



EU - TYPE EXAMINATION CERTIFICATE



No. SK 18 - 082 MI-003 Rev. 0

Issued by **Slovenská legálna metrológia, n. o.** Notified Body number **1432**
Hviezdoslavova 31
974 01 Banská Bystrica
Slovak Republic

In accordance with Annex II, Module B to Government Ordinance of the Slovak Republic No. 145/2016 Coll. relating to the making available on the market of measuring instruments, which implements, in Slovakia, the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments as later amended (MID).

Applicable essential requirements Annex I and Annex V to MID

Manufacturer **LUNA ELEKTRİK ELEKTRONİK SANAYİ ve TİCARET A.Ş.**
A.O.S.B. 10001 Sokak No:9
Çiğli - İzmir, Turkey

Applicant **Manufacturer**

Measuring instrument **Active electrical energy meter**

Type	LUN23
Trade mark	see Descriptive annex
SW version	10.01

Environment classes

- climatic	(-40 to +70) °C
- mechanical	M1
- electromagnetic	E2

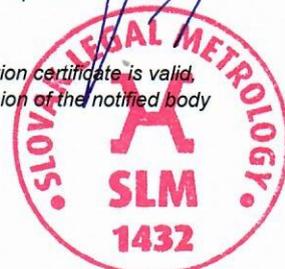
Description and documentation The principal technical and metrological data, characteristics, instrument description and approval conditions are set out in the Descriptive annex to this EU - type examination certificate (9 pages), which is part of this EU - type examination certificate. The test reports, designs, schematic diagrams and documentation used during certification process are recorded under reference folder LUNA_LUN23_0_00.

Valid until **10 May 2028**

Date of issue 10 May 2018



Ing. Štefan Král, PhD.
Representative of Notified Body



Where the instrument is subject to other Directives covering other aspects, this EU - type examination certificate is valid, assuming that the instrument conforms to the provisions of those Directives. Without written permission of the notified body this certificate may be reproduced only as a whole.

1. Designation

Three-phase static active electrical energy meter type **LUN23** (Fig. 1 and 2) is intended for the measurement of the active electrical energy in three-phase 4-wires power network in residential (households), commercial, light industrial; indoor and outdoor use.

The meter is intended for *direct connection* to the distribution network. It measures the active energy in the class B or C as per harmonized standards EN 50470-1 and EN 50470-3 in the import and export direction.

2. Description

Essential parts of the electricity meter (Fig. 3):

- Measurement sensors;
- Main PCB, MCU, supply circuit;
- terminal block and terminal cover;
- LCD;
- housing of the meter.

Non-essential parts of the electricity meter:

- communication modules (see section 4);
- latching relay (optional).

2.1 Metrological functions

2.1.1 Essential functions

- measuring, memorizing and displaying of the active electrical energy (import and export separately);
- multi-tariff (8 tariff-rates) measurement of the active electrical energy (optional).

2.1.2 Non-essential functions

- simultaneous measurement of active and reactive electrical energy fully-compatible as a whole;
- measuring, memorizing and displaying of the reactive electrical energy (import and export separately);
- measurement of electrical parameters (V_{rms} , I_{rms}^* , neutral current, Power Factor, Frequency);
- real time clock and calendar;
- manual or automatic ending the billing period;
- automatic daylight saving on RTC;
- harmonic measurement;
- recording date and time of last 32 supply interruptions;
- event logs of: main cover and terminal cover tampering, low battery, real time clock failure, magnetic intervention, phase interruption, etc.;
- maximum demand recording (monthly report; date and time of occurrence);
- load profile recording;
- battery operation.

Detailed descriptions and operation of the meter, block and connections schemes, wiring diagrams and values of parameters may be found in manufacturer's documentations stored in folder LUNA_LUN23_0_00.

* Note: rms – root mean square

2.2 Software

Software version *	10.01
CRC checksum	0x2B4C24AB

Note:

*) : Software version is shown on a display by pressing the meter's button (displaying OBIS code 96.97).

2.3 Optional equipment and functions subject to MID requirements

- not applicable.

2.4 Integrated equipment and functions not subject to MID

- function button;
- terminal and main cover sensors;
- Real Time Clock;
- internal non-volatile memory (EEPROM or SPI Flash, optional);
- see also section 2.1.2 and section 4.

The above mentioned parts (section 2.4) are outside the scope of Annex V to Directive 2014/32/EU.

3. Technical and metrological data

Parameter	Unit	Value
Reference voltage U_n	V	3 x 230/400
Reference frequency f_n	Hz	50
Reference current I_{ref}	A	5
Maximum current I_{max}	A	100
Accuracy class (index)	-	B or C
Transitional current I_{tr}	A	0,5
Minimum current I_{min}	A	0,15
Meter constant	imp/kWh	1000
Mechanical class	-	M1
Electromagnetic class	-	E2
Climatic environment	°C	-40 to 70
Protection degree	-	IP54
Installation conditions	-	outdoors (humidity without moisture condensation)

4. Interfaces and compatibility conditions (optional)

- Optical Communication Port;
- Serial Interface RS-485;
- PLC communication interface;
- RF communication interface;



- GSM/GPRS communication interface;
- Demand reset button;
- RF-ID module;
- relay output;
- magnetic field detection sensor;
- audible alarm (“buzzer”).

5. Marking and inscriptions

The following data shall be marked on the electricity meter (Fig. 4):

- a) manufacturer’s mark or name;
- b) manufacturer’s postal address (article 8, point 6 of Directive 2014/32/EU);
- c) type of the meter;
- d) serial number and year of production;
- e) reference voltage (U_n);
- f) reference current (I_{ref});
- g) minimum current (I_{min});
- h) maximum current (I_{max});
- i) reference frequency (f_n);
- j) class index (B or C);
- k) temperature range of operation;
- l) electromagnetic and mechanical class;
- m) the connection mode for which the meter is specified;
- n) meter constant;
- o) meter directionality type;
- p) EU-type examination certificate number SK 18 – 082 MI-003;
- q) CE marking and supplementary metrology marking according to Article 21 and Article 22 of Directive 2014/32/EU (CE marking and supplementary metrology marking following with number of a notified body).

Any inscriptions on the meter must be in the official language; the international abbreviations are admitted. Markings on the measuring instrument shall comply with the requirements of Article 9, Annex 1 to Directive 2014/32/EU.

5.1 Designation of trademarks on the electricity meters

Manufacturer may use the following trademark on its electricity meters:



6. Security measures

The electricity meter shall be protected against unauthorised manipulation by two sealing marks which secure the connection of the front cover to the base of the meter (Fig. 5).

- A.) meter cover 2 x

After the installation the meter should be sealed by *service* seals according to national requirements:

- B.) terminal cover 2 x



7. Requirements on production, putting into use and utilization

7.1 Requirements on production

- no special requirements identified.

7.2 Requirements on putting into use

- electricity meters must be installed in accordance with requirements listed in installation and user manual issued by the manufacturer (see documentation folder LUNA_LUN23_0_00).

7.3 Requirements for utilization

- in accordance with requirements of the manufacturer's documentation.

8. Documentation used for assessment purposes

- evaluation report No. 048/1432/17 MI-003 of 09/05/2018, issued by SLM NB 1432;
- manufacturer's technical documentation is stored in documentation folder LUNA_LUN23_0_00.

9. Standards and regulations used for assessment purposes

9.1 Regulations, harmonized standards and normative documents

- Government Ordinance of the Slovak Republic No. 145/2016 Coll. relating to the making available on the market of measuring instruments, which implements in Slovakia, the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments as later amended;
- EN 50470-1:2006;
- EN 50470-3:2006;
- EN 62058-31:2010.

9.2 Further applied standards and documents

- WELMEC Guide 11.1, Issue 4;
- WELMEC Guide 7.2 2015.



10. Final provisions on electricity meter

Construction, technical and metrological parameters of the meter must comply with the documentation presented within the process of type certification. All the characteristics of the measuring instrument (including those not mentioned) shall meet the respective requirements of Government Ordinance of the Slovak Republic No 145/2016 Coll. relating to the marking available on the market of measuring instruments, which implements, in Slovakia, the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the marking available on the market of measuring instruments as later amended (MID).

11. Figures



Fig. 1: Electricity meter LUNA type LUN23



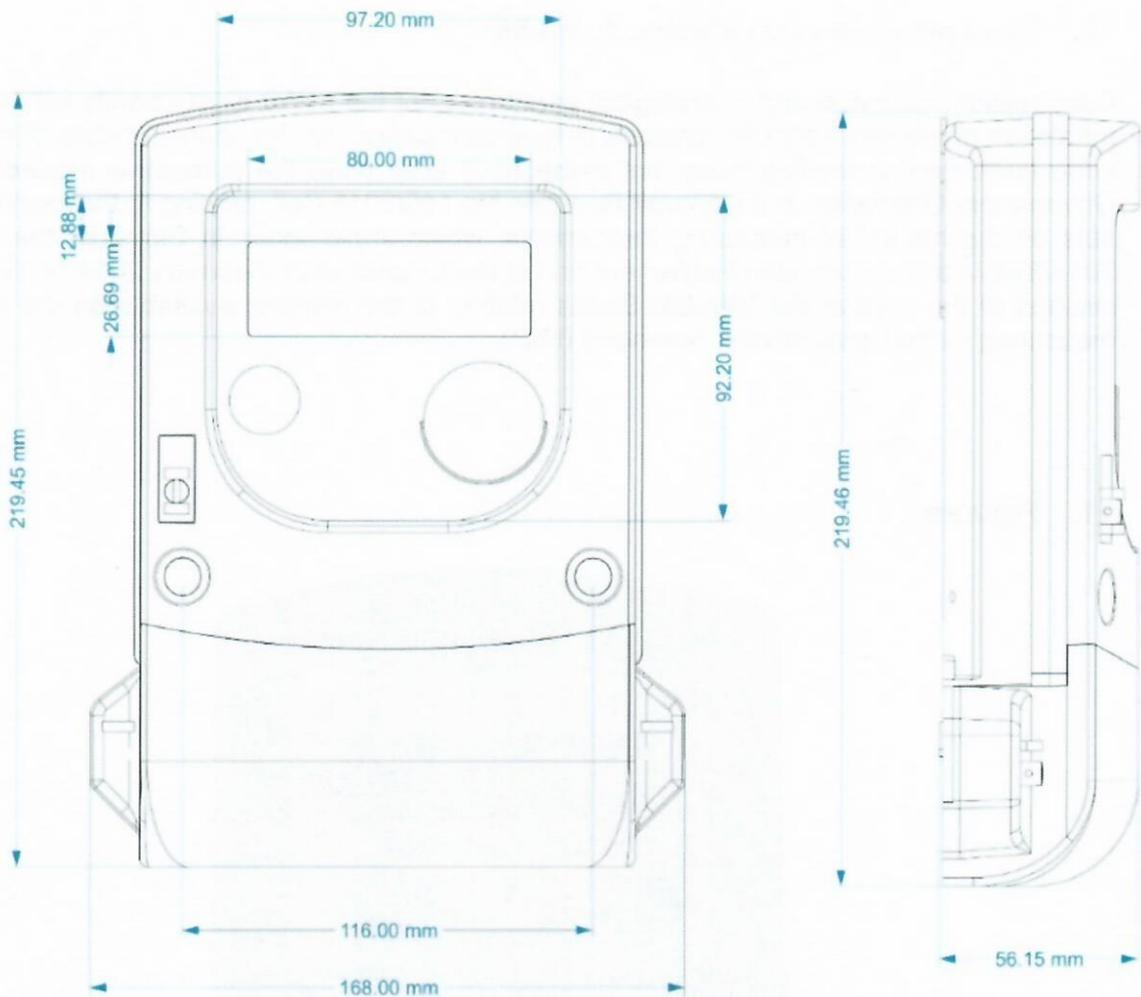


Fig. 2: View and main dimensions of electricity meter LUNA type LUN23

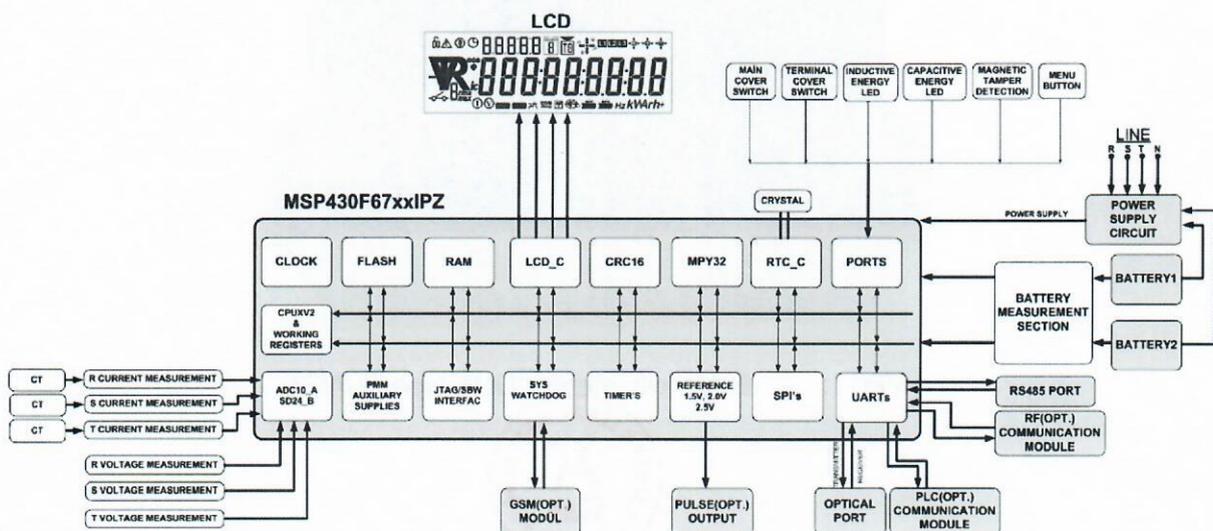


Fig. 3: Block diagram of electricity meter LUNA type LUN23





Fig. 4: Example of the name-plate of the LUNA type LUN23 meter

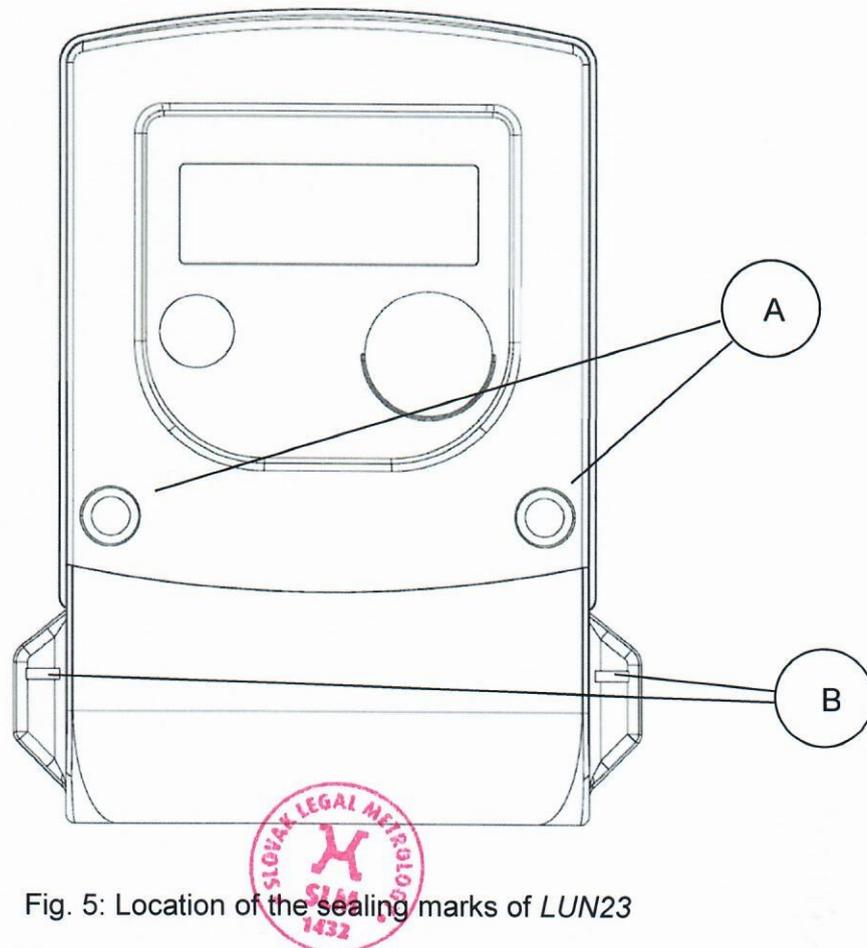


Fig. 5: Location of the sealing marks of LUN23

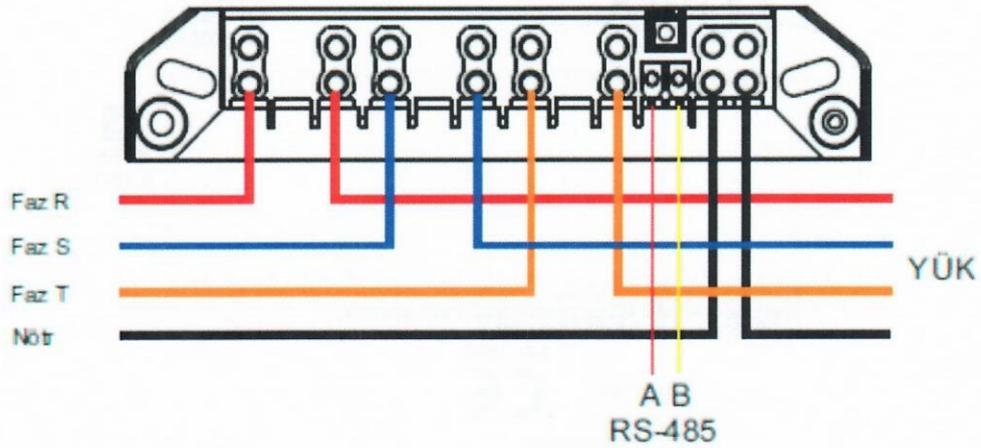


Fig. 6 Connection diagram of LUN23



12. Influence factors for temperature, frequency and voltage variation

During the type examination the influence factors for temperature, frequency and voltage are determined at each load. The sum of square values (δ) at tested loads has been calculated from the following formula:

$$e_c = \sqrt{e^2(l, \cos \varphi) + \delta^2(T, l, \cos \varphi) + \delta^2(U, l, \cos \varphi) + \delta^2(f, l, \cos \varphi)}$$

with

$e(l, \cos \varphi)$	<i>the intrinsic error of the meter at a certain load</i>
$\delta(T, l, \cos \varphi)$	<i>additional percentage error due to the variation of the temperature at certain load</i>
$\delta(U, l, \cos \varphi)$	<i>additional percentage error due to the variation of the voltage at certain load</i>
$\delta(f, l, \cos \varphi)$	<i>additional percentage error due to the variation of the frequency at certain load</i>

Data of the specimen representative of the type:

Type of the measuring instrument	-	LUN23
Serial number of the sample	-	170815-02/1
Test report no.	-	EL17-0029/R1 09-17
Reference current I_{ref}	A	5
Minimum current I_{min}	A	0,15
Transitional current I_{tr}	A	0,5
Maximum current I_{max}	A	100
Reference voltage U_n	V	3 x 230/400
Reference frequency f_n	Hz	50
Accuracy class	-	C

Values of error $\delta(T, U, f)$:

		Ambient Temperature Range						
Current	PF cos	55 to 70 °C	40 to 55 °C	30 to 40 °C	5 to 30 °C	-10 to 5 °C	-25 to -10 °C	-40 to -25 °C
I_{min}	1	0,37	0,26	0,17	0,14	0,27	0,44	0,59
I_{tr}	1	0,29	0,22	0,11	0,07	0,25	0,39	0,51
$10I_{tr}$	1	0,32	0,20	0,08	0,08	0,22	0,29	0,42
I_{max}	1	0,33	0,22	0,14	0,09	0,23	0,29	0,43
I_{tr}	0,5 ind	0,26	0,19	0,11	0,11	0,28	0,39	0,50
$10I_{tr}$	0,5 ind	0,31	0,26	0,20	0,14	0,18	0,26	0,38
I_{max}	0,5 ind	0,49	0,48	0,48	0,35	0,33	0,35	0,43
I_{tr}	0,8 cap	0,29	0,19	0,11	0,09	0,26	0,37	0,50
$10I_{tr}$	0,8 cap	0,26	0,16	0,08	0,07	0,24	0,34	0,46
I_{max}	0,8 cap	0,37	0,26	0,20	0,13	0,18	0,40	0,49

