

EU certifikat o pregledu zasnove / EU Design Examination Certificate

Pregled zasnove merilnega instrumenta v skladu z EU direktivo o merilnih instrumentih 2014/32/EU /
Design examination of Measuring Instrument according to EU Directive on Measuring Instruments 2014/32/EU

Št. / No.: 21MID003
Sprememba / Modification: M04

Ime in naslov naročnika / Name and address of the applicant :

Naročnik / Applicant: **ISKRAEMECO, merjenje in upravljanje energije, d.d.**
Naslov / Address: **Savska loka 4, 4000 Kranj, SLOVENIJA**

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

Proizvajalec / Manufacturer : **ISKRAEMECO, merjenje in upravljanje energije, d.d.**
Naslov / Address : **Savska loka 4, 4000 Kranj, SLOVENIJA**

Podatki o merilu / Description of the measuring instrument :

Merilo / Measuring instrument: **Trifazni večfunkcijski števec električne energije /
Three phase multifunction electricity meter**

Tip / Type: **IE.7**

Varianta števca / Meter variant: **IE.7-TT2, IE.7-PT2, IE.7-TV2**

Referenčne napetosti / Reference voltages: **3x230/400 V, 3x63,5/110 V, 3x230 V, 3x110V**

Referenčni tokovi / Reference currents: **1 A**

Nazivni tokovi / Rated currents: **10A**

Referenčna frekvenca / Reference frequency: **50 Hz**

Razred točnosti / Accuracy class: **A, B, C**

V skladu s Pravilnikom o merilnih instrumentih (UL RS št. 19/2016), priloga 5 (MI-003) – Števci delovne električne energije, priloga 2 modul 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 EU Directive on Measuring Instruments 2014/32/EU, Annex V (MI-003) – Active Electrical Energy Meters, Annex II Module 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.

SIQ LJUBLJANA je priglašeni organ v skladu z EU direktivo o merilnih instrumentih 2014/32/EU s priglasitveno številko 1304. Certifikacijski organ ni akreditiran za namen priglasitve. / SIQ LJUBLJANA is a notified body according to EU Directive on Measuring Instruments 2014/32/EU with notification number 1304. Certification body is not accredited for notification purposes.

V skladu z zgoraj navedenim Pravilnikom o merilnih instrumentih mora naročnik obvestiti priglašeni organ o vsaki narejeni ali načrtovani spremembi ter reklamaciji s strani tretje osebe. / In accordance with the above mentioned Directive the applicant has to inform the notified body of any already performed or planned modifications and reclamations from the third party.

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 EU certifikat o pregledu zasnove je sprememba certifikata št. 21MID003M03. /
This EU Design Examination Certificate modifies Certificate No. 21MID003M03.

Certifikat ima prilogo, ki vsebuje 9 strani. / Certificate has an Annex, which includes 9 pages.

Ta EU certifikat o pregledu zasnove velja do 2031-06-11. /
This EU Design Examination Certificate valid till 2031-06-11.

Ljubljana, 2023-05-22

Podpis pooblaščenice osebe / Authorised signature

Bojan Pečavar

Priloga k certifikatu št. / Annex to the Certificate No.: 21MID003
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1. Places of manufacture

- ISKRAEMECO, merjenje in upravljanje energije, d.d.
Savska Loka 4, 4000 Kranj, Slovenija

2. Appearance of the electricity meter and approved meter types



Figure 1: View of IE.7-TT2 three phase multifunction electricity meter



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- Type designations: **IE.7-TT2, IE.7-PT2, IE.7-TV2**
- Meter variants and versions:

Meter variant:	Version:
IE.7-TT2	H00, H01, H02
IE.7-PT2	H02
IE.7-TV2	H02

3. Metrological characteristics of the measuring instrument

- Reference voltages: **3x230/400 V, 3x63,5/110 V, 3x230 V, 3x110V**
 - Reference currents: **1 A**
 - Rated currents: **10 A**
 - Maximum currents: **10 A**
 - Reference frequency: **50 Hz**
 - Climatic environments: **from -40 °C to +70 °C**
non-condensing humidity
closed location
 - Mechanical environments: **M2**
 - Electromagnetic environments: **E2**
 - Meter constants: **10.000 impulses/kWh**
 - Main board versions: **027.640.316.000**
027.640.384.000
- Main technical documents: **IE.x User manual, EAK 020.616.456**
IE.7 Object list examples, EBS 020.616.478

4. Software identification

- Software Versions: **ISKIE7TC01100009**
ISKIE7TC01200006
ISKIE7TC04200057
ISKIE7TC05200059

Core ID (1-0:0.2.0):	Core hash:
ISKIE7TC01100009	44 93 E4 19 87 D2 7C 56 E4 FD FB 3E 64 3D 22 0B 32 56 A0 04 0E 11 27 73 C3 ED CF 9A 0B 65 5D 9B
ISKIE7TC01200006	7C 95 6A 64 65 7A 8F 16 5F 72 D2 0A E9 6D 53 BD EF 56 40 0D 20 8A 9F CB 9D BB 50 19 6C 26 CD 94
ISKIE7TC04200057	30 74 36 32 42 D6 C5 E9 76 F9 6B 7F 43 6C 11 4C E1 13 48 B1 59 B1 3D 86 3A EF CA 46 16 3A 9F 98
ISKIE7TC05200059	C6 DB 39 18 D3 83 C0 36 0C 82 8E 69 1C 35 78 A9 95 44 E9 9C A0 6E 00 A1 57 F4 BE C5 FE 3F 38 11

The FW identification is displayed on the meter LCD. Detailed instructions are in the documents listed in paragraph 3.

5. Influence factors

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

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

Current transformer operated polyphase meter with balanced loads: $U_{ref} = 3 \times 63,5/110 \text{ V}$; $f = 50 \text{ Hz}$,
 $I_{max} = 10 \text{ A}$, 3P4W

I	I [A]	PF	Imp.	IF [%]
Active energy – reception				
I _{min}	0.01	1	1	0,03
I _{tr}	0.05	1	1	0,03
I _{tr}	0.05	0.5L	1	0,11
I _{tr}	0.05	0.8C	1	0,04
I _{ref}	1	1	8	0,02
I _{ref}	1	0.5L	4	0,08
I _{ref}	1	0.8C	6	0,05
I _{max}	10	1	75	0,02
I _{max}	10	0.5L	40	0,06
I _{max}	10	0.8C	60	0,02
Active energy – generation				
I _{min}	0.01	1	1	0,03
I _{tr}	0.05	1	1	0,03
I _{tr}	0.05	0.5L	1	0,08
I _{tr}	0.05	0.8C	1	0,05
I _{ref}	1	1	8	0,02
I _{ref}	1	0.5L	4	0,08
I _{ref}	1	0.8C	6	0,05
I _{max}	10	1	75	0,02
I _{max}	10	0.5L	40	0,08
I _{max}	10	0.8C	60	0,04



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Current transformer operated polyphase meter with balanced loads: $U_{ref} = 3 \times 230/400 \text{ V}$; $f = 50 \text{ Hz}$,
 $I_{max} = 10 \text{ A}$, 3P4W; $U_{ref} = 3 \times 230 \text{ V}$, $f = 50 \text{ Hz}$, $I_{max} = 10 \text{ A}$, 3P3W

I	I [A]	PF	Imp.	IF [%]
Active energy – reception				
I _{min}	0.01	1	1	0,04
I _{tr}	0.05	1	2	0,03
I _{tr}	0.05	0.5L	1	0,08
I _{tr}	0.05	0.8C	2	0,09
I _{ref}	1	1	29	0,04
I _{ref}	1	0.5L	15	0,07
I _{ref}	1	0.8C	23	0,07
I _{max}	10	1	290	0,02
I _{max}	10	0.5L	145	0,06
I _{max}	10	0.8C	230	0,03
Active energy – generation				
I _{min}	0.01	1	1	0,04
I _{tr}	0.05	1	2	0,03
I _{tr}	0.05	0.5L	1	0,08
I _{tr}	0.05	0.8C	2	0,08
I _{ref}	1	1	29	0,04
I _{ref}	1	0.5L	15	0,08
I _{ref}	1	0.8C	23	0,07
I _{max}	10	1	290	0,03
I _{max}	10	0.5L	145	0,08
I _{max}	10	0.8C	230	0,06



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Current and voltage transformer operated polyphase meter with balanced loads: **Uref = 3x57,7/100 V;**
f = 50 Hz, 3P4W

I	I [A]	PF	Imp.	IF [%]
Active energy – reception				
Imin	0.01	1	1	0,06
Itr	0.05	1	1	0,05
Itr	0.05	0.5L	1	0,05
Itr	0.05	0.8C	1	0,05
Itr	0.25	1	5	0,05
Itr	0.25	0.5L	2	0,05
Itr	0.25	0.8C	2	0,07
Iref	1	1	10	0,02
Iref	1	0.5L	5	0,05
Iref	1	0.8C	10	0,03
Iref	5	1	40	0,03
Iref	5	0.5L	20	0,05
Iref	5	0.8C	30	0,05
Imax	6	1	50	0,02
Imax	6	0.5L	25	0,04
Imax	6	0.8C	35	0,03
Imax	10	1	80	0,02
Imax	10	0.5L	40	0,05
Imax	10	0.8C	60	0,03
Active energy – generation				
Imin	0.01	1	1	0,03
Itr	0.05	1	1	0,02
Itr	0.05	0.5L	1	0,05
Itr	0.05	0.8C	1	0,03
Itr	0.25	1	5	0,02
Itr	0.25	0.5L	2	0,05
Itr	0.25	0.8C	2	0,03
Iref	1	1	10	0,02
Iref	1	0.5L	5	0,06
Iref	1	0.8C	10	0,03
Iref	5	1	40	0,02
Iref	5	0.5L	20	0,06
Iref	5	0.8C	30	0,03
Imax	6	1	50	0,02
Imax	6	0.5L	25	0,05
Imax	6	0.8C	35	0,03
Imax	10	1	80	0,02
Imax	10	0.5L	40	0,05
Imax	10	0.8C	60	0,03

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6. Additional information

6.1. Examples of front plates

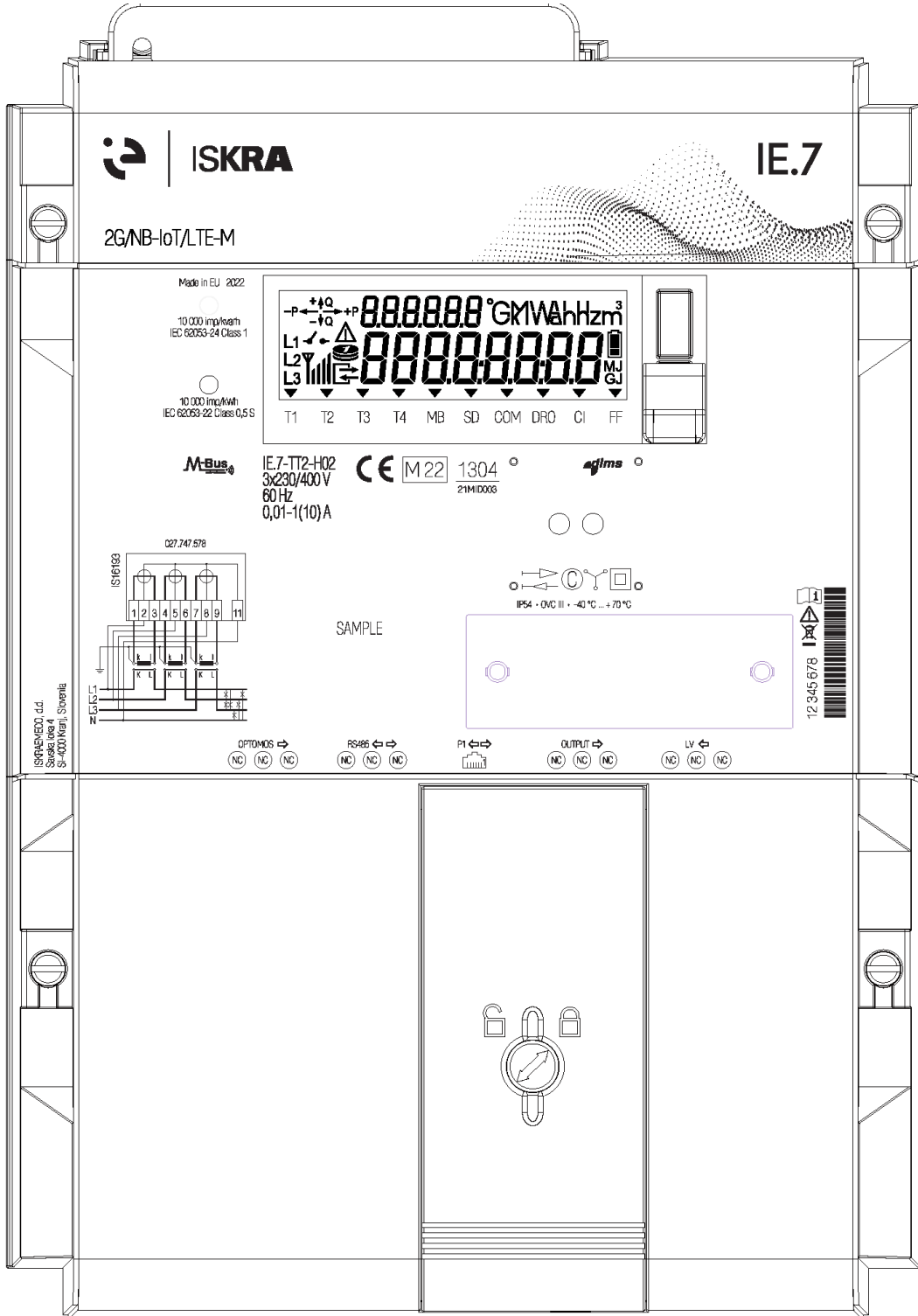


Figure 2: Front plate of IE.7-TT2-H01 – long type designation

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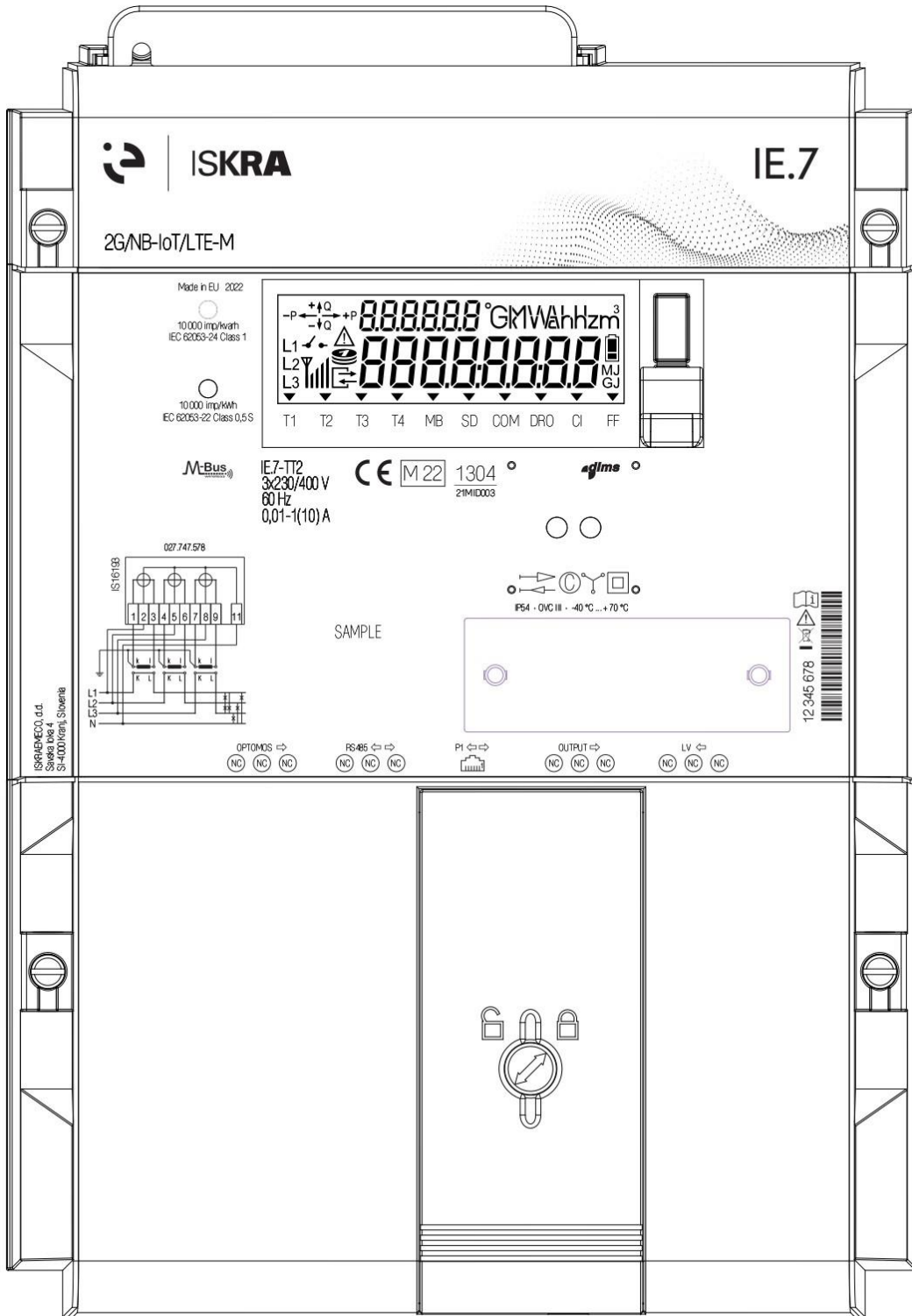


Figure 3: Front plate of IE.7-TT2 – short type designation

In case of short meter type designation on the meter name plate the HW version appears in the register on LCD.

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6.2. Essential parts

- 6.2.1 Measurement systems for all electricity meters are described in the documents listed in paragraph 3.
- 6.2.2 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 on the front plates (example front plates of the meters) are shown in paragraph 6.1.

6.3. Essential characteristics

- 6.3.1 See paragraph 3 and the characteristics mentioned below.
- 6.3.2 Number of registers
Lists of registers for all electricity meters are given in the documents listed in paragraph 3.
- 6.3.3 Error register
Detailed information about error registers for all electricity meters are given in the documents listed in paragraph 3.
- 6.3.4 Active energy measurement
The meter is capable of measuring energy in 2 directions and has 4 types of measurements ('+A' with return stop, '+A/-A' with return stop, '-A' without return stop, '-A' with return stop). Import and export energy are presented in separate registers.
Registers for active energy measurement are given in the documents listed in paragraph 3.

6.4. Conditional parts

- 6.4.1 Terminals block
The connections for the cables on the terminals block allow a cable cross-section from 1.5 mm² to 6 mm² (main terminals with diameter 5 mm). Auxiliary terminals allow a cable cross-section from 0,5 mm² to 2,5 mm². The cables are each fastened to the main terminals with Combi Pozidriv + Slot (2) screws and auxiliary terminals with Combi Pozidriv + Slot (1) screws.
- 6.4.2 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.
- 6.4.3 Housing
The meter has a separated terminals cover, made of self-extinguishing UV stabilized polycarbonate. It can be transparent or non-transparent.
- 6.4.4 Data display
The quantity of measured energy is presented by means of a liquid crystal display (LCD) providing 3 rows of 16 characters.
The lists of the displayed signals and alarms for all electricity meters are provided in the documents listed in paragraph 3.
- 6.4.5 Communication interface
The IE.7-TT2, IE.7-PT2 and IE.7-TV2 electricity meters can be equipped with an optical interface, P1 interface, M-Bus interface and RS-485 communication. Meters can support 2G, 3G, 4G and MB-IoT communication.
Detailed description of communication interfaces for all electricity meters are provided in the documents listed in paragraph 3.

6.5. Non-essential parts

- 6.5.1 Inputs and outputs
The IE.7-TT2, IE.7-PT2 and IE.7-TV2 electricity meters support different inputs and outputs which can be applied in the meter optionally i.e. pulse input, tariff input, alarm input, external key input, pulse output (SSR – solid state relay output), load management 5A relay output.



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Detailed descriptions are given in the documents listed in paragraph 3.

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

- Sealing of all electricity meters is described in the documents listed in paragraph 3.
- The meter cover is permanently fixed to the meter base so the access to internal electronics of the electricity meter is not possible. The terminal cover is sealed with the pair of wire seals, which are sealed after installation. They prevent the access to terminals of the electricity meter. The communication module cover is sealed with a pair of seals to prevent the access to the communication module. Terminal cover and communication module cover cannot be opened without removing the wire seals.
- The meters are equipped with a terminal cover opening detector. The meters register if and when the terminal cover was opened in a special memory location. Terminal cover opening detector is described in the documents listed in paragraph 3.
- The meters are equipped with an external magnet field detector. Events are recorded in the fraud detection log-book. External magnet field detector is described in the documents listed in paragraph 3.

8. 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 documents listed in paragraph 3.

9. Information to verify the characteristics of manufactured measuring instruments:

- Manufacturer provides a software tool Symbiot MeterConfigurator which allows reading of all data and configuration of the registers of the meter. To use the Symbiot MeterConfigurator a personal computer and the interface are needed.

10. Assessment of compliance with the essential requirements stated in Annex I and specific requirements stated in Annex V (MI-003) of the Directive on Measuring Instruments 2014/32/EU:

- 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.
- Presumption of conformity that meter is compliant with the essential requirements is fulfilled also with conformity to the requirements with the European Technical Report CLC/TR50579 - Electricity metering equipment - Severity levels, immunity requirements and test methods for conducted disturbances in the frequency range 2 -150 kHz.
- The content of the technical file is in conformity with the above-mentioned requirements.

Modifications stated in this certificate:

- New meter variant IE.7-TV2, version H02, has been added to the certificate.

The documentation is kept in the technical file No.:

21TF003

Ljubljana, 2023-05-22

Podpis pooblaščenice osebe / *Authorised signature*

Bojan Pečavar

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