matismart

IoT
Internet Of Thing

Smart Energy Management System

MT61-GP

Focus on Smart Electricity

Smart Energy Management System

Overview

Energy management Platform
for utility or enterprises

Gateway

www

cloud

www

App for end-users

LAN, RS485

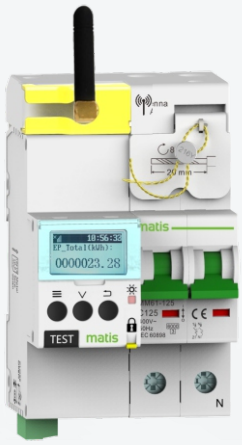
GSM/GPRS 2G/3G
NB-iOT

MT61-GP is a kind o innovative smart power meter, which includes hardware-smart metering breaker and softwares-power energy management platform for utility or enterprise and App for end-users. It integrates the most frontier technologies: AI,big data, IoT and cloud computing.

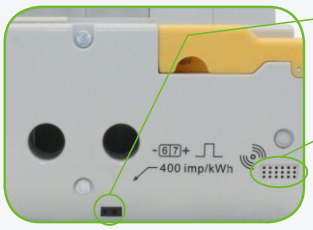
MT61-GP can realize energy consumption management, real-time monitoring, on-line payment, fault warning and alarm, Remote control. This system effectively helps utility and enterprise to rationally energy, reduce energy consumption, improve operation environment and increase economic benefits.

Structure

General Structure



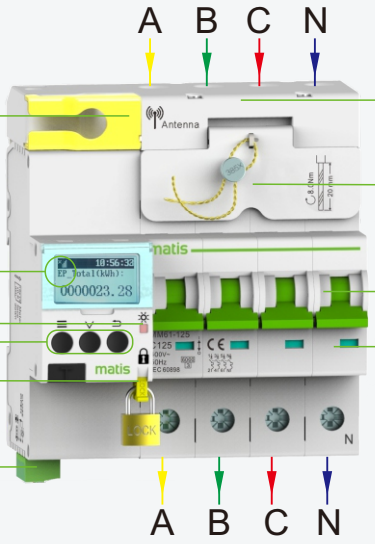
- **LED indicator**
  - Green: GPRS signal normal
  - Green Flash: connecting to server
  - Red Flash: Voltage abnormal or reclosing of voltage turns normal
  - No light: No network



- **Pulse output**
  400 imp/Kwh
- **Buzzer**

Top part of device

- **LCD screen**
- **Antenna Cover**
- **Metering seal**
- **Metering CT module**

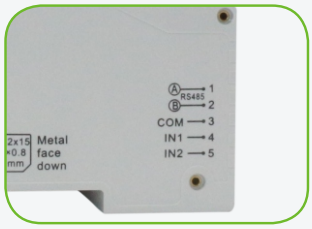


- **Handle**
- **ON/OFF Indicator**

- **communication port :Antena**
- **Protection cover**

Front part of device

side of device



side of device

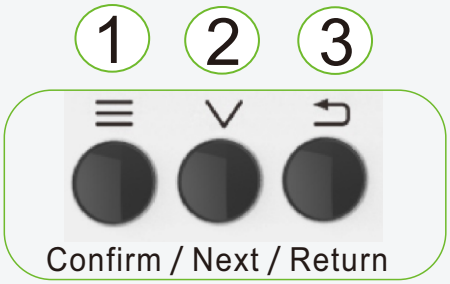
- **Communication port**
- **Security Lock**
  Pull out and hang lock (dia 4.5mm) while maintenance
- **Function Button**
  Next, Confirm, Return(Left to right)

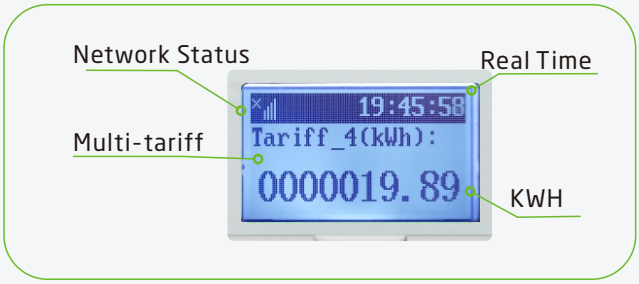
SIM Card slot
Support 2G/3G SIM card

Communication port
1&2:RS485
3:com port
4&5:Alarm Input

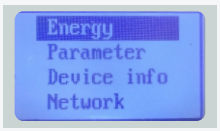
Structure

Device Operation Instruction

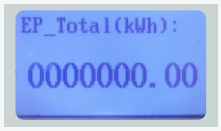




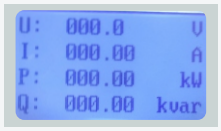
① confirm Confirm --> Energy inquiry / Parameter query / Device information



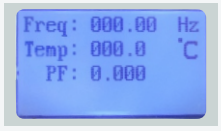
1.1 Energy inquiry --> --> First phase energy (kwh): / Second phase energy(kwh): / Third phase energy(kwh): / Forth phase energy(kwh): / Total Energy(kwh):



1.2 Parameter query --> --> Voltage U: V / Current I: A / Active Power P: kW / Reactive Power: kvar

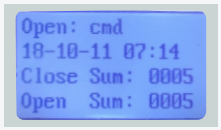


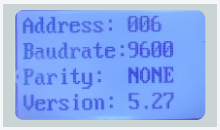
Power factor : 1.00 / Frequency: 050.00Hz / Temperature : 32.00 OC



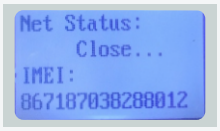
1.3 Device information --> --> Trip or Reclose status / Communication Connection

1.31 Trip or Reclose status --> --> Status / Close(Open) / Open total: 3631 / Trip total: 3630





1.32 Communication Connection --> --> Add:1 / Baud Rate: 9600 / Check Digit: NONE / Version: 5.01



Features

Individual Device

This system is a kind of "all-in-one device", which integrates smart metering breaker, protection, remote control and communication ect. It includes single phase two wires and three phases four wires, and the rated current is up to 100A.

Minimum Space requirement

Comparing to traditional 2P and 4P MCB, it only has extra controller of 36mm width.

Very simple installation

The device can be mounted in 35mm Din Rail very easily and individually.

Metering:

- Active and reactive energy metering(accuracy:class 1.0)
- Respective Measurement of Forward/reverse active energy (Programmable)
- Maximum demand (MD) Measurement
- Multi-tariff measurement : 4 tariffs(Sharp, Peak, Flat,Valley) and 24 hours shifts & automatic Switch to the other standby tariff12 monthly billings record (data item programmable)
- 7 digits
- Data frozen: daily,weekly,monthly, quartly data frozen and be transferred to cloud sever.
- Strong anti-tamper functions:Electricity theft detection,terminal cover locked and alarm of opening meter box door.

Full Protection

This system includes all the protections: Overload, Short Circuit, Over/Under Voltage, Phase Loss, unbalance, High Temperature

Communication :

Rs485, GRPS2G/3G,NB-IoT

Protocol

Modbus and MQTT

Electrical faults analysis

The device may realize real-time analysis of all electrical faults: short circuit, earth leakage, overload, over/under voltage, overheated.

Monitoring in real time

The device may make realize real-time monitoring of electrical circuit parameters: Current, voltage, active Power, reactive power, Power factor, Frequency, temperature

Over/under voltage value and over current protection value limit

The over/under voltage value and over current protection value can be adjustable through software platform.

Power Management

Electricity Monitoring

Power Consumption Metering

Electricity Safety

Smart Power Energy

Smart Energy Management System

Benefits

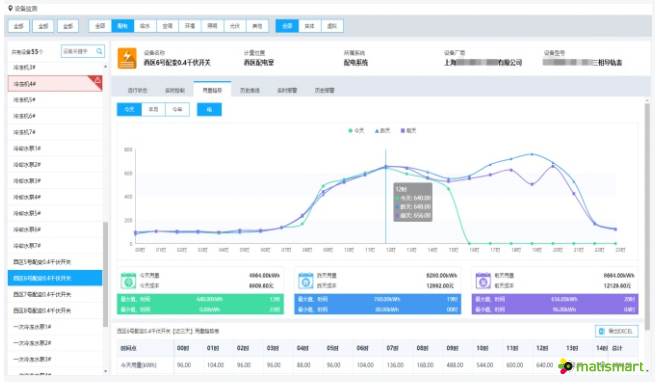
Intelligent Energy meter with advanced billing system

The developing countries are still deficient in the generation of Electrical energy in contrast to demand of the country. In addition to this, prominent problem they are facing is electrical power loss. In some countries the loss is so severe that the government has to allocate loan or subsidies so that the utilities can sustain. The most prominent reason behind the loss is unpaid bill and energy theft.

Detecting power theft

The system has two facilities to detect power theft: meter alert system and terminal cover locked. The alert system will send alert SMS to software platform when there is power theft after supply cut in addition to this, as there is daily data availability fetched from each device, so one can predict per day consumption for some period then one can check respected device for energy theft.

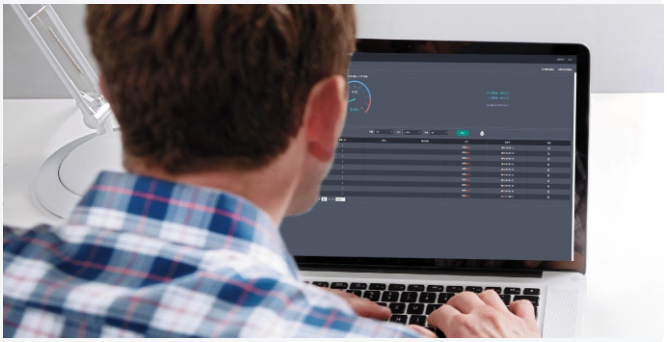
Energy Consumption Management



This system can help increase the energy efficiency and cost savings, maximise electrical network reliability and availability, and optimise electrical asset performance.

- Collect and analyse energy consumption data from each area for each type of load or circuit
- Gain an accurate understanding of business expenses by allocating the energy-related costs
- Bill checking to verify that you are only charged for the energy you use
- Energy cost and usage analysis per zone, per usage or per time period to optimise energy usage

Remote control



The hardware device may be controlled by software platform of Utility or enterprise customers, if the customers'charge in account is overdue, the utility may switch off the device remotely.

Software Introduction

The smart energy management system is an innovative cloud-computing platform which mainly is used in utility as smart meter, telcom and industry. For the sector of utility, software includes App operation version in smart phone for customer's use and management software platform for utility or enterprise's use.

APP

It includes , Billing, account and online payment, device management, safety supervision, energy consumption analysis

Billing:

The real-time power consumption and bill of each device information can be checked and read through terminal APP.

Account and online payment

The customers open one account in the terminal App and the balance in account can be check and the alert will be showed in the APP if the balance is less the limit regulated by utility. The customer may make the online payment through credit card or Alipay.

Device management:

The device may be controlled remotely by App and all real-time electrical parameter of device may be showed here: current, voltage, active power, reactive power, frequency, Power factor, temperature and others.

Real-time monitoring

Showing operation status of important load at all the times and places and helping to improve energy management ability.

Safety Supervision

The system can make the following alarms: overload, short circuit, over current, over voltage and under voltage , phase loss and unbalance. It can improve the power quality and preotects appliances from electrial faults.

Energy consumption analysis and comparision

Multi-dimensional energy consumption and comparison daily, monthly, quarterly and yearly may be released and it help the customer to make energy saving and cost saving.

Smart Energy Management System

Software Platform

Software platform is designed to make control management, billing and payment management, real-time electrical parameter monitoring, energy consumption management, anti-tamper management, electrical safety supervison and data report for utility or enterprises.

Electrical safety supervision

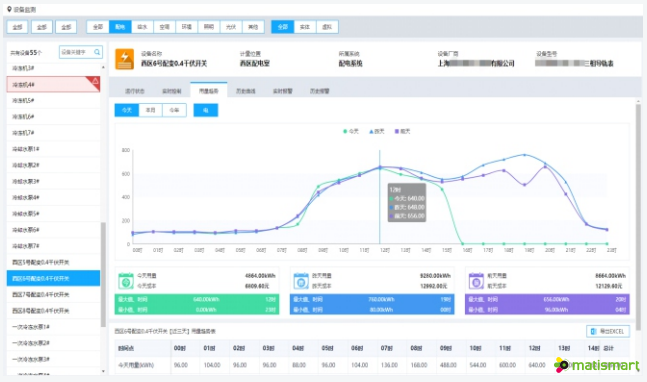
The system can make the following alarms: overload, short circuit, over current, over voltage and under voltage , phase loss and unbalance and show the location of device with fault.

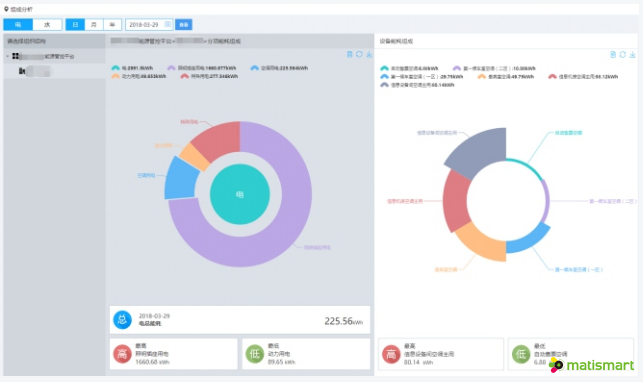
Control management

The device may be controlled by software platform of Utility or enterprise customers, if the customers' charge in account is overdue, the utility may switch off the device remotely.

Energy consumption management

The system helps illustrate and analyze the instantaneous energy consumption level and realize the real time power efficiency monitoring. The platform customize load classification, vertical comparison between classified load. Therefore, it help identify energy saving, further to save energy cost, through analysis and comparison.





parameter monitoring

rm can show operation status of all the loads at all
places and help to improve energy management

Software platform

Real-time parameter monitoring

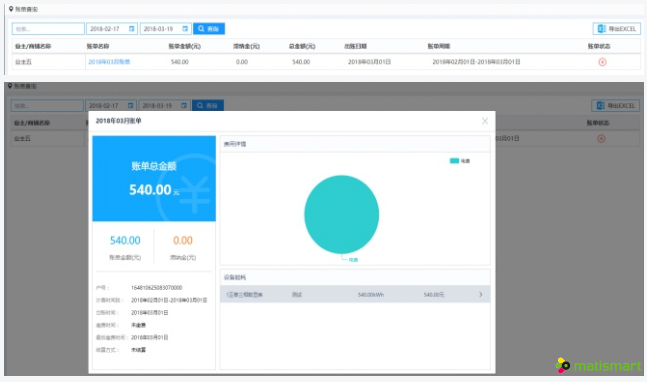
The platform can show operation status of all the loads at all times and places and help to improve energy management ability.

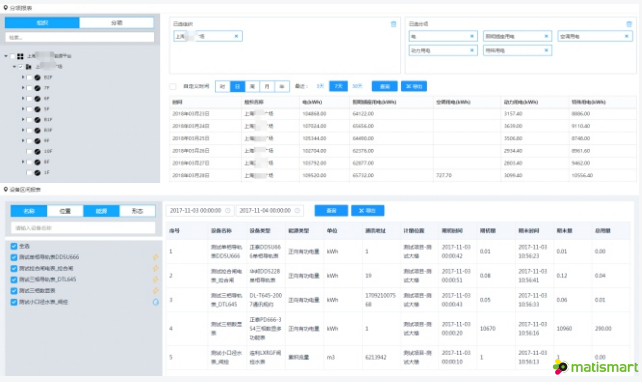
Billing and payment management

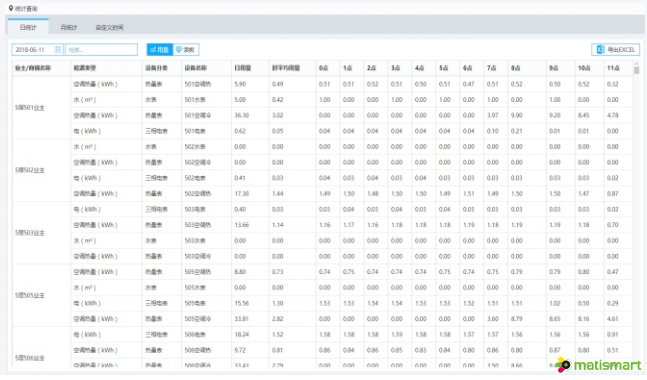
The utility or enterprise can release on-time bill to App terminal of each customers and collect electricity tariffs through software platform. The utility or enterprise will take actions when the charge in account of custumer is overdue.

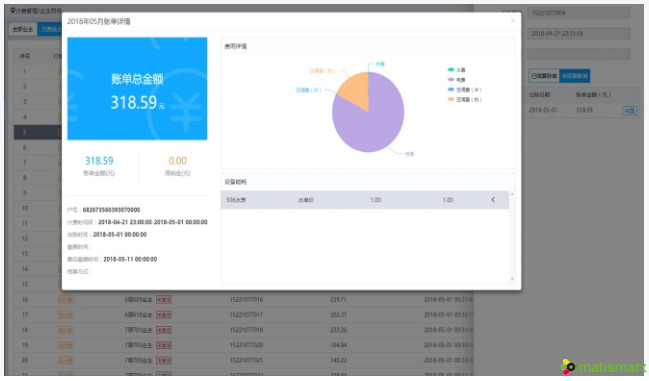
Data report

The system can provide real-time report and historical data report, these reports show real-time data and status for operation system in uniform table format which can provide dynamic comparison and monitoring for each device.









Applications

internal energy management and assessment

Application case: internal energy management and assessment

Keywords: independent measurement, accurate and reliable, energy saving and efficiency increasing.

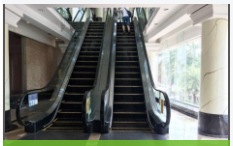
In this software platform, the user may find the basic analytic functions such as a dashboard data, instantaneous values, comparison functions and cost allocation by consumer group.
The building energy flows and costs are transparent, therefore, this solution is suitable for energy management and energy cost allocation application seeking energy efficiency improvement and cost reductions.

Key customer value

- It stops billing electricity according to the area, and provides a more reasonable billing method: independent and accurate measurement of the actual electricity consumption of each store.
- It understands the power consumption and manages comprehensively by dividing the public area.
- It implements the overall energy-saving tasks of the mall through various methods such as inter-regional comparison and electricity tari ffmanagement system.
- It establishes a simple power management system to improve the energy management efficiency of the mall.

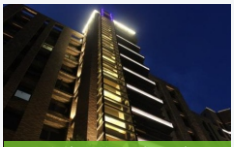
Recommended solution

- An electric energy meter is installed in the distribution box of each independent metering area of the shopping mall, and the meter is independently measured.
- An electric meter is installed in the distribution room of each floor to measure the energy consumption of the public area and the power parameter monitoring.
- The instrument uses Schneider's rail-mounted electric energy meter, which is small in size and easy to install, which saves space.


Elevator


Emergency Illumination


Smoke Exhaust Fan


Public Illumination


Sewage Pump


Firefighting Power Distribution

Applications

Independent power line

Application case: commercial building

Keywords: load energy consumption, energy management system, high cost-effective solution

the building, identifying areas where energy needs to be improved, and helping to reduce building energy consumption. reliable energy consumption data of these public facilities, enabling electricity to control the entire energy use process within As a equipment manager, I want to make the most of lighting control systems. There is also a need to keep abreast of the

Key customer value

- It measures independently the energy consumption of each load in the building, such as air conditioners, elevators, pumps, lighting, etc.
- Obtain comprehensive energy consumption information, establish and optimize energy management systems, review reports in a variety of ways and find energy consumption through comparison.
- Optimize equipment operating efficiency and avoid unnecessary investment, saving 2%-5% of building operation costs.
- It can provide end-to-end one-stop services, from installation and configuration, communication debugging to software development.

Equipment advantage

- Accurately count the energy consumption of each equipment and load to obtain comprehensive and detailed energy data.
- Through the equipment energy analysis, benchmarking and some other methods, establish a scientific electricity model and optimize the use of equipment.
- Establish and improve the power management system, so that there are calculable and comparable standards.
- Verify the actual effect of some energy-saving investments and avoid unnecessary investment to increase the return on investment.


Low Voltage Power Distribution


Security Power Distribution


Refrigeration & Heat Equipments

Smart Energy Management System

Applications

Energy saving increases productivity

Application case: Industrial production

Keywords: energy consumption assessment,production efficiency

As a production manager, I need to ensure a high qualification rate while continuously improving production efficiency. By comparing the power consumption records of production equipment, the energy efficiency ratio of the team can be assessed, and the energy efficiency of labor and equipment can be improved to ensure the highest operation of the process.

Electrical and energy management

- Detailed measurement of energy consumption data of key equipment and complete sets of equipment on the production line, and analysis of changes in different environments.
- By analyzing the energy consumption data, it is timely found that the equipment is abnormal, such as lack of lubrication, etc., to improve equipment energy efficiency.

Production and efficiency management

- Through the analysis of the energy consumption and output data , the energy consumption comparison between the production team is evaluated.
- To estab lish energy consumption evaluation and management system to improve production management level

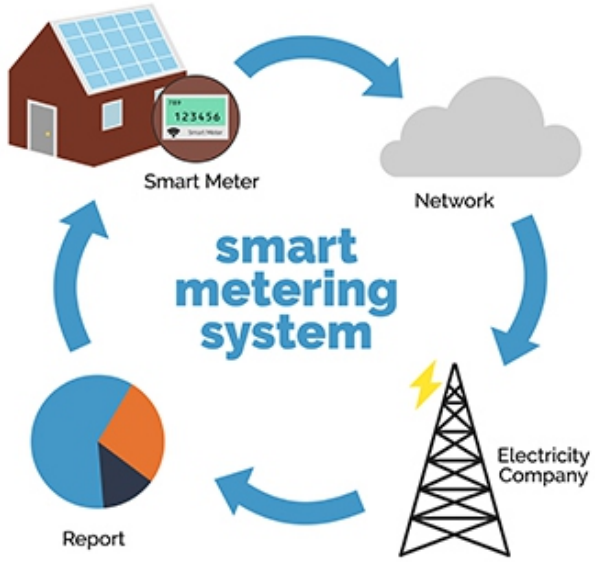

Low Voltage Power Distribution

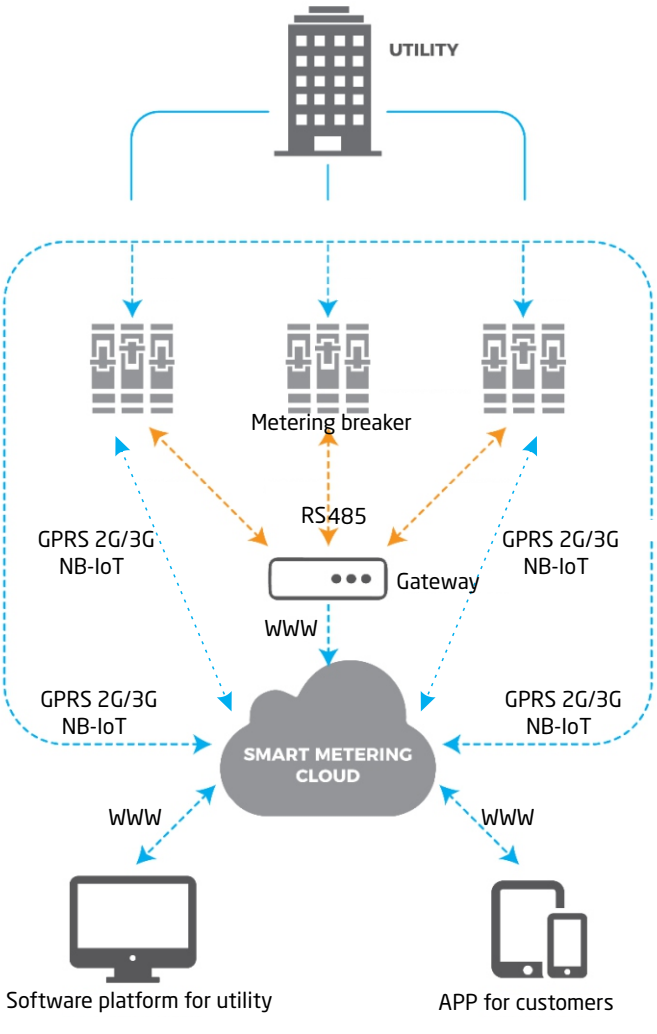

Smoke Exhaust Fan


Sewage Pump

Applications

Utility

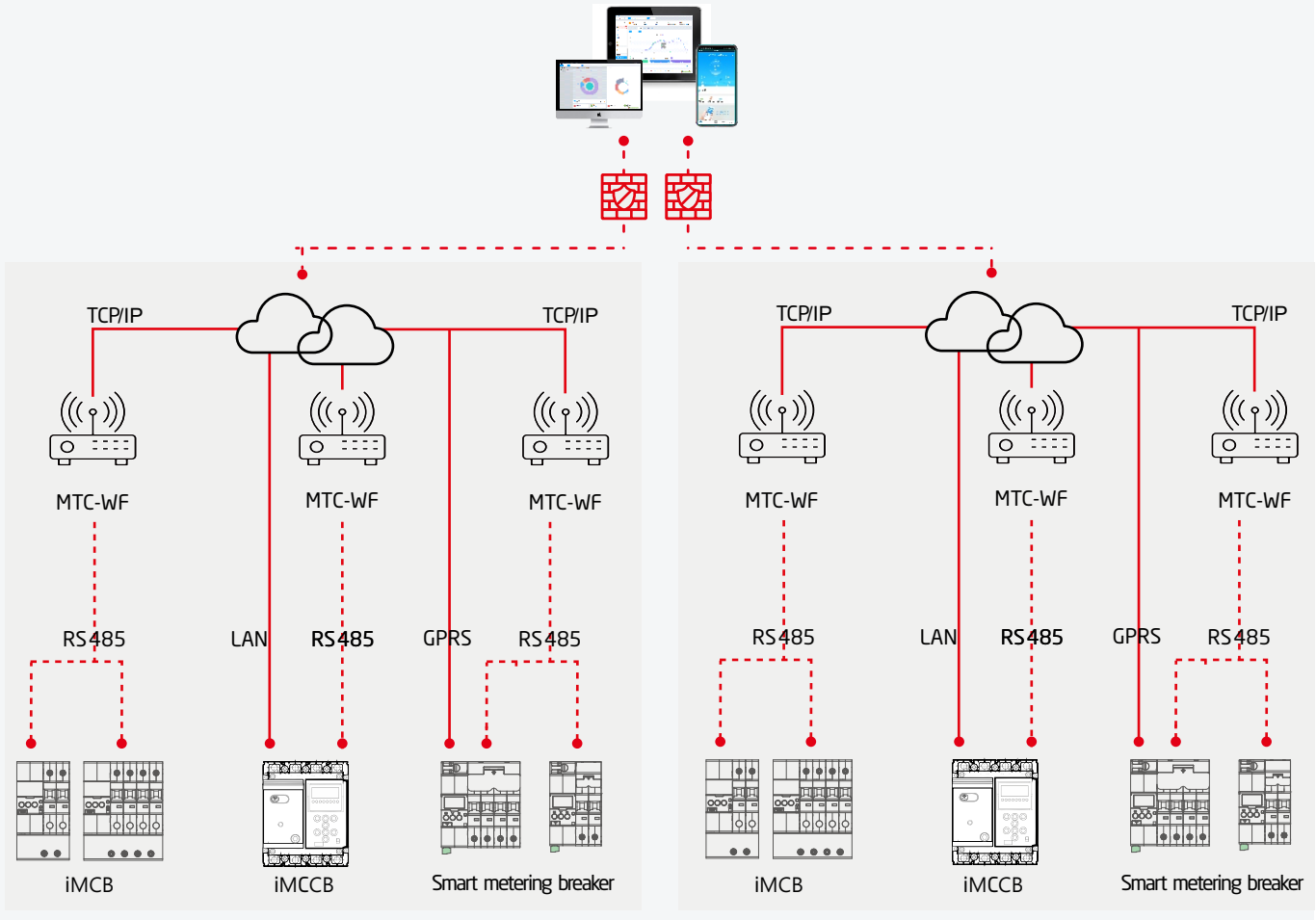




Smart Energy Management System

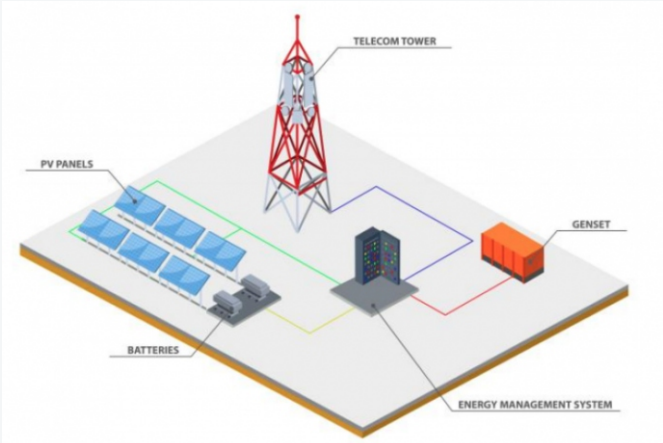
Applications

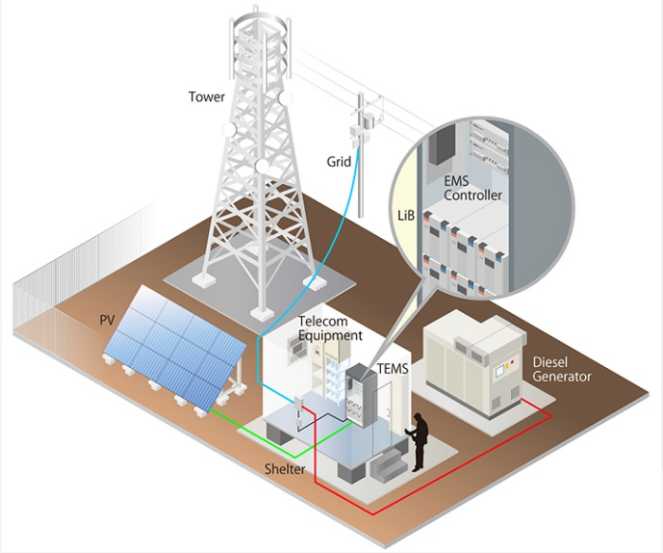
Industry

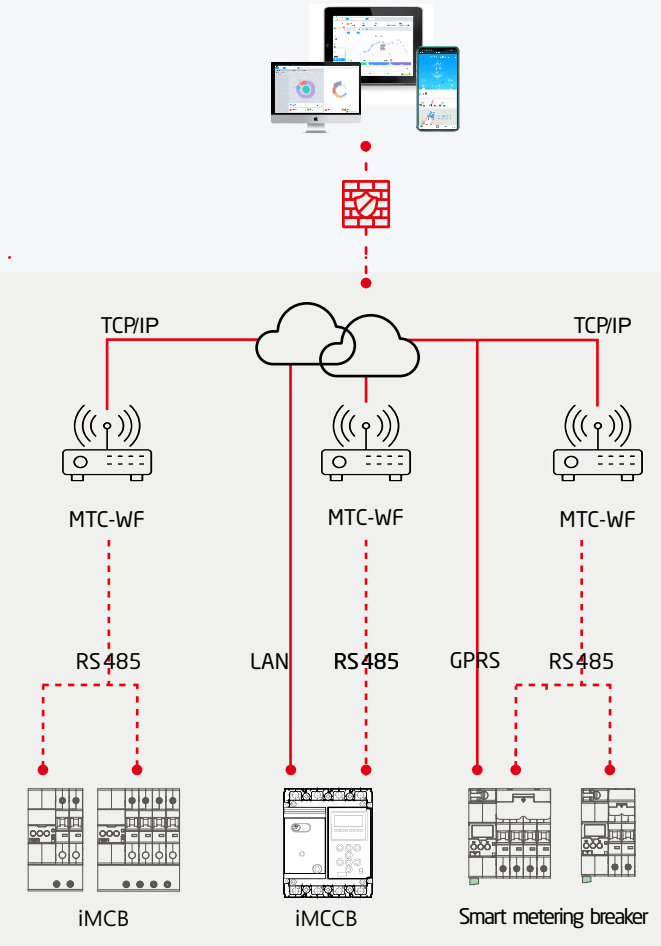


Applications

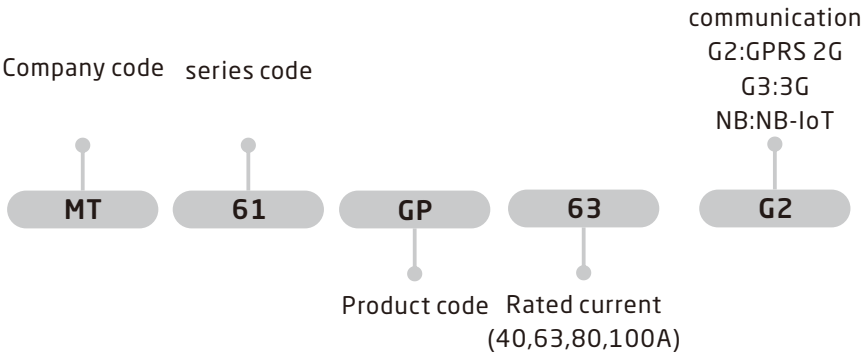
Telecom tower







Instruction of type code for power supply module



Technical specification

Item Code:		MT61-GP	MT61GP
Picture			
Standards:		IEC62053-21, IEC60898	
Approvals:		CE,CCC,	
Phase		Single phase	Three phase
Rated Voltage	Vac	230V/110V	380/220V
Working Voltage	Vac		
Maximum Voltage	Vac		
Insulation Voltage	Vac	500	
Type of Energy Meter		Bidirectional Meter(Purchase and supply)	
Measurement Value		Active energy(kWh), Reactive energy (kvar) , active Power(kW),Current(A), Voltage(V), Power factor(cosphi),temperature, Switch Status	
Accuacy for Active energy		Class 1	
Accuacy for Reactive energy			
Impulse		1000 imp/kWh	
Frequency (HZ):	Hz	50/60	
Rated Current	A	16,32,40,63,80	
Limit Current	A	125A	
Measuring range		0.4-18400W	
Data storage		24 months	
Power consumption			
Rated impulse withstand voltage (1.2/50) Uimp	Vac	2500	
Rated Breaking capacity acc.to IEC60899 Icn	A	6000	
Triping Characteristic		C (5-10In)	
Connectivity		RS485, GPRS 2G, GPRS 3G(900/2100MHz)	
Conductor cross-sections	mm	25	
Pollution Degree		2	
Ambient temperature:	°C	-15 - +40	
Storage temperature:	°C	-25---+70	
Humidity		< 95%	
Altitude:	m	<=2000	
Terminal Connection		Cable/Pin-type busbar	
Mounting		Din rail En60715(35mm) by means of fast clip device	
Connection		From top to bottom	

Ordering information

Pictures	Curve	Phase	Rated current In (A)	communication	Type Code	No of Modules (1 module=18mm)	Weight.
	c	Single Phase	16	GPRS 2G	MT61-GP-16G2	4 (72mm)	
			32		MT61-GP-32G2		
			40		MT61-GP-40G2		
			63		MT61-GP-63G2		
			80		MT61-GP-80G2		
			100		MT61-GP-80G2		
	c	Three Phase	16	GPRS 2G	MT61-GP-16G2	8 (144mm)	
			32		MT61-GP-32G2		
			40		MT61-GP-40G2		
			63		MT61-GP-3G2		
			80		MT61-GP-80G2		
			100		MT61-GP-100G2		
	c	Single Phase	16	GPRS 3G	MT61-GP-16G3	4 (72mm)	
			32		MT61-GP-32G3		
			40		MT61-GP-40G3		
			63		MT61-GP-63G3		
			80		MT61-GP-80G3		
			100		MT61-GP-80G3		
	c	Three Phase	16	GPRS 3G	MT61-GP-16G3	8 (144mm)	
			32		MT61-GP-32G3		
			40		MT61-GP-40G3		
			63		MT61-GP-63G3		
			80		MT61-GP-80G3		
			100		MT61-GP-100G3		
	c	Single Phase	16	NB-IoT	MT61-GP-16NB	4 (72mm)	
			32		MT61-GP-32NB		
			40		MT61-GP-40NB		
			63		MT61-GP-63NB		
			80		MT61-GP-80NB		
			100		MT61-GP-80NB		
	c	Three Phase	16	NB-IoT	MT61-GP-16NB	8 (144mm)	
			32		MT61-GP-32NB		
			40		MT61-GP-40NB		
			63		MT61-GP-63NB		
			80		MT61-GP-80NB		
			100		MT61-GP-100NB		

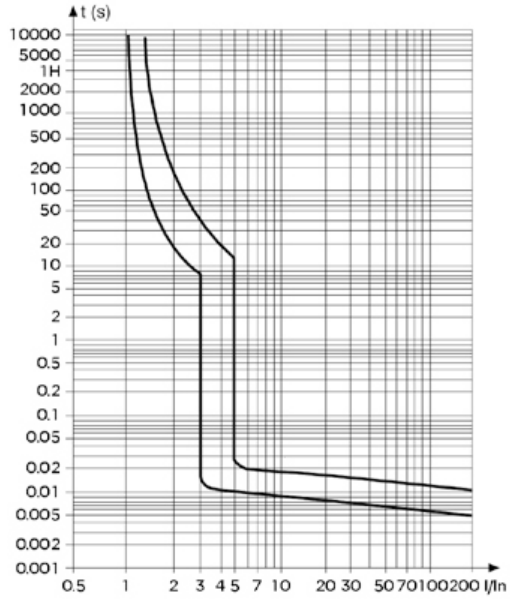
Accessory

Pictures	Accessory name	Specification	Type Code
	Mini antenna		MT61-GP-ATS
	Antenna		MT61-GP-ATL

Technical information

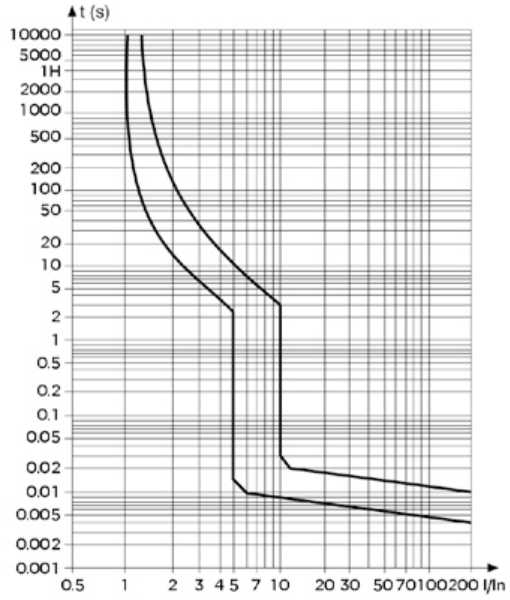
Tripping characteristic curves

B-curve: (3-5) In



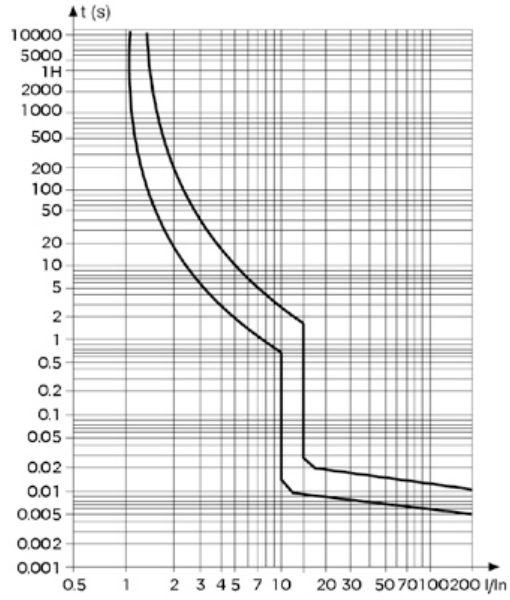
B type trip curve

C-curve: (5-10) In

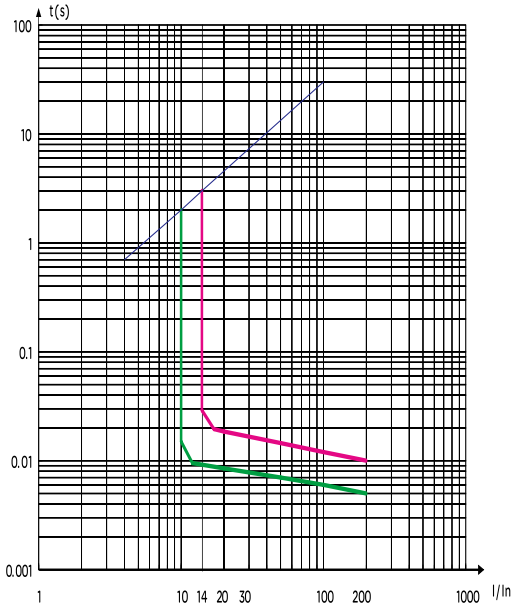


C type trip curve

D-curve: (10-14) In



D type trip curve



Magnetic trip diagram

Magnetic release for Smart Breaker

An electromagnet with plunger ensures instantanueous tripping in case of short circuit. The IEC60898 distringuishes three different types: B, C, D

Standard	Curve	Start Status	Test current	Test Request	Tripping time	Applications	Ambient Temperature for Test
IEC60898	B	Cold	3In	No trip	t≤ 0.1s	Only for resistive loads such as: Electrical heating water heating stoves	30°C
		Cold	5In	Trip	t < 0.1s		
	C	Cold	5In	No trip	t≤ 0.1s	Usual loads such as: Lighting Socket outlets small motor	
		Cold	10In	Trip	t < 0.1s		
	D	Cold	10In	No trip	t≤ 0.1s	Control and protection of circuits having important transient inrush currents(large motors)	
		Cold	14In	Trip	t < 0.1s		

Thermal release for Smart Breaker

The release is initated by a bimetal strip in case of overload, the standard defines the range of release for specific overload value
Referece ambient temperature is 30°C

Standard	Start Status	Test current	Test Request	Tripping time	Ambient Temp
IEC60898	Cold	1.13In	No Trip	T>= 1h(In<=63A)	30°C
				T>=2h(In>63A)	
	Hot	1.45In	Trip	T<1h(In<=63A)	
				T<<2h(In>63A)	
	Cold	2.55In	Trip	1s<t<60s(In<=32A)	
				1s<t<120s(In>32A)	

Magnetic release for Smart Breaker

An electromagnet with plunger ensures instantaneous tripping in case of short circuit. The IEC60898 distringuishes three different types: B, C, D

Standard	Curve	Start Status	Test current	Test Request	Tripping time	Applications	Ambient Temperature for Test
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		Cold	10In	Trip	t < 0.1s		
	D	Cold	10In	No trip	t≤ 0.1s	Control and protection of circuits having important transient inrush currents(large motors)	
		Cold	14In	Trip	t < 0.1s		

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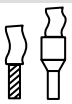
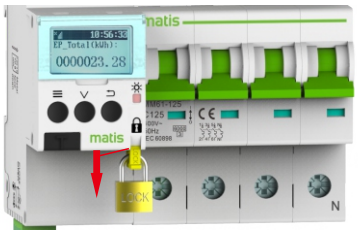
	Hot	1.45In	Trip	T<1h(In<=63A)	
				T<<2h(In>63A)	
	Cold	2.55In	Trip	1s<t<60s(In<=32A)	
				1s<t<120s(In>32A)	

Screw size	Rated torque	Ultimate torque	National standard	Hard line	Cord or hoop terminal
					
1~25	2.5 Nm	5.1 Nm	2.0 Nm	1-25mm^2	1-16mm^2
32~80	3.5 Nm	5.6 Nm	3.5 Nm	1-35mm^2	1-25mm^2

Installation and Wiring Diagram

> This product must be installed by authorized electrician.

> The safety lock should be pulled out before instllation to avoid electric shock.



> It requires to input SIM data card (12x15x0.8mm), with metal face downside in slot, before power on. Press SIM card inside and it will spring out. (Note: no such slot for SIM card if standard version)

> Open antenna cover, and screw the terminal (No antenna for standard version)

> Screw tightly all terminal screws, release safety lock to return inside. Manually switch on the handle once.
(it requires to switch on the device once through Rs485 if reclose fails)

Screw tightly all terminal screws

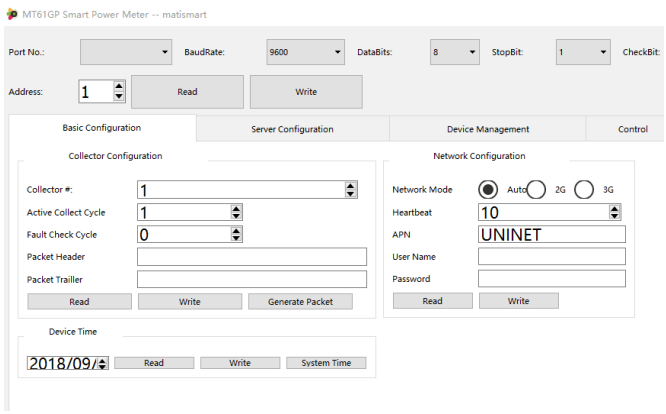
release safety lock to return inside

Manually switch on the handle once.

> APN Configuration

MT61GP 3G Configuration Tool

On Request



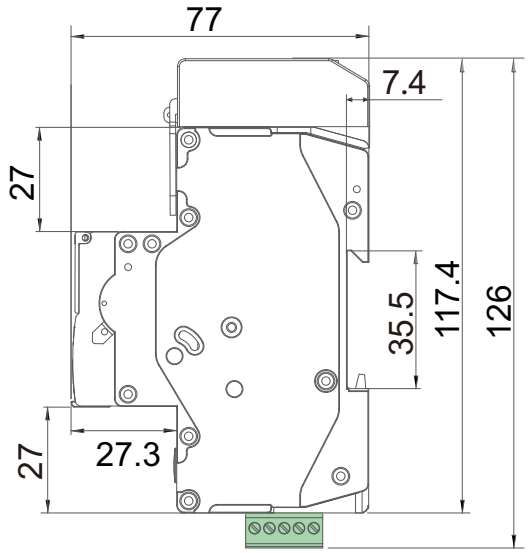
Data SIM card

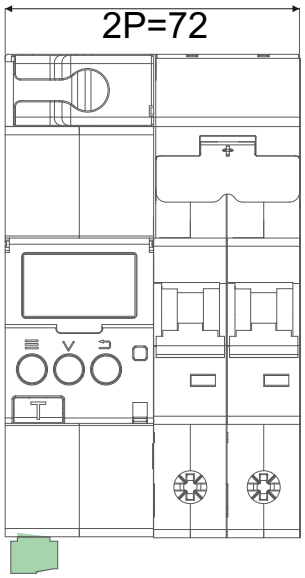
APN

configuration

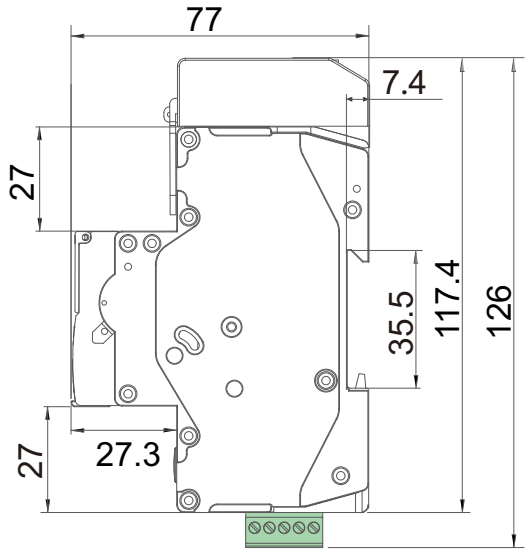
Outline and installation dimensions

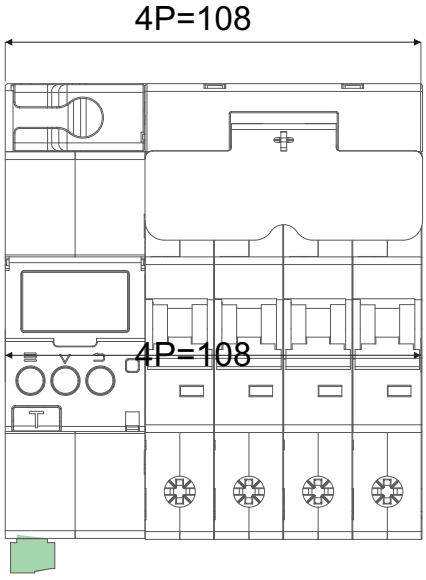
MT61-GP-2P





MT61-GP-4P





matismart

MT7 Smart Breaker
iOS

MT7 Smart Breaker
Android

Shanghai Matis Electric Co.,Ltd.

Room 318-320 No.83, 3rd Huanhu West Road,
Pudong, Shanghai, China 201306

+86 21 60503668 +86 18621879631

ricky@matismart.com

www.matismart.com