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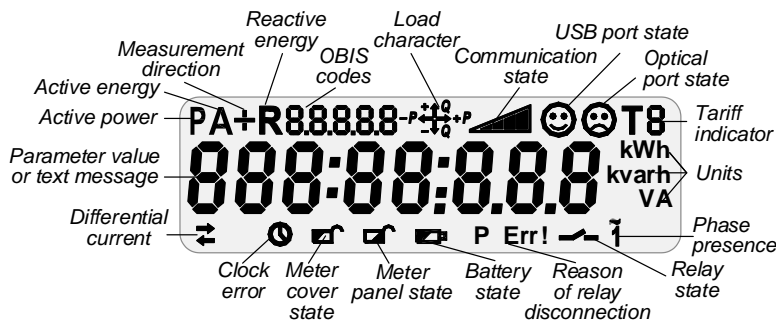
## AD11B.1-4-1

**MULTI-FUNCTION & MULTI-TARIFF  
SINGLE-PHASE ELECTRONIC METERS  
DESIGNED FOR USE IN AMI /AMR SYSTEM**

### OVERALL VIEW



### DISPLAY INDICATIONS



<b>KWh</b>	Active energy ( <i>export/import</i> )
<b>KVArh</b>	Reactive energy ( <i>4 quadrants</i> )
<b>V</b> <b>A</b>	Measured quantities
<b>THD</b>	Calculation of total harmonic distortion factor
<b>T1-T6</b>	Multirate registration
	Built-in clock
	Event Log
	Load profile
<b>I1 ≠ I2</b>	Differential current detection
<b>IP54</b>	Protection level
	Reserve power supply
	Standard data model, open protocols
	Optical port
	Disconnecting relay
	Sensor of meter cover opening
	Sensor of meter panel opening
	Magnetic field sensor
<b>PLC</b>	PLC universal platform
	Extension communication interface



**DLMS/COSEM SUPPORT**

- Standard data model
- Standard communication protocols
- Interoperability

**BUILT-IN CLOCK**

- Real Time Clock, accuracy 0.5 s.
- IEC 62052-21 standard compliant
- External synchronization
- Sleep mode, battery
- Daylight saving time support

**MEASURED QUANTITIES**

- Active energy, class B, export/import
- Reactive energy, class 2, 4 quadrants
- Power, Max Demand
  - integration period: 15', 30', 60', day
  - average interval: day, month
- Phase voltage/current, instantaneous value, RMS

**METERING DATA**

- Actual meter readings
- Periodic meter readings: daily, monthly
- Interval meter readings: 5', 10', 15', 20', 30', 60'
- Timestamp

**DATA STORAGE**

- Non-volatile memory
- Capacity depends on data type and number of parameters and can be expanded for one type of data on the expense of another
- Up to 3 interval profiles and 1 billing profile. For example:
  - *15 minutes interval profile:* 6 parameters for about 63 days
  - *hourly interval profile:* 6 parameters for about 13 days
  - *monthly billing profile:* 6 parameters for about 110 months

**MULTI-RATE METERING**

- Up to 6 tariff registers
- Up to 24 changeovers per day
- Tariff indicator is displayed on LCD and transmitted to an external system
- Active and passive tariff plans, configurable activation time of the passive tariff plan

**CALENDAR**

- Up to 12 seasons per year
- Up to 7 daily profiles per week
- Up to 30 special days per year
- Support of movable holidays

**EVENTS & ALARMS HANDLING**

- Continuous control of current state of meter functional nodes and alarms/events, timestamps
- Standard set of events processing including: registration in the special logs and registers, event report sending, states displaying, load switching off on special cases
- Different types of event logs

**TEST OUTPUTS**

- Outputs: LEDs, optical port
- Parameters under control: active energy, reactive energy

**BUILT-IN DISPLAY**

- LCD, 8 digits, configurable decimal place (up to 3 digits)
- Special symbols, data identification according to IEC 62056-61 (OBIS)
- Metering data and specified messages displaying
- Service/client lists of parameters
- Manual/automatic modes of scrolling
- Display self-testing
- Configurable backlight mode
- Sleep mode

**LOAD CONTROL**

- Built-in relay (100 A)
- Control modes:
  - remote (by command)
  - local (by condition)
  - manual (by push button)
- Continuous relay state control
- Relay status displaying
- Events registering

**ELECTRICAL ENERGY QUALITY CONTROL**

- Quality indexes:
  - average voltage
  - voltage sags and swells
  - outages
  - network frequency
  - THD for voltage/current harmonics
- Remote or local configuring of parameters thresholds
- Events registering

**THRESHOLDS MANAGEMENT**

- Configurable thresholds values
- Possibility to disconnect consumer from the network, when a threshold is crossed
- Events registering

**FRAUD & THEFT PROTECTION**

- Continuous monitoring, including sleep mode time
- Fraud types under control:
  - meter cover and panel opening
  - inadmissible differential current
  - strong external magnetic field
- Hall sensor for magnetic field detection
- Events registering
- Possibility of sealing meter cover, panel and terminal block

**METER SELF-CONTROL**

- Built-in test for continuous self-control
- Quick response on severe error
- Events registering

**INFORMATION SECURITY**

- Communication encryption (AES-GCM-128 security suite)
- Access rights for data access
- Firmware protection
- Events registering

**DATA TRANSMISSION**

- Data transmission on demand or by schedule
- Request types:
  - Concentrator request (via communication channel)
  - Hand Held Unit request (via optical port)

**POWER LINE COMMUNICATION (PLC)**

- Built-in OFDM PLC modem
- OFDM (PRIME), ITU-T G.9904 standard compliant
- OFDM (G3-PLC), ITU-T G.9903 standard compliant
- PLC features:
  - CENELEC A Band
  - EMC standards compliance
  - Auto-discovery
  - Repeating

**EXTENSION COMMUNICATION INTERFACE**

- Built-in extension interface, which allows connection of various 3<sup>rd</sup> party USB adapters (up to 2) for:
  - *HAN communication*, for example: wireless M-Bus, RS-485 and/or
  - *WAN communication*, for example: 3GPP
- Control of USB power supply

**OPTICAL PORT**

- IEC 62056-21 standard compliant
- Data transmission rate 115200 bps
- Possibility of local data exchange and meter parameterization
- Restricted access owing to sealed meter cover

**METER PARAMETERIZATION**

- Remote (via communication channel) or local (via optical port)
- Access rights assignment from HES
- Events registering

**SOFTWARE UPGRADE**

- Remote (via communication channel) or local (via optical port)
- Events registering

**PUSH BUTTONS**

- Client button on meter case for:
  - manual reconnection of customer's load
  - manual meter screens scrolling
  - viewing data on LCD when the power is off
- Service button under sealed meter cover. May be implemented for any service purposes according to customer requirements

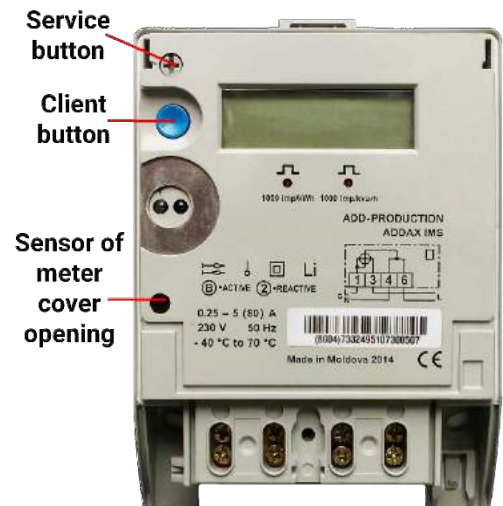
**BACKUP POWER SUPPLY**

- Battery for meter backup supply in sleep mode
- Battery lifetime - not less than 20 years

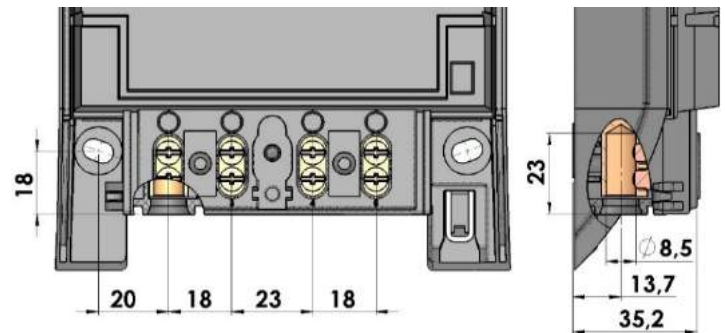
## TECHNICAL SPECIFICATIONS

<b>Accuracy class:</b>	
- Active energy	B
- Reactive energy	2
<b>Reference current, I<sub>ref</sub></b>	5 A
<b>Maximum current, I<sub>max</sub></b>	100 A
<b>Minimum current</b>	0.05 I <sub>ref</sub>
<b>Starting current:</b>	
- Active energy	0.004 I <sub>ref</sub>
- Reactive energy	0.005 I <sub>ref</sub>
<b>Reference voltage, U<sub>n</sub></b>	230 V
<b>Voltage range</b>	0.8 U <sub>n</sub> ... 1.2 U <sub>n</sub>
<b>Reference frequency</b>	50 Hz
<b>Meter constant:</b>	
- Active energy	1000 imp/kWh
- Reactive energy	1000 imp/kvarh
<b>Temperature range</b>	-40°C ... +70°C
<b>Clock accuracy (at 25°C) (IEC 62052-21)</b>	≤0.5 s /24 h
<b>Data transmission rate via OFDM PLC (on physical layer, with coding):</b>	
- PRIME	21-64 kbps
- G3	5-33 kbps
<b>Inherent consumption of current circuit, not more (IEC 62053-61)</b>	1 VA
<b>Inherent consumption of voltage circuit, active/total (when communication over USB is active), not more (IEC 62053-61)</b>	5 W / 8 VA
<b>Insulation strength (IEC 61010-1-90)</b>	4 kV, 50 Hz, 1 min
<b>Shock voltage (IEC 60060-1)</b>	12 kV, 1.2/50 μs
<b>Electrostatic discharge (IEC 61000-4-2)</b>	15 kV
<b>High frequency radiant field (IEC 61000-4-3)</b>	10 V/m
<b>High frequency interferences (IEC 61000-4-4)</b>	4 kV
<b>Surge immunity test (IEC 61000-4-5)</b>	6 kV
<b>IP rating</b>	IP54
<b>Mean total lifetime, not less</b>	30 years
<b>Dimensions</b>	205 x 130 x 48 mm

## PUSH BUTTONS\*

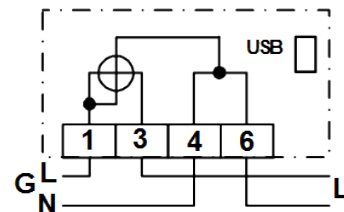


## TERMINAL BLOCK DIMENSIONS\*



\* - meter cover is removed

## CONNECTION DIAGRAM



## DESIGN FEATURES

### TERMINAL BLOCK

- DIN 43857 standard compliance
- Universal clamping type for terminals of current circuits:  
D = 8 mm

### MOUNTING

- By 3 fixing points
- Movable hanger

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