



PEM5000 series

Three-phase multifunctional power quality analyzer

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Product model

Model	Function Description	Current Port Category	Auxiliary Power Supply
PEM5353-A	Three-phase multifunction energy meter with complex tariff (6Tariff), multi-parameter measurement, Modbus communication, and DI/DO interface	Screw-type Current Terminal	220V AC auxiliary power supply (85-305VAC/100-430VDC)
PEM5553-A	Three-phase multifunction energy meter with complex tariff (7Tariff), multi-parameter measurement, Modbus communication, and DI/DO interface	RJ12-type Current Input	
PEM5353-D	Three-phase multifunction energy meter with energy metering, time-of-use tariff (8Tariff), multi-parameter measurement, Modbus communication, and DI/DO	Screw-type Current Terminal	24V DC auxiliary power (18-36V DC)
PEM5553-D	Three-phase multifunction energy meter with complex tariff (9Tariff), multi-parameter measurement, Modbus communication, and DI/DO interface	RJ12-type Current Input	
PEM5353-H	Three-phase multifunction energy meter with time-of-use billing (10 Tariff), multi-parameter measurement, Modbus communication, and DI/DO interface	Screw-type Current Terminal	480V AC auxiliary power (90-528V AC)
PEM5553-H	Three-phase multifunction energy meter with complex tariff (11Tariff), multi-parameter measurement, Modbus communication, and DI/DO interface	RJ12-type Current Input	



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.



Three-phase multifunctional power quality analyzer



The PEM5000 is a three-phase power quality analyzer for real-time monitoring. It supports A/B/C/N current inputs, various sensors, and provides comprehensive electrical parameter measurement.

Featuring multi-tariff metering, demand statistics, and event logging, it communicates via RS485 and Ethernet. Ideal for energy management, power monitoring, and system integration.

Comprehensive Measurement Functions

- Supports power parameter measurement for single-phase and three-phase systems.
- Measures multiple electrical parameters including current, voltage, power factor, power, and energy.
- Comprehensive power quality parameter measurement, including harmonics (1st–50th), waveforms, unbalance, phasor diagrams, swells, dips, demand, max/min values, etc.

High-precision Metering

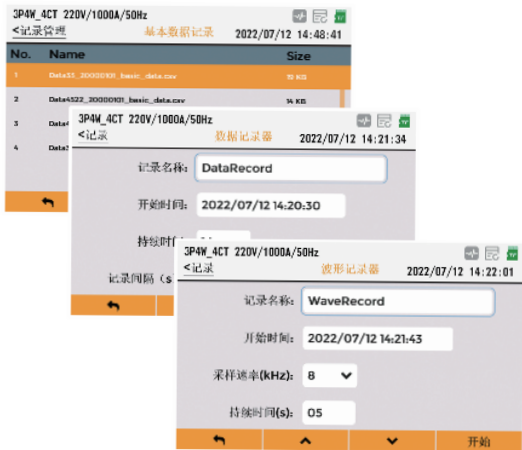
- Accuracy for active and apparent energy is 0.5%.
- Voltage measurement accuracy is 0.2%
- Current measurement accuracy is 0.2%.
- Active and apparent power accuracy is 0.5%.
- Frequency measurement accuracy up to $\pm 0.001\text{Hz}$.
- Power factor accuracy is ± 0.005 .

Standard RJ45 and RS485 interfaces

- Standard RJ45 Ethernet and RS485 communication interfaces.
- Supports standard Modbus-TCP and Modbus-RTU protocols, compatible with various configuration systems.

Ease of Installation and Use

- Supports external Rogowski coils or voltage-type CTs for non-intrusive testing.
- Various wiring configurations: 3P4W (4CT/3CT), 3P3W (3CT/2CT), 1P3W, and 1P2W.



Powerful Data Storage and Recording Capabilities

- Built-in 32GB TF card for data storage and recording functions.
- Supports data logging, event logging, and waveform recording in CSV format.
- Supports data export via USB flash drive and data deletion via the user interface.
- Supports setting record name, start time, duration, and logging interval.
- Data logging starts at the set time and stops automatically upon completion.

Wide Range of Electrical Parameters

- Wide voltage measurement range; both channel input and measurement range are 0–600VAC.
- Ultra-wide power supply range, supporting 85–305VAC / 100–430VDC.
- Current measurement input channel voltage range is 0–420mVAC.
- Frequency measurement range is 45Hz–65Hz, configurable to 50Hz or 60Hz.



User-friendly Interface and Configuration

- Equipped with a 3.5-inch IPS display
- 480 x 800 resolution
- Supports multiple languages (Simplified/Traditional Chinese, English, French, Russian, Spanish, Portuguese, etc.).



Interface Overview



key	name	function
	direction key	For page switching and parameter selection
	return key	Returns the previous interface
	Confirm key	Confirmation for selection and operation
	function key	Function extension for different pages



Function Selection

	PEM5353-A	PEM5553-A	PEM5353-D	PEM5553-D	PEM5353-H	PEM5553-H
CT linkage	Screw terminal current port	Rogowski Coil	Screw terminal current port	Rogowski Coil	Screw terminal current port	Rogowski Coil
		0-900mVAC peak,636 mV RMS		0-900mVAC peak,636 mV RMS		0-900mVAC peak,636 mV RMS
accessory power supply	95-265V AC110~370V DC		18~36V DC		90-528V AC	
instantaneous value						
phase voltage	U1, U2, U3, AVG, U0 (zero-sequence voltage)					
line voltage	U12,U23,U31,AVG					
current	I1,I2,I3,AVG,I _n					
frequency	F1, F2, F3, Σ (Comprehensive)					
power factor	PF PF1, PF2, PF3, Σ (Comprehensive)					
phasor power factor	DPF DPF1, DPF2, DPF3, Σ (Comprehensive)					
active power	P1, P2, P3, Σ (total)					
reactive power	Q1, Q2, Q3, Σ (total)					
apparent output	S1, S2, S3, Σ (sum)					
electric energy						
active power	EP1, EP2, EP3, Σ (sum) When the total electricity reaches 1.0 x10 ⁹ kWh, the power of each phase will automatically reset to zero.					
active power	EP1, EP2, EP3, Σ (sum) When the total electricity reaches 1.0 x10 ⁹ kWh, the power of each phase will automatically reset to zero.					
reactive power	EQ1, EQ2, EQ3, Σ (sum) When the total power reaches 1.0 x10 ⁹ kVarh, the power of each phase will automatically reset to zero.					
negative reactive power	EQ1, EQ2, EQ3, Σ (sum) When the total power reaches 1.0 x10 ⁹ kVarh, the power of each phase will automatically reset to zero.					
apparent electric energy	ES1, ES2, ES3, Σ (total) When the total energy reaches 1.0x10 ⁹ kVah, the energy in each phase will automatically reset to zero.					
tariff electricity	ET1,ET2, ET3,ET4, ET5,ET6 When the power reaches 1.0 x10 ⁹ kWh, it will reset automatically.					
demand						
demand	total active power, total reactive power, total apparent power					
maximum demand of active power	Maximum demand and time					
maximum demand of total reactive power	Maximum demand and time					
maximum apparent power demand	Maximum demand and time					
harmonic wav						
Voltage harmonic percentage	Total harmonics (U1, U2, U3), odd total harmonics (U1, U2, U3), even total harmonics (U1, U2, U3) Partial harmonics 1-50 (U1, U2, U3)					
current harmonic percentage	Total harmonics (I1, I2, I3), odd total harmonics (I1, I2, I3), even total harmonics (I1, I2, I3), K coefficient (I1, I2, I3) Partial harmonics 1-50 (I1, I2, I3)					



Function Selection

voltage harmonic value	Total harmonics (U1, U2, U3) Partial harmonics 1–50 (U1, U2, U3)
current harmonic value	Total harmonics (I1, I2, I3) Partial harmonics 1–50 (I1, I2, I3)
Maximum Minimum	
phase voltage	Each phase and the average
line voltage	Each phase and the average
current	Each phase and the average
active power	Each phase and the average
reactive power	Each phase and the average
apparent output	Each phase and the average
degree of unbalancedness	
voltage unbalance	Negative sequence, zero sequence
current imbalance	Negative sequence, zero sequence
Current K Factor and Wave Peak Factor	
Current K coefficient parameter	K coefficient calculation method: Parameters e and q for EU calculation method
current K factor	A/B/C phase current K coefficient
current wave peak factor	A/B/C phase current peak factor
voltage crest factor	A/B/C phase voltage peak factor
phase diagram	
phase diagram	Phase diagram between voltage and current
phase sequence	Voltage, Current
Voltage angle	U1,U2,U3
current angle	I1,I2,I3
voltage current angle	UI1,UI2,UI3
event argument	
jumping event	Voltage surge threshold, voltage drop threshold, voltage interruption threshold
phase sequence display	Phase sequence name/Phase sequence color
data logger	Instantaneous quantity\\Electric energy\\Demand\\Harmonic\\Unbalance degree
curve tracer	Sampling rate and time are adjustable
kWh overload alarm	■
DI/DO	■
Modbus RTU	■
Modbus TCP	■

Record and store functional data record types

project	state
Record start time	Settable
Record end time	Settable
Record period	Settable

Basic data record content

Data category	content
instantaneous recording	Voltage, Current, Zero Sequence, Frequency, Power, Power Factor, Fundamental Power Factor
electric energy record	Active/reactive power in both directions, apparent energy
demand record	Voltage, Current, Active/Reactive/Apparent Demand, Maximum Demand and Time
harmonic recording	Voltage/current THD, odd/even, 1—50th harmonic
imbalance record	Voltage/current negative sequence, zero sequence

harmonic data recording

type	content
voltage harmonic	THD (Total Harmonic Distortion), odd, even, and 1—50—order subharmonics
current harmonics	THD, odd, even, K factor, 1—50th harmonic

incident record

Event item	content
event type	System event type
Record content	Event time, recovery time, and corresponding value

Data save format

- Data record format: CSV
- Event record format: CSV

record declaration

- Records are generated only when the recording feature is enabled.
- Data can be exported for analysis or reports.

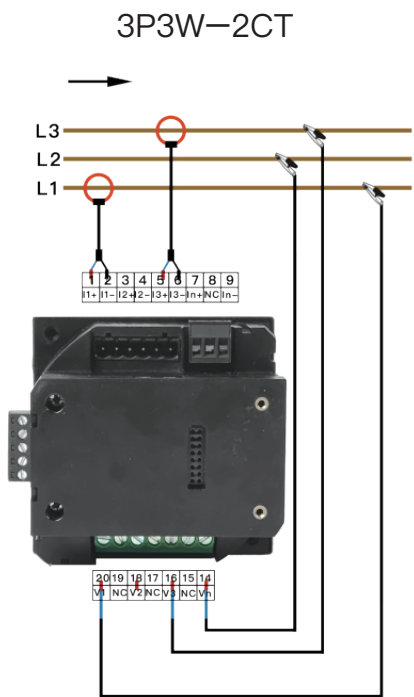
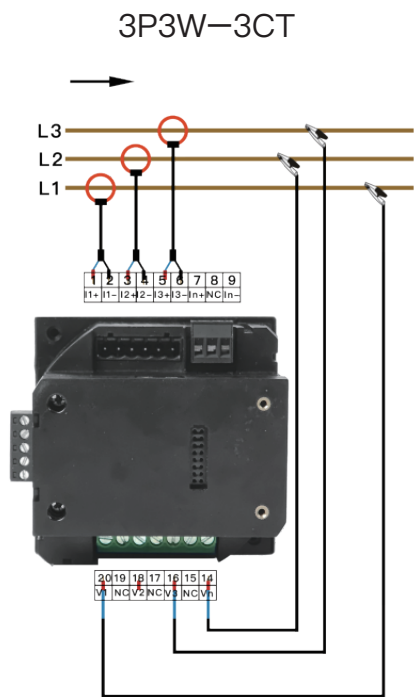
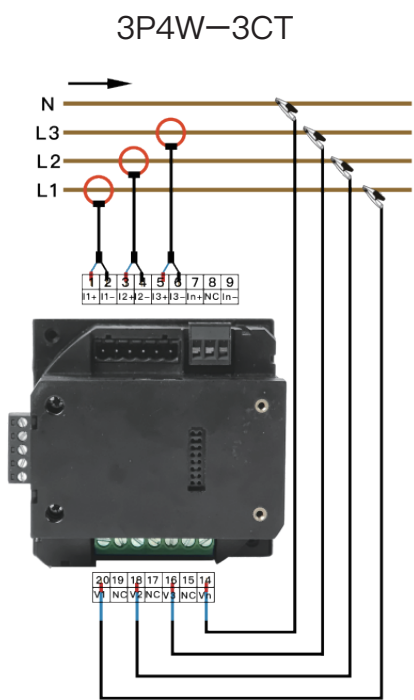
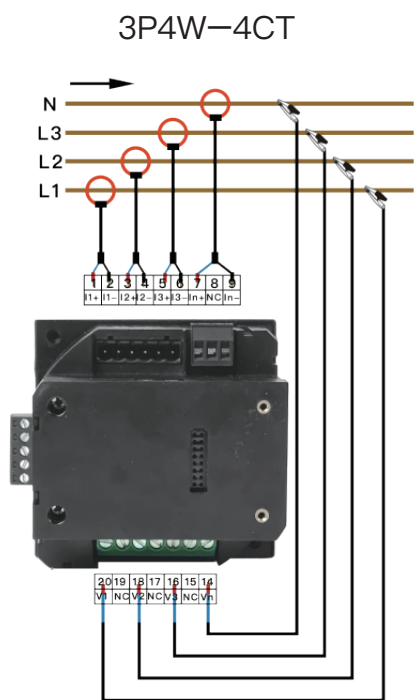


Technical Parameters

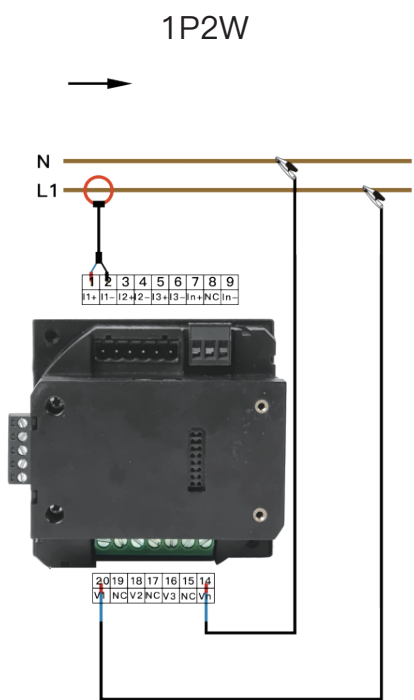
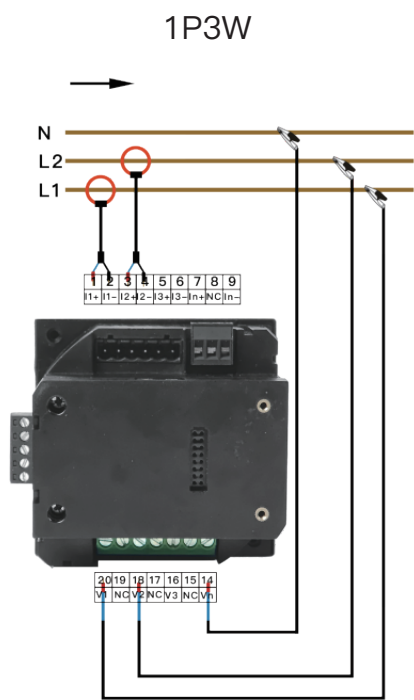
	PEM5353-A	PEM5553-A	PEM5353-D	PEM5553-D	PEM5353-H	PEM5553-H
CT linkage	Screw terminal current port	Rogowski Coil	Screw terminal current port	Rogowski Coil	Screw terminal current port	Rogowski Coil
		0-900mVAC peak,636 mV RMS		0-900mVAC peak,636 mV RMS		0-900mVAC peak,636 mV RMS
Rogowski Coil	-	50mVKA@50Hz(0-12000A),@60Hz(0-10000A) 85mVKA@50Hz(0-7000A),@60Hz(0-6000A) 100mVKA@50Hz(0-6000A),@60Hz(0-5000A)	-	50mVKA@50Hz(0-12000A),@60Hz(0-10000A) 85mVKA@50Hz(0-7000A),@60Hz(0-6000A) 100mVKA@50Hz(0-6000A),@60Hz(0-5000A)	-	50mVKA@50Hz(0-12000A),@60Hz(0-10000A) 85mVKA@50Hz(0-7000A),@60Hz(0-6000A) 100mVKA@50Hz(0-6000A),@60Hz(0-5000A)
measuring voltage	L-N: 0 ~ 720VAC					
frequency range	45-65 Hz 1P+N, 3P,3P+N					
current measurement accuracy	±(0.1% + current sensor accuracy)					
voltage measurement accuracy	±0.2%(0V~720V AC)					
grid frequency	±0.01% (45~65Hz) Power factor ±0.005					
active and apparent power	IEC62053-22 Class 0.5%					
reactive power	IEC62053-21 Class 1%					
active and apparent power	IEC62053-22 Class 0.5%					
reactive power	IEC62053-21 Class 1%					
relay output	2-channel electromagnetic relay output, contact capacity: 3A 30V DC, 3A 250V AC					
digital input	2-channel dry contact input with optocoupler isolation (5kVrms)					
communication	Modbus; Communication rate: 2400bps to 38400bps; Protocol: Modbus-RTU					
storage class	TF block					
SC	32 GB					
Export Data	Export via USB (the file system must be FAT32)					
size	96 × 96 × 94 mm					
weight	~850g					
operating temperature range	-20℃ ~ +70℃					
storage temperature range	-40℃ ~ +85℃					
Humidity range	5~95% RH (no condensation)					
class of pollution	Pollution Level 2 (compliant with IEC 60664-1)					
overvoltage capacity	Overvoltage category III, suitable for distribution systems below 277/480VAC or 400/690VAC (compliant with IEC 60664-1)					
insulation strength	Complies with IEC 61010-1, rated for 4kV AC for 1 minute					
height	≤ 3000m (compliant with IEC 61010-1)					
levels of protection	IP20 (compliant with IEC 60529)					
metric	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 Diagrams



Wiring Diagrams



Wiring System	CT	Current Measurement Principle	Voltage Measurement Req	Applications / Remarks
3P4W-4CT	A, B, C, N	Neutral current (IN) is measured by N-phase CT	3 phase voltages (Va, Vb, Vc)	Applications requiring accurate zero-sequence current measurement in 4-wire systems
3P4W-3CT	A, B, C	IN is calculated via vector sum: $IN = -(IA + IB + IC)$	3 phase voltages (Va, Vb, Vc)	Standard distribution systems where independent zero-sequence measurement is not required (Default)
3P3W-3CT	A, B, C	A, B, and C phase currents are directly measured by CTs	2 line voltages (Vab, Vcb)	Typical 3P3W industrial systems, e.g., motor loads without neutral
3P3W-2CT	A, C	Phase B current is calculated via 2-CT algorithm (e.g., Blondel's Theorem)	2 line voltages (Vab, Vcb)	3-wire systems using 2 CTs to save cost while meeting accuracy requirements
1P3W	L1	Measures L1 current; neutral current is the vector difference between L1 and L2	2 voltages (L1-N, L2-N)	Split-phase systems such as US/JP standards (e.g., 120V/240V residential)
1P2W	L	Direct measurement of line current	1 voltage (L-N)	Standard single-phase lines, e.g., 220V appliances, lighting

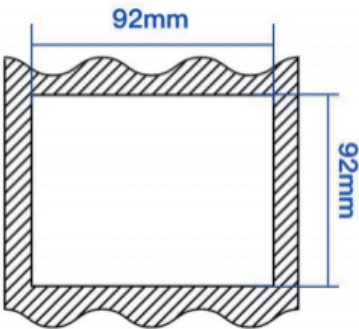


Wiring Instructions

Overall Dimensions



Cutout Dimensions



Terminal Description

Interface number	Interface name	function definition	remarks
1	I1 +	A-phase current input positive	input channel
2	I1 —	A-phase current input negative	
3	I2 +	B-phase current input positive	
4	I2 —	B-phase current input negative	
5	I3 +	C-phase current input positive	
6	I3 —	C-phase current input negative	
7	In +	The N-phase (zero-sequence) current is input to the positive terminal.	zero sequence current input
8	NC	empty	NF
9	In —	The N-phase (zero-sequence) current input is negative.	zero sequence current input
10	N / —	Power supply (negative terminal)	Power supply range: 85—305VAC / 100—430VDC
11	NC	empty	
12	NC	empty	
13	L / +	Power supply (positive terminal)	Power supply range: 85—305VAC / 100—430VDC
14	Vn	N-phase voltage input	measuring voltage channel
15	NC	empty	NF
16	V3	C-phase voltage input	measuring voltage channel
17	NC	empty	NF
18	V2	B-phase voltage input	measuring voltage channel
19	NC	empty	NF



Wiring Instructions

Terminal Description

Interface number	Interface name	function definition	remarks
20	V1	A-phase voltage input	measuring voltage channel
21	DIC	digital input common terminal	2-way digital input
22	DI1	Digital Input Channel 1	dry contact input
23	DI2	Digital Input Channel 2	dry contact input
24	RNC	Relay 2 normally closed contact	Output of Relay 2
25	RNO	Relay 2 normally open contact	
26	RCOM	Relay 2 Common Terminal	
27	RCOM	Relay 1 Common Terminal	Output of Relay 1
28	RNO	Relay 1 normally open contact	
29	RNC	Relay 1 normally closed contact	
30	B	RS485 Communication B End	RS485 interface
31	A	RS485 Communication A Port	
32	LAN	Ethernet communication port	RJ45 (Modbus-TCP)
33	Flash Drive USB	USB drive port	Export data (USB storage)