SASTEK UYGUNLUK DEĞERLENDİRME HİZMETLERİ A.Ş.

Batı Sitesi Mahallesi Tahsin Kahraman Caddesi No:82
Gersan Sanayi Sitesi 06370 Yenimahalle / Ankara-TÜRKİYE

2014/32/EU MID – B MODÜLÜ / *B MODULE*

AT TİP ÜRÜN ONAY BELGESİ

EU TYPE EXAMINATION CERTIFICATE

Sertifika No: *Certificate Number*	MID-2759-2200024
Bakanlık Belge No: *Government Certificate Number*	MID-2759-2200024
Teknik Düzenleme: *In accordance with*	2014/32/EU – Aktif Elektrik Enerji Sayaçları (MI-003) *Active electrical energy meters (MI-003)*
Belgenin Verildiği Firma: *Issued to (applicant) company*	NIK-ELEKTRONIKA,LLC
Üretim Yeri Adresi: *Manufacturer Address*	13A Marshala Tymonshenka Str., Office, 606 Kyiv 04212, UKRAINE
Ölçüm Cihazı: *Measuring Instrument*	NIK 2100 A...P6... Tek Fazlı Statik Aktif Elektrik Sayacı *NIK 2100 A...P6... Single Phase Static Active Electricity Meter*
Geçerlilik: *Valid Until*	23.06.2032
Onaylanmış Kurum No: *Notified Body Number*	2759
Yayın Tarihi: *Date of Issue*	23.06.2022

SASTEK

Denizhan ÖZER
Genel Müdür/*General Manager*

Bu sertifika Onaylanmış Kuruluşun yazılı izni olmadan kısmen çoğaltılamaz. İmzasız ve mühürsüz sertifikalar geçersizdir. Bu sertifika Final Protokolü doküman ile birlikte geçerlidir.

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1. REGULATIONS AND STANDARDS USED FOR ASSESSMENTS

This type of instrument has been assessed against the requirements of the appropriate instrument provided in DIRECTIVE 2014/32/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014.
Requirements for the appropriate instrument are listed in Annex I “Essensial requirements” and in Annex V “active electrical energy meters (MI-003)”.
Marking of meters conforms to EN 50470-1, EN 50470-3, EN 62053-23 and manufacturer’s plans.
It was determined that the fonts and signs used for marking were arranged in accordance with the manufacturer’s plans.

Standards used for assessment:
EN 50470-1:2007 - Electricity metering equipment (a.c.) - Part 1: General requirements, tests and test conditions - Metering equipment (class indexes A, B and C)
EN 50470-3:2007 Electricity metering equipment (a.c.) -- Part 3: Particular requirements - Static meters for active energy (class indexes A, B and C)
IEC 62053-23:2021 Electricity metering equipment - Particular requirements - Part 23: Static meters for reactive energy (classes 2 and 3)
EN 62059-32-1:2012 Electricity metering equipment - Dependability - Part 32-1: Durability - Testing of the stability of metrological characteristics by applying elevated temperature
WELMEC 7.2 Software Guide, Version 2022
WELMEC 11.3 Guide for sealing of Active Electrical Energy Meters and Gas Meters and Conversion Devices, Version 2020

2. INTRODUCTION OF CERTIFIED PRODUCTS

NIK 2100 XP6T.2X0X.X.XX series; (hereinafter referred to as the meter) has been determined to be designed for the application of bidirectional measurement of electrical active energy.

3. TECHNICAL PARAMETERS

Technical parameters are given in Table 1.

Accuracy class for active energy measurement (according to EN 50470-3)	B
Accuracy class for reactive energy measurement (EN 62053-23)	2
Reference voltage Un , B	220V, 230 V, 240 V (depending on version)
Voltage operating range, % of Un	-20 up to +15
Starting current for active energy I st, A	0.0125
Starting current for reactive energy I st, A	0.0156
Minimum current I_{min} , A	0.25
Transient current I_{tr} , A	0.5
Reference current, I_{ref} , A	5
Maximum current, I_{max} , A	80
Meter constant for direct connection, imp/(kWt h)	6400

Power consumption of the meter voltage circuit, not more than V·A (W)	20(5)
The power consumption of the meter current circuit (at I=Iref), not more than V·A	0.2
Reference frequency fref, Hz	50
LCD number of digits to display basic information	6+2
Number of odds, maximum	4
Storage of a load profile with integration time of 60 minutes, days (days)	180
Storing the energy data consumed at all rates at the end of the day (day)	180
Storing the energy data consumed at all rates at the end of the month (month)	48
Storing average voltage values with day integration time	10
Verification interval(year)	16
Operating temperature range, °C	-40 up to +70
Storage temperature range, °C	-40 up to +70
Relative humidity at +30 °C, maximum, %	95
Degree of protection	IP54
Mechanical grade	M2
Electromagnetic class	E2
Weight (max kg)	one

TABLE -1

3.1 Versions and Functions of Meters

The versions of the meters and the structure of their marking are given in Table 2.

NIK 2100	.	X	P6	T	.	2	X	0	X	.	X	.	X	X

Reference Voltage	
1	220 V
2	230 V
3	240 V
Energy measurement capability	
1	Further direction (+,+)
2	Further and reverse direction (+,-)
Sensors	
0	Sensorless
C	With electromagnetic field sensor
M	Magnetic area with sensor
MC	Magnetic area and electromagnetic field with sensor
Load control relay availability	
0	without relay
2	with relay
this third interface is out of use	
Second interface availability	
8	PLC DCSK interface
9	PLC G3 interface
Design	
2	Multiple ratio meter with optical reader and with Sealed function button
T	Meter with tariff display
Direct connection with rated and maximum current 5(80) A	
Measured energy type	
A	Active energy measurement
AR	Active and reactive energy measurement

TABLE-2

4. INTERFACE DESCRIPTION

Depending on the version, the meters provide the ability to transmit measurement information via standard interfaces .

List and features of interface and markings of the interfaces on the nameplate of the meter are given in Table 3.

Interface	Definition
PLC DCSK	Interface for data transmission on power lines with modulated signals ➢ Marked as "PLC" on the nameplate ➢ Exchange rate up to 150 Kbps ➢ CENELEC-A Frequency tape (10kHz - 95kHz). ➢ DCSK modulation
PLC G3	Interface for data transmission on power lines with modulated signals ➢ Marked as "PLC3" on the nameplate ➢ Exchange rate up to 150 Kbps ➢ CENELEC-A Frequency tape (10 kHz – 500 kHz). ➢ OFDM modulation.

TABLE-3

5. PROCESSING OF MEASURED VALUES (HARDWARE & SOFTWARE)

It has been observed that the software integrity is protected by the checksum, which is the relevant part of the programming code.

In case of software change, the manufacturer has to notify the notified body of the new software and version.
The software list is given in Table 4.

Software	Software Calculator	Software Version Displayed on Meter LCD	Ability to Measure Reactive Energy	Explanation
EM0522.v.2.04.154.hex	3D6C0627	0522F2.04	No	Two elements, one direction, PLC DCSK
EM0523.v.2.04.154.hex	B1EC700C	0523F2.04	No	Two elements, two directions, PLC DCSK
EM0562.v.2.04.154.hex	EEE56293	0562F2.04	No	Two elements, one direction, PLC G3
EM0563.v.2.04.154.hex	9BF8F19F	0563F2.04	No	Two elements, two directions, PLC G3
EM0566.v.2.04.154.hex	0BF8EF01	0566F2.04	Yes	Two elements, one direction, PLC G3
EM0567.v.2.04.154.hex	A934365C	0567F2.04	Yes	Two elements, two directions, PLC G3

TABLE 4

5.1 Display of Measurement Results

The meter has a built-in backlit LCD display. The screen shows the next data and information.
-Shows the measured parameter and unit.(A; V; kW; kWh)
-Indicates the reverse current direction in the first and second measuring element.
-Indicates that the current strength in the first and second measuring elements is not equal.
-Indicates that the communication session between the meter and other external devices is in progress.
-Indicates that the load is cut off for the consumer. (closed load control relay)
-Indicates whether the meter case and terminal cover are opened.

5.2 Safety and Protection of Meters

It has been observed that the device before the B module certification and conformity assessment is secured as follows:
-It has been observed that the protection against tampering with the meter system is fixed with two screw sealing positions in the meter casing.
-Protection against interference with optical interfaces has been observed to be provided with a screw seal on the cover of the optical port.
- It has been observed that protection against access to the meter terminal is provided by the sealed position of the screw fixing the terminal cover.

Access to the data is only possible through special software after entering the password.
The user password only allows data to be read from the meters. It has been determined that data cannot be written to the meter with the user password.
The operator password allows data to be entered and read.
It has been observed that the meters can only be intervened by the relevant authorized service.

6. ISSUES OUTSIDE THE SCOPE OF THE MID

It has been observed that the meter in question also has a reactive measurement feature.
As a result of the tests performed, it was observed that the reactive meters of the same model, which are outside the scope of MID, were designed in accordance with the relevant standards in terms of bidirectional measurement.

7. NORMATIVE DOCUMENTS BASED ON CERTIFICATION

- EMC and Metrological test reports made by ELDAŞ Test Laboratory dated -25.03.2022
  Report No: (220112-01)

- EMC, Metrological and Durability test reports made by UKR Test Center dated 16.02.2020
  Report No: (0215-4-2020) , (170-5-2021)

-NIK 2100 User Manual

-NIK 2100 Technical documents

- NIK 2100 WELMEC 7.2 Software Verification Reports

8. LABEL INFORMATION

It has been observed that the quality of texts and symbols provides clear images throughout the meter's lifetime.
It has been determined that the marking is made in Ukrainian or in the language specified in the supply contract.
It has been observed that offset printing or marking is done in a way that does not impair quality.

An example of the NIK 2100 XP6T.2X0X.X.XX meter is shown in Figure 1.

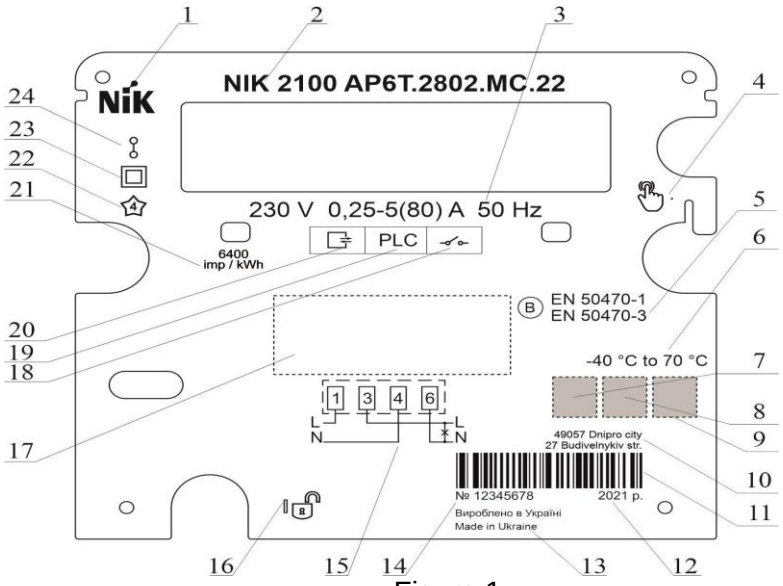

Figure 1

1. Registered trademark
2. Meter version
3. Main technical specifications (reference voltage, minimum, reference and maximum current, reference frequency)
4. "View" button
5. Symbol of the accuracy class of the meter for measuring active energy and related standards
6. Operating temperature range
7. First location for certification marks
8. Second position for certification marks
9. Third position for certification marks
10. Manufacturer's address
11. Barcode
12. Indication of the year of issue of the meter
13. Inscription "Made in Ukraine"
14. Factory number according to the manufacturer's numbering system
15. Connection diagram of the meter
16. Function button mark
17. Space for additional marking at the request of the consumer. Interface and relay plate
18. Display of the load control relay
19. Display of the second interface; the mark shown in the figure corresponds to the PLC interface
20. Display of "Optical Port" interface

21. Pulse output constant of the meter
22. Marking of 4 kV insulation test voltage (marks in case of customer requirements)
23. Marking of class II meter case protection
24. Marking the number of measuring elements

9. MECHANICAL SEALING

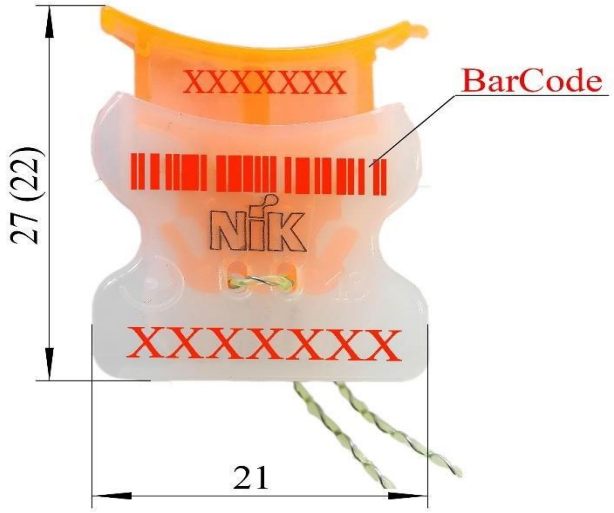

Figure 2 Example of security seal

Figure 2 shows an example of the Technical Control Unit's security seal. Vertical dimensions: 27 mm - for open seal and 22 mm - for closed seal.

The figure in red shows the positions of the following variables: XXXXXXX - The unique serial number of the seal.

BarCode - The barcode of the serial number in EAN8 format. Permanent assignment:

"NIK" – registered trademark of the manufacturer.

The dimensions in Figure 4 are given in mm.

10. SOFTWARE SEALING

After software is written to a microcontroller, a manufacturer's programming unit bytes intelligently compares the contents of the microcontroller memory for their accuracy and notifies the operator if errors are detected.

The software design includes a unit that checks the software file integrity in the microcontroller memory.

If an incorrect calculator value is detected during software startup or regular check, the software displays a corresponding error on the meter display.

To protect software from tampering, a software read protection mechanism provided by a microcontroller manufacturer is used.

When flashing the controller with equipment other than production, the firmware file is not additionally modified with the addition of the checksum value, and the program always returns an error.

11. LCD SCREEN READING

The meters have a liquid crystal display (hereinafter - LCD) shown in Figure 2.

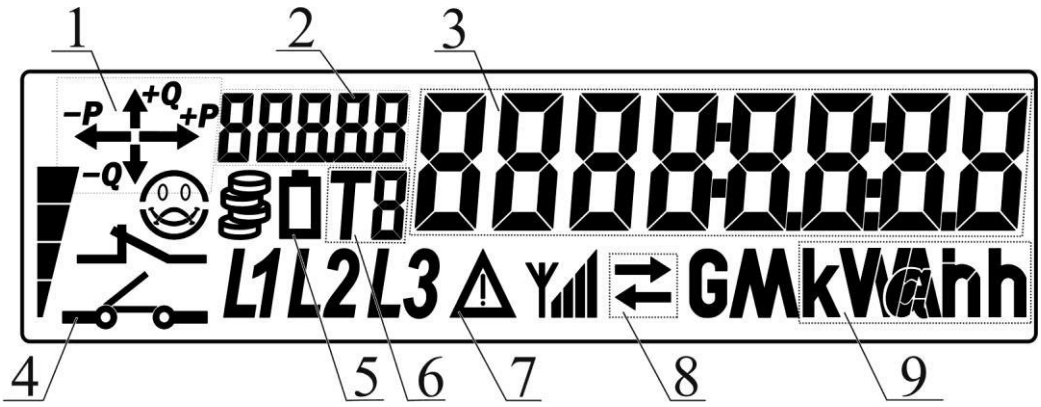

Figure 3. LCD view of meters

Figure 4 shows the following items of the LCD:

1. Instrument cluster of energy angle dial:

1.1. « +P » active energy (A+);

1.2. « -P » active energy (A-);

2. Display group of OBIS code of the displayed parameter.

3. Group showing the value of the parameter being measured.

4. Load control relay status indicator. The « » symbol indicates an open relay.

5. Battery charge indicator « ». If the icon is displayed on the display, the battery needs to be replaced.

6. « T8 » The number of the currently active rate.

7. Internal error indicator « » flashes when an error occurs or during emergency speed.

8. Data exchange via the interface display « ».

9. Unit instrument cluster:

9.1. « A » current in amperes;

9.2. « » voltage in volts ; V

9.3. « kW » active power in kilowatts;

9.4. « kvar » reactive power in kilowatts;

9.5. « kW h » active energy in kilowatt-hours;

9.6. « kVarh » reactive energy in kilowatt-hours;

9.7. « h » network frequency.

Unmarked and undefined indicator elements of this type in meters are not applied.

12. OVERVIEW OF THE METER

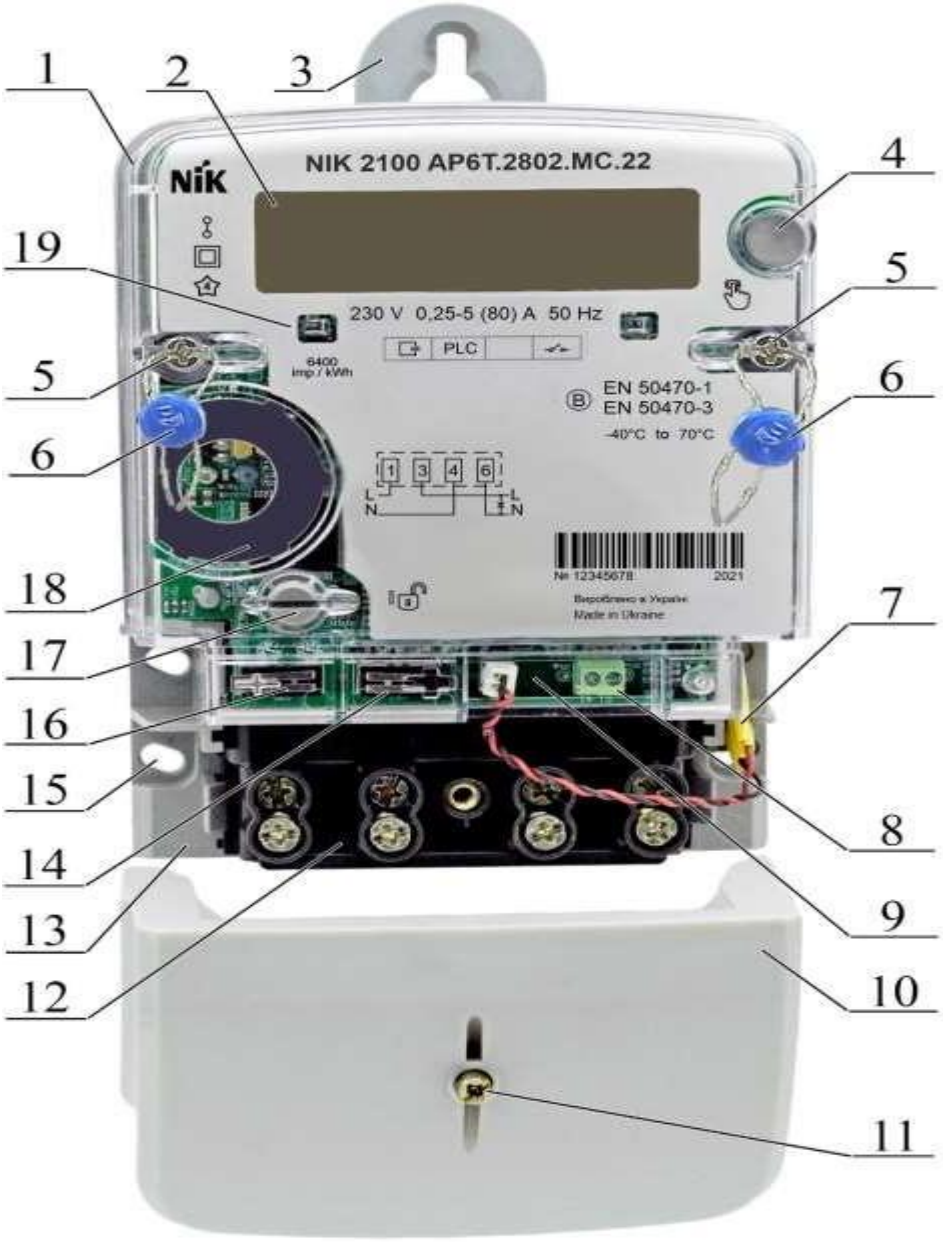

Figure 4

1. Cover of the meter;
2. Liquid crystal indicator;
3. Clamp for mounting the meter;
4. "View" button;
5. Sealing screws of the meter casing;
6. Seals of the meter casing;
7. Backup power battery;
8. Connector of electrical test output;
9. Printed circuit board with electronic components;
10. Terminal cover;
11. Sealing screw of terminal cover;

12. The block of clamps;
13. Base of the meter;
14. Sensor for detecting terminal cover opening;
15. Holes in the base for mounting the meter;
16. Sensor for detection of the meter cover opening;
17. Functional button;
18. Optoport;
19. LED test output when measuring active energy and its designation (the constant of main pulse test output of the meter).

13. GENERAL DIMENSIONS AND CONNECTION DIAGRAMS OF METERS

. The dimensions in Figure 6 are given in mm.

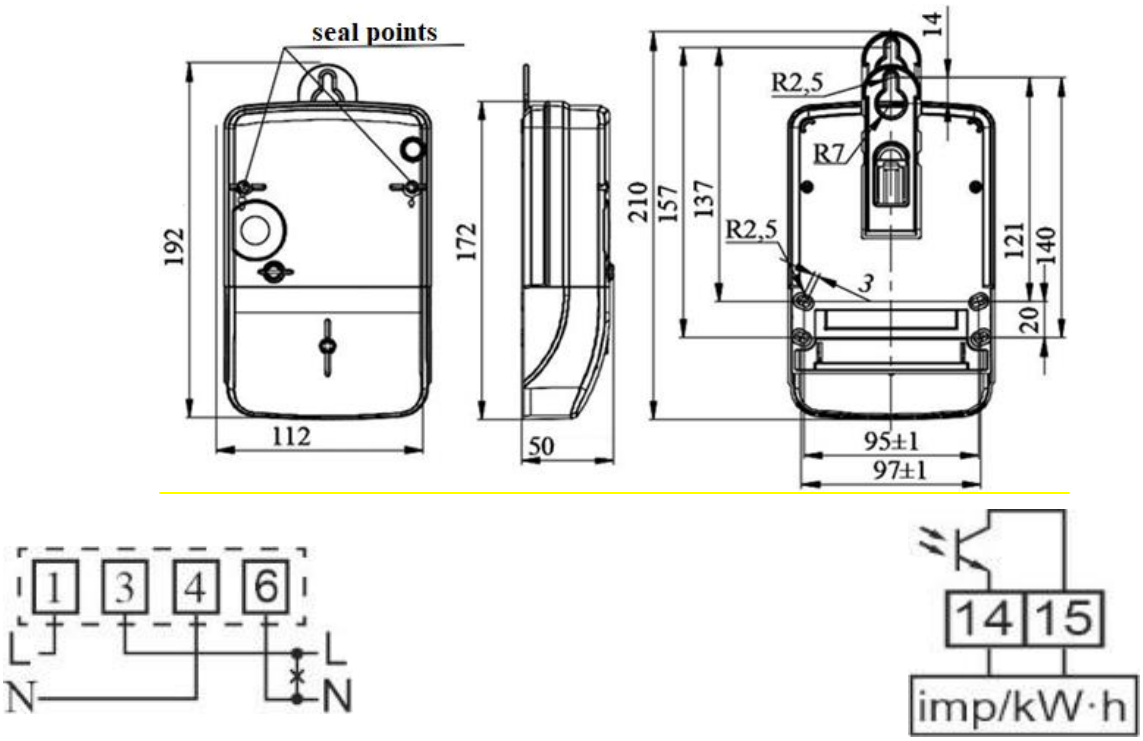

Figure 5

CONTROL
Ömer Faruk İLDAY
Technical Expert
Date:20.06.2022