

*add new tech to your business!*

A large, 3D-rendered arrow graphic pointing to the right. The arrow is composed of multiple overlapping, semi-transparent layers, creating a sense of depth and motion. The edges of the arrow are highlighted with a bright yellow-orange glow. The background of the entire page is a dark blue gradient with a network of white lines and dots, resembling a data or communication network.

**AD23M**  
datasheet

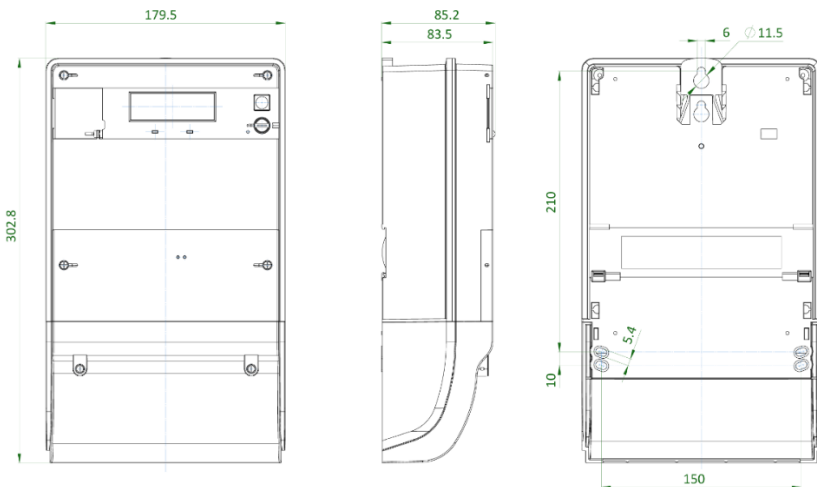
## AD23M

**MODULAR SMART  
THREE-PHASE ELECTRONIC METERS  
DESIGNED FOR USE IN AMI/AMR SYSTEM**

### OVERALL VIEW



### Overall dimensions



<b>KWh KVArh</b>	Active energy ( <i>export/import</i> ) Reactive energy ( <i>4 quadrants</i> )
<b>V 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
	Disconnecting built-in relay
	Replaceable battery
	Standard data model, open protocols
	Sealed optical port
	Sensors of cover opening – meter, terminal block, communication module
	Magnetic field sensor Magnetic protection shield
	Built-in communication interfaces
<b>NIC</b>	Various modules for WAN communication
	Authentication & Encryption

## 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
- Daylight saving time (DST) support

## MEASURED QUANTITIES

- Active energy, class B (1), export/import
- Reactive energy, class 2, 4 quadrants
- 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
- 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 12 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

## TEST OUTPUTS

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

## METER SELF-CONTROL

- Built-in test for continuous self-control
- Quick response on severe error
- Meter state events registering

## 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

## 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

## LOAD CONTROL

- Built-in relay (60 A)
- Control modes:
  - remote (by command)
  - local (by condition)
  - manual (by push button)
- Continuous relay state control
- Relay status displaying
- Load switch 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
- Quality control events registering

## THRESHOLDS MANAGEMENT

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

## FRAUD & THEFT PROTECTION

- Continuous monitoring;
- 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 transformer in the neutral

- Protective seals

- Fraud events registering

## INFORMATION SECURITY

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

## DATA TRANSMISSION

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

## WAN NIC COMMUNICATIONS

- One basement (*X3 NIC* terminal) – various communication modules (optional):
  - 2G/3G/4G
  - NB-IoT
  - LoRa
  - PLC/PLC + RF Hybrid. *X2* terminal for coupler connection.

## BUILT-IN COMMUNICATIONS

- RS-485 interface (*X1 RS-485-2* terminal)
  - provides a link between the meter and other devices via WAGO connectors
- Bluetooth 5.0 to communicate with other closely-spaced smart meters.

## OPTICAL PORT

- IEC 62056-21 standard compliant
- Data transmission rate up to 57 600 bps
- Possibility of local data exchange and meter parameterization
- Sealable optical port case

## PUSH BUTTONS

- Accessible multi-functional button;
- Sealable service button, is active when the power is on.

## METER PARAMETERIZATION

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

## SOFTWARE UPDATE

- Remote (via communication channel) or local (via optical port)
- Software update events registering

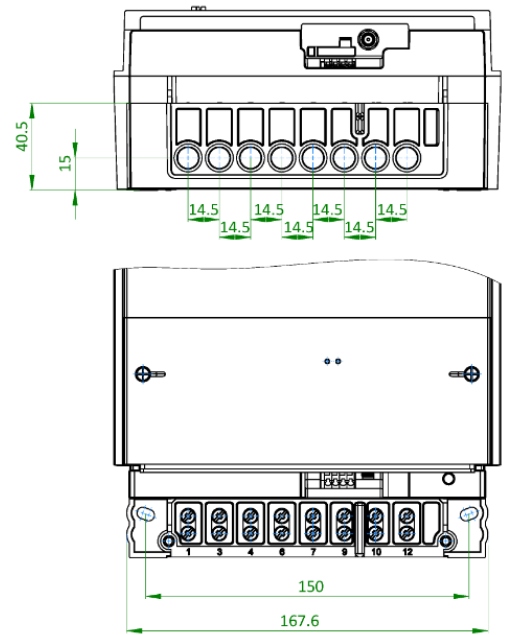
## BACKUP POWER SUPPLY

- Two batteries (optionally):
  - Internal battery to support RTC and one-time operation of opening sensors. Battery lifetime - not less than 15 years
  - Replaceable battery in special compartment on the meter front.

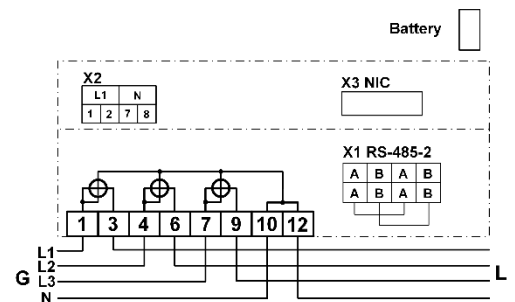
## TECHNICAL SPECIFICATIONS

<b>Accuracy class:</b>	
- Active energy	B (1)
- Reactive energy	2
<b>Reference current, Iref</b>	5 A
<b>Maximum current, Imax</b>	60 A
<b>Minimum current</b>	0.05 Iref
<b>Starting current:</b>	
- Active energy	0.004 Iref
- Reactive energy	0.005 Iref
<b>Reference voltage, Un</b>	3 x 230 V
<b>Voltage range</b>	from 0.8 Un to 1.2 Un
<b>Reference frequency</b>	50 Hz
<b>Meter constant:</b>	
- Active energy	1 000 imp/kWh
- Reactive energy	1 000 imp/kvarh
<b>Temperature range</b>	from -40°C to +70°C
<b>Internal clock</b>	quartz crystal 32 kHz
<b>Clock accuracy (at 25°C) (IEC 62052-21)</b>	≤0.5 s /24 h
<b>Inherent consumption of current circuit, not more (IEC 62053-61)</b>	1 VA
<b>Inherent consumption of voltage circuit, active/total, per phase, not more (IEC 62053-61)</b>	2 W / 10 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>	20 years
<b>Dimensions, W x H x D</b>	179.5 x 302.8 x 85.2 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 mm

### HOUSING

- Light-tone non-flammable polycarbonate

### MOUNTING

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

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