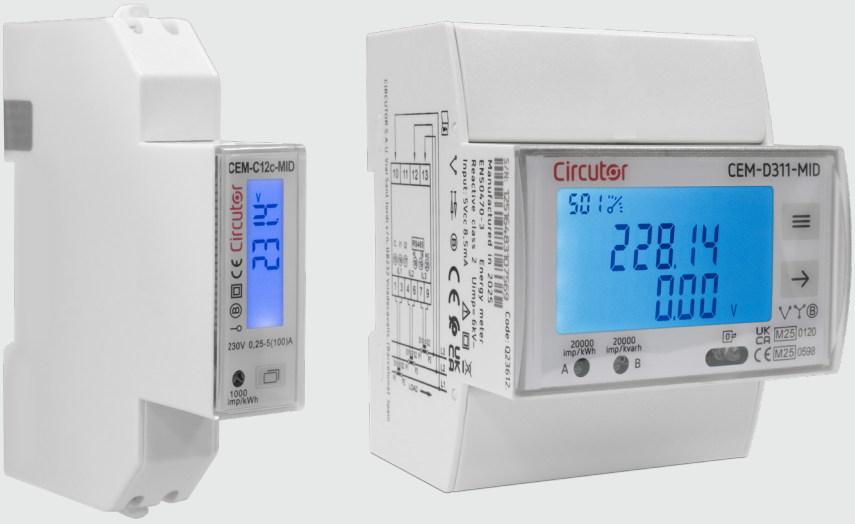


QUALITY & METERING

CEM

Energy meters for managing consumption and generation

The Future is Efficiency
circutor.com

Circutor

Control and optimization of consumption

CEM energy meters are a reliable and versatile solution for monitoring electrical consumption, both of specific loads or circuits within an installation and of associated services in the tertiary sector, such as hotels, campsites, marinas, or any space with multiple consumers and a single supply point.

This information can be used to track energy costs and optimize consumption, facilitating individual cost allocation and the detection of high-consumption areas for more efficient action.

All **CEM** models are **MID** certified, ensuring accuracy, safety and legal compliance for billing applications within Europe, as well as **IEC** certified for other international uses.

Energy consumption management for all types of installations

Solutions for energy sub-metering

Invoice or record the consumption of your installation

CEM meters accurately record electrical energy consumption, both active and reactive. They are ideal for data centers, retail stores, or leased services where it is necessary to monetize the energy consumption of each user through billing meters that provide accurate data.

In industrial settings, they allow monitoring energy consumption by specific production line or load, enabling both consumption analysis and the implementation of energy efficiency measures.

Energy billing

Invoice your clients' or tenants' energy consumption.

Optimize your consumption

Identify the highest consumption areas and apply corrective actions or automation.

Integrate with your BMS

Monitor, control, and automate your services while reducing operation and maintenance costs.

Analyzes your installation

It records the values of various electrical parameters in your installation.

Ideal for Energy audits:

ISO 50001

The **CEM** range helps organizations record energy usage, understand energy consumption, identify savings opportunities and patterns, track consumption trends, and certify their facilities according to **ISO 50001**.

Network analysis

CEM devices also act as power analyzers, measuring voltage, current, active/reactive/apparent power, demand, power factor, frequency, and other electrical variables such as CO_2 emissions or operating hours. This information helps calculate energy KPIs and support maintenance operations.

What type of certification do I need?

MID certification

The **MID** certification (**EN 50470**) is mandatory for energy re-billing. Their use is a legal requirement throughout the European Union.

The **CEM** range complies with the **MID** certification as per the **EN 50470** standard (Class B in active energy) at the European level, depending on the model.

IEC certification

The **IEC** certification records energy consumption with the same reliability as a fiscal meter. It is valid for rebilling in countries outside the European Union or for any type of private installation.

The **CEM** range complies with standards **IEC 62053-21** (Class 1 for active energy) and **IEC 62053-23** (Class 2 for reactive energy), depending on the model.

Our range of CEM meters

Designed for energy management

CEM meters are specially designed for installation in electrical panels, offering added value in energy management of installations and providing network analysis features for efficient management across all types of facilities.

SELECT THE RIGHT METER FOR YOUR INSTALLATION

DIRECT MEASUREMENT | INDIRECT MEASUREMENT

SINGLE-PHASE MEASUREMENT | THREE-PHASE MEASUREMENT

CEM-C12c

Direct single-phase energy meter

CEM-D200

Direct three-phase energy meters

CEM-D300

Indirect three-phase energy meters

Buildings

Offices, institutional buildings, schools and universities, hospitals and clinics...

Connect the **CEM** meters to your BMS via Modbus or M-Bus to monitor consumption and facilitate energy optimization and ISO 50001 compliance.

Services

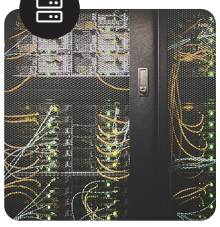
Shopping centers, hotels or apartments, campsites, marinas, sports centers...

Automatically record your customers' consumption and generate invoice simulations for energy allocation, with guaranteed traceability thanks to MID certification.

Industry

Food industry, textile, chemical, steel, electronics, naval, telecommunications...

Integrate the **CEM** meters to know the real energy cost per machine or process and drive efficiency through KPIs and load-type analysis.



Data Centers

Improve billing and efficiency of Data Centers by monitoring key indicators such as PUE and DCE.

Electric Vehicle Chargers

Ensure legal and precise measurement of consumption, enabling official billing, energy management, and advanced functions like dynamic load control or *Vehicle-to-Grid*.

CEM-C12c

Direct single-phase energy meter

Features / performance

- 1x 230 V or 1x127 V
- Class B/1 for active energy (**EN 50470 / IEC 62053-21**)
- Class 2 for reactive energy (**IEC 62053-23**)
- Consumption + Generation (4 quadrants)
- RS-485 Communications (Modbus RTU)
- Self-powered from the measurement
- Compact size (1 DIN module)
- Sealable
- Capacitive keypad.

CEM-D200

Direct three-phase energy meters

Features / performance

- 3x 127(230)...3x 230(400) V
- Class B/1 for active energy (**EN 50470 / IEC 62053-21**)
- Class 2 for reactive energy (**IEC 62053-23**)
- Consumption + Generation (4 quadrants)
- RS-485 (Modbus RTU)or M-Bus communications (depending on model)
- Self-powered from the measurement
- 4DIN modules
- Sealable
- Capacitive keypad.

CEM-D300

Indirect three-phase energy meters

Access information remotely
Choose the version with communications to view data directly from its backlit screen or integrate it into management and billing systems via RS-485 communications (Modbus protocol) or M-Bus.

Transfers consumption information
The version with digital output allows pulses proportional to energy consumption to be sent to a pulse concentrator, a programmable logic controller (PLC), or any device with digital inputs, facilitating consumption management from an external system.

Differentiates between mains and auxiliary sources
Uses the digital input to record energy from two different sources. If your installation combines mains supply with auxiliary sources such as generators or UPS units, you can differentiate the two consumptions in separate records or tariffs using the digital input contact. This way, you'll know how much energy you consume from the mains and how much from the auxiliary source so you can assign a specific cost to each.

Additionally, the device separately records the operating hours of each source, helping define energy KPIs and maintenance planning.

Power analyzer function
The **CEM-C12c** meter includes advanced network analysis features, ideal for monitoring a wide range of electrical parameters such as voltage, current, frequency, reactive power (inductive and capacitive), apparent power, maximum demand, power factor, and reactive energy (inductive and capacitive).

The **CEM-D** meters also integrate network analysis functions, as well as energy cost, CO_2 emissions, and operating hours.

Records other supplies
With the version featuring a digital input, you can register pulses from other meters for energy, water, gas, or heat, and monitor this information both locally and remotely via the integrated communications.

Monitors the status of your installation
The digital input can be configured as either a pulse counter or a logical status input. In the latter mode, it allows monitoring the status of any sensor, load, or line by detecting changes through the digital input contact. This way, you can supervise the real-time operation of your installation's controllers.

Automatic energy billing

Management via PowerStudio SCADA software

Connect your **CEM** meters to the **PowerStudio SCADA** energy management software via RS-485 communications (Modbus RTU) and automate the entire billing process.

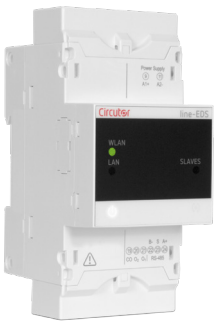
Quickly and accurately generate simulated electricity bills, allocate costs among users, and determine the exact consumption of each line or load in your installation.

Full energy management with no need for a PC

Monitor your entire installation from a single device with the **Line-EDS-PSS-PRO** energy manager, without the need for external servers or additional software.

Log and monitor consumption in real time, automate processes using PLC logic or calendars, and access customized SCADA displays for each installation.

You can also generate simulated bills and send them automatically via email, streamlining energy management from a single device.



Flexible communication solutions for your installation

Adapt the communication method to your installation's needs. Create a LAN network using our Ethernet/Wi-Fi converter, or set up your own private wireless network with the LoRa converter, with no need to connect to your LAN. This helps reduce cabling and shortens implementation time.

TCPRS1+

RS-485 media converter (Modbus/RTU) to Ethernet/Wi-Fi (Modbus/TCP).

Bridge LR

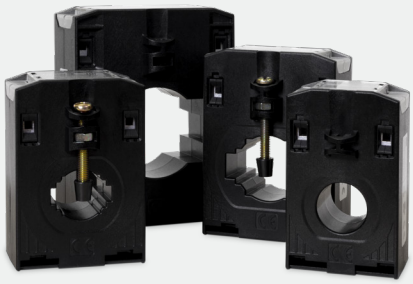
RS-485 media converter (Modbus/RTU) to LoRa wireless (Modbus/RTU).

Current measurement transformers for CEM-D300 meters

Closed-core **TD** transformers are the best option for new installations or where a service interruption is possible.
TP transformers are ideal for existing installations where the power can't be cut in order to install them.

TD

Closed-core
current transformers



Primary current: from 40...4000 A

Secondary currents.../ 5 A or .../1 A

TP

Open-core
current transformers

Primary current: from 75...5000 A

Secondary current .../ 5 A or .../ 1 A

Choose the model that best suits your needs

Model	Code	*V* measurement range	*I* measurement range	Freq.	Digital o/p	Digital i/p	Rates	Com.	Protocol	Certification
CEM-C12c	**Q27211.**	1 x 230 V	5 (100) A	50/60 Hz	-	-	1	RS-485	Modbus	**IEC**
CEM-C12c	**Q272110020000.**	1 x 127 V	5 (100) A	60 Hz	-	-	1	RS-485	Modbus	**IEC**
CEM-C12c-MID	**Q27212.**	1 x 230 V	0.25...5 (100) A	50 Hz	-	-	1	RS-485	Modbus	**MID**

Model	Code	*V* measurement range	*I* measurement range	Freq.	Digital o/p	Digital i/p	Rates	Com.	Protocol	Certification
CEM-D210	**Q22601.**	3x127(230)...3x230(400) V	(5) 100 A	50/60 Hz	1	-	1	-	-	**IEC**
CEM-D211	**Q22611.**	3x127(230)...3x230(400) V	(5) 100 A	50/60 Hz	-	2	4	RS-485	Modbus/RTU	**IEC**
CEM-D212	**Q22621.**	3x127(230)...3x230(400) V	(5) 100 A	50/60 Hz	-	2	4	-	M-Bus	**IEC**
CEM-D210-MID	**Q22602.**	3x127(230)...3x230(400) V	(5) 100 A	50 Hz	1	-	1	-	-	**MID**
CEM-D211-MID	**Q22612.**	3x127(230)...3x230(400) V	(5) 100 A	50 Hz	-	2	4	RS-485	Modbus/RTU	**MID**
CEM-D212-MID	**Q22622.**	3x127(230)...3x230(400) V	(5) 100 A	50 Hz	-	2	4	-	M-Bus	**MID**
CEM-D310	**Q23601.**	3x127(230)...3x230(400) V	.../5A or .../1A	50/60 Hz	1	-	1	-	-	**IEC**
CEM-D311	**Q23611.**	3x127(230)...3x230(400) V	.../5A or .../1A	50/60 Hz	-	2	4	RS-485	Modbus/RTU	**IEC**
CEM-D312	**Q23621.**	3x127(230)...3x230(400) V	.../5A or .../1A	50/60 Hz	-	2	4	-	M-Bus	**IEC**
CEM-D310-MID	**Q23602.**	3x127(230)...3x230(400) V	.../5 A	50 Hz	1	-	1	-	-	**MID**
CEM-D311-MID	**Q23612.**	3x127(230)...3x230(400) V	.../5 A	50 Hz	-	2	4	RS-485	Modbus/RTU	**MID**
CEM-D312-MID	**Q23622.**	3x127(230)...3x230(400) V	.../5 A	50 Hz	-	2	4	-	M-Bus	**MID**

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