, I, \cos\varphi) + \delta^2_f (f, I, \cos\varphi)$$

Direct connected meter at balanced load points:

Reference Voltage : $U_{ref} = 3 \times 230/400 \text{ V}$ with balanced load

I	I [A]	PF	imp.	IF [%]
Active energy - reception				
I _{min}	0,5	1	2	0,10
I _{tr}	1	1	3	0,06
I _{tr}	1	0.5L	2	0,07
I _{tr}	1	0.8C	3	0,07
I _{ref}	10	1	10	0,04
I _{ref}	10	0.5L	6	0,06
I _{ref}	10	0.8C	8	0,04
I _{max}	120	1	100	0,04
I _{max}	120	0.5L	60	0,08
I _{max}	120	0.8C	80	0,04
Active energy - generation				
I _{min}	0,5	1	2	0,11
I _{tr}	1	1	3	0,07
I _{tr}	1	0.5L	2	0,21
I _{tr}	1	0.8C	3	0,06
I _{ref}	10	1	10	0,04
I _{ref}	10	0.5L	6	0,09
I _{ref}	10	0.8C	8	0,04
I _{max}	120	1	100	0,06
I _{max}	120	0.5L	60	0,07
I _{max}	120	0.8C	80	0,05



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1.1. MET410 Three phase static electricity meter

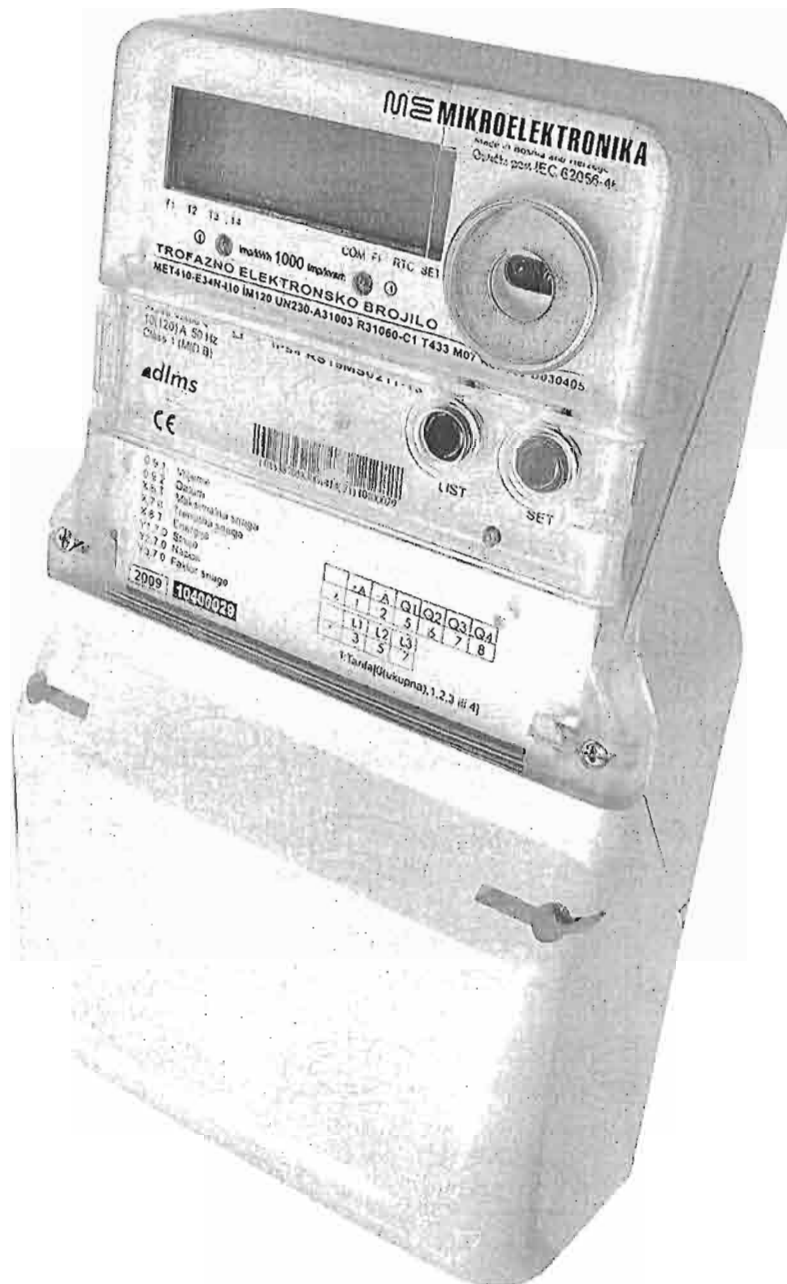


Figure 1: View of MET410 Three phase static electricity meter



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1.2. Front plate

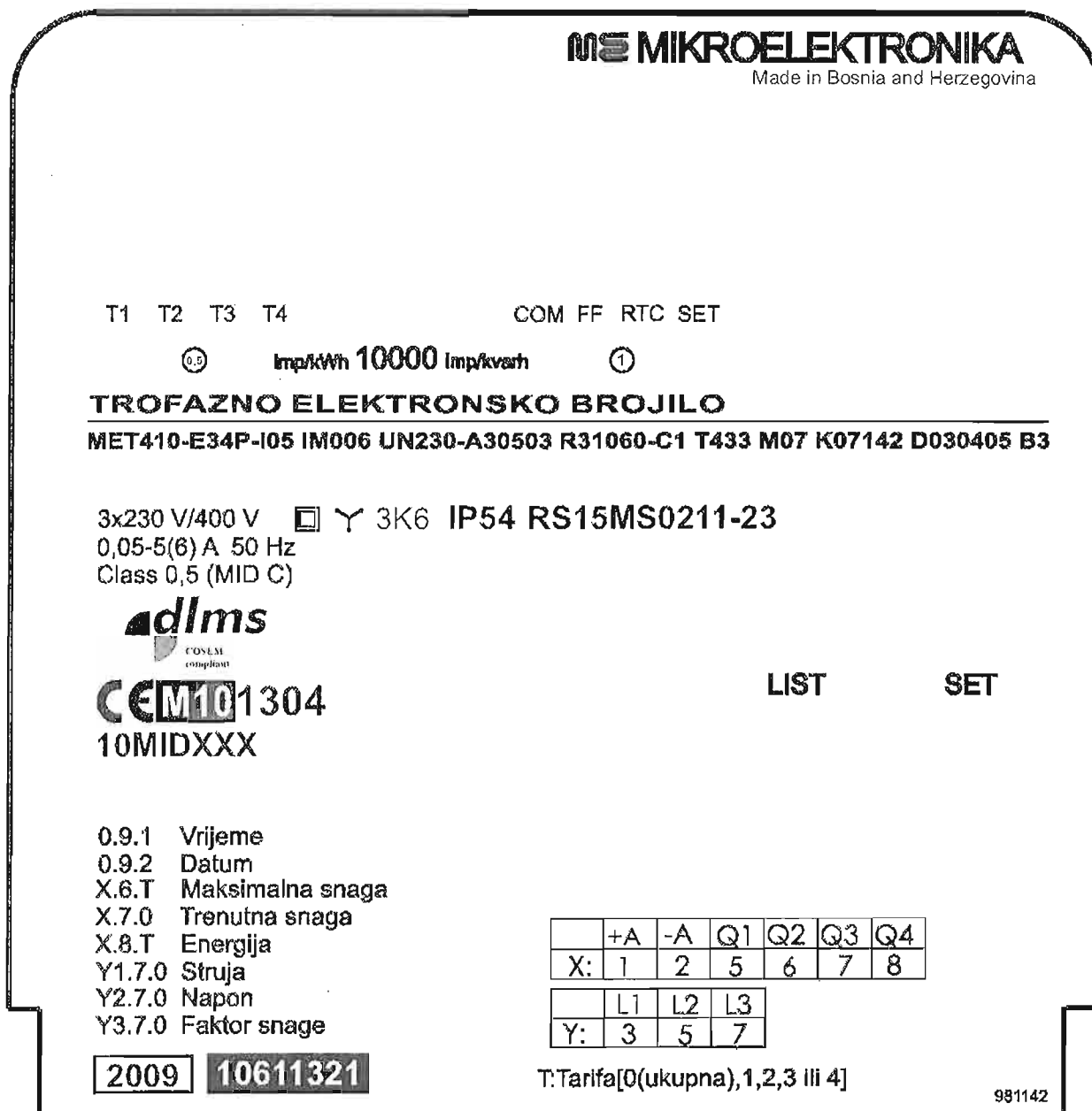


Figure 2: Front plate of MET410



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1.3. Essential parts

- 1.3.1. Measuring sensor is described in 1551-207-MET410 Technical description (Tehnički opis) Rev A, chapter 6. and 7.
- 1.3.2. Printed circuit boards are described in 1076-903672 (PLOČA ŠT. MET4XX-OSN-R23), 1076-903671 (PLOČA ŠT. MET4XX-PRE-1-R23) and 1076-903670 (PLOČA ŠT. MET4XX-REZ-T-R23). All parts of the printed circuit boards are essential, except, the components which are related to parts described in paragraphs 1.4 or 1.6.
- 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 document 1301-903952 (PLOČA NATPISNA) and in the 1551-207-MET410 Technical description (Tehnički opis) Rev A, chapter 15.
- 1.3.4. An indication of the energy transit through the meter is provided for by means of a LED (active and reactive energy).

1.4. Essential characteristics

- 1.4.1. See paragraph 1 and the characteristics mentioned below.
- 1.4.2. Approved meter type: MET410
A complete type designation is given in the document Način označavanja MET410.pdf.
- 1.4.3. Frequency: 50 Hz
- 1.4.4. Meter constant: 1.000 impulses/kWh (direct connection)
10.000 impulses/kWh (semi-direct connection)
40.000 impulses/kWh (indirect and Aron connection)
- 1.4.5. Number of registers: The registers are described in 1551-207-MET410 Technical description (Tehnički opis) Rev A, chapter 14.1.
- 1.4.6. Error register: The registers are described in 1551-207-MET410 Technical description (Tehnički opis) Rev A, chapter 14.7.1 and 14.7.2.
- 1.4.7. Export energy: The meter is capable of measuring energy in 2 directions. 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
MET410: V 04.17	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 in the display sequence and can be read via the optical communications port.

- 1.4.8.1. Software type: P
- 1.4.8.2. Risk Class: C
- 1.4.8.3. Software functions: Extensions L and T



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1.5. Additional parts

- 1.5.1. Terminals block
The connections for the current cables on the terminals block allow a cable cross-section of 6 to 25 mm². The cables are each fastened to the terminals via one M3 or M6 screw.
- 1.5.2. Housing
The meter has a housing resistant to the penetration of dust and water. The housing is made of self-extinguishing polycarbonate.
- 1.5.3. Terminals cover and customer's terminals cover
The terminals cover is made of self-extinguishing polycarbonate.
- 1.5.4. Data display
The quantity of measured energy is presented by means of a dot-matrix LCD display. The list of the displayed screens is given in the 1551-207-MET410 Technical description, chapter 9.
- 1.5.5. Tariff control
The meter is provided with more than one register and the tariff switching is controlled by means of a built-in Real Time Clock, whereby the EMC-requirements are fulfilled as described in Annex MI-003 of Directive 2004/22/EC.
- 1.5.6. IC communication port
The meter is equipped with IC port. It could be used for data reading and for programming of the meter's parameters with the IEC 62056-46 (DLMS) protocol.
- 1.5.7. Communication module/modem interface
The MET410 is capable of communicating via the communication module/modem with the IEC 62056-46 (DLMS) protocol.
- 1.5.8. Router communication interface
The meters that are not physically accessible could communicate over the GSM/GPRS modem in combination with PLC or RS232/RS485 module/modem.

1.6. Additional characteristics

- 1.6.1. Maximum current: equals to 120 A and is 12 times higher than the reference current.

1.7. Non-essential parts

- 1.7.1. Bi-stable breaker:
The meter has a possibility of additional built in bi-stable breaker for electrical energy control.



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

- Sealing: see 1551-207-MET410 Technical description (Tehnički opis) Rev A, Chapter 6.
- The instrument cover is sealed with a conventional wire seal preventing access to inner electronic part of the measuring instrument. An example of sealing is presented in the document 1551-207-MET410 Technical description (Tehnički opis) Rev A, Chapter 6.
- The power terminals cover is sealed with a conventional wire seal preventing access to the power terminals and SET keyboard used for setting of the measuring instrument's parameters. An example of sealing is presented in the document 1551-207-MET410 Technical description (Tehnički opis) Rev A, Chapter 6.
- When the meter is operative the measurement integrity function is switched ON. Under this function all special events (opening of the covers, high magnetic field) are saved in the memory. For detailed description see 1551-207-MET410 Technical description (Tehnički opis) Rev A, chapter 12.

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 1551-207-MET410 Technical description (Tehnički opis) Rev A.

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

- Manufacturer provides a software tool MESMET which allows reading of all data and configuration of the registers of the meter. To use the MESMET 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 fulfils the above-mentioned requirements.
- The use of harmonized standards (EN 50470-1 in 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.:

10TF002

Examined by




Mag. Matjaz Lindič