

PREPAID METERS



AD11C.1-2-1














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

OVERALL VIEW



DISPLAY INDICATIONS



KWh	Active energy (<i>export/import</i>)
V A	Measured quantities
T11	Multirate registration
	Built-in clock
	Event Log
	Load profile
I1≠I2	Differential current detection
IP54	Protection level
	Backup 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 (<i>optionally</i>)
NFC	Contactless NFC technology
	Prepayment mode support
	Smart cards support
	Encryption

FUNCTIONALITY

DLMS/COSEM SUPPORT

- Standard data model
- Standard communication protocols
- Interoperability

BUILT-IN CLOCK

- Real Time Clock (RTC), accuracy 0,5 s.
- IEC 62052-21 standard compliant
- Local synchronization
- Sleep mode, battery
- Daylight saving time support

MEASURED QUANTITIES

- Active energy, class C, export/import
- Power, Max Demand
 - integration period: 15', 30', 60', 1 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: 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 11 tariff registers
- Step tariffs, programmable thresholds
- Tariff indicator is displayed on LCD
- Active and passive tariff plans, configurable activation time of the passive tariff plan

EVENTS HANDLING

- Continuous control for fraud and tamper events
- Standard set of events processing including: registration in the special log, states displaying, load switching off on special cases
- Timestamps

TEST OUTPUTS

- Outputs: 2 optical outputs (LEDs), optical port
- Parameters under control: active energy, reactive energy

BUILT-IN DISPLAY

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

LOAD CONTROL

- Built-in relay (80 A) in phase wire and in neutral
- Continuous relay state control
- Relay status displaying
- Events registering

ELECTRICAL ENERGY QUALITY CONTROL

- Quality indexes:
 - average voltage
 - voltage sags and swells
 - outages
 - network frequency

THRESHOLDS MANAGEMENT

- Possibility to configure parameters thresholds
- 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 case cover opening
 - meter terminal block cover opening
 - inadmissible differential current
 - strong external magnetic field (*optionally*)
- Magnetic shield inside to protect measuring transformers (*optionally*)
- Protective seals
- Events registering

SECURITY

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

METER SELF-CONTROL

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

NEAR FIELD COMMUNICATION (NFC)

- Wireless communication, based on RFID technology
- Frequency band: 13.56MHz (ISO/IEC 14443 Type A compliant)
- Password protected tag access

SMART CARDS HANDLING

- Contactless NFC technology
- Built-in card receiver
- Smart cards for secure transactions:
 - prepayment related tokens and configurations to the meter
 - readings and other information from the meter
- Different card types depending on supported functions
- Secured data storage using AES128 algorithm and digital signature
- Displaying of card manipulation messages of LCD

OPTICAL PORT

- IEC 62056-21 standard compliant
- Data transmission rate 115200 bps
- Possibility of local data exchange and meter parameterization

TECHNOLOGICAL PORT

- Allows replication of essential data and configuration in case of the meter failure
- Technological port is only available when the meter cover is detached

PREPAYMENT FUNCTIONALITY

- Pre-payment and post-payment mode support
- Energy measuring and displaying in kWh and cash (*optionally*)
- Functionality to disconnect consumers' load when their credit amount is exhausted
- Token transmission using smart cards

SOFTWARE UPGRADE

- Locally via optical port

METER PARAMETERIZATION

- Locally via optical port and using dedicated smart cards via NFC
- Differentiation of access rights

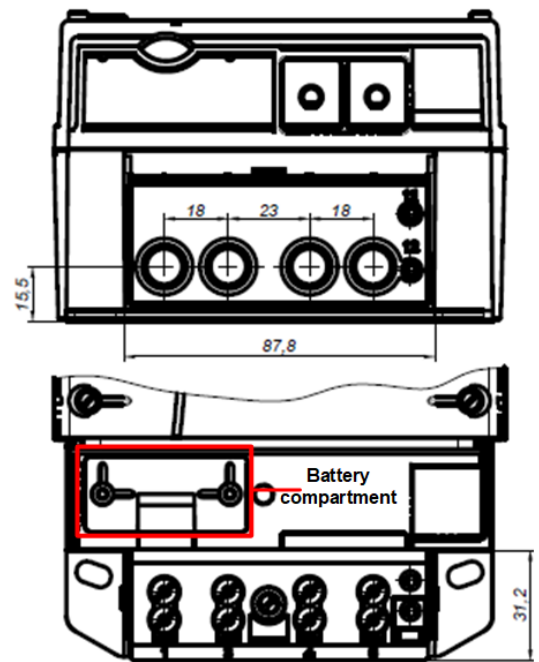
BACKUP POWER SUPPLY

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

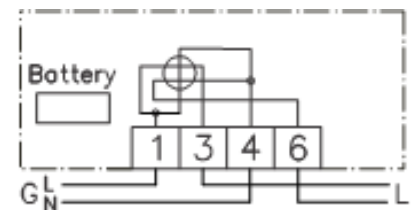
TECHINICAL SPECIFICATIONS

Accuracy class	C
Reference current, I_{ref}	5 A
Maximum current, I_{max}	80 A
Minimum current	$0.03 I_{ref}$
Starting current	$0.004 I_{ref}$
Reference voltage, U_n	220 V
Voltage range	$0.8 U_n \dots 1.4 U_n$
Reference frequency	50 Hz
Meter constant	3200 imp/kWh
Temperature range	$-40^{\circ}\text{C} \dots +70^{\circ}\text{C}$
Internal clock	quartz crystal 32 kHz
Clock accuracy (at 25°C) (IEC 62052-21)	$\leq 0.5 \text{ s} / 24 \text{ h}$
Inherent consumption of current circuit, not more (IEC 62053-61)	1 VA
Inherent consumption of voltage circuit, active/total, 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 μs
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	IP54
Mean total lifetime, not less	20 years
Dimensions	216 x 127,5 x 87.5 mm

TERMINAL BLOCK DIMENSIONS



CONNECTION DIAGRAM (IEC)



DESIGN FEATURES

HOUSING

- Light-tone non-flammable polycarbonate
- IP 54 protection against water and dust

MOUNTING

- By 3 fixing points

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