



EC-TYPE EXAMINATION CERTIFICATE

Number: TCM 221/14 - 5136

Addition 2

This addition replaces all previous versions of this certificate in full wording.

Page 1 from 8 pages

- In accordance:** with Directive 2004/22/EC of the European Parliament and of the Council as amended implemented in Czech Republic by Government Order No. 464/2005 Coll. as amended that lays down technical requirements on measuring instruments.
- Manufacturer:** Zakład Elektronicznych Urządzeń Pomiarowych POZYTON Sp. z o.o.
ul. Staszica 8
42-200 Częstochowa
Poland
- For:** active electrical energy meter - 1-phase
type: LABM
Accuracy class: A or B
mechanical environment class: M1
electromagnetic environment class: E2
temperature range: -40 °C...+70 °C
- Valid until:** 13 January 2024
- Document No:** 0511-CS-A003-14
- Description:** Essential characteristics, approved conditions and special conditions, if any, are described in this certificate.
- Date of issue:** 21 December 2015

Certificate approved by:



RNDr. Pavel Klenovský

1. Meter Characteristics

The electricity meter LABM is a 1-phase up to four-tariff active energy meter designed to measure residential and light industrial energy consumption.

It measures active energy in classes A or B as per EN 50470-1 and EN 50470-3 in both import and export directions. It measures reactive energy in classes 2 or 3 as per EN 62053-23 and in class 1 as per EN 62053-24 in both import and export directions or in four quadrants.

Besides energy, it can also measure, load profile of active and reactive power in both directions 15, 30 or 60 minutes of integration period, maximum demand, measurement and registration of active power over-limit consumption, instantaneous effective values of voltage, current, power and frequency and can register voltage interruptions. Meter has also additional register of active energy, counted when strong magnetic field occurs in meter's vicinity.

Energy values measured (e.g. up to four consumption and supply tariffs, total energy across all tariffs) with additional information as actual active tariff, power direction are shown on the LCD which can be optionally backlighted. Values to be displayed are configurable. Metering data measured by the meter can be scrolled manually using capacitive switch on the meter front or automatically in predefined sequence of LCD screens (upon the customer's definition).

Mechanical switch on the meter front is used for: resetting of billing data, unlocking of meter parameterization that is available via optical interface and manually setting of date and time.

Measured values can be read from LCD also in no power mode. To activate this mode mechanical switch must be pushed for at least 5 seconds.

Meter tariffs are switched by internal real time clock. Meter LABM is equipped with 2 batteries: First for internal clock (CR2032 type), second one (AA, LR6 type) enables readout of metering data in case of voltage failure. All billing data are registered in non-volatile memory.

As a standard the meter is equipped with an optical interface for local readout, configuration and parameterization and with optical interface used for operating with external communication modules.

On the nameplate test LED for testing purposes is placed.

Hardware Version: LABM_V4

Firmware Version: v 01.01 (CRC: 3915)

v 01.02 (CRC: 5B28)

v 01.03 (CRC: BE99)

Type designation including internal identification of configuration is:

LABM-

bT66CEFMQY-D09EF0103(example)

where (internal identification of configuration):

bT66	C	E	F	M	O	Q	V	W	Y-	D	09	E	F	0103
														Software version
														Reference current – 5 A
														Reference voltage – 230 V
														Communication interfaces
														Hardware generation
														Optical interface blocking switch
														Relay output
														High current relay for load control
														Optional remote date and time programming by communication interfaces
														External battery input
														Maximum demand indicator
														Sensor of magnetic field
														Remote configuration blocking switch
														Sensor of cover opening
														Manufacturer marking

Detailed explanation of letters/digits – see user`s manual



2. Main Metrological Characteristics

Measurement	- active energy in 1-phase 2-wire distribution network - measurement both import and/or export of energy - up to 4 tariffs (tariffs are switched by internal RTC)
Measurement Method	Static meter Current input with current transformer, voltage input with resistor divider
Class	A or B
Display	LCD
Reference Voltage U_n	230 V
Reference Frequency f_n	50 Hz
Reference Current I_{ref}	5 A
Transitional Current I_r	0,5 A
Minimum Current I_{min}	0,25 A
Starting Current I_{st}	20 mA
Maximum Current I_{max}	60 A
Constant (LED)	2400 imp/kWh
Specified Operating Temperature Range	-40°C...+70°C (3K7) - (LCD visible from -35°C)*
Degree of Protection Against Dust and Water	IP54
Protective Class (Electrical)	II
Mechanical Environment	M1
Electromagnetic Environment	E2

*) At -40 °C, the meter measures correctly but the measurement data displayed are illegible. They can be obtained either through the optical interface or read on the display at a higher temperature (≥ -35 °C).

3. Interfaces

- Optical interface: as per EN 62056-21
- Optical interface used for operating with external communication modules
- RS485 interface (option)

4. Main Functional Characteristics

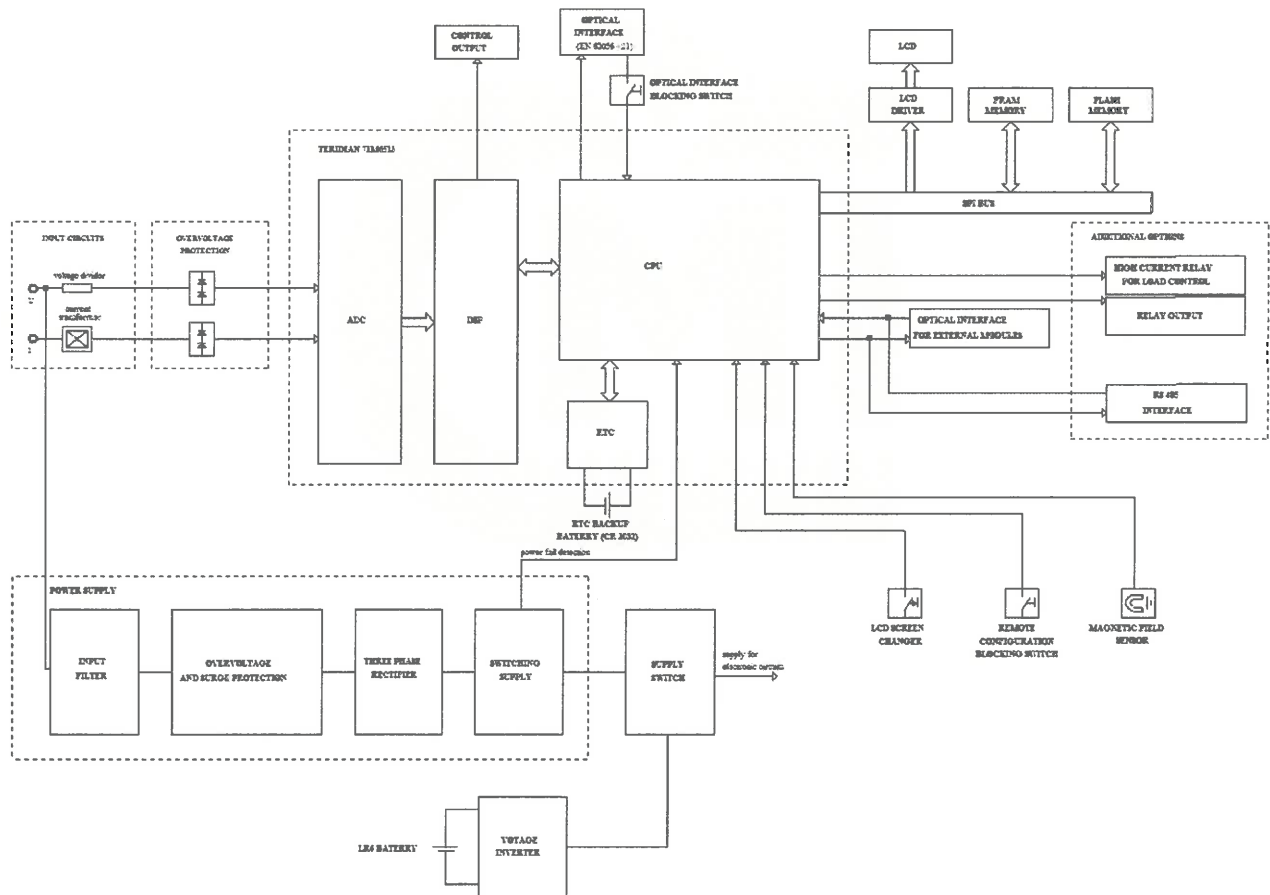
- Internal tariff switching – energy import and energy export can each be split up into 4 tariffs
- Ability to display energy values with up to 3 decimal places
- Load profiles
- Number of voltage interruptions
- Additional register of active energy counted when strong magnetic field occurs in meter vicinity
- Relay output (option)
- High current relay for load control (option)



The meters also measure additional values (and display them if so configured):

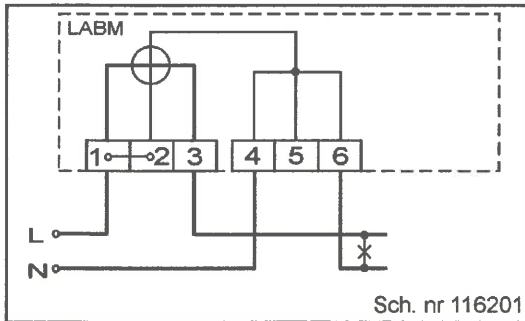
- Reactive power and energy in both directions or in four quadrants
- 10 maximum active power values (value, date, time) in both directions
- Instantaneous value of active and reactive power with actual cycle minute (both directions)
- Instantaneous effective voltage value
- Instantaneous effective current value
- Instantaneous power
- Frequency
- Date and time of last billing period closing
- Historical active and reactive energy counters (both directions or for reactive energy in four quadrants, all tariffs and total)
- Maximum demand value programmed into meter's memory

5. Meter Block Diagram

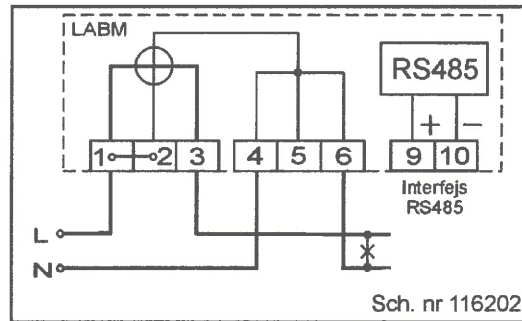


6. Wiring Diagrams

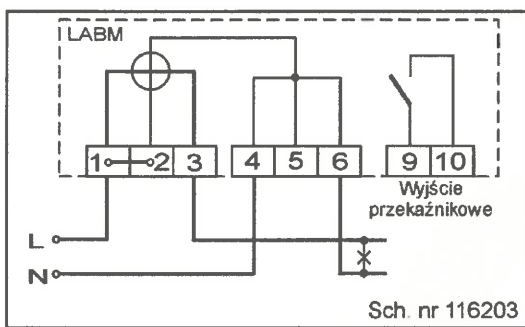
Standard



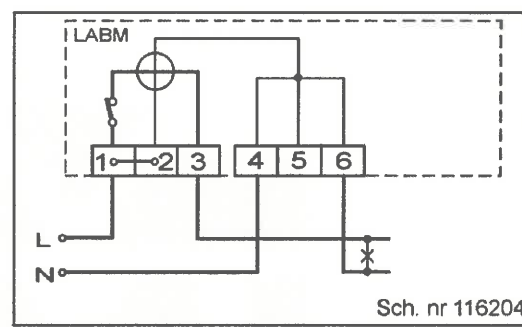
Optional – RS485 interface



Optional – Relay output



Optional - High current relay for load control



7. Photograph of Meter



Location of securing marks



8. Type test

Meters were tested at the Czech Metrology Institute Brno as per EN 50470-1 and EN 50470-3 standards. Test results are presented in Test Report No. 6011-PT-TS001-14, 6011-PT-TS032-14 and 6011-PT-TS034-15.

The meters complied with all test requirements.

9. Meter Marking

9.1 Name-plate

The following data shall be quoted on the meter name-plate:

- Manufacturer's name or his trade mark;
- Type Designation or meter commercial name;
- "CE" marking and supplementary metrological marking;
- Number of EC-type examination certificate;
- Serial number and year of production;
- Class index;
- Specified operating temperature range (in °C or as IEC environmental class);
- Types of distribution network (graphical symbol);
- Reference voltage;
- Reference (rated) current;
- Maximum current;
- Minimum current;
- Reference frequency;
- Constant of meter;
- Sign of double square for meters with protective class II.

9.2 Supplementary Documentation

The meter shall be accompanied by supplementary documentation. A batch of identical meters intended for a single customer can be accompanied by a single copy of supplementary documentation only. This documentation shall as a minimum include all data listed on the name-plate (see 9.1, except for serial number and production year) and also the following:

- Brief description of meter, including values / data measured, data logging and display possibilities
- Wiring diagrams (the wiring diagram shall be also shown on the meter case)
- Storage conditions
- EMC data
- Starting current
- Transitional current
- Consumption of voltage and current circuits
- Maximum cross-section of connecting conductors
- Mass and dimensions
- Way of meter disposal

9.3 Sealing

The meter is sealed by two manufacturer's official marks (Module D of MID) or by two marks of notified body (module F of MID). These marks are pendent seals or stickers (position of marks - refer to Photograph of Meter).



10. Testing for declaration of conformity to type

The conformity assessment procedure consists of these tests (at reference conditions):

1. Test of no-load
2. Test of starting
3. Accuracy of meter (using test output)
4. Test of meter constant

Tests are performed in accordance with the EN 50470-1 and EN 50470-3 standards. Meter intrinsic errors $e(I, \cos \varphi)$ are measured at reference voltage 230 V, 50 Hz and currents and $\cos \varphi$ as given in tables below. After the test, the composite errors e_c are calculated at rated operating conditions according to the formula as follows:

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

where

- $e(I, \cos \varphi)$ - intrinsic error for a given current and $\cos \varphi$;
- $\delta(T, I, \cos \varphi)$ - additional percentage error due to variation of temperature in rated temperature range and for a given current and $\cos \varphi$; the value was determined during type examination;
- $\delta(U, I, \cos \varphi)$ - additional percentage error due to variation of voltage $\pm 10\% U_{ref}$ for a given current and $\cos \varphi$; the value was determined during type examination;
- $\delta(f, I, \cos \varphi)$ - additional percentage error due to variation of frequency $\pm 2\% f_{ref}$ for a given current and $\cos \varphi$; the value was determined during type examination.

Table given values are substituted for $\delta(T, I, \cos \varphi)$, $\delta(U, I, \cos \varphi)$, $e(I, \cos \varphi)$ in the formula. The meter is considered compliant if the composite errors are smaller than the maximum permissible errors MPE.

MPE values for class A and B are given in Directive 2004/22/EC of the European Parliament and of the council on measuring instruments, Annex MI-03, Table 2.

Calculation of composite error												
Current	cos φ	Additional error (%)						Intr. error $e(I, \cos \varphi)$	MPE (%) for class B in temp. ranges			
		$\delta(T, I, \cos \varphi)$				$\delta(U, I, \cos \varphi)$	$\delta(f, I, \cos \varphi)$		1	2	3	4
		1	2	3	4							
I_{min}	1	0,30	0,44	0,58	0,84	0,02	0,01	0,07	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
I_r	1	0,31	0,53	0,68	0,84	0,02	0,01	0,06	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,5i	0,87	1,49	2,23	2,77	0,02	0,01	0,32	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,8c	0,09	0,28	0,17	0,26	0,01	0,01	0,09	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
I_{ref}	1	0,35	0,51	0,70	0,91	0,01	0,01	0,08	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,5i	0,82	1,60	2,17	2,72	0,01	0,01	0,18	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,8c	0,10	0,26	0,23	1,04	0,01	0,01	0,03	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
I_{max}	1	0,32	0,56	0,75	0,74	0,01	0,01	0,10	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,5i	0,73	1,55	2,08	2,20	0,01	0,01	0,16	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$
	0,8c	0,11	0,32	0,19	0,23	0,01	0,01	0,19	$\pm 2,0$	$\pm 2,5$	$\pm 3,5$	$\pm 4,0$

- Temperature Range 1: +5 °C thru +30 °C
- Temperature Range 2: -10 °C thru +5 °C and +30 °C thru +40 °C
- Temperature Range 3: -25 °C thru -10 °C and +40 °C thru +55 °C
- Temperature Range 4: -40 °C thru -25 °C and +55 °C thru +70 °C

