



MPM 4000 series

Multi Circuit Multi-Functional Smart Meter

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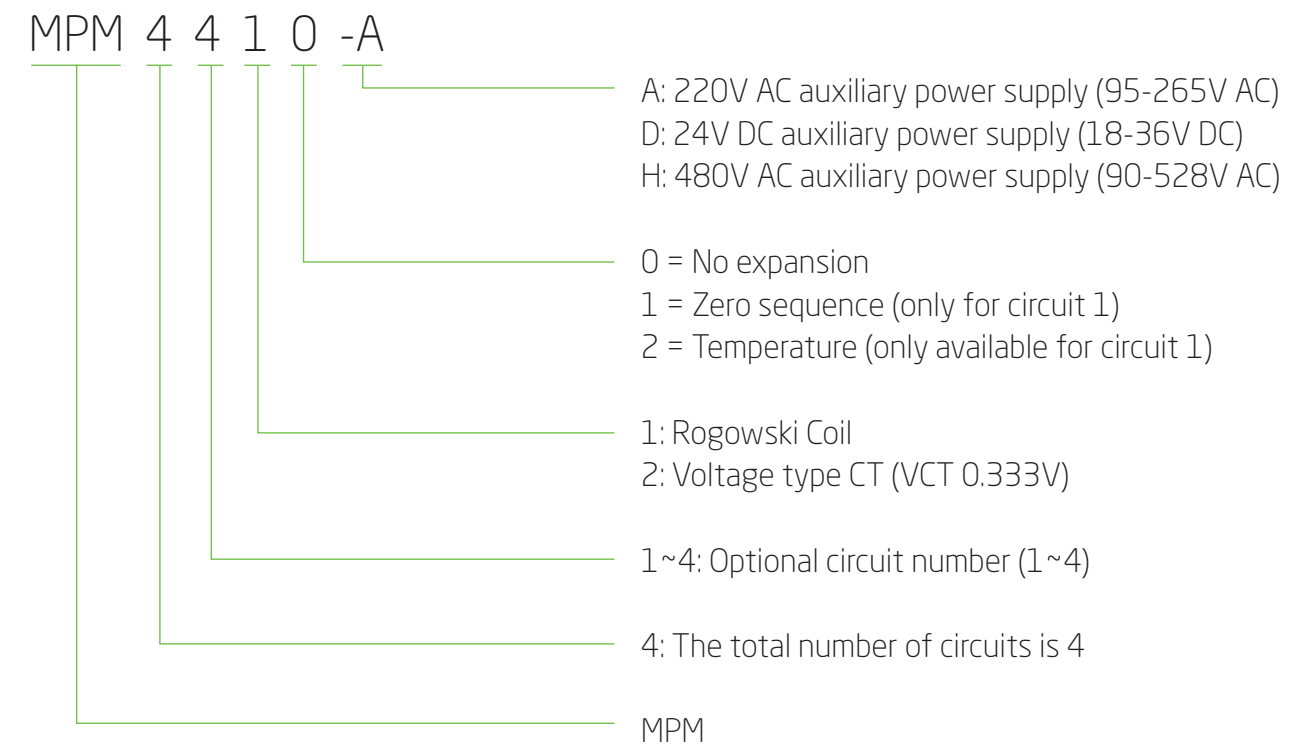
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Model Definition



Applicable Scenarios



Industrial power distribution system:
Provide accurate energy consumption monitoring, improve energy quality and equipment stability.



Smart building management:
Optimize electricity usage structure, reduce energy consumption, and improve energy management efficiency.



Data center power monitoring:
Accurately measure power demand and improve power supply reliability.



New energy grid connection monitoring:
Support renewable energy systems such as solar energy and wind energy, and monitor power parameters in real time.



MPM series Multi-Circuit Multi-Functional Smart Meter



MPM4000 is a high-performance DIN-rail Smart Meter that supports multiparameter measurement and time-of-use (TOU) energy metering.

It features quick installation, flexible communication, and multiple power supply options, making it suitable for various power distribution scenarios.

Multiple metering wiring modes, strong compatibility

- Supports 1 to 4 loops (configurable).
- Supports single-phase, three-phase three-wire, three-phase four-wire systems:
- Three-phase four-wire 4CT:3P4W_4CT
- Three-phase four-wire 3CT:3P4W_3CT
- Three-phase three-wire 3CT:3P3W_3CT
- Three-phase three-wire 2CT:3P3W_2CT
- Single-phase three-wire:1P3W
- Single-phase two-wire:1P2W
- Applicable to various industrial and commercial power systems to meet the needs of different users.

High-precision power parameter measurement

- Measuring voltage range: L-N 0~600V AC
- Current measurement accuracy: 0.1% + sensor accuracy
- Voltage measurement accuracy: $\pm 0.2\%$ (60V~600V AC)
- Power grid frequency measurement accuracy: $\pm 0.01\%$ (45~65Hz)
- Power factor measurement accuracy: ± 0.005
- Comply with international metering standards:
 - Active and apparent power: IEC 62053-22 Class 0.5S
 - Reactive power: IEC 62053-21 Class 1S
 - Active energy: IEC 62053-22 Class 0.5S
 - Reactive energy: IEC 62053-21 Class 1S
- Frequency range 45-65Hz, supports 1P+N, 3P, 3P+N systems

Digital Signal Output Function

- 1 electromagnetic relay output:
Contact capacity: 3A 30V DC / 3A 250V AC

Detection of Zero-Sequence Current and Temperature

- Supports one expansion slot for optional zero-sequence or temperature detection (limited to Circuit 1).

Comply with international measurement standards

- It complies with international standards such as EN 62052-11, EN 61557-12, EN 62053-21, EN 62053-22, EN 62053-23, EN 50470-1, EN 50470-3, EN 61010-1, EN 61010-2, EN 61010-031, etc., ensuring measurement accuracy and safety



Parameter Storage Function

Key measurement data, such as configuration parameters, energy values, maximum/minimum values, demand, zero-sequence current/voltage, etc., will be retained upon power loss.

History Recording Function

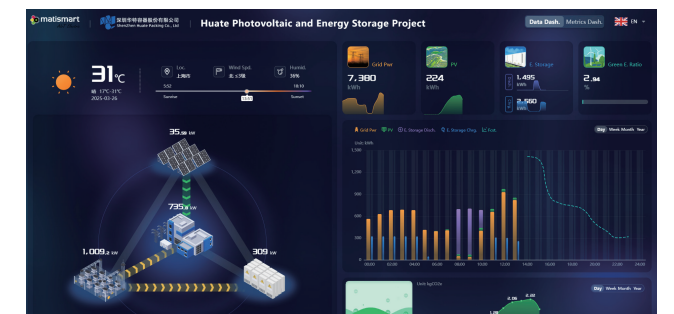
Includes energy records, demand changes, alarm event logs, configuration file changes, etc.
Recording interval is adjustable from 5 to 9999 seconds.

Data Export Function

Data can be exported via the built-in FTP server.
If Ethernet mode is enabled, files can also be exported remotely through the Web page.

Powerful communication capabilities, supporting industry standard protocols

- Modbus-RTU communication protocol
- Communication rate: 2400bps~38400bps
- LAN, Modbus-TCP/IP, Web Server, FTP Server
- Compatible with a variety of SCADA, PLC, and smart power distribution systems, it can be seamlessly connected to the industrial automation monitoring platform.



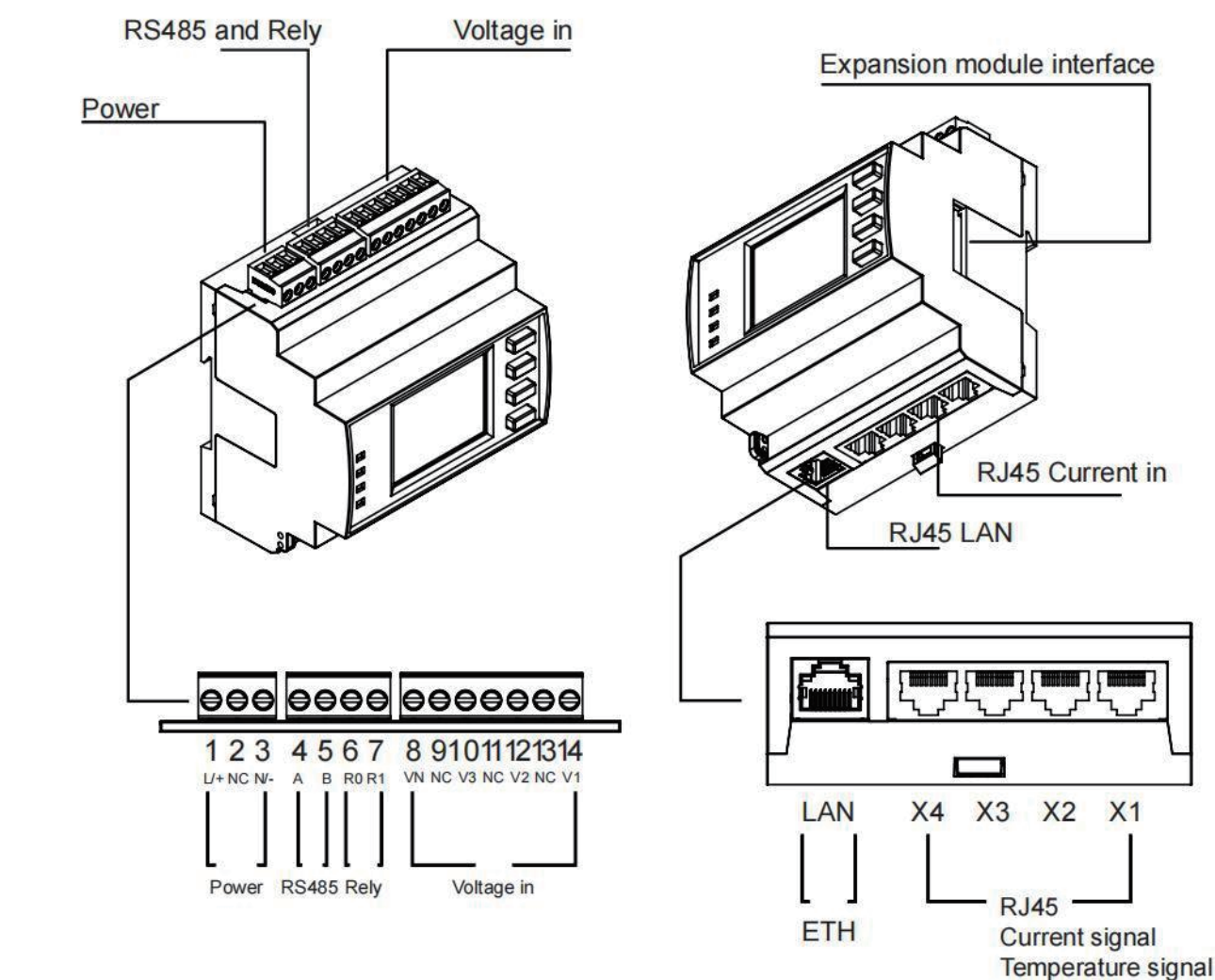
Strong environmental adaptability, suitable for harsh working conditions

- Operating temperature range: $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Storage temperature range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Humidity range: 5~95% RH (50°C , non-condensing)
- Pollution degree: Pollution degree 2 (in accordance with IEC 60664-1)
- Overvoltage capability: Overvoltage category III, applicable to 277/480V AC or 400/690V AC distribution system (compliant with IEC 60664-1)
- Dielectric strength: compliant with IEC 61010-1, withstand voltage AC 4kV / 1min
- Altitude: $\leq 33000\text{m}$ (in accordance with IEC 61010-1)
- Protection class: IP20 (according to IEC 60529)





Interface Introduction



Interface NO.	Interface Name	Interface Description
1	L/+	Power input positive; no polarity for AC, pay attention to the positive pole for DC
2	NC	Null (unused)
3	N/-	Power input negative pole
4	A	RS485 communication terminal A
5	B	RS485 communication terminal B
6	R0	Relay output terminal (dry contact)
7	R1	Relay output terminal
8	VN	N phase voltage input terminal
9	NC	Null (unused)
10	V3	C phase voltage input terminal
11	NC	Null (unused)
12	V2	B phase voltage input terminal
13	NV	Null (unused)
14	V1	A phase voltage input terminal



Model Selection

	MPM4410-A	MPM4411-A	MPM4412-A	MPM4420-A	MPM4421-A	MPM4422-A
Scalability	-	Zero sequence	Temperature	-	Zero sequence	Temperature
CT connection	Rogowski Coil			Voltage type CT (VCT 0.333V)		
Auxiliary power supply	220V AC (95-265V)					
Instantaneous value measurement	Phase voltage:U1, U2, U3, AVG, U0 (zero sequence voltage) Line voltage:U12, U23, U31, AVG Current :I1, I2, I3, AVG, In Frequency :F1, F2, F3, Σ (comprehensive) Power factor:PF PF1, PF2, PF3, Σ (comprehensive) Fundamental power factor:DPF DPF1, DPF2,DPF3, Σ (comprehensive) Active power:P1, P2, P3, Σ (total) Reactive power:Q1, Q2, Q3, Σ (total) Apparent power:S1, S2, S3, Σ (total)					
Energy Measurement	Positive active energy:EP1, EP2, EP3, Σ (total) Negative active energy:EP1, EP2, EP3, Σ (total) Positive reactive energy:EQ1, EQ2, EQ3, Σ (total) Negative reactive energy:EQ1, EQ2, EQ3, Σ (total) Apparent energy:ES1, ES2, ES3, Σ (total) Tariff energy:ET1, ET2, ET3, ET4, ET5, ET6 When the energy reaches 1.0 x10 ⁹ kWh, the energy will automatically reset					
Harmonic	Voltage harmonic percentage:Total harmonics (U1, U2, U3), total odd harmonics (U1, U2, U3), total even harmonics (U1, U2, U3), sub-harmonics 1-50 (U1, U2, U3) Current harmonic percentage:Total harmonics (I1, I2, I3), total odd harmonics (I1, I2, I3), total even harmonics (I1, I2, I3), K factor (I1, I2, I3), sub-harmonics 1-50 (I1, I2, I3) Voltage harmonic value :Total harmonics (U1, U2, U3), sub-harmonics 1-50 (U1, U2, U3) Current harmonic value :Total harmonics (I1, I2, I3), sub-harmonics 1-50 (I1, I2, I3)					
Phase diagram	Phase diagram:Phase diagram display between voltage and current Phase sequence:Voltage, current Voltage angle:U1,U2,U3 Current angle:I1,I2,I3 Voltage and current angle:UI1,UI2,UI3					
Demand	Demand:Total active power, total reactive power, total apparent power Maximum total active power maximum demand:Maximum demand and time Total reactive power maximum demand:Maximum demand and time Total apparent power maximum demand:Maximum demand and time					
Imbalance	Voltage imbalance:Negative sequence, zero sequence Current imbalance:Negative sequence, zero sequence					
Max. & min. value	Phase voltage:Each phase and average Line voltage:Each phase and average Current:Each phase and average Active power:Each phase and average Reactive power:Each phase and average Apparent power:Each phase and average					
kWh overload alarm	■					
Modbus communication	■					

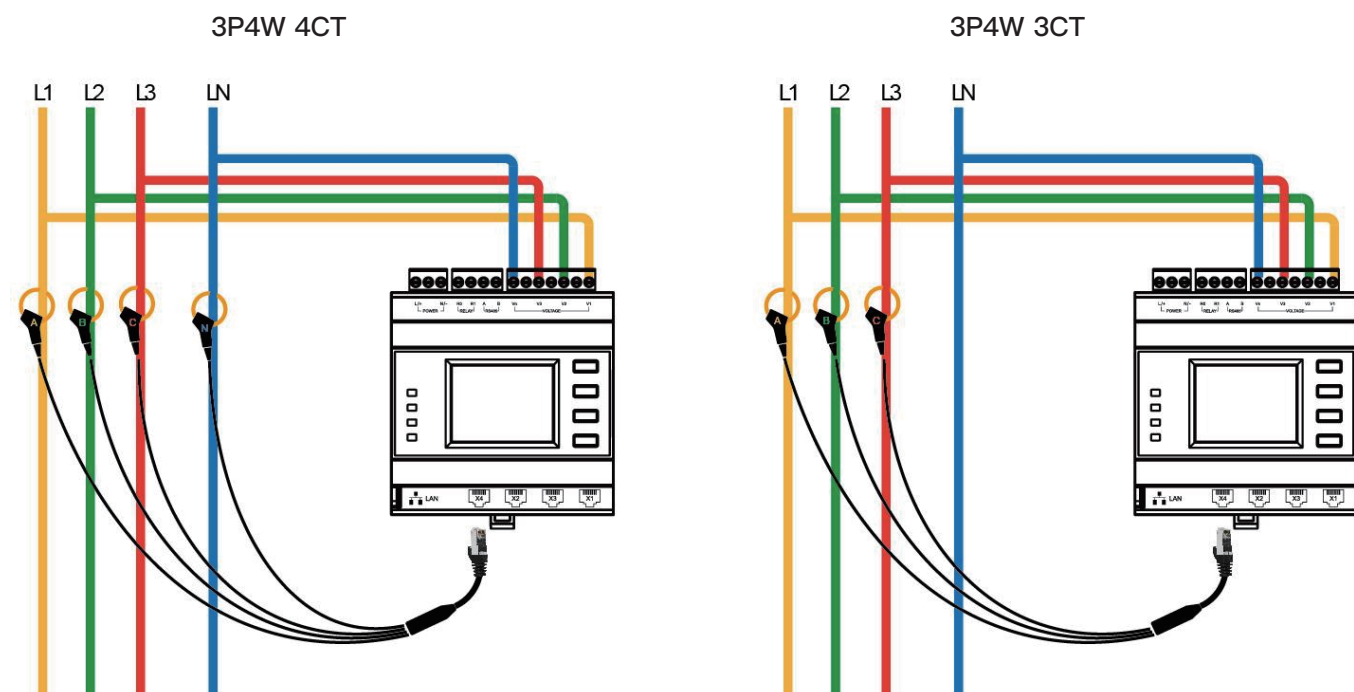


Technical Parameter

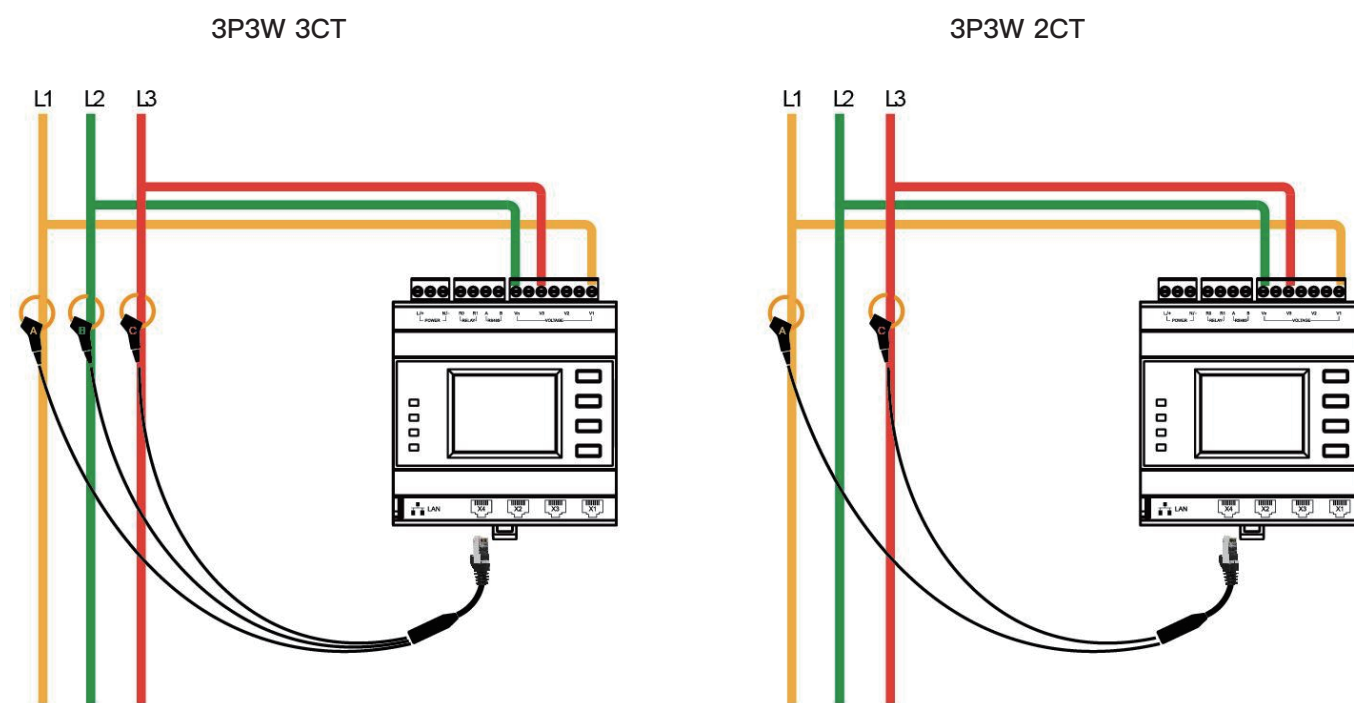
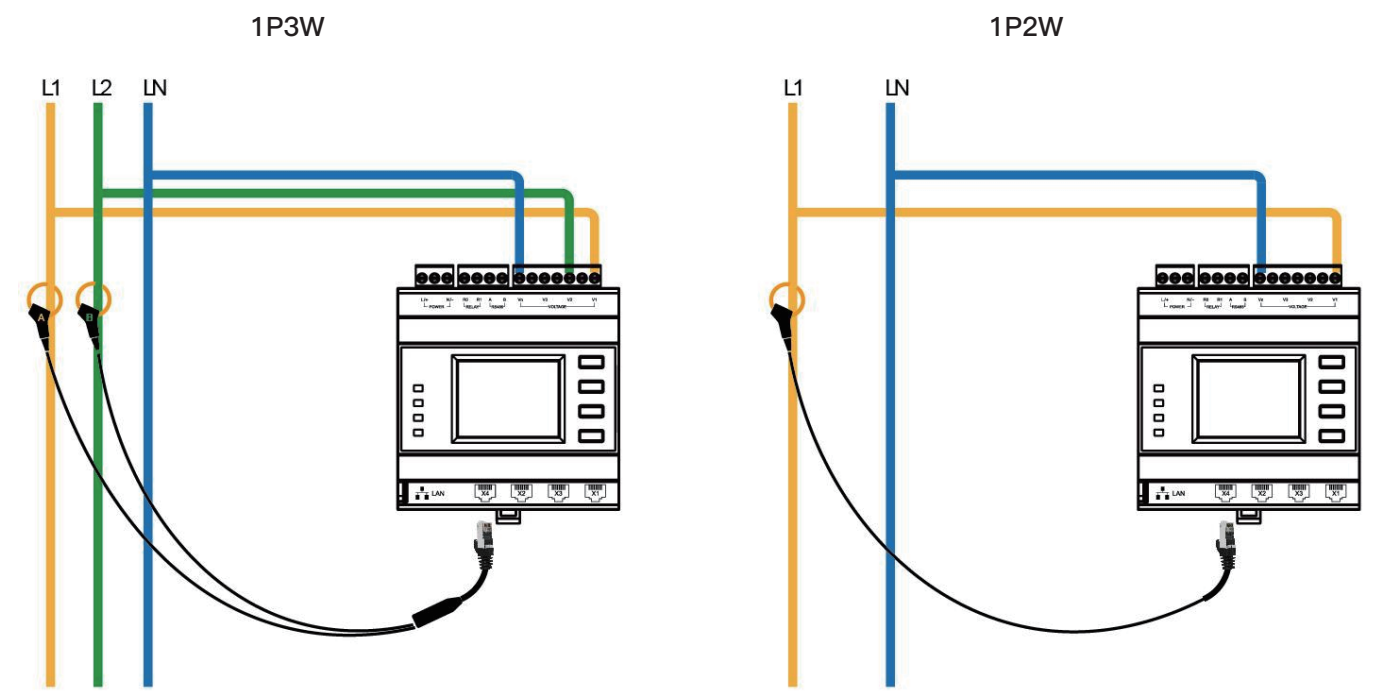
		MPM4410-A	MPM4411-A	MPM4412-A	MPM4420-A	MPM4421-A	MPM4422-A
CT connection		Rogowski Coil 0-900mVAC peak,636 mV RMS				Screw terminals	
Rogowski Coil		50mVKA@50Hz(0-12000A),@60Hz(0-10000A) 85mVKA@50Hz(0-7000A),@60Hz(0-6000A) 100mVKA@50Hz(0-6000A),@60Hz(0-5000A)				-	
Metering wiring mode		3P4W-4CT / 3P4W-3CT / 3P3W-3CT / 3P3W-2CT/1P3W-2CT / 1P2W-1CT					
Measurement voltage		L-N: 0 ~ 600VAC					
Frequency range		45-65 Hz 1P+N, 3P,3P+N					
Measurement accuracy	Current measurement accuracy	0.1%+ current sensor accuracy					
	Voltage measurement accuracy	±0.2%(60V~600V AC)					
	Grid frequency	±0.01% (45~65Hz) power factor ±0.005					
	Active and apparent power	IEC62053-22 class 0.5S					
	Reactive power	IEC62053-21 class 1S					
	Active energy	IEC62053-22 class 0.5S					
	Reactive energy	IEC62053-21 class 1S					
Environmental conditions	Operating temperature range	-20℃ ~ +70℃					
	Storage temperature range	-40℃ ~ +85℃					
	Humidity	5~95% RH, 50℃ (non-condensing)					
	Pollution degree	Pollution degree 2 (in accordance with IEC 60664-1)					
	Overvoltage capability	Overvoltage category III for power distribution systems up to 277/480VAC or 400/690VAC (in accordance with IEC 60664-1)					
	Dielectric strength	Complies with IEC 61010-1, withstand voltage AC 4kV / 1min					
	Altitude	≤ 3000m (in accordance with IEC 61010-1)					
	Protection class	IP20 (in accordance with IEC 60529)					
Digital signal	Relay output	1 electromagnetic relay output, contact capacity: 3A 30V DC, 3A 250V AC		1 electromagnetic relay output, contact capacity: 3A 30V DC, 3A 250V AC		1 electromagnetic relay output, contact capacity: 3A 30V DC, 3A 250V AC	
Communication		RS485 (Modbus RTU) 、LAN、Modbus-TCP/IP、Web Server、FTP Server					
Mechanical characteristic	Dimensions	90mm × 89mm × 66mm					
	Measurement standards	EN 62052-11, EN61557-12, EN 62053-21, EN 62053-22, EN 62053-23, EN 50470-1, EN 50470-3, EN 61010-1, EN61010-2, EN 61010-031					



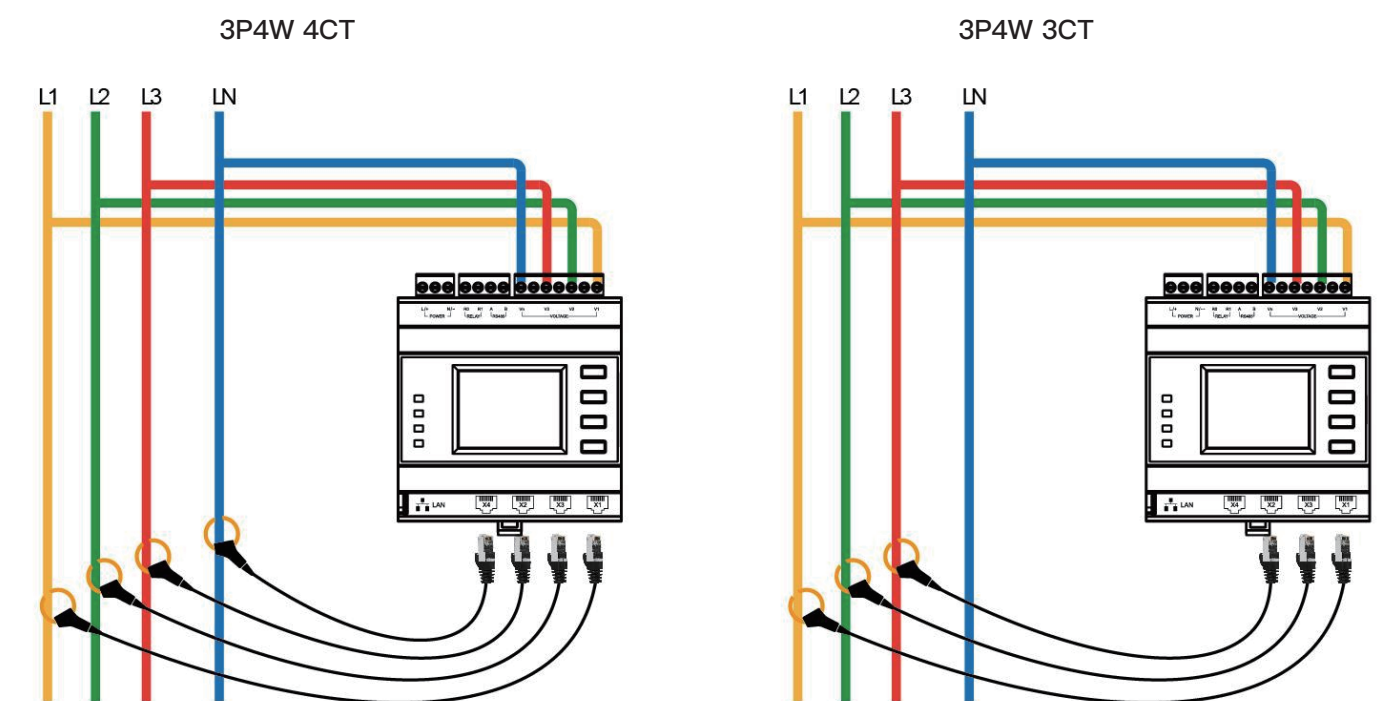
Wiring diagram



Wiring diagram



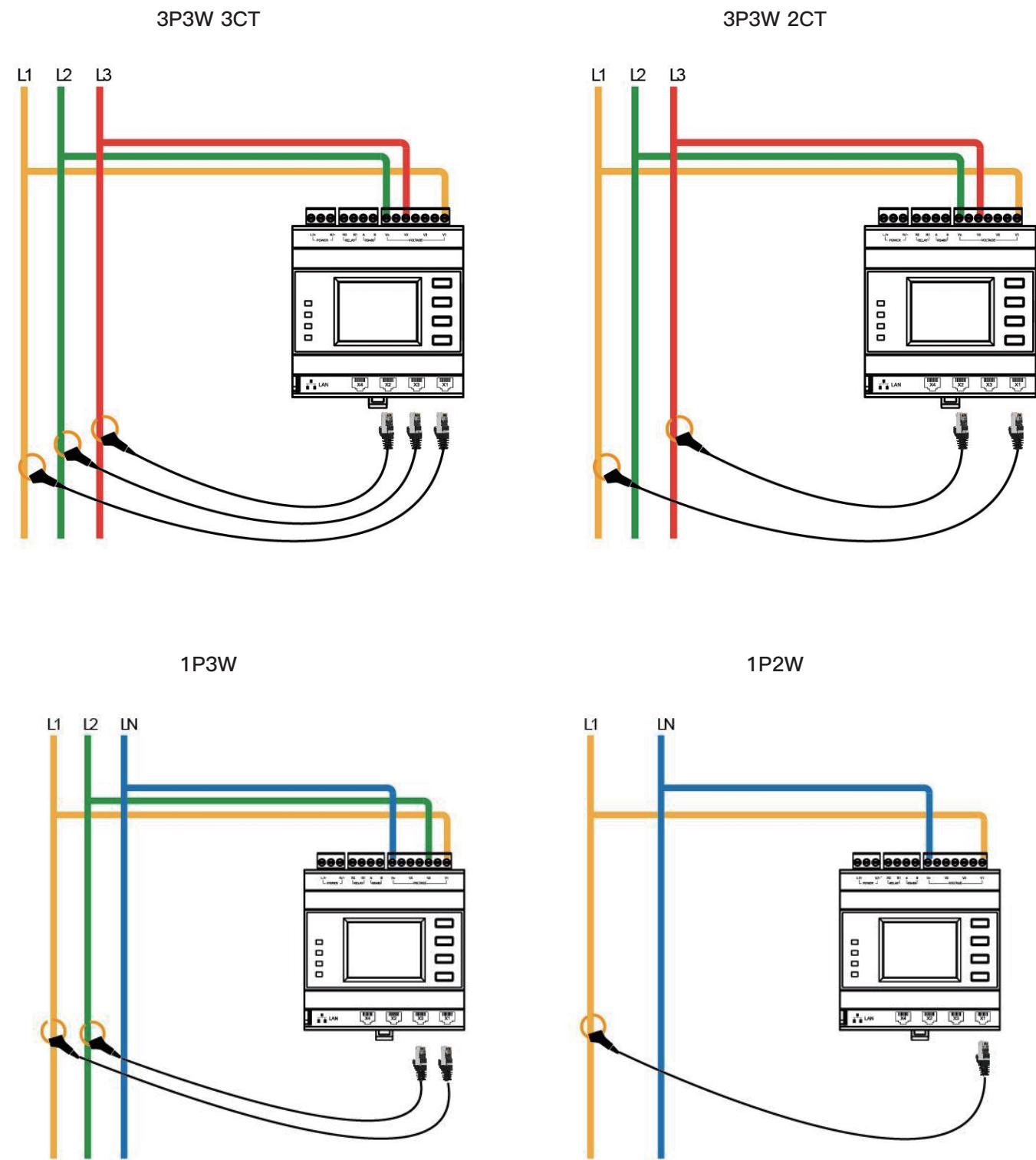
Wiring Instructions for Versions with Zero Sequence or Temperature Detection





Wiring diagram

Wiring Instructions for Versions with Zero Sequence or Temperature Detection

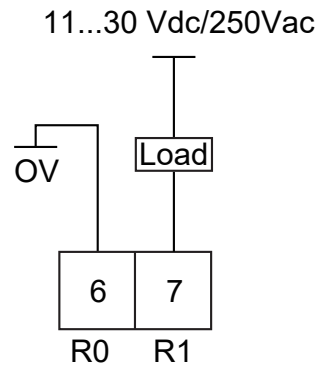


Wiring diagram

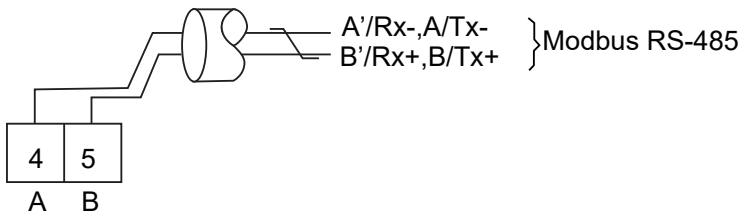
Solution	Wiring Type	CT Quantity	Scope of Application
3P4W 4CT	Three-phase four-wire	4	Accurate metering, supports neutral current measurement, suitable for high-precision applications such as industrial facilities, large commercial buildings, data centers, etc.
3P4W 3CT		3	Conventional low-voltage system (such as 380V/220V), suitable for standard three-phase four-wire power distribution scenarios
3P3W 3CT	Three-phase three-wire	3	High voltage three-phase three-wire system (such as 10kV), suitable for industrial and power transmission and distribution applications
3P3W 2CT		2	Economical solution, suitable for three-phase three-wire systems with relatively balanced loads, such as some industrial equipment
1P3W	Single-phase three-wire	2	American power supply system, suitable for residential and small commercial users in North America, Japan and other regions
1P2W	Single-phase two-wire	1	Normal household power supply (such as 220V), suitable for residential and commercial single-phase power metering

Communication and control interface

Relay output



RS485 Wiring



Dimensions

