

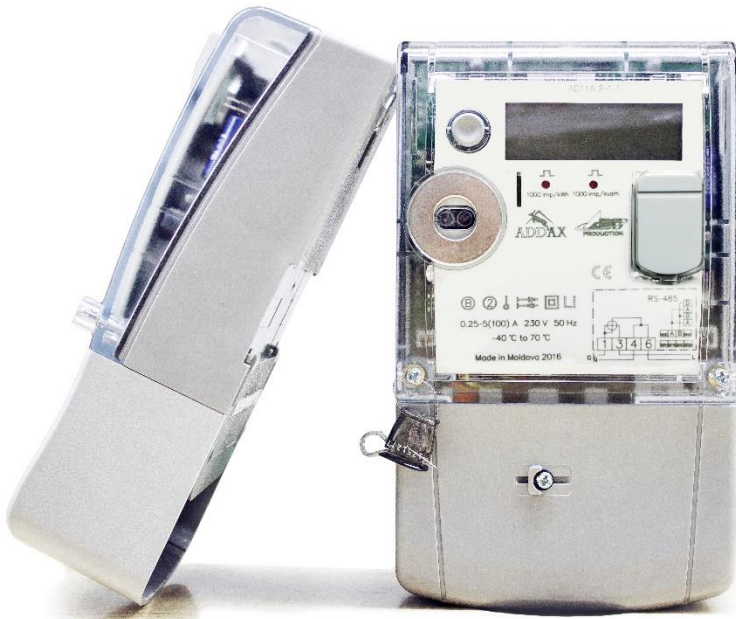


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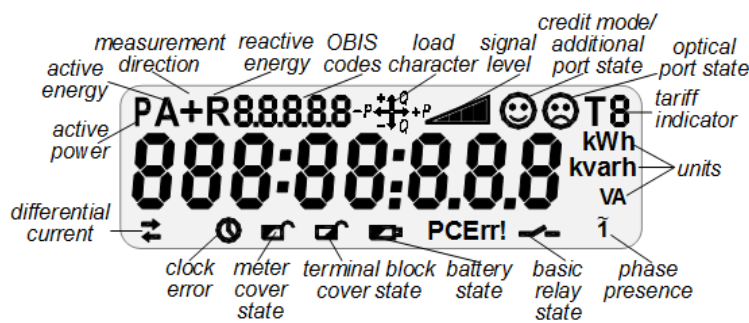
AD11A.1-1-1

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

OVERALL VIEW



DISPLAY INDICATIONS



KWh KVArh	Active energy (<i>export/import</i>) Reactive energy (<i>4 quadrants</i>)
V A	Measured quantities
THD	Calculation of total harmonic distortion factor
T1-T6	Multirate registration
	Built-in clock
	Event Log
	Load profile
I1≠I2	Differential current detection
IP51	Protection level
	Reserve power supply
	Standard data model, open protocols
	Optical port
	Built-in relays
	Sensor of meter cover opening
	Sensor of terminal block cover opening
	Magnetic field sensor
PLC	PLC universal platform
	Multifunctional communication interface
LDTI	Local Data Transmission 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, neutral current, difference between phase and neutral currents

METERING DATA

- Actual meter readings
- Periodic meter readings: daily, monthly
- Interval meter readings: 1', 5', 10', 15', 20', 30', 60'
- Timestamp

DATA STORAGE

- Non-volatile memory
- Storage 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: 2 optical outputs (LEDs), optical port, 2 impulse outputs
- 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

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

FRAUD & THEFT PROTECTION

- Continuous monitoring, including sleep mode time
- Fraud types under control:
 - meter/terminal block cover opening
 - inadmissible differential current
 - strong external magnetic field
- Hall sensor for magnetic field detection
- Tamper detection: shunt in the phase circuit and differential current sensor (coil) in the neutral
- Protective seals
- 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)

INFORMATION SECURITY

- Communication encryption (AES-GCM-128 security suite)
- Data access according to stated rights
- Firmware protection
- Events registering

THRESHOLDS MANAGEMENT

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

METER SELF-CONTROL

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

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

MULTIFUNCTIONAL COMMUNICATION INTERFACE

- Built-in multifunctional interfaces:
 - RS-485*
 - allows connection of external devices to a single RS-485 bus
 - provides a link between the meter and an extension communication module and ensures the power supply of the extension communication module
 - WM-Bus*
 - provide data exchange with other intellectual devices on consumer's side
 - Local Data Transmission Interface*
 - provides one-way communication interface to one customer device or a Local Adaptor);
 - PHY Layer (twisted pair): M-Bus according to EN 13757-2.
 - Baud rate up to 9600 bps;

OPTICAL PORT

- IEC 62056-21 standard compliant
- Data transmission rate 9600 bps
- Possibility of local data exchange and meter parameterization

METER PARAMETERIZATION

- Remote (via communication channel) or local (via optical port)
- Assignment of the access rights from HES
- Events registering

SOFTWARE UPGRADE

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

BACKUP POWER SUPPLY

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

TECHNICAL SPECIFICATIONS

Accuracy class:

- Active energy B
- Reactive energy 2

Reference current, I_{ref} 5 A

Maximum current, I_{max} 80 A

Minimum current 0.05 I_{ref}

Starting current:

- Active energy 0.004 I_{ref}
- Reactive energy 0.005 I_{ref}

Reference voltage, U_n 230 V

Voltage range 0.8 U_n ... 1.2 U_n

Reference frequency 50 Hz

Meter constant:

- Active energy 1000 imp/kWh
- Reactive energy 1000 imp/kvarh

Temperature range -40°C ... +70°C

Internal clock quartz crystal 32 kHz

Clock accuracy (at 25°C) (IEC 62052-21) ≤ 0.5 s / 24 h

Data transmission rate via OFDM PLC (on physical layer, with coding):

- PRIME 21-64 kbps
- G3 5-33 kbps

Inherent consumption of current circuit, not more (IEC 62053-61) 1 VA

Inherent consumption of voltage circuit, active/total, per phase (when communication over CM-Bus is active), not more (IEC 62053-61) 2 W / 10 VA

Insulation strength (IEC 61010-1-90) 4 kV, 50 Hz, 1 min

Shock voltage (IEC 60060-1) 12 kV, 1.2/50 μ s

Electrostatic discharge (IEC 61000-4-2) 15 kV

High frequency radiant field (IEC 61000-4-3) 10 V/m

High frequency interferences (IEC 61000-4-4) 4 kV

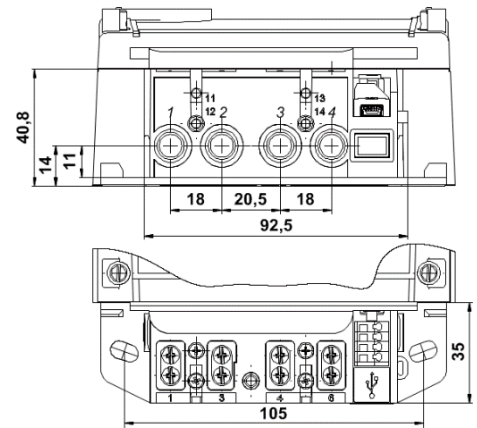
Surge immunity test (IEC 61000-4-5) 6 kV

IP rating IP51

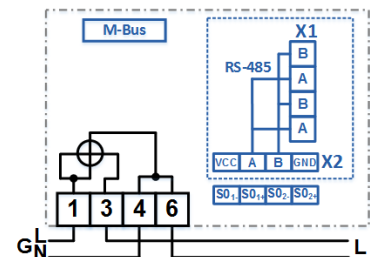
Mean total lifetime, not less 30 years

Dimensions 213.5 x 127.5 x 62 mm

TERMINAL BLOCK DIMENSIONS



CONNECTION DIAGRAM (IEC)



DESIGN FEATURES

TERMINAL BLOCK

- DIN 43857 standard specifications
- Universal clamping type for terminals of current circuits: D = 8,5 mm

HOUSING

- Light-tone non-flammable polycarbonate
- IP 51 protection against dust and water

MOUNTING

- By 3 fixing points or on DIN rail (35 mm)

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MULTIFUNCTIONAL INTERFACES UNDER TERMINAL BLOCK COVER

