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SED102

SINGLE PHASE
SMART ELECTRICITY METER



PRODUCT OVERVIEW

The **SED102** Smart Electricity Meter is a single-phase meter designed with high flexibility for input communication. It boasts the capability to simultaneously accommodate up to three modules, comprising two communication modules and one input module.

FRONT VIEW DESCRIPTION:

DISPLAY

The digital display on the front cover provides real-time information such as energy consumption, voltage, and current.

DATA QUERY BUTTON

A button is included for users to query or cycle through different data on the display. This can help users' access additional information or navigate the meter's menu.

OPTICAL COMMUNICATION INTERFACE

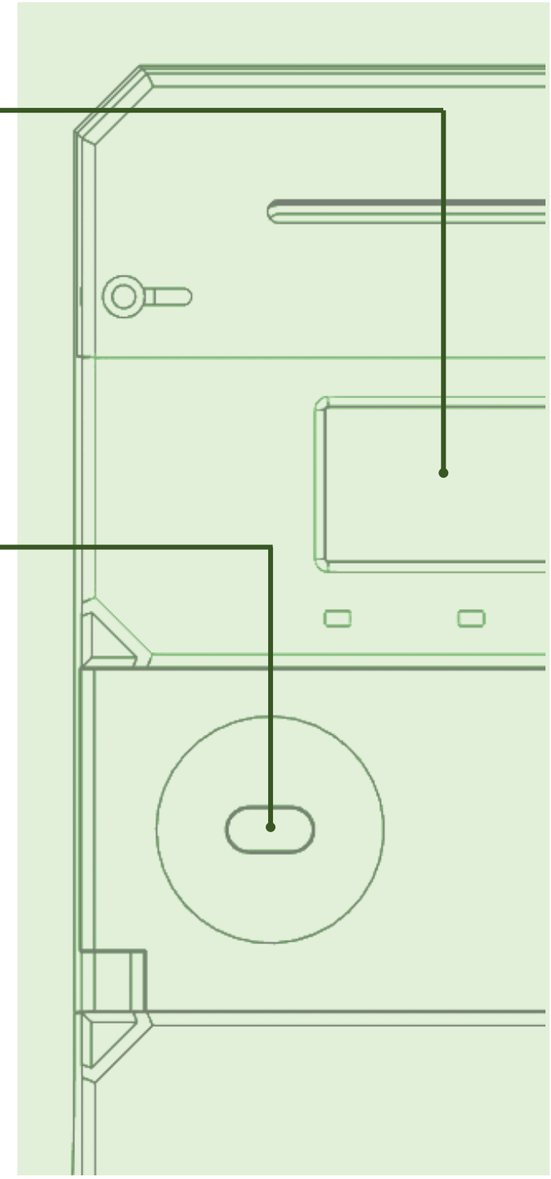
An optical communication interface is present for data exchange. This interface might be used for data reading , configuration and firmware upgrade.

METER INFORMATION

Important meter information is printed on both the front cover and the module door. This could include details like the meter's serial number, model, and other relevant specifications.

PROGRAM BUTTON

There is a sealable demand button that allows for demand reset. The sealable design ensures that the settings remain secure and tamper resistant.



MAJOR APPLICATION

The single-phase SED102 smart electricity meter has several major applications:

Remote Communication and Control:

The meter supports remote communication and control using a CAT.1+2G module. This enables two-way communication with utility providers or other relevant entities.

Digital Medium for Information Exchange:

The meter utilizes digital media for information exchange. This likely involves the use of digital signals or protocols for transmitting and receiving data, enhancing the efficiency and accuracy of communication.

Keypad and Button Input Unit:

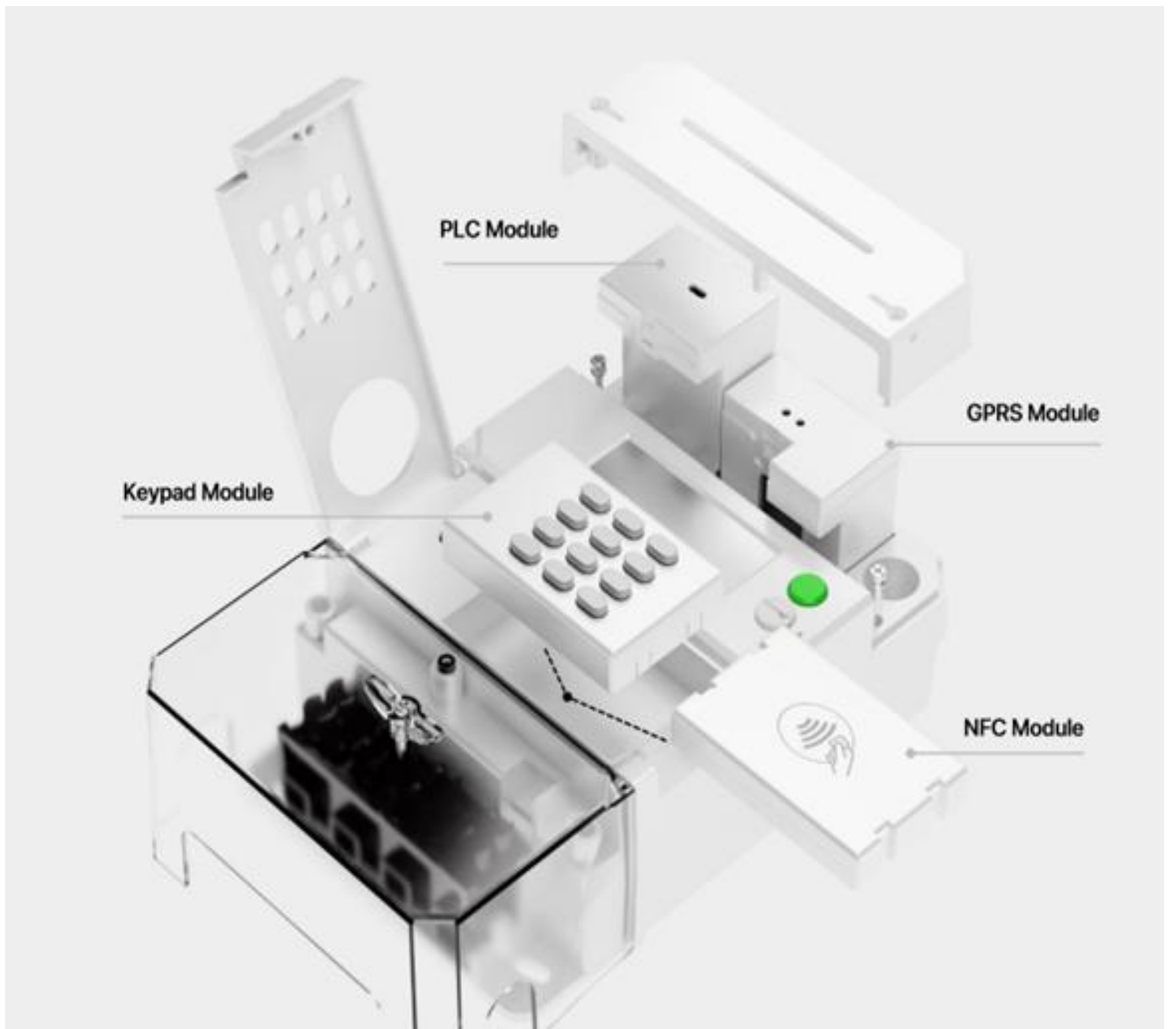
The inclusion of a keypad and button input unit allows for user interaction. Users can input commands, query data, or navigate through the meter's features using the keypad and buttons

Infrared Communication:

Infrared communication capability is included, allowing the meter to communicate with other devices or systems using infrared signals.

DLMS/COSEM Specification:

The meter adheres to the DLMS/COSEM (Device Language Message Specification/Companion Specification for Energy Metering) standard. This specification facilitates interoperability and allows the meter to connect seamlessly with the master station or other devices that also comply with the standard.



Protective PCB Board:

The electric meter's PCB (Printed Circuit Board) is coated with protective paint. This protective layer serves as a barrier against moisture, dust, and pests, ensuring the durability and reliability of the meter in various environmental conditions. The SED102 smart electricity meter offers a range of advanced features for communication, control, and measurement, making it suitable for modern energy management systems. These capabilities contribute to more efficient energy usage, billing, and overall utility operations.

Load Switch and other auxiliary equipment:

The load switch may enable remote control of electrical loads, contributing to demand response and load management strategies.

Measurement Unit:

The meter includes a measurement unit responsible for accurately measuring electricity consumption. This unit ensures precise data collection for billing and monitoring purposes.

Display Unit:

A display unit is integrated into the meter, providing real-time information about energy consumption, voltage, and current. Users can easily access and monitor their electricity usage

Real-Time Clock Unit:

The meter incorporates a real-time clock unit, enabling it to timestamp data and events accurately. This feature is crucial for time-of-use billing and tracking consumption patterns over specific time periods.

FEATURES

The characteristics of the single-phase SME102 smart electricity meter are as follows:

Plug-In Remote Communication Module:

The meter supports a plug-in remote communication module, allowing for flexible communication options and easy upgrades

Plug-In Input Module (Keypad/NFC):

It features a plug-in input module, supporting either a keypad or Near Field Communication (NFC) technology for user interaction and data input.

DLMS/COSEM Specification:

The meter complies with the DLMS/COSEM (Device Language Message Specification / Companion Specification for Energy Metering) standard. This ensures full interoperability with head-end systems and other compliant devices, enabling standardized data exchange, remote configuration, and secure communication across smart utility networks.

Software Upgrade locally or remotely:

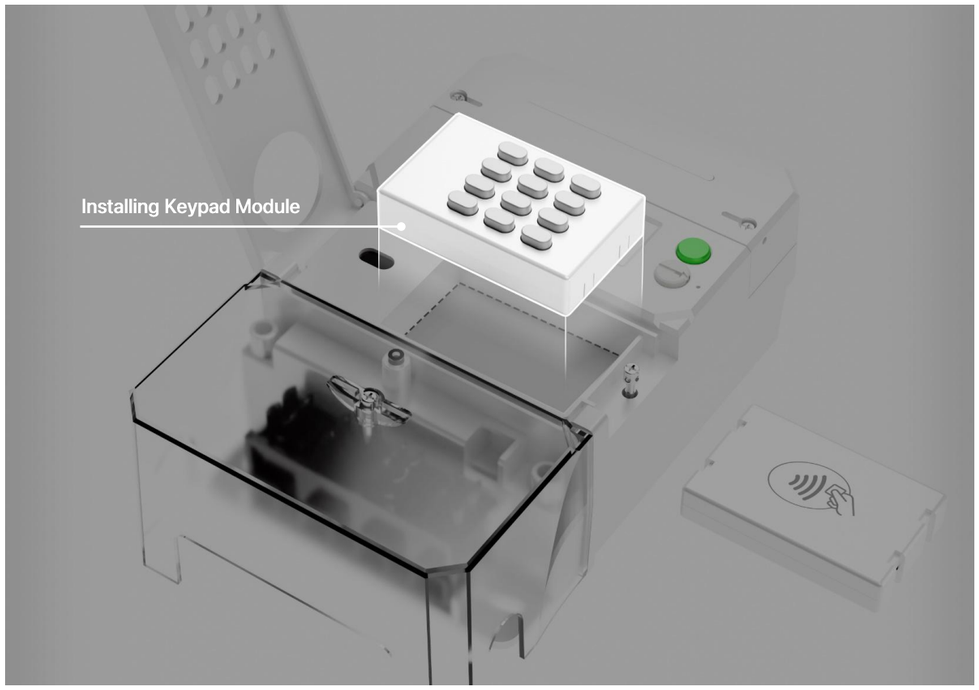
The meter supports software upgrades, which can be performed either locally or remotely. This ensures that the meter can stay up-to-date with the latest features and security enhancements.

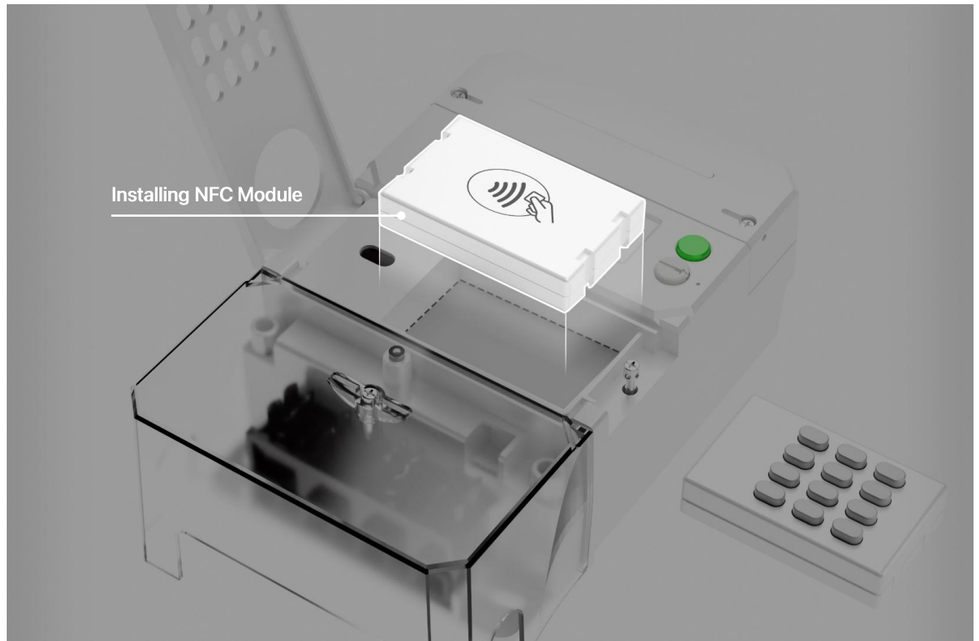
Communication Data Encryption:

Communication data encryption is implemented to ensure highly reliable and secure communication between the meter and external systems.

Internal Magnetic Latching Relay:

An internal large capacity magnetic latching relay is included, supporting load control through parameter configuration or communication commands. This allows for efficient management of electrical loads.





STS Standard:

The meter complies with the STS (Standard Transfer Specification) standard, which is often used for secure and standardized token-based prepayment systems. These characteristics collectively contribute to the functionality, reliability, and versatility of the SED102 smart electricity meter in various applications, offering advanced features for both users and utility providers.

Active Energy Accuracy:

The meter has a high level of accuracy for active energy measurement, complying with Class 1 standards as per IEC 62053-21.

Wide Range of Current Measurement:

The meter offers a wide range of current measurement, covering starting current to the maximum current, with accurate readings.

Data Display:

It provides data display functionality, including information presented on the meter's LCD display. Users can access real-time data about energy consumption, voltage, current, and more.

Grid Parameter Detection:

The meter can detect grid parameters in real-time, including power, voltage, current, power factor, etc. This information is crucial for monitoring and managing the electrical grid.

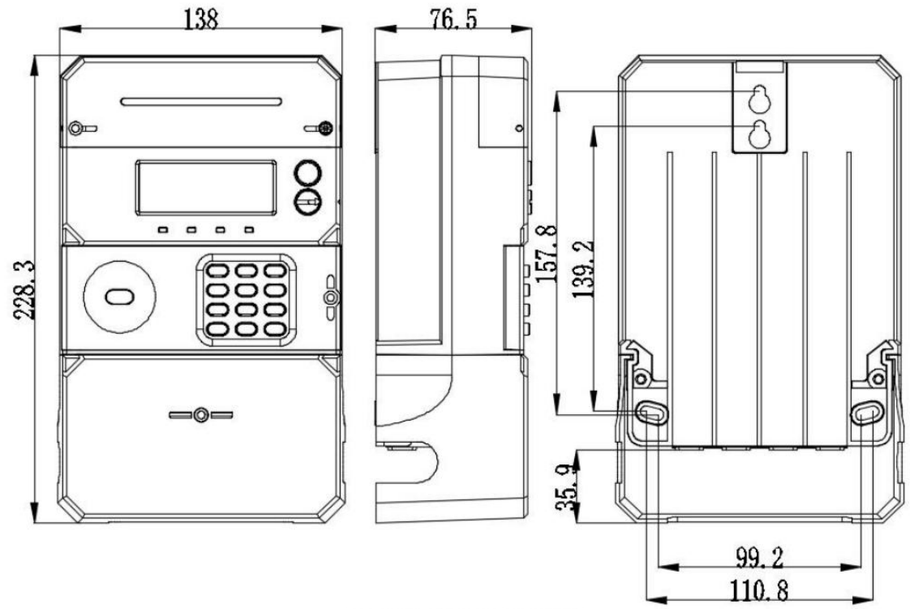
Changeable Battery:

The meter supports a changeable battery, ensuring that the display remains functional even in the absence of power. This is important for continuous monitoring and data retrieval.

Real-Time Clock:

A real-time clock is integrated into the meter, providing accurate timestamping for data and events

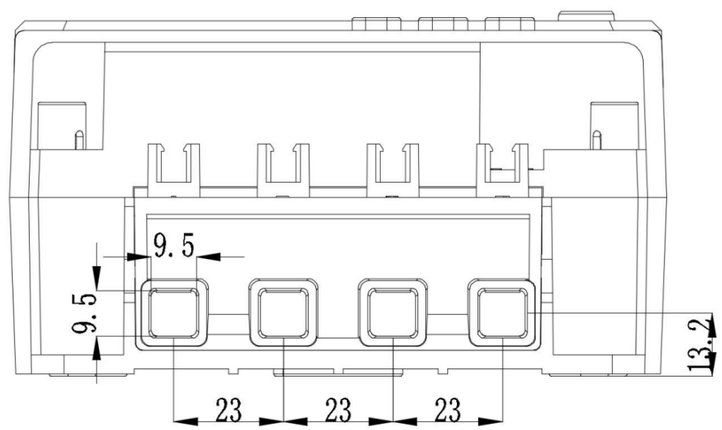
DIMENSIONS



*ALL UNITS ARE IN MM (MILIMETER)

TERMINAL

The meter is for front projection mounting. The terminal holes and screws are moving cage type.

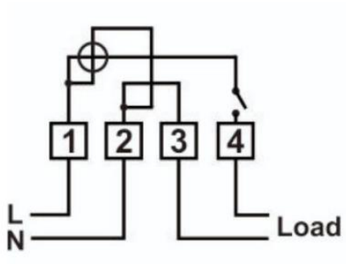


STANDARDS

IEC Standard	Description
IEC 62053-21	Electricity metering equipment- Particular requirements- Part 21: Static meters for AC active energy (classes 0,5, 1 and 2)
IEC62053-23	Electricity metering equipment- Particular requirements- Part 23: Static meters for reactive energy (classes 2 and 3)
IEC 62052-11	Electricity metering equipment (a.c.)- General requirements, tests and test conditions - Part 11: Metering equipment
IEC62053-31	Electricity metering equipment (AC)- General requirements, tests and test conditions- Part 31: Product safety requirements and tests
IEC60695-2-11	Fire hazard testing- Part 2-11: Glowing/hot-wire based test methods- Glow-wire flammability test method for end products (GWEPT)
IEC 62056-21	Electricity metering- Data exchange for meter reading, tariff and load control- Part 21:Direct local data exchange
IEC62056-42	Electricity metering- Data exchange for meter reading, tariff and load control- Part 42:Physical layer services and procedures for connection-oriented asynchronous data exchange
IEC62056-6-1	Electricity metering data exchange- The DLMS®/COSEM suite- Part 6-1: Object Identification System (OBIS)
IEC62056-6-2	Electricity metering data exchange- The DLMS®/COSEM suite- Part 6-2: COSEM interface classes
IEC62056-46	Electricity metering- Data exchange for meter reading, tariff and load control- Part 46: Data link layer using HDLC protocol
IEC62056-5-3	Electricity metering data exchange- The DLMS®/COSEM suite- Part 5-3: DLMS®/COSEM application layer
IEC62056-4-7	Electricity metering data exchange- The DLMS/COSEM suite- Part 4-7: DLMS/COSEM transport layer for IP networks
IEC62055-31	Electricity metering- Payment systems Part 31: Particular requirements Static payment meters for active energy (classes 1 and 2)
IEC62055-41 - 2014	Electricity metering- Payment systems- Part 41: Standard transfer specification (STS) - Application layer protocol for one-way token carrier systems
IEC62055-51 - 2007	Electricity metering- Payment systems- Part 51: Standard transfer specification {STS} - Physical layer protocol for one-way numeric and magnetic card token carriers

CONNECTION

The wiring diagram is laser printed on the terminal cover of the meter. This provides users with clear guidance on how to connect the meter according to their specific requirements. The Material used for the Microcontroller Unit (MCU) enclosure has good dielectric and mechanical strength with the minimum thickness of 2.0mm, ensuring durability and robustness.



The material used in the MCU enclosure complies with the IEC 60695-2-11 standard, which involves the glow wire test. This standard assesses the fire hazard of electrical equipment by exposing it to a simulated ignition source. These specifications reflect a focus on safety, durability, and compliance with industry standards for the materials used in the construction of the smart electricity meter. The inclusion of the wiring diagram on the terminal cover makes the installation process user friendly and efficient, allowing customers to follow clear instructions for proper connection.

Auxiliary Terminal Description and Electrical Characteristics

5 6 RS485	RS485

TECHNICAL PARAMETERS

Parameter	Specification
Reference voltage	230V
Working voltage	0.6Un~1.2Un
Reference current	5A
Maximum current	100A
Accuracy class	Class 1 (Active) ; Class 2 (Reactive)
Pulse constant	Active: 1000 imp/kWh ; Reactive:1000 imp/kvarh
Frequency	50Hz±5%
Temperature	Working temperature range:-40℃～+70℃ Store temperature:-40℃～+70℃
Humidity	≤95%
Altitude	3000m

Parameter	Specification
Atmospheric pressure	63kPa-106kPa
Relay	Maximum switch current: up to 120A Short circuit <= 10ms: 3600A Mechanical life: >= 100000 OPS Electric life: >= 10000 OPS
Wiring	LNNL Connection for overhead and underground system
Voltage circuit consumption	≤ 1W and 5 VA @ 230V
Current circuit consumption	2VA @ 5A, 50Hz, 30° C
Starting current	4‰ Ib
Protection degree	IP54
Display format	LCD supports 8 digits Auto scroll mode, manual display mode , power off display mode
Button	The upper button is used for manual display The lower button (sealed) is used for Demand reset
Keyboard	12 keys with audible feedback, meter still IP54 Compliant
PCB Board	Conformal coated
Average Service life	≥15 years (Except for the battery, the average life of battery is not less than 10 years)
RTC Accuracy	0.5s/day at reference temperature, comply with IEC 62054-21
Communication interface (optional)	Optical: read and configure the meter locally Remote communication: RS485 / CAT.1+2G
Backup-power supply	Internal battery or Extend Replacement Battery. Support RTC, LCD with backlight during AC power off.
Measurement	One elements
Electrostatic Discharge Immunity	Contact Discharge ： 10KV Air Discharge ： 16KV
HF Electromagnetic Field Immunity	80 MHz to 2 GHz @10V/m with load; 80 MHz to 2 GHz @30V/mnoload
Fast Transient Burst	4kV
Radio Interference Test	Equipment of CISPR 22 Class B
Immunity to conducted disturbances induced by radio-frequency fields	150kHz—80MHz 10V/M
Surge/Voltage Immunity	6KV
Impulse Voltage	8KV

MECHANICAL STRUCTURE

Material Used:

- The meter base and cover are made of non-metallic material.
- The material is non-hygroscopic (does not absorb moisture).
- It is UV stabilized, which means it can withstand exposure to sunlight without significant degradation.
- The material is flame retardant, offering safety in the event of a fire.
- It is polished, providing a smooth and aesthetically pleasing surface.
- The material has high impact-resilience, indicating its ability to absorb and withstand impacts without breaking.
- It has low dirt absorption properties, making it easier to clean and maintain. The material used for the terminal block is capable of passing the ISO 75-1 standard. ISO 75-1 is a standard for testing the temperature behavior of plastics.

NON-METALIC

NON-HYGROSCOPIC

UV STABILIZED

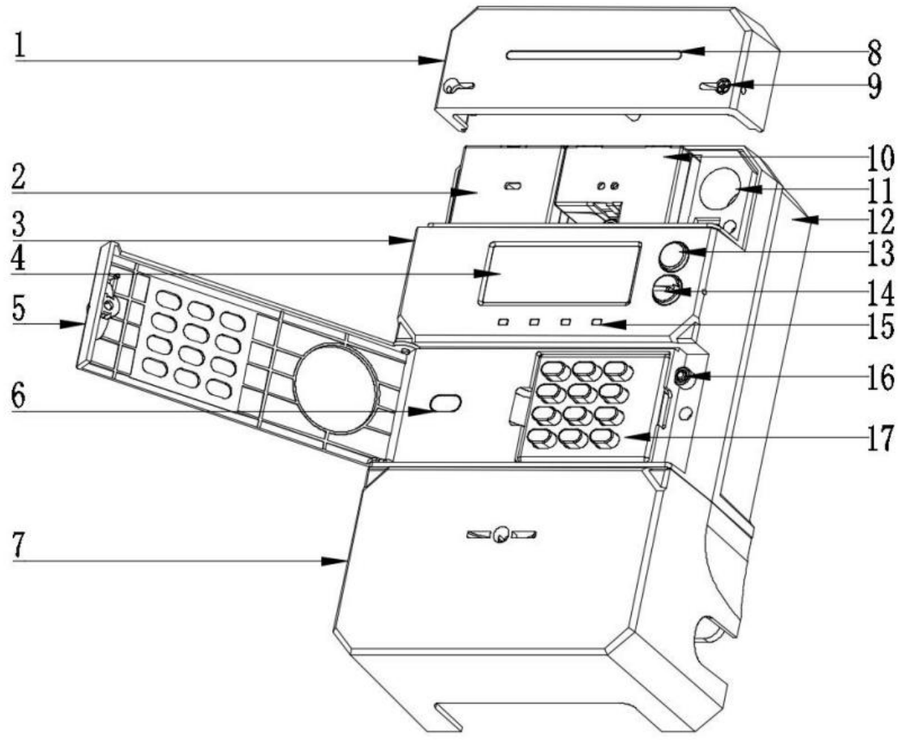
FLAME RETARDANT

ISO 75-1



CASE COMPONENTS

The case includes various components that are visible from the outside.



1	Module cover	2	Replaceable PLC module	3	Top cover
4	LCD	5	Module cover 2	6	Optical port
7	Terminal cover	8	Module LED	9	Module cover screw
10	Replaceable CAT.1+2G module	11	Replaceable battery	12	Meter base
13	Display button	14	Demand reset button	15	Meter LED
16	Module cover open	17	keypad		