Slovenský metrologický ústav
Karloveská 63, 842 55 Bratislava 4,
Slovenská republika

IAF — MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

⊕ **SNAS**
Reg. No. 101/P-035

CERTIFIKÁT EÚ SKÚŠKY TYPU
EU – type examination certificate

Číslo dokumentu: *Document number:*	**SK18-MI003-SMU020** **Revízia 6** Revízia 6 nahrádza certifikát zo dňa 21. marca 2023 *Revision 6* *Revision 6 replaces the certificate issued by March 21, 2023*

V súlade s:
In accordance with:

prílohou č. 2, Modul B nariadenia vlády Slovenskej republiky č. 145/2016 Z. z. o sprístupňovaní meradiel na trhu v znení nariadenia vlády SR č. 328/2019 Z. z., ktorým sa preberá smernica Európskeho parlamentu a Rady 2014/32/EU o harmonizácii právnych predpisov členských štátov týkajúcich sa sprístupnenia meradiel na trhu

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 as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., which implemented the Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments

Žiadateľ/Výrobca:
Issued to (Manufacturer):

Applied Meters, a.s.
Budovateľská 50, 080 01 Prešov, Slovenská republika

Druh meradla:
Type of instrument:

Elektromery na meranie činnej elektrickej energie (MI-003) / jednofázový statický elektromer
Active electrical energy meters (MI003)/ single–phase static electricity meter

Označenie typu:
Type designation:

AMS B3

Základné požiadavky:
Essential requirements:

príloha č. 1 a príloha č. 5 (MI-003) k nariadeniu vlády SR č. 145/2016 Z. z. v znení nariadenia vlády SR č. 328/2019 Z. z
Annex No. 1 and Annex No. V (MI-003) to Government Ordinance of the Slovak Republic No. 145/2016 Coll. as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll

Platnosť do:
Valid until:

1. februára 2028
February 1, 2028

Notifikovaná osoba:
Notified body:

Slovenský metrologický ústav   **1781**
Slovak Institute of Metrology   *1781*

Dátum vydania:
Date of issue:

26. septembra 2023
September 26, 2023

Základné charakteristiky, popis meradla a podmienky schválenia sú uvedené v prílohe, ktorá je súčasťou tohto certifikátu. Certifikát vrátane prílohy má spolu 21 strán.
Essential characteristics, instrument description and approval conditions are set out in the appendix hereto, which forms the part of the certificate. The certificate including the appendix contains 21 pages.

(pečiatka: NB 1781 — SLOVAK INSTITUTE OF METROLOGY Bratislava — SMÚ)

Ing. Viliam Mazúr
zástupca notifikovanej osoby
representative of notified body

Poznámka: Tento certifikát EÚ skúšky typu môže byť rozmnožovaný len celý a nezmenený. Bez podpisu a odtlačku pečiatky je neplatný.
Note: This EU-type examination certificate shall not be reproduced except in full. Certificates without signature and stamp are not valid.

Slovenský metrologický ústav
Karloveská 63, 842 55 Bratislava 4, Slovenská republika

History of the Certificate

Issue of the Certificate	Date	Modifications
SK18-MI003-SMU020	2. February, 2018	Initial certificate
SK18-MI003-SMU020 Revision 1	4. February, 2019	Changes in technical parameters and documentation
SK18-MI003-SMU020 Revision 2	25. February, 2020	Changes in technical parameters and documentation
SK18-MI003-SMU020 Revision 3	9. September, 2020	Changes in technical parameters and documentation
SK18-MI003-SMU020 Revision 4	11. January, 2021	Changes in technical parameters and documentation
SK18-MI003-SMU020 Revision 5	21. March 2023	Changes in technical parameters and documentation
SK18-MI003-SMU020 Revision 6	26. September 2023	Changes in technical parameters and documentation

1. Provisions and standards used for assessment

1.1 Generally binding instructions.

Meter type was examined in terms of request for given type provisions Government Ordinance of the Slovak Republic No. 145/2016 Coll. relating to the making available on the market of measuring instruments as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., which implemented 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 (next Government Ordinance).

Requirements are set out in Annex No. 1 and Annex No. 5 Active electrical energy meters (MI-003) to Government Ordinance of SR No. 145/2016 Coll. as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll.

1.1 Normative standards and other related standards

STN EN 50470-1 Electricity metering equipment (AC). Part 1: General requirements, tests and test conditions – Metering equipment (class indexes A, B and C) (2008)

STN EN 50470-3 Electricity metering equipment (AC). Part 3: Particular requirements – Static meters for active energy (class indexes A, B and C) (EN 50470-3:2022-08)

STN EN 62052-11 Electricity metering equipment (AC). General requirements, tests and test conditions – Part 11: Metering equipment

STN EN 62053-21 Electricity metering equipment (AC). Particular requirements. Part 21: Static meters for active energy (classes 1 and 2)

STN EN 62053-23 Electricity metering equipment (a.c.). Particular requirements. Part 23: Static meters for reactive energy (classes 2 and 3)

WELMEC 7.2 Software Guide

WELMEC 11.1 Common application for utility meters

WELMEC 11.3 Guide for sealing of Active Electrical Energy Meters and Gas Meters and Conversion Devices

2. Type marking

Single–phase static electricity meter type AMS B3

Marking of construction of the energy meter type AMS B3x_5-x_6A$x_8x_9x_{10}$Tx_{11}:

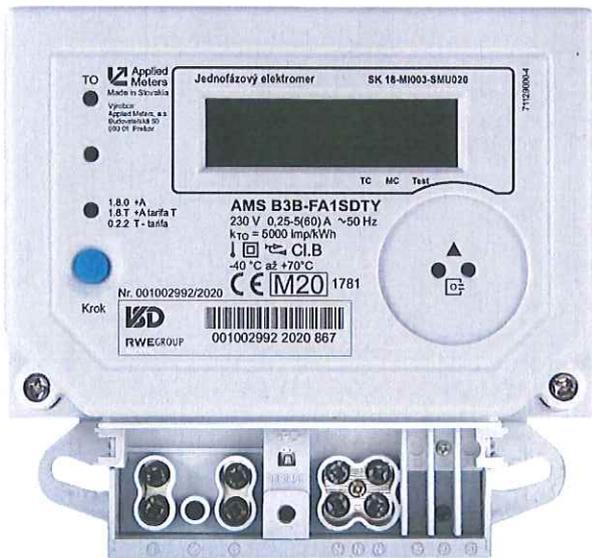| AMS B3		Type marking
x_5	current overload:	**3** – 200 %; **4** – 400 %; **5** – 500 %; **6** – 600 %; **8** – 800 %; **A** – 1000 %; **B** – 1200 %; **E** – 2000 %
x_6	execution:	**O** - multifunctional energy meter with LCD and without Real Time Clock **F** - multifunctional energy meter with LCD and Real Time Clock;
x_7	measured energy:	**A** - active energy; **R** – active and reactive energy;
x_8	connection to network:	**1** - single-phase two-wires; **3** – single-phase three-wires
x_9	current converter:	**S** – shunt; **T** - transformer
x_{10}	terminal version:	**D** - DIN terminal; **C** – BS terminal
T	processor :	type of used processor HT
x_{11}	special modules:	**Y**- auxiliary relay 2A connecting according to tariff tariff control: **E** – external power supply, **without E** – internal clock (time tables)/execution F **4** – interface RS 485

„ Single-phase static energy meter type AMS B3X-FA1SDT."
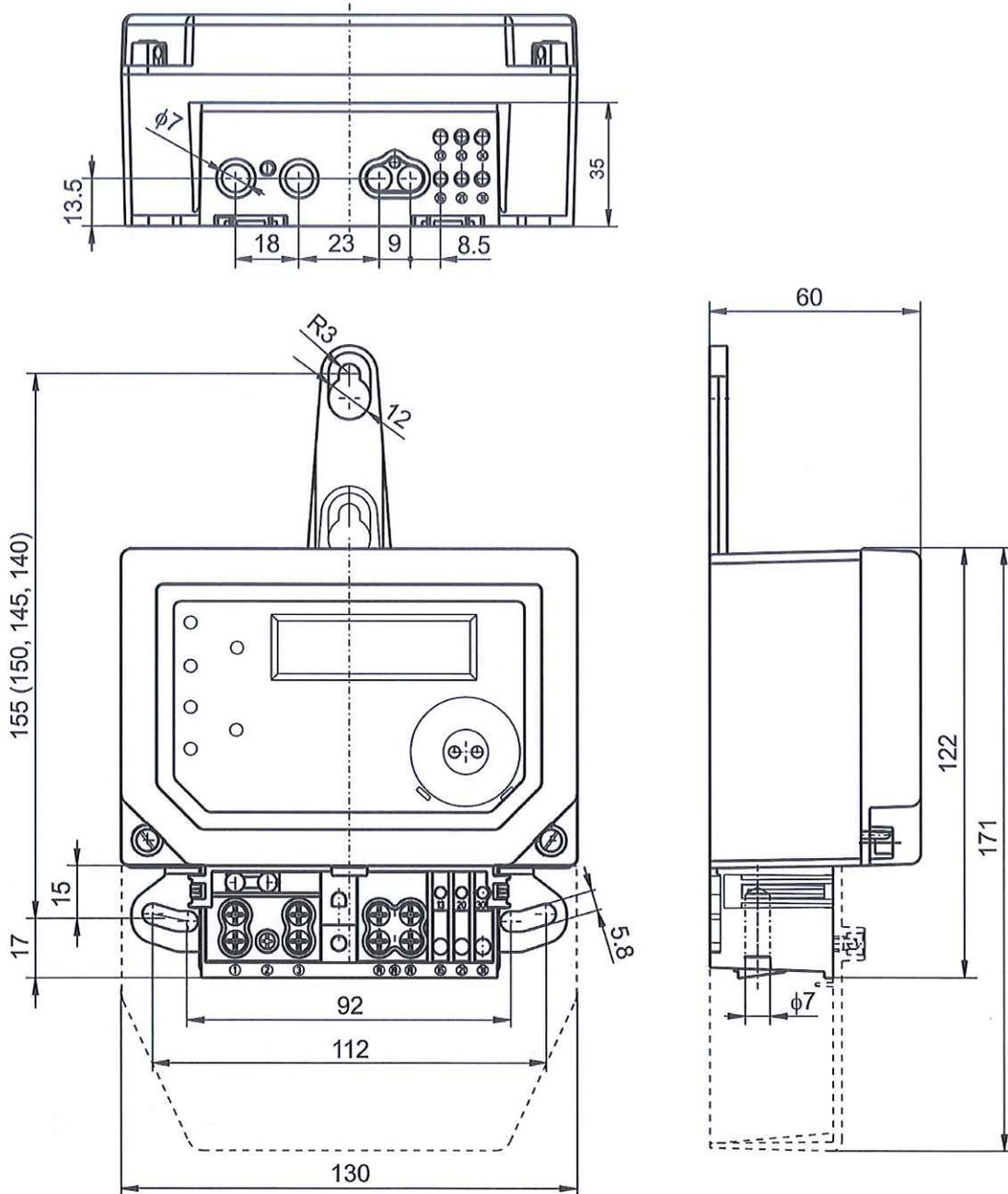### (General form and overall dimensions)
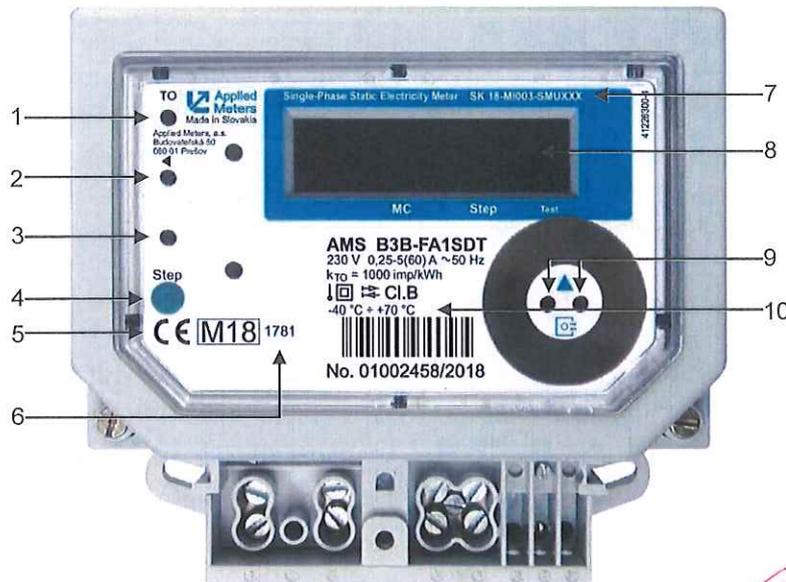
Legenda:

1. Test output;
2. Reverse energy flow;
3. Mains voltage;
4. Step control button;
5. Conformity with the approved type;
6. Notified body;
7. EU type certificate number;
8. Display;
9. Optical communication interface;
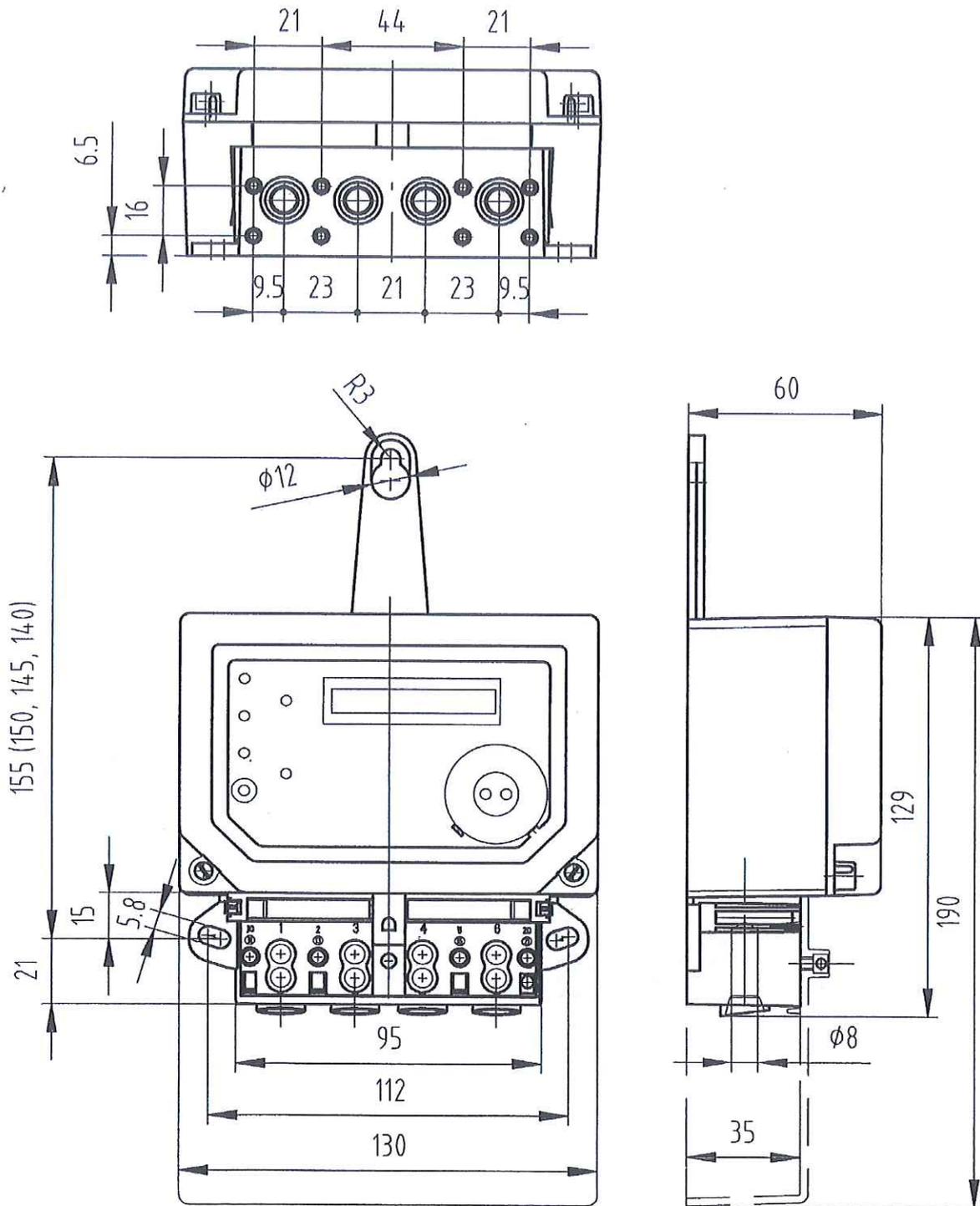10. Field for type, version and technical data;

TO — Applied Meters — Hecho en Colombia
Rymel
Contador de energía estático
AMS B3B-OA3STCT
240-120 V 5-60 A ~60 Hz
k_{TO} = 5000 imp/kWh
k_{SO} = 2500 imp/kWh
Tensión
Rango de temperatura:
1. De funcionamiento especificado: -20°C a +70°C
2. Límite de funcionamiento: -40°C a +70°C
3. Límite de almacenamiento y transporte: -40°C a +70°C
kWh
No. 4601002767
2019
Peso 0,5 kg

TO — Applied Meters — Made in Slovakia
Applied Meters, a.s. Budovateľská 50 080 01, Prešov
ENERGO-PRO
Single-Phase Static Electricity Meter
SK 18-MI003-SMU020
AMS B3B-FA1SDT
230 V 0.25-5(60) A ~50 Hz
k_{TO} = 5000 imp/kWh
1.8.0 Energy Total
1.8.x Energy Tariff
T1 T2 T3 T4
Cl.A -25°C + +55°C
2019 CE M19 1781
kWh
ENERGO - PRO
1132 0219 0064 7851

TO — Applied Meters — Made in Slovakia
Jednofázový elektromer
SK 18-MI003-SMU020
Výrobca: Applied Meters, a.s. Budovateľská 50 080 01 Prešov
AMS B3B-FA1SDTY
230 V 0.25-5(60) A ~50 Hz
k_{TO} = 5000 imp/kWh
Cl.B
-40 °C až +70°C
1.8.0 +A
1.8.T +A tarifa T
0.2.2 T - tarifa
Nr. 001002992/2020 CE M20 1781
Krok
RWE GROUP
001002992 2020 867
TC MC Test

6 kV UC2 IEC 62052-11 IEC 62053-21, 23
TO_A — Applied Meters — Hecho en Colombia
Cl.1
TO_R — Rymel
Cl.2
Tensión
Contador de energía estático 1F2H
AMS B3E-OR1SBT
120 V 5-100 A ~60 Hz
k_{TOA} = 5000 imp/kWh
k_{TOR} = 5000 imp/kvarh
k_{SOA} = 2500 imp/kWh
Rango de temperatura:
1. De funcionamiento especificado: 20°C a +70°C
2. Límite de funcionamiento: -40°C a +70°C
3. Límite de almacenamiento y transporte: -40°C a +70°C
kWh
kvarh
IP 53
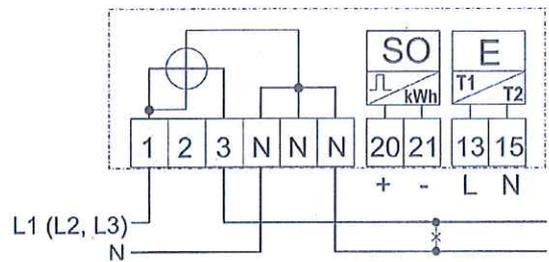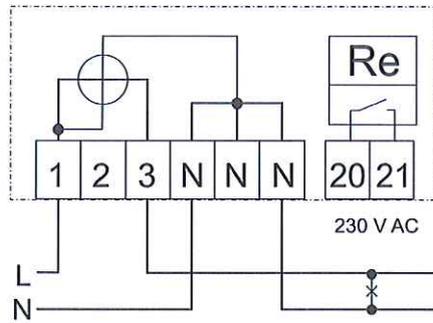Peso 0,4 kg
No.4601003461/2023

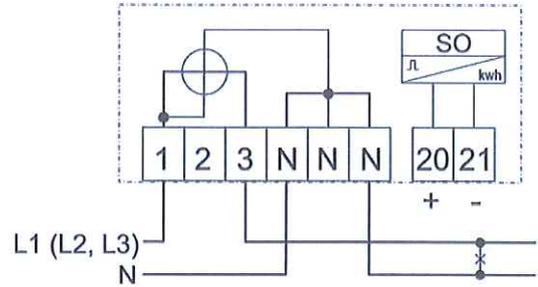## Dimensioned sketch and view at electrometers of AMS B3 type

"AMS B3x-xA1SDT

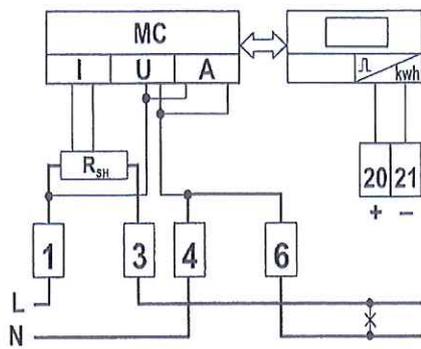**AMS B3x-OAx / AMS B3E-ORx**

"AMS B3B-FA1SDTY" / "AMS B3x-xA1SDT(E)" / "AMS B3x-FA1SDT4"

![Slovenský metrologický ústav logo] **Slovenský metrologický ústav**
Karloveská 63, 842 55 Bratislava 4, Slovenská republika

Annex to the EU – type examination certificate No. SK18-MI003-SMU020 Revision 6, dated September 26, 2023
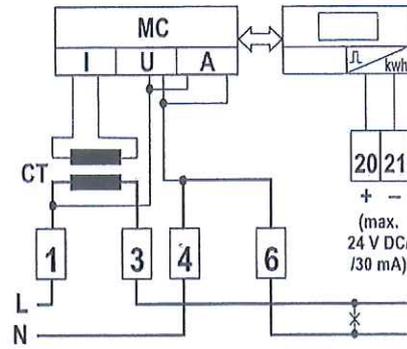
page 7 of 20 pages
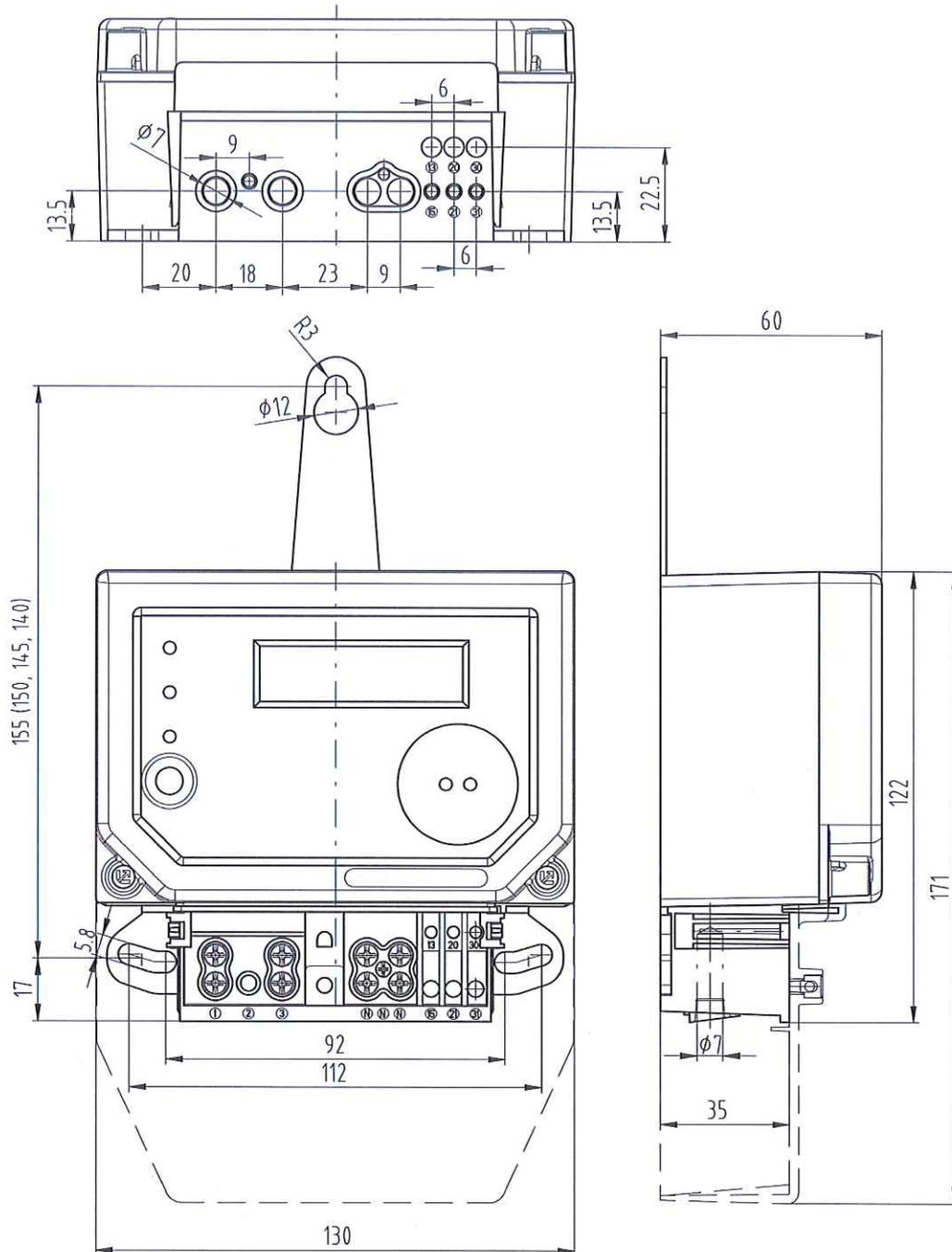
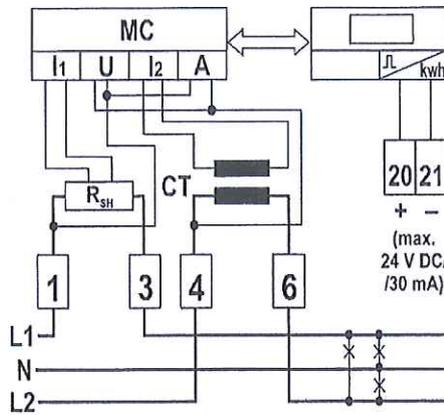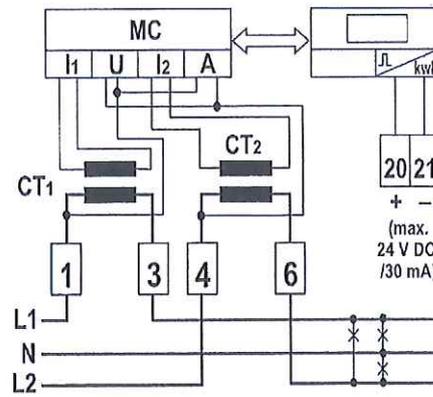## Connection diagram of meter type AMS B3
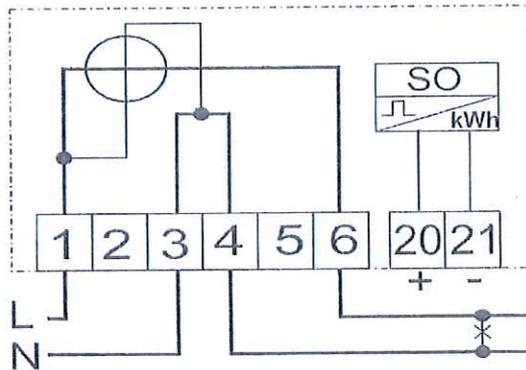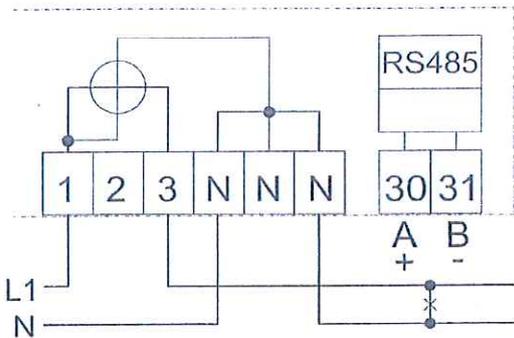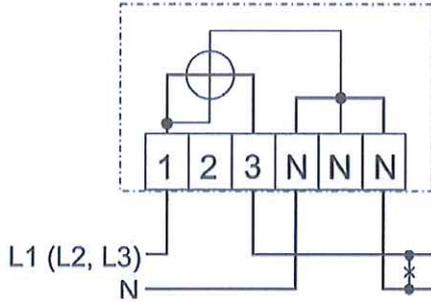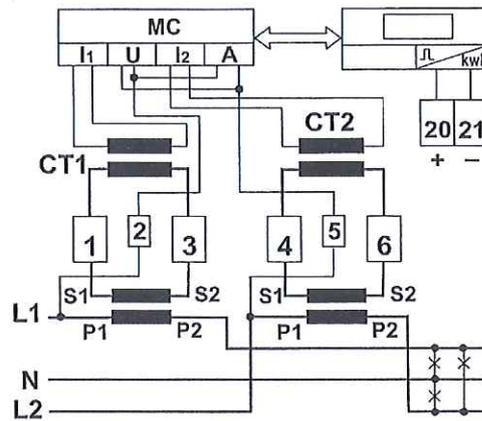
AMS B3B-OA1SCT

AMS B3E-OA1TCT

AMS B3B-OA3STCT


AMS B3E-OA3TCT

AMS B33-OA3TCT

3. Measuring instrument description

3.1 Technical description of measuring instrument

Single-phase static energy meter AMS B3 is designed for measurement of active energy flowing in both directions with a measured consumption displayed on LCD, with measurement instantaneous voltage, current, and power values, with simultaneous display of some network states. They allow record the contents of selected energy registers (total and rate) for billing period (max. 15 entries). It is also possible to record events such as, power cut voltage, removing the cover of the terminal, removing the cover of the meter, magnetic field influence, change of date and time, wrong password, alteration of any parameter, alteration of ToU, battery voltage drop in three separate logbooks and registration of disruptions   in separate counters. They are equipped with their own real-time clock. Based on different execution the meter is capable of measuring reactive energy as well.

The meters enable tariff control by switching time tables (max 4 tariffs) or control by external power supply (2 tariffs).

Construction of a single-phase static energy meter, model AMS B3 consists of the following parts:
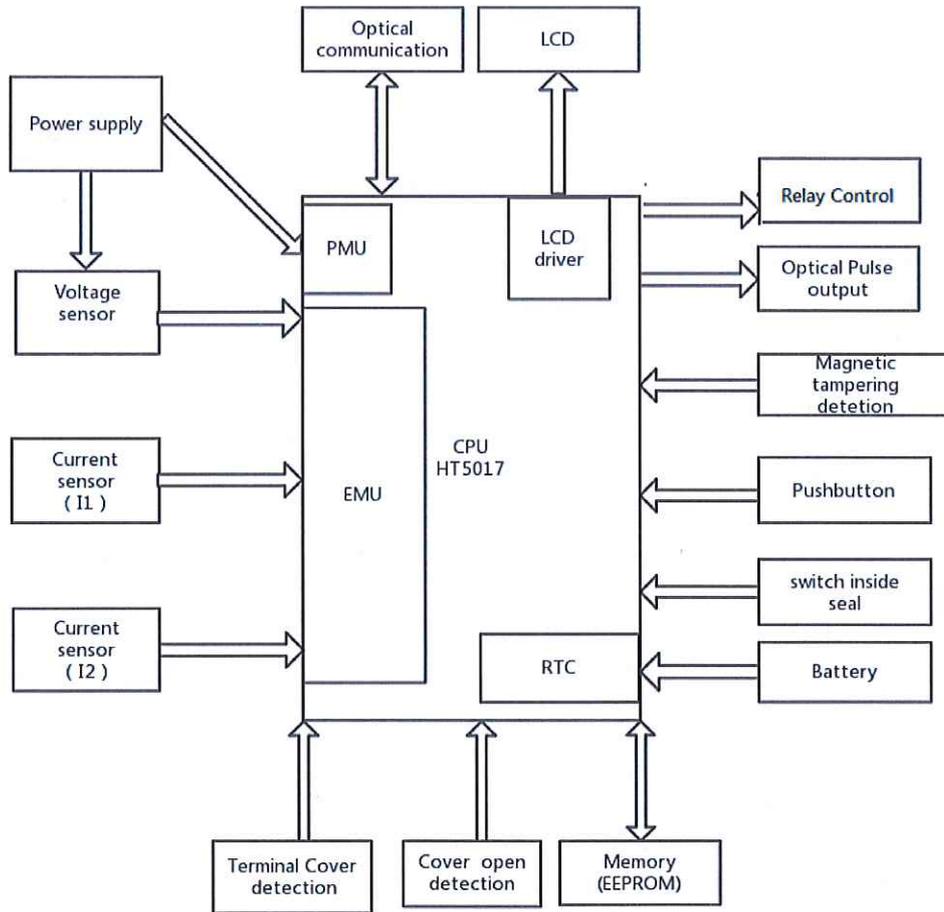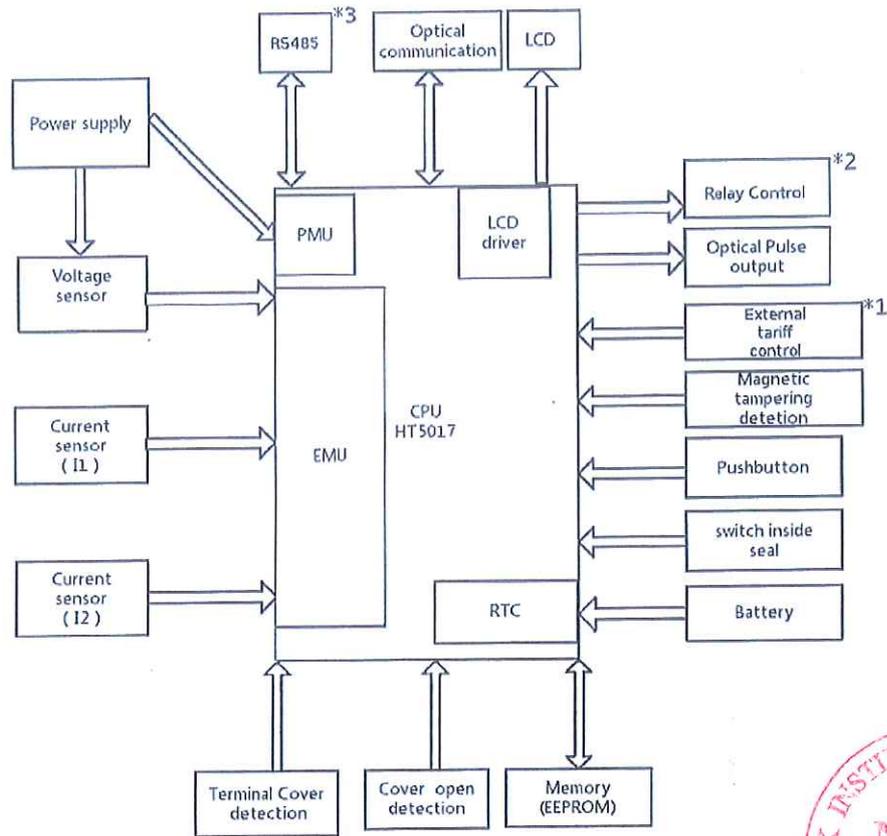
*1 - only for PCB v08

*2 - only for PCB Relay v02

*3 - only for PCB v06

Single-phase static energy meters type AMS B3 are meters constructed for measurement in single -phase two-wire or three-wire grids. Principle of operation of the meter is based on analogy - digital conversion and subsequent digital signal processing, whose frequency is proportional to the measured electrical energy.

The meter supports integrated 8 digit or 7digit LCD display to display detailed information on electrical energy consumption.

Construction of a single-phase static energy meter, model AMS B3 consists of the following parts:
Main components are voltage and current sensors. Resistive voltage divider is used for measurement of voltage. Divider diminishes input voltage up to convenient for metering scheme value. This input voltage is then supplied to the measurement circuits.
Shunt or current transformer is used for measuring current. Current flowing through the shunt generates voltage, which value is proportional to current value.
Power supply source provides supplying of measurement circuits and microprocessor.

Energy measurement unit (EMU) provides measurement of active power, voltage, current, frequency and power factor as a part of the HT5017 chip. PCB (Printed Circuit Board) AEM HT5017 V08 allows external control of tariffs, PCB AEM HT5017 V06 is used with RS485 connection and PCB AEM HT5017 V11 (or AEM HT50 Pv11) is used in meter capable of reactive energy measurement Firmware is burned in the chip HT5017. The measuring system is placed on the printed circuit board using SMD technology.

Optical communication interface for two-way communication according to EN 62056-21, mode C, default with a communication speed 300 / 9 600 bauds. The proposed speed (implicitly 9,600 Baud) is parameterized and can have values (according to EN 62056-21): 300, 600, 1200, 2400, 4800, 9600, 19200 baud. The use of an optical probe and a PC or manual portable terminal (RPT) allows parameterisation of the meter, changing or resetting the programmed parameters, and reading

of the meter data. The PC / RPT communication status indicates a character $\boxminus$ on the display. The manufacturer supplies optical probes with a AMOS magnetic head with USB interface, or RS 232.

Serial interface RS 485 - The communication module represents additional equipment in PCB with an active RS 485 communication line. The communication protocol for the RS 485 interface is the same as for the optical interface. The RS 485 interface is connected to the terminals of the meter 30 (A [+]) a 31 (B [-]).

Memory EEPROM is independent of power. Meter also contains internal memory RAM in microprocessor.

Test output (TO_A) – for the active energy (Optical pulse output - LED diode). The LED flashing frequency depends on the energy meter constant k_{TOA} (imp/kWh) and it is proportional to the measured active energy.

Test output (TO_R) – for reactive energy. The LED flashing frequency depends on the energy meter constant k_{TOR} (imp/kvarh) and it is proportional to the measured active energy.

Optical pulse output SO – SO output is connected to terminals 20 (+) and 21 (-) and is realized as passive output SO (open collector), which needs connection of external power with voltage 24 V and load to max. 30 mA. Constant of the k_{SO} is on label.

Output relay – if a tariff (T1, T2, T3, T4) is active the relay is switched on.

LED diode marked as ◄ – for indication of reverse energy flow (it is part only some executions). If the current wires are incorrectly connected or the current flows in the opposite direction (supply), the diode is lit (also reversed flow of energy will be indicated on the LCD with the appropriate arrow).

The green LED (power) indicates the presence of the mains voltage (it is part only some executions) or with L1 symbol on display..

The meter can be equipped with an output relay, copying the tariff T1, T2, T3 or T4 (programmable using the AMsoft PFO program). If the tariff is active, the contact is closed.

Disturbances:

The meter may be equipped with sensors and signalling disturbances. Possible disturbances:

Disconnection/connection of voltage, alteration of parameter, magnetic field influence, removal of the terminal cover, and removal of the case of meter.

The magnetic field influence indicates a character $\bigcap$ on the LCD or arrow on LCD (depending on the used LCD) , and in the appropriate register is incremented the number of disturbances and the influence is recorded in Logbook P205 or P.98 as events (magnetic field influence on and off) if the influence lasts for at least set time (parameterizable value).

Terminal cover removal indicates the arrow on the LCD opposite the **TC** sign (related arrow can be set by the manufacturer) and in the appropriate register is increased the number of disturbances and the disturbance is recorded in Logbook P204 or P.98 as events (opening and closing of the terminal cover). Terminal cover removal is recorded also even when the meter is not energized.

Removal of the case indicates the arrow on the LCD opposite the **MC** sign (related arrow can be set by the manufacturer) and in the appropriate register is increased the number of violations and

the disturbance is recorded in Logbook P204 or P.98 as events (opening and closing of the case). The case removal is recorded also even when the meter is not energized.

Pushbutton for the LCD operation control of displaying modes CYCLIC, STEP, TEST, TEST of LCD, Back up. It is marked with a sign -„step". The meter shows the values of registers in CYCLIC mode cyclically every set time (from 1 to 255 s). The values displayed without voltage provides battery (on push by button) or supercapacitor (for 48 hours).

Real time clock (RTC), calendar and automatic adjustment for a leap year. In the event of a phase failure, the RTC is powered by a backup lithium battery (10 year lifespan).

Time of usage (ToU) is capable of using 4 tariffs in programmable time.

The energy meter assembly is placed into an insulated full-plastic case designed for mounting with fixing screws. The manufacturer declares the protection class IP54 under the following conditions:

- meter is fixed with screws at three fixing points,
- vertical position of the meter,
- flat smooth pad (panel).

IP54 for AMS B3B-OA1SCT, AMS B3B-OA3STCT, AMS B3E-OA3TCT, AMS B33-OA3TCT, AMS B3B-FA1SDTY, AMS B3x_5-x_6A1SDTx_8 under the same conditions.

The meter case is all insulated in the Protection Class II. The case consists of base, terminal block, terminal block cover, meter cover and cover insertion. Meter cover can be is manufactured without solid plate. The plate is in that case replaced by laser labelling directly on the meter cover. The cover insertion is made of transparent polycarbonate which is inserted into the meter cover. The case allows sealing of the energy meter cover at two sealing points and the terminal block cover at one sealing point. In a case of ultrasonically welded base and cover, there are two possible ways, by so called "void" sticker or by two screws with blind plugs.

Interfaces and compatibility conditions:

Meter has 7 or 8 digit LCD display and LED optical pulse output TO or SO for active energy. The step display input control is accessible from the front of the meter. Optical interface is a standard optical interface for two-way communication according to EN 62056-21, mode C. The meter is equipped with an external input for tariff control and internal clock (RTC). Optionally meter have RS 485 interface.

Software:

The energy meter senses the electrical voltages and currents via the input circuits that suitably adjust the signal for the inputs of the measurement circuits. Outputs from the measurement circuits are processed through the main unit (MCU). In the real time MCU check each parameter of the calibration; keep the normal configuration of the parameters and the measurement accuracy. Processor HT5017 (v01-v08) HiTrend Technology (Shanghai) Co., Ltd. is used in the main unit MCU.

The energy meters are equipped with software that creates a functional unit and ensures performing of all meter functions connected with control of input measuring pulses, calculation and archiving of the measured values of energy and power, displaying of data, operating the communication interfaces etc. The energy meter has all parameters, constants related to the measuring of energy, power or service functions stored in a non-volatile memory. Change of the parameters is possible via the communication interface using communication software of the manufacturer. The software provides access to the meter′s parameters in maximum six levels (0, 1, 2, 5, 6, 8. The 8th level is only manufacturer access).

The password P1, P1a is required by meter from the parameterization program for specific access level, when any specific parameter is changed. The password P2 is the security algorithm in the software used for increasing of parameters security. After sealing the meter no change of metrological relevant parameters or version of used software (firmware) is possible.

Checksum is created by algorithm CRC16 (Art. 3 document No. 71124700) and is displayable on the LCD.

Software of the meter is identified as a whole by the version number and the corresponding checksum:

Energy meter type:	version:	checksum:
AMS B3	200.02	0x735B
AMS B3	200.03	0x5A5F
AMS B3	200.04	0x525A
AMS B3	200.05	0x35BB
AMS B3	200.10	0xA2F5
AMS B3	200.20	0xA34B
AMS B3	211.00	0xA572
AMS B3	231.00	0x087B
AMS B3	231.10	0xBB50
AMS B3	231.20	0x6304
AMS B3	200.30	0xFE22
AMS B3	212.00	0x83D3

Software specification: (refer to WELMEC Guide 7.2):
- Software type: P;
- Risk Class: C
- Extension:
- not applicable: L/S/D/T

3.2   Indication of the measurement results

Energy meter supports an integrated 8 or 7 digit LCD display to view detailed information on electricity consumption, measured data and technical information. The display can be equipped with backlight, making it easier to visualize data. The display values are specified when configuring the meter. Meters of type AMS B3 provide identifying information in the form of symbols and OBIS codes. Meter allows automatic or manual change of the display mode for displayed data. Automatic mode is designed for client, manual mode is for service purposes.

LCD driver is a control circuit contained in the main unit which displays various data types on the LCD. The data could be:

- the measured / calculated values are displayed in an 7-digit field (dimension 8x4 mm);
- the measured / calculated values are displayed in an 8-digit field (dimension 8x3,8 mm);
- OBIS code display - 4-digit field;

Display of meter type AMS B3 version D8"

Network voltage presence, phase sequence — Communication — Battery status — Magnetic field influence — Energy flow +A — Tariff — Units — Energy flow -A — alarm — OBIS code

Bargraph — S₁ — S₂ — S₃ — S₄ — S₅ — S₆ — S₇

„ Display of meter type AMS B3 version D7"

-A — +A — OBIS codes — S9 — S10 — Communication S1 — S2 — S3 — S4 — S5 — S6 — S7 — S8

First type of LCD display (D7) consists of several symbols in the following groups:

- measured / calculated values are displayed in the field with 7 digits (dimension 8x4mm);
- displaying of OBIS codes (the field with 4 digits);
- energy flow direction, energy measurement quadrant, active energy consumption (▶), the active energy supply or reverse connection of wires (◀); status when the meter is power supplied or status when the energy meter does not record energy (the current is less than the starting current of the meter) is indicated by permanent and simultaneous illumination of 4 arrows – symbols for the energy flow directions (◀ ↕ ▶).

  For ten arrows on LCD is possible to set different function of the meter.

Second type of LCD display (D8) consists of several symbols in the following groups:

- Measured/calculated values are displayed in the field with 8 digits (dimensions 8x3,8 mm).
- Displaying of OBIS codes– the field with 4 digits (dimensions 5x2,3 mm).
  - direction of energy flow: consumption (➡), supply or reverse wiring (⬅);
  - ✛ a condition where the meter does not measure (no current, load, or current is smaller than the start-up current of the meter);
  - Tariff T1, T2, T3, T4, relay status, battery status, unit of displayed quantity, disturbance of magnetic field;
  - The connection to the voltage is indicated by the appropriate symbol L1;
  - LCD arrows allow you to indicate different states of the meter. Each of the 7 parameterizable arrows (S1 - S7) can be assigned different function using the AMsoft PFO, which should be showed.

For each arrow, one of the following features can be selected:

Function	Description
Terminal cover	Indication of opening the terminal cover
Main Cover	Indication of case opening
R1	Indication of closed relay contact
Hz	Units Hz
Step	Indication of step mode
Test	Indication of test mode
ON	Power On Indication

- instantaneous power size can also be indicated using bar graph. If the power t is below the rise value, the graph bar segment is not displayed. When the power has a value greater than the rise power the corresponding bar graph segment lights up depending on the instantaneous power size. The power to illuminate the segment can be parameterized by the manufacturer. Indication of instantaneous power using the graph bar is independent on the measurement mode. The default total power values indicated by the graph:

Lighted segment	Power P
bargraph off	$P <$ starting power
	$P \geq$ starting power
	$8\ W \leq P < 32W$
	$32W \leq P < 128\ W$
	$128W \leq P < 512\ W$
	$512W \leq P < 2048W$
	$2048W \leq P < 8192W$
	$P \geq 8192\ W$

Detailed information on symbols displayed on display are in the documentation referred to in Section 3.5. (Example of data displayed on the LCD meter type AMS B3 is in Annex 4 for 7 digit and 8 digit).

3.3 Optional (additional) equipment and functions are subjected to the requirements of the government (they are subject to assessment under Government Ordinance).

Functions integrated in the measuring instrument are required to meet demands of the Government Ordinance are as follows:
- measurement of the active energy in the summary mode;
- measurement of the active energy in the separate mode - consumption and supply in three total registers (1.8.0, 2.8.0 and 15.8.0) and twelve tariff registers.
- average active power (average demand) for a chosen measurement period;

Note: The tests of the meter, which refers to the measurement of active energy are carried out according to the standards STN EN 50470-1: 2008 and EN 50470-3: 2008

3.4 Integrated (additional) equipment's and functions, which are not the subject of assessment according to Government Ordinance

Additional functions integrated in the measuring instrument which are not subject to requirements of the Government Ordinance and do not influence the measurement of active energy, are measurements and calculations of:
- instantaneous active power for consumption (+P) and for supply (-P);
- total power factor and network frequency,
- measurement of the reactive energy in separate mode (3.8.0 and 4.8.0);
- internal status message, internal error message, used firmware version, serial number, date, time etc.;

3.5 Technical documentation

User Guide for single-phase static energy meter for measuring active energy, direct connection, with internal clock, data profiles and RS485 AMS B3x-FA1SDT4 (1_03/3_MD8A4_slo/RN_2023/05);

User Guide for single-phase static energy meter for measuring active and reactive energy with LCD (1_02/3_MD7k_slo/KOL_2023/06);

User Guide for single-phase static energy meter for measuring of active energy with LCD and internal clock and external controlled tariffs AMS B3x-xA1SDT(E) (1_03/3_MD8A_slo_2023/01);

User Guide for single-phase static energy meter for measuring of active energy with LCD and internal clock AMS B3B-FA1SDT (1_03/3_Mds8_slo/bul_2019/08);

User Guide for single-phase static energy meter for measuring of active energy with LCD and internal clock AMS B3B-FA1SDTY (1_03/3_MD8A_slo_2020/07);

User Guide for single-phase static energy meter for measuring of active energy with LCD and internal clock AMS B3B-FA1SDT (1_03/3_Mds8_slo/bul_2019/08);

User Guide for single-phase static energy meter for measuring of active energy with LCD AMS B3x-OAx (1_02/3_M_slo/LA_2019/08);

Block diagrams – static energy meter AMS B3:
- Block diagram for AMS B3 / AEM HT5017 Relay (document Applied meters, V. 4);
- Block diagram for AMS B3 / AEM HT5017SCH (document Applied meters, Block_diagram_XH-04-212.pdf);
- Block diagram for AMS B3 / AEM HT5017SCH_V04;
- Block diagram for AMS B3 / AEM HT5017 V08 SCH;
- Block diagram for AMS B3 / AEM HT5017 V11 SCH;
- Block diagram for AMS B3 / AEM HT5017 with RS485 SCH;

List of components (materials) - static energy meter AMS B3:
- AEM HT5017 Relay – Bill of materials for AMS B3B FA1SDTY;
- document Applied Meters; PCB_BoM 2017-09-12.pdf;
- document Applied Meters; AMS_B3x_F_BLG_BOM.xls;
- document Applied Meters; AEM HT5017 Bill of materials for:
    AMS B33-OA3TCT set 240-120V x/5(10) A 60 Hz with SO output;
    AMS B3B-OA1SCT 120V 5(60) A 60 Hz with SO output;
    AMS B3B-OA3STCT set 240-120V 5(60) A 60 Hz with SO output;
    AMS B3E-OA3TCT set 240-120V 5(100) A 60 Hz with SO output;
- Bill of materials HUN MVM AMS B3B-FA1SDT;
- Bill of materials of AMS B3B-OR1SBT 3317640S, 2023-04-17;
- Bill of materials of AMS B3B-FA1SDT 33167501, 2023-05-14;
- Bill of materials of AMS B3E-OR1SBT set 220 V, 5(100) A, 60Hz, 3317640S, with SO output, case for ultrasonic welding;

Circuit board – static energy meter AMS B3:
- (document Applied meters; drawing AEM HT5017 Relay V02_Top);
- (document Applied meters; drawing AEM HT5017 Relay V02_Bottom);
- (document Applied meters; drawing PCB_TOP V04 _2017_09_11.pdf);
- (document Applied meters; drawing PCB_Bottom V04 _2017_09_11.pdf);
- (document Applied meters; HT5017_V05__Bottom.pdf);
- (document Applied meters; HT5017_V05__Top.pdf);
- (document Applied meters; drawing AEM HT50 Pv11 Bottom);
- (document Applied meters; drawing AEM HT50 Pv11 Top);
- (document Applied meters; drawing AEM HT5017 V06_Bottom);
- (document Applied meters; drawing AEM HT5017 V06_Top);

List of OBIS codes for AMS B3." (document Applied Meters; 13_List of OBIS - AMS_B3_F_FW 200_01_ZSE.xls);
- List_of_OBIS_-_AMS_B3_F_v10_G.xls (FW: 200.03);
- List_of_OBIS_-_AMS_B3_F_BLG_v11.xls (FW: 200.02);
- List of objects and Access layers of software: 200.30;
- List of objects and Access layers of software: 212.00;
- List of objects and Access layers of software: 211.00, 231.00, 231.10, 231.20;
- List of objects and Access layers of software: 200.02, 200.04;
- List of objects and Access layers of software: 200.03;
- List of objects and Access layers of software: 200.05;
- List of objects and Access layers of software: 200.20;

Firmware description of AMS B3, document no.: 71124700, Rev. 3;
Firmware description of AMS B3, document no.: 71124700, Rev. 4;
Firmware description of AMS B3, document no.: 71124700, Rev. 5;

Display – D8-14x53-SDT-M13998-RP-4 (document Applied Meters; 10_Display_D8.pdf).

Technical documentation is placed at the producer's and at the notified body's premises in the file No. NO-371/18, No. NO-403/19, No. NO-418/19, NO-460/20/B, No. NO-475/20/B,No. NO-572/23/B and No. NO-600/23/B.

4. Technical characteristics

4.1. Basic technical characteristics

Measured energy: Active energy

Range:
- reference voltages U_n: 110 V, 120V, 220 V (220 V – 110 V 3-wire); 240 V (240 V– 120 V 3-wire) (-30, +15%); 220 V, 230 V, 240 V (-30,+15%);

- reference frequency $f_{ref.}$: 50 Hz (±2%), 60 Hz (±2%);

Meter for direct connection:
- starting current I_{st}: 0,01 A; 0,02 A; 0,04 A;
- minimal current I_{min}: 0,25 A; 0,5 A;
- transient current I_{tr}: 0,5 A; 1 A;
- reference current $I_{ref.}$ ($I_{ref} = 10 I_{tr}$): 5 A; 10 A;
- maximum current $I_{max.}$: 60 A; 100 A;
- overload: 400 %; 500 %, 600 %; 800 %; 1000 %; 120 0%; 2000 %;

Meter for indirect connection:
- starting current I_{st}:   0,01 A;
- minimal current I_{min}:   0,100 A;
- transient current I_{tr}:   0,25 A;
- reference current $I_{ref.}$ ($I_{ref} = 10I_{tr}$):   5 A;
- maximum current $I_{max.}$:   10 A;
- overload: 200 %

Working temperature range:	-25 °C to +55 °C; -40 °C to +70 °C;
Limit range of operation:	-40 °C to +70 °C;
Limit range for storage and transportation:	-40 °C to +70 °C;
Mechanical class:	M1
Electromagnetic class:	E2

4.2 Additional technical characteristics

Type: AMS B3
Voltage and current ranges: (point 3 of this report);

Constant of pulses:
- testing output k_{TO}:   1000 imp/kWh - 32000 imp/kWh
with 1000 pulse step

- testing output k_{TOR} 1000 imp/kvarh - 32000 imp/kvarh
with 1000 pulse step
- transmission output k_{so}: k_{TO}/K; K = 1, 2, 4, 5, 10;

Self-consumption:
- of voltage circuit: ≤ 7,8 VA/0,8 W; 5,15 VA/0,51 W; 8,8 VA/0,47 W, 0,51 VA/0,22 W; 5,29 VA/0,53 W

- of current circuit: ≤ 0,1 VA; 0,02 VA

Average temperature coefficient [%/K]:   ≤ 0,04 %/K;
Weight: ≤ 0,6 kg;

5. Basic metrological characteristics

Accuracy class for measurement of energy (according to the version of the meter):
- direct connection (active):   A; B (STN EN 50470-3);
- direct or indirect connection (active)   1; 2 (STN EN62053-21);
- direct connection (reactive):   2 (STN EN 62053-23);

6. Results of conformity assessment

From test results, assessments and evaluations stated in the evaluation report No. NO-600/23/B/ER Revision 6 of the date August 14, 2023 implicates, that technical design of the measuring instrument – single-phase static energy meter type AMS B3 complies with technical requirements of by the Government Ordinance of the Slovak Republic No. 145/2016 Coll. Relating to the making available on the market of measuring instruments as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., which implemented the Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments, Annex No.1 on MI-003 and EN 50470-1 and EN 50470-3.

7.   Data placed on the measuring instrument

At each instrument, or in product documentation, according to Annex No. 1 to Government Ordinance, STN EN 50470-1 and STN EN 50470-3 shall be given at least the following information:
- manufacturer name, trade name or register trade mark of the manufacturer, and settlement, place of business or address in state language;
- marking of the type;
- number of EU type examination certificate;
- mark of conformity 'CE', the supplementary metrology mark "M";
- number of phases and the number of wires for which the meter is determined (using a graphic symbol);
- connection diagram;
- serial number and year of manufacture;
- reference voltage;
- current measuring range;
- reference frequency;
- meter constant;
- unit of measured energy;
- accuracy class of the meter;
- operating temperature range of the meter, or class environment;
- insulation type (using the graphic symbol);

8.   Instrument protection

Instrument prior to the D or F conformity assessment is secured following way:

- Protection against the penetration into the measuring system of energy meter is assured by two possible ways:
    - sealing of a position of two screws with sealing wire and seal, by which the cover of energy meter is screwed to the base. (Sealing is performed after the verification of the energy meter is performed)
    - by ultrasonically welding the base with the cover and sticking over the connection so called "void" sticker or by two screws with blind plugs

- Protection against access to the meter terminal block is provided by sealing position of one screw that secure the terminal cover. (Sealing is performed after connecting the meter the electrical network with montage seal).

9.   Conditions for conformity assessment of produced measuring instruments with approved type

Measuring instruments placed on the market in accordance with procedure for conformity assessment according to the Annex No.2 (Module D or F) of Government Ordinance should be in compliance with the technical description by the item 3 of this Annex and at test should be in compliance with the requirements determined in No. 1 and MI-003 Annexes of Government Ordinance; EN 50470-1 and EN 50470-3.

A metrological test may only be performed by a producer, or a notified body respectively in line with the conformity assessment procedure according to the D or F Annexes of the Governmental ordinance respectively

10. Requirements for the manufacture, installation and special conditions of use

10.1 Installation data and installation requirements
Installation requirements are in the manufacturer's documentation referred to in Section3.5 report.

10.2 Terms of Use
The measuring instrument should be used within the recommendations of a producer or manufacturer: "User Guide for single-phase static energy meter AMS B3x.xx" (referred to in Section 3.5)

11. The maximum permissible error (MPE) of the meter type AMS B3x-xA1SDT

The total error under certain load must be calculated by the following formula:

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

where:

$e\ (I,\cos\varphi)$	=	meter error at a certain load;
$\delta\ (T,I,\cos\varphi)$	=	additional error in % as a result of changes in temperature at the same load;
$\delta\ (U,I,\cos\varphi)$	=	additional error in % as a result of voltage changes at the same load;
$\delta\ (f,I,\cos\varphi)$	=	additional error in % as a result of frequency changes at the same load.

Total additional error values in %

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

Load (current, power factor)		-40°C	-25°C	-10°C	5°C	30°C	40°C	55°C	70°C
I_{min}	PF=1	1,32	0,99	0,64	0,35	0,26	0,57	0,80	1,22
$I_{tr,}$	PF=1	1,22	0,80	0,57	0,41	0,53	0,71	0,88	1,23
I_{tr}	PF=0.5ind	1,28	1,00	0,76	0,43	0,28	0,66	0,82	1,59
I_{tr}	PF=0.8kap	1,24	0,87	0,62	0,38	0,37	0,69	0,92	1,17
I_b	PF=1	1,26	0,99	0,70	0,42	0,32	0,64	0,84	1,14
I_b	PF=0.5ind	1,20	0,95	0,62	0,37	0,86	0,64	0,91	1,41
I_b	PF=0.8kap	1,39	0,97	0,77	0,50	0,36	0,56	0,84	1,07
I_{max}	PF=1	1,12	0,84	0,52	0,30	0,26	0,41	0,66	1,11
I_{max}	PF=0.5ind	0,97	0,81	0,65	0,48	0,33	0,60	0,84	1,11
I_{max}	PF=0.8kap	1,11	0,84	0,72	0,49	0,34	0,55	0,79	1,13

Assessment was performed by: Mr. Juraj Slučiak