



# Solutions for Self-consumption

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The drop in the cost of solar photovoltaic installations, coupled with the increased cost of electrical energy borne by end consumers in recent years, has accelerated the arrival of the so-called grid parity in many regions throughout the world. CIRCUTOR, by establishing synergies between knowledge of the measurement, management and improvement of the quality

of electrical energy and exploiting the renewable resources that produce it, has designed solutions that integrate energy distributed in the electrical grid with instantaneous and time-delayed self-consumption applications for industrial applications, service facilities and even residential buildings

## A solution adapted to each need

Each consumer has a different demand curve, as well as specific situation in terms of access to the grid. To this end, CIRCUTOR has designed different solutions that adapt to each situation, offering optimum management of solar resources, optimising efficiency, simplifying management processes and achieving the highest possible cost savings.

The solutions offered fall into two categories, based on the time relationship established between solar production and the consumption of electricity in each case:

- Instantaneous or direct self-consumption, without storage
- Time-delayed self-consumption with storage
- Installations isolated from the grid
- Installations with DC coupling to the grid
- Installations with AC coupling to the grid.

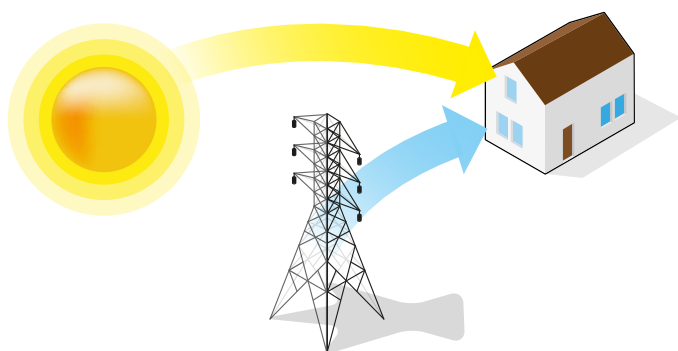




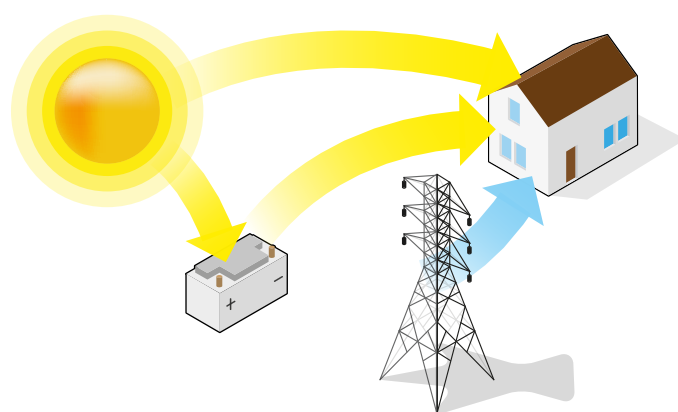
## Instantaneous self-consumption with control of the energy injected into the grid

Ideal for buildings with significant daytime electricity consumption. **CDP** (Dynamic Power Control) controllers adjust the maximum production power of photovoltaic inverters to that being consumed in the building at all times. Therefore, we can guarantee that, for example, surplus energy is not injected into the grid or that the power fraction allowed by the specific laws of each country is injected into the grid.

In many countries, this type of installation allows the use of the photovoltaic system as an inherent element of the building's internal electrical network, becoming an energy saving element and not an energy generation system that requires the capacity to discharge energy into the grid to which it is connected.



Instantaneous self-consumption with control over the energy injected into the grid.



Instantaneous self-consumption with storage and control over the energy injected into the grid.

## Time-delayed self-consumption with energy storage

It is necessary in buildings where the main consumption of electricity is during night-time or low solar radiation hours.

### Installations isolated from the electrical network

It can supply energy to places that do not have good access to the electrical distribution lines, catering for the energy needs of different consumption types (residential, agriculture, tourism, etc.) The solutions isolated from the grid offer high quality electric supply for any common use of energy, such as lighting, household appliances, power units, etc., both in single and three-phase applications.

Hybrid solar-diesel generation can improve the performance of the installation and minimise the use of the support generating set, depending on the consumption features and intelligent management of storage and demand.

### Installations with DC coupling to the grid

Buildings connected to the grid can improve their degree of solar self-supply by installing a battery between the building and grid that stores surplus energy during periods of high insolation for its future consumption.

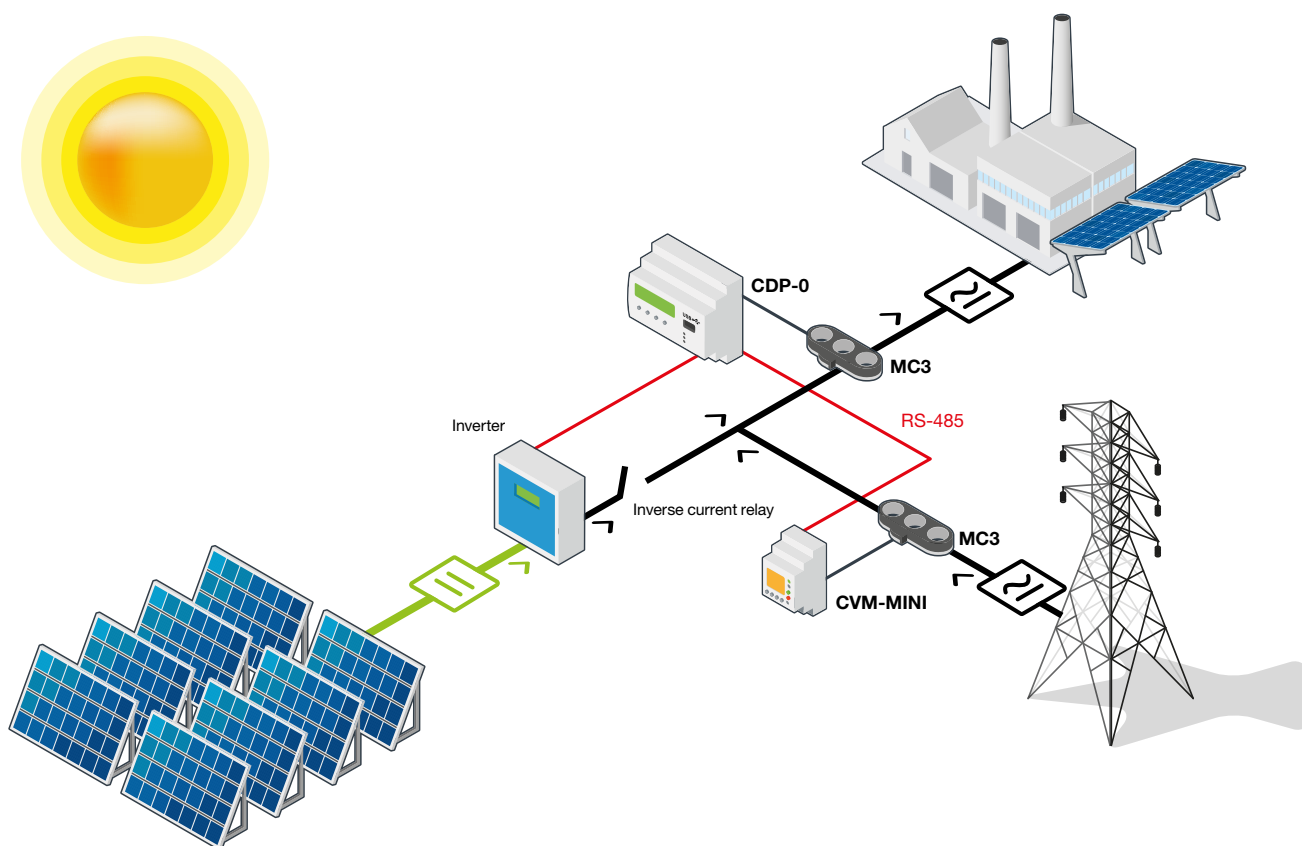
In these systems, controlling the battery charge plays a crucial role, since it manages the flows of energy between all elements in an installation. Therefore, the system can self-consume energy directly during the day, storing daytime surplus energy in the battery and, finally, reduce the consumption of grid energy during periods of low insolation by discharging the battery.

### Installations with AC coupling to the grid

Buildings connected to the grid that already have a photovoltaic generation system installed can transfer part of the solar energy production for its consumption during periods of low insolation.

In these systems, controlling the battery charge can reduce or even eliminate surplus daytime energy transferred to the grid and reduce the power peaks required by the grid by injecting the power stored in the storage system.

# Instantaneous self-consumption with zero injection Kits for installations connected to the grid



## Description

CIRCUTOR's photovoltaic kits for grid connection systems contain all the elements necessary for the instantaneous self-consumption of solar energy when it is generated, ensuring at all times that the surpluses are not injected into the grid. These kits are supplied with the following:

- Photovoltaic modules
- Anodised aluminium structure and ties
- Power Inverter for grid connection
- **CDP** - Dynamic power control
- Protection against DC and AC overvoltages

## Benefits of using the kits

- Easy to process the order through a single code and supplier
- Compatibility with all components is guaranteed
- Remote monitoring (via web server embedded in **CDP**) and historical data storage.
- Measurement of the installation's flows of energy
- Top quality components
- Compatibility with pre-configured cabinets (Combiner Box) that facilitate assembly.
- Possibility of dimensioning the versions with the kit references for other power levels and configurations (subject to order)
- Optional adaptation of the references listed to different grid typologies (international configuration, UL certification) with different frequency and voltage levels (subject to order).

# Instantaneous self-consumption with zero injection

## Kits for installations connected to the grid

### EFM-CDP, kits of photovoltaic instantaneous self-consumption solutions for buildings/industries (On Grid systems)

Type	Code	Network type	PV power (Wp)	Number of inverters	Inverter power (kW)	TOTAL power (kW)
KIT EFM-CDP 8-S	E5K035	Three-phase 3x230/400V	8250	1	8,0	8,0
KIT EFM-CDP 8-S-PRO	E5K036	Three-phase 3x230/400V	9000	1	8,0	8,0
KIT EFM-CDP 10-S	E5K041	Three-phase 3x230/400V	10500	1	10,0	10,0
KIT EFM-CDP 10-S-PRO	E5K042	Three-phase 3x230/400V	11000	1	10,0	10,0
KIT EFM-CDP 15-M	E5K051	Three-phase 3x230/400V	15000	3	5,0	15,0
KIT EFM-CDP 15-M-PRO	E5K052	Three-phase 3x230/400V	16500	3	5,0	15,0
KIT EFM-CDP 20-M	E5K061	Three-phase 3x230/400V	21000	2	10,0	20,0
KIT EFM-CDP 20-M-PRO	E5K062	Three-phase 3x230/400V	22000	2	10,0	20,0
KIT EFM-CDP 24-M	E5K071	Three-phase 3x230/400V	26000	2	12,0	24,0
KIT EFM-CDP 24-M-PRO	E5K072	Three-phase 3x230/400V	28000	2	12,0	24,0
KIT EFM-CDP 30-M	E5K081	Three-phase 3x230/400V	31500	3	10,0	30,0
KIT EFM-CDP 30-M-PRO	E5K082	Three-phase 3x230/400V	33000	3	10,0	30,0
KIT EFM-CDP 40-M-PRO	E5K200	Three-phase 3x230/400V	44000	2	20,0	40,0
KIT EFM-CDP 60-M-PRO	E5K210	Three-phase 3x230/400V	66000	3	20,0	60,0
KIT EFM-CDP 80-M-PRO	E5K220	Three-phase 3x230/400V	88000	4	20,0	80,0
KIT EFM-CDP 100-S-PRO	E5K230	Three-phase 3x230/400V	105000	1	100,0	100,0
KIT EFM-CDP 100-M-PRO	E5K231	Three-phase 3x230/400V	110000	5	20,0	100,0

### EFM-CDP, kits of photovoltaic instantaneous self-consumption solutions for residential sector (On Grid systems)

Type	Code	Network type	PV power (Wp)	Number of inverters	Inverter power (kW)	TOTAL power (kW)
KIT EFM-CDP 1,5-S	E5K011	Single-phase 230V	1250 Wp	1	1,5 kW	1,5 kW
KIT EFM-CDP 1,5-S-PRO	E5K012	Single-phase 230V	1750 Wp	1	1,5 kW	1,5 kW
KIT EFM-CDP 2,5-S	E5K021	Single-phase 230V	2750 Wp	1	2,5 kW	2,5 kW
KIT EFM-CDP 2,5-S-PRO	E5K022	Single-phase 230V	3000 Wp	1	2,5 kW	2,5 kW
KIT EFM-CDP 3-S-T	E5K123	Three-phase 3x230/400V	3000 Wp	1	3,0 kW	3,0 kW
KIT EFM-CDP 4,5-M	E5K130	Three-phase 3x230/400V	3750 Wp	3	1,5 kW	4,5 kW
KIT EFM-CDP 5-S	E5K031	Single-phase 230V	5000 Wp	1	5,0 kW	5,0 kW
KIT EFM-CDP 5-S-PRO	E5K032	Single-phase 230V	5500 Wp	1	5,0 kW	5,0 kW
KIT EFM-CDP 5-S-T	E5K131	Three-phase 3x230/400V	5000 Wp	1	5,0 kW	5,0 kW
KIT EFM-CDP 5-S-PRO-T	E5K132	Three-phase 3x230/400V	5500 Wp	1	5,0 kW	5,0 kW
KIT EFM-CDP 6-M	E5K134	Three-phase 3x230/400V	6750 Wp	3	2,0 kW	6,0 kW
KIT EFM-CDP 6-S	E5K033	Three-phase 3x230/400V	6500 Wp	1	6,0 kW	6,0 kW
KIT EFM-CDP 6-S-PRO	E5K034	Three-phase 3x230/400V	7000 Wp	1	6,0 kW	6,0 kW
KIT EFM-CDP 7,5-M	E5K133	Three-phase 3x230/400V	7500 Wp	3	2,5 kW	7,5 kW

\* The units that make up the kits are sized according to the following conditions:

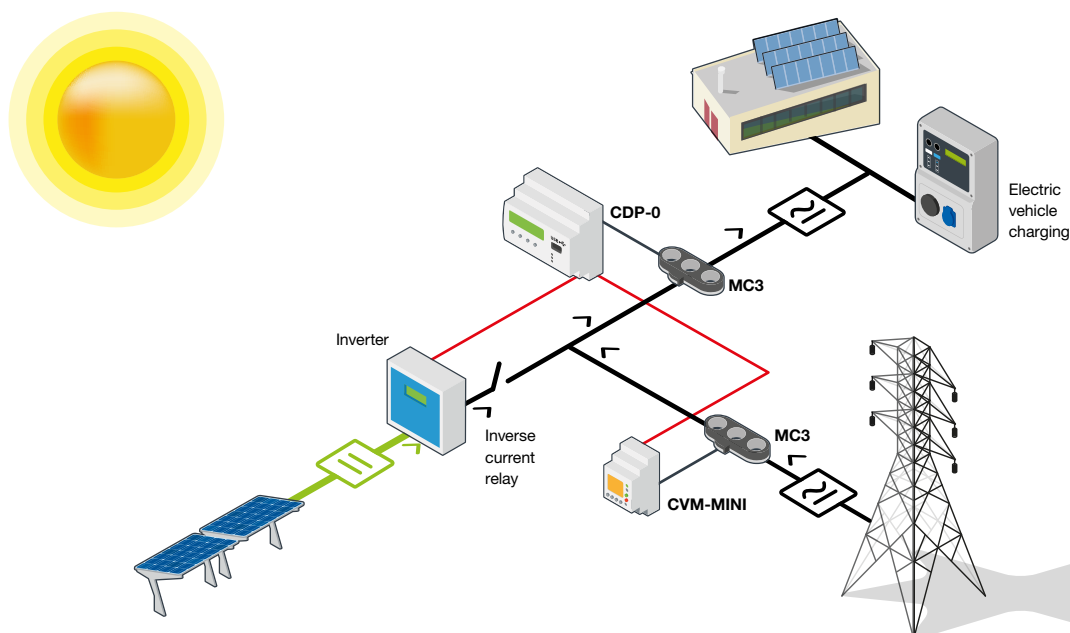
Available radiation of 4.75 kWh/m<sup>2</sup> (centre of the Iberian peninsula).

Solar generator with optimum orientation (0° south) and tilt (35°).

\*\* The performance of the units and expected annual energy production is subject to adapting each kit to the established consumer profile.

\*\*\* The listing and description of the individual devices that make up the photovoltaic kits, their features and manufacturer will only be indicated upon confirming their order.

# Instantaneous or time-delayed self-consumption with zero injection. Kits for solar canopies



## Description

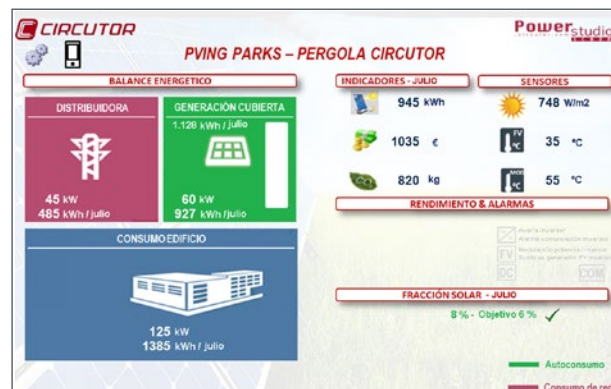
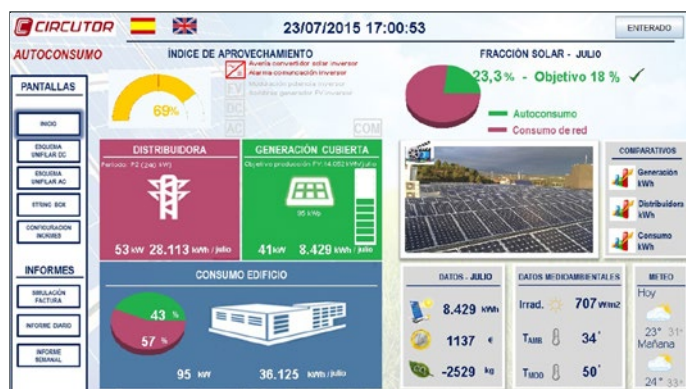
Solar canopies are built with a solid machined, welded and galvanised steel structure that can integrate the photovoltaic generation field by optimising the use of the terrain, guaranteeing the safety of the installation and achieving an appealing design.

The energy supplied by the solar photovoltaic generator installed on the canopy can be combined for different energy uses:

- Instantaneous self-consumption connected to the network inside the building.
- Self-consumption isolated from the grid with the power supply provided by a battery charging system.
- Power supply for any of the electric vehicle charging systems with the use of one of CIRCUTOR's smart charging stations.

## Benefits of using the kits

- Generation of solar energy in places where there is no roof or free surface to install solar modules
- Mitigation of peak consumption effects in vehicle charging systems
- Remote monitoring (via web server embedded in CDP) and historical data storage
- Measurement of the installation's energy flows and optional integration with the building's energy management systems with the Power Studio Scada application
- Top quality components
- Easy to install
- Modular solution, easy to adapt to available parking spaces.





The main element is the photovoltaic canopy itself, which is modular and comes in many dimensions that allow it to adapt to any type of surface.



The next element is the electric vehicle charging system, which leverages the renewable energy generated by the canopy and supplies it to the vehicles that are connected to it.



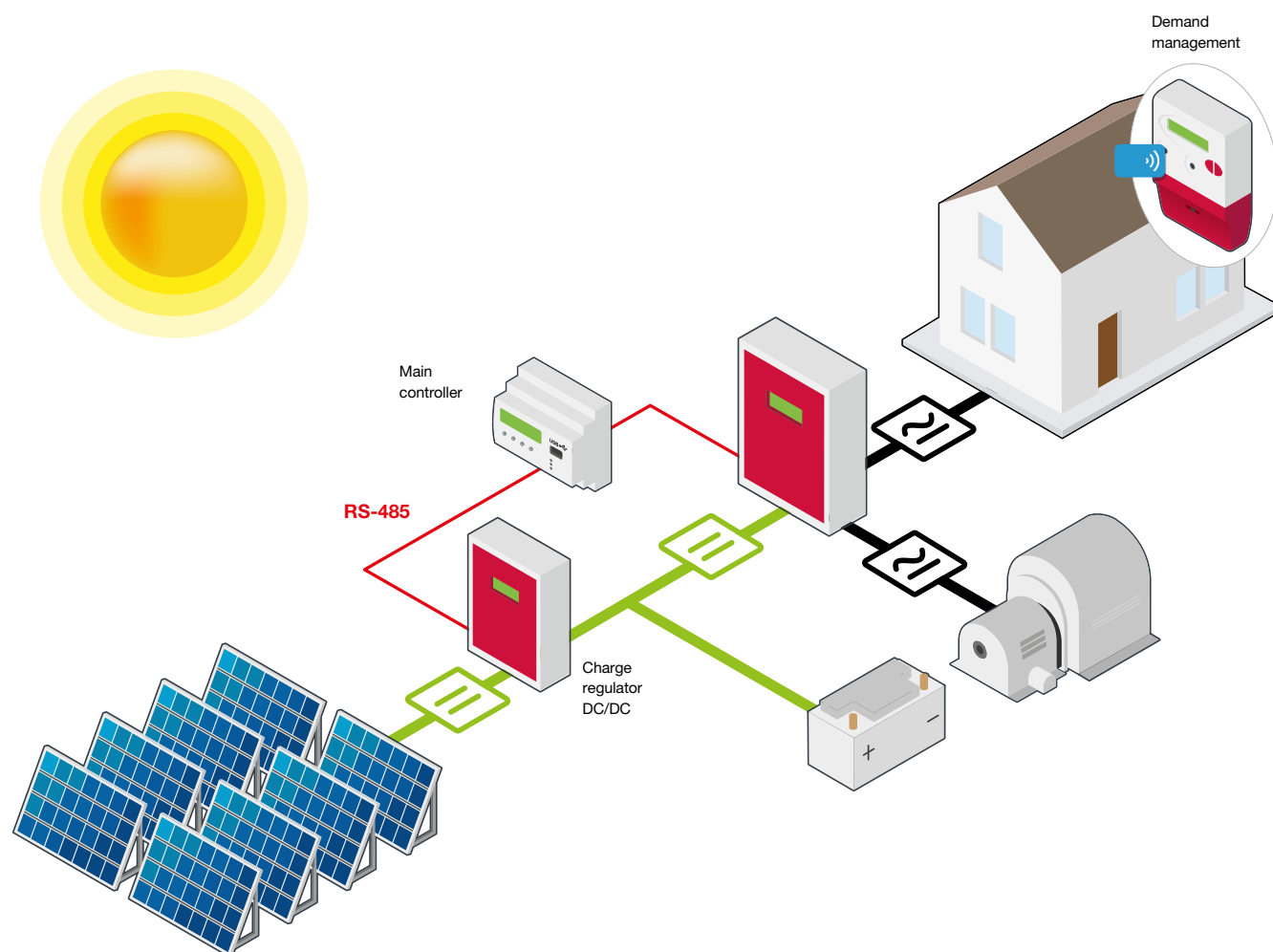
Finally, the energy management software manages and controls all the elements and links them together for comprehensive monitoring of the entire solution.

#### PVing PARKS, Instantaneous or time-delayed self-consumption with zero injection. Kits for solar canopies

Type MP2 (Single)	Code	FV Power (Wp)	Spaces	Grid type	Dimensions	Inverter	Weight (kg)
EFM-PVing PARK C2PS-BC	E6K200	3750	2	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 3,7 kW	1350
EFM-PVing PARK C2PS-MT	E6K201	3750	2	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 3,7 kW	1350
EFM-PVing PARK C2PS-WB	E6K211	3750	2	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 3,7 kW	1350
EFM-PVing PARK C2PS-RVE2	E6K262	3750	2	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 3,7 kW	1350
EFM-PVing PARK C3PS-BC	E6K300	6000	3	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 5,0 kW	1600
EFM-PVing PARK C3PS-MT	E6K301	6000	3	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 5,0 kW	1600
EFM-PVing PARK C3PS-WB	E6K311	6000	3	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 5,0 kW	1600
EFM-PVing PARK C3PS-RVE2	E6K362	6000	3	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 5,0 kW	1600
EFM-PVing PARK C4PS-BC	E6K400	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 7,0 kW	2200
EFM-PVing PARK C4PS-MT	E6K401	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 7,0 kW	2200
EFM-PVing PARK C4PS-WB	E6K411	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 7,0 kW	2200
EFM-PVing PARK C4PS-RVE2	E6K462	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 7,0 kW	2200
EFM-PVing PARK C6PS-BC	E6K600	11250	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 10 kW	2700
EFM-PVing PARK C6PS-MT	E6K601	11250	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 10 kW	2700
EFM-PVing PARK C6PS-WB	E6K611	11250	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 10 kW	2700
EFM-PVing PARK C6PS-RVE2	E6K662	11250	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 10 kW	2700
<b>Type MP4 (Double)</b>							
EFM-PVing PARK C4PD-BC	E6KA00	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 7,0 kW	2492
EFM-PVing PARK C4PD-MT	E6KA01	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 7,0 kW	2492
EFM-PVing PARK C4PD-WB	E6KA11	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 7,0 kW	2492
EFM-PVing PARK C4PD-RVE2	E6KA62	7500	4	3 x 230/400 V - Three-phase	3,72 x 4,83 x 5 m	1 x 7,0 kW	2492
EFM-PVing PARK C6PD-BC	E6KB00	12000	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 10 kW	3015
EFM-PVing PARK C6PD-MT	E6KB01	12000	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 10 kW	3015
EFM-PVing PARK C6PD-WB	E6KB11	12000	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 10 kW	3015
EFM-PVing PARK C6PD-RVE2	E6KB62	12000	6	3 x 230/400 V - Three-phase	3,72 x 4,83 x 8 m	1 x 10 kW	3015
EFM-PVing PARK C8PD-BC	E6KC00	15000	8	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 15 kW	4254
EFM-PVing PARK C8PD-MT	E6KC01	15000	8	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 15 kW	4254
EFM-PVing PARK C8PD-WB	E6KC11	15000	8	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 15 kW	4254
EFM-PVing PARK C8PD-RVE2	E6KC62	15000	8	3 x 230/400 V - Three-phase	3,72 x 4,83 x 10 m	1 x 15 kW	4254
EFM-PVing PARK C12PD-BC	E6KD00	22500	12	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 20 kW	5275
EFM-PVing PARK C12PD-MT	E6KD01	22500	12	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 20 kW	5275
EFM-PVing PARK C12PD-WB	E6KD11	22500	12	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 20 kW	5275
EFM-PVing PARK C12PD-RVE2	E6KD62	22500	12	3 x 230/400 V - Three-phase	3,72 x 4,83 x 15 m	1 x 20 kW	5275



# Time-delayed self-consumption isolated from the grid Kits for autonomous installations





# Time-delayed self-consumption isolated from the grid

## Kits for autonomous installations

### Description

CIRCUTOR's photovoltaic kits for grid-isolated systems contain a set of devices necessary for the autonomous self-consumption of energy, in systems isolated from distribution lines. The kit contains the following devices:

- Photovoltaic modules
- Anodised aluminium structure and ties
- MPPT load regulator (depending on the reference chosen)
- Inverter or dual Inverter-Loader (depending on the reference chosen)
- Maintenance-free gel lead-acid battery bank
- Battery temperature sensor
- **BII Dispenser** - available daily energy dispenser
- AC and DC overvoltage protection

### Benefits of using the kits

- The photovoltaic kits and their components are included in a single order reference, generating savings in procurement logistics.
- Minimum maintenance of the solar installation, reliability and ease of assembly.
- Possibility of remote web monitoring and historical data storage (subject to order).
- Possibility of dimensioning the kit references for three-phase configuration (subject to order).



### Kits for installations isolated from the grid with single-phase consumption

Type	Code	Daily consumption (Wh/dia)	Grid type	FV Power (Wp)	N. elements	Battery (V / Ah)	Inverter nominal power (W)
EFM-ISLAND S-3000	E4K394	3500	1 x 230 V	1500	12 x 2	24 / 575	3000
EFM-ISLAND S-3500	E4K4C5	4500	1 x 230 V	2250	24 x 2	48 / 360	3500
EFM-ISLAND S-5000	E4K5D6	6000	1 x 230 V	3000	24 x 2	48 / 575	5000
EFM-ISLAND S-7000	E4K6E7	9000	1 x 230 V	4500	24 x 2	48 / 850	7000
EFM-ISLAND S-10000	E4K7F8	12000	1 x 230 V	6000	24 x 2	48 / 1130	10000
EFM-ISLAND T-10500	E4K8G8	13600	3 x 230/400 V	7500	24 x 2	48 / 1695	10500
EFM-ISLAND T-21000	E4K9H9	27200	3 x 230/400 V	13500	24 x 2	48 / 2600	21000
EFM-ISLAND S-10000	E4K7F8	12000	1 x 230	6000	24 x 2	48 / 1130	10000
EFM-ISLAND T-10500	E4K8G8	13600	3 x 230/400	6750	24 x 2	48 / 1130	10500
EFM-ISLAND T-21000	E4K9H9	27200	3 x 230/400	13500	24 x 2	48 / 2600	21000

\* The units that make up the kits are dimensioned according to the following conditions:

Available radiation of 4.75 kWh/m<sup>2</sup> (centre of the Iberian peninsula)

Units dimensioned to supply energy during months of lower solar radiation availability

\*\* The proper functioning of the units is subject to fulfilling the stated daily consumption for each kit.

\*\*\* The listing and description of the individual devices that make up the photovoltaic kits, their features and manufacturer will only be indicated upon confirming their order.

# Self-consumption with storage. DC Coupling

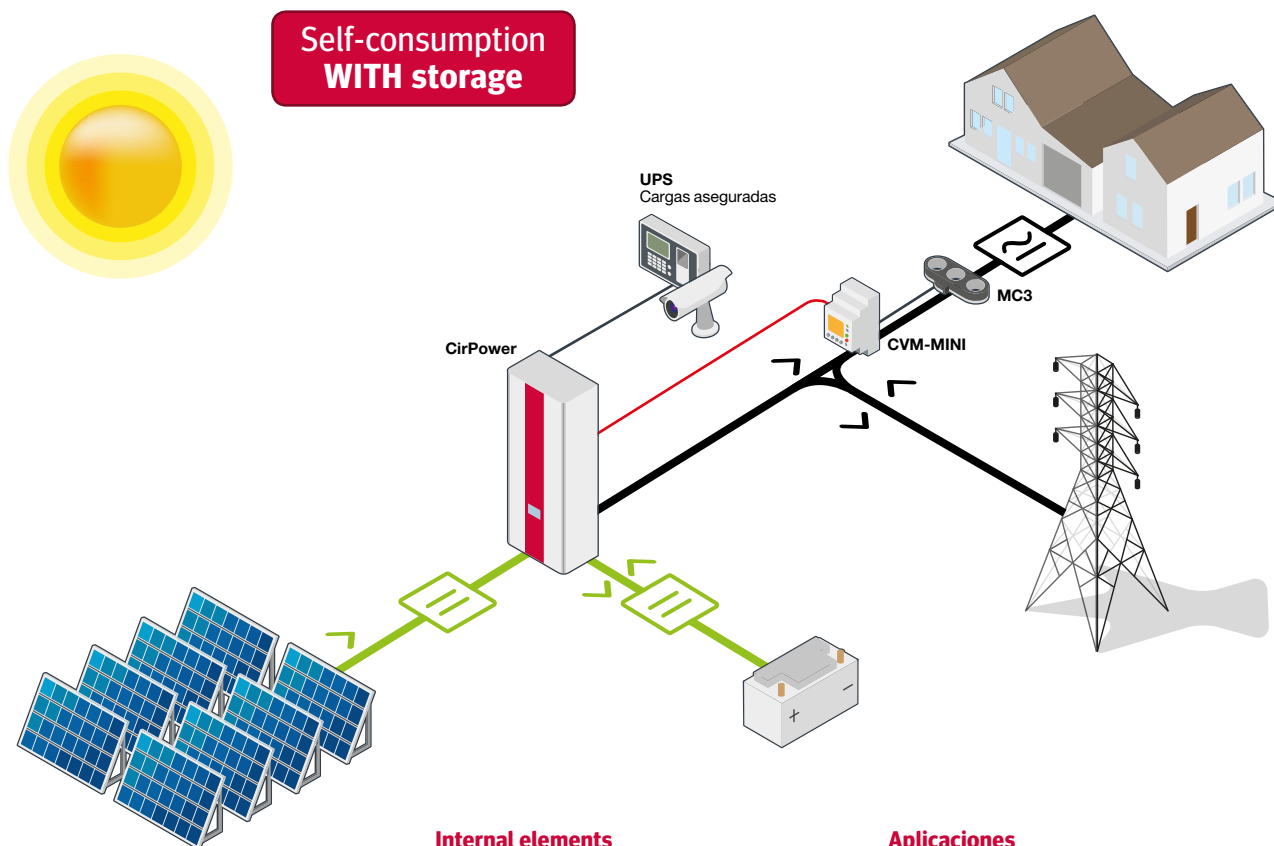
Users that mainly consume energy in low or zero insolation hours can optimise their self-consumption installations by diverting surplus energy to a battery formed by electrochemical batteries. This type of system can have different configurations, DC and AC.

In the DC coupling, the energy coming from the photovoltaic modules is managed and redirected to consumption and/or the battery in its original form of direct current, without having been previously converted to alternating current.

The CirPower Hybrid inverter internally manages the energy balance of the flow coming from the solar modules and the battery

in order to subsequently convert the power required by the loads into alternating current. This is the maximum efficiency formula to satisfy consumers with consumption that is time-delayed, i.e., not during daylight hours. The surplus energy is stored directly in the battery with no need for it to be rectified, as it comes from the same type of current source as that which is stored in the battery.

The fact that all of the energy flows are managed by one unit means that this management process is more efficient and versatile, as different strategies can be established that prioritise self-consumption, energy safety, the reduction of power spikes and also disconnection from the network for standalone operation when it suits the user.

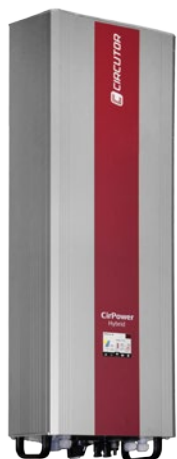


## Internal elements

- Bidirectional inverter
- Control and monitoring of batteries
- Grid connection through transfer relay
- Anti-islanding control
- Internet data monitoring and logging

## Aplicaciones

- Self-consumption with grid-assisted storage
- Power supply of guaranteed loads
- Control of energy cost
- Support for weak grids
- Installations isolated from the grid



CirPower Hybrid

## EFM-HYB CirPower, kits para instalaciones conectadas a red o aisladas

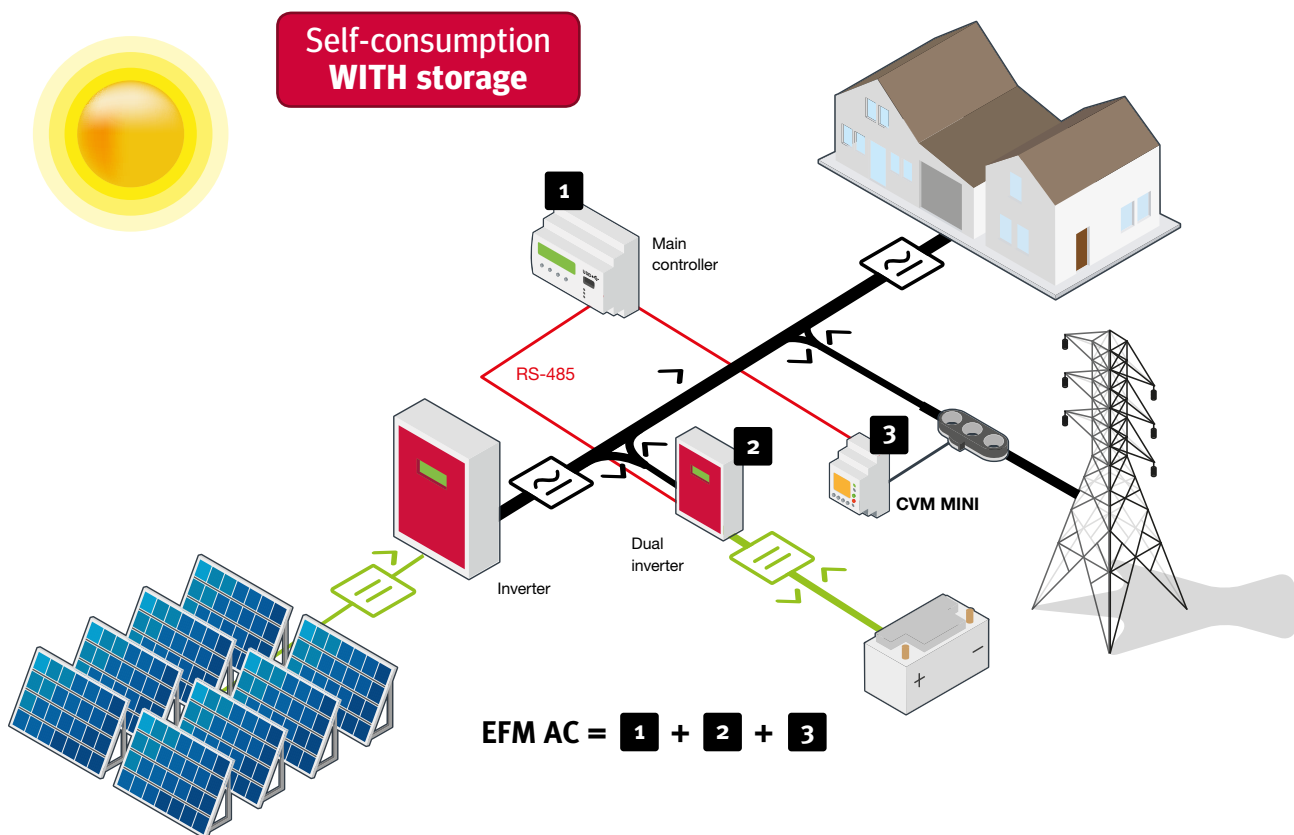
Type	Code	Daily consumption	FV Power	Battery
EFM-HYB-25-100	E7K111	8200 Wh/day	2500 Wp	48 V / 150 Ah
EFM-HYB-35-100	E7K121	11600 Wh/day	3500 Wp	48 V / 150 Ah
EFM-HYB-40-130	E7K132	12800 Wh/day	4000 Wp	48 V / 300 Ah
EFM-HYB-50-130	E7K142	15500 Wh/day	5000 Wp	48 V / 300 Ah

All the kits use the CIRCUTOR single-phase hybrid inverter with 1x230 V, 4 kW nominal power and 48 V battery voltage. All the kits include combiner box and string box (electrical panels in general) with protection and monitoring devices. For other options or special needs, please contact with your commercial agent. All EFM-HYB Kits can be supplied without batteries, please contact us for more information.

# Time-delayed self-consumption with storage. AC Coupling

This solution is especially suitable for those buildings that already have a grid-connected photovoltaic installation for energy sales for which you wish to divert part of the production to be consumed when solar radiation decreases.

In these systems, the supervisor modulates the inverter-charger with the aim of minimising energy exchange with the grid. It charges the battery based on the surplus in daytime hours and discharges the battery based on consumption in hours of low or zero insolation.



## Internal elements

- Bidirectional inverter
- Control and monitoring of batteries
- Grid connection through transfer relay
- Anti-islanding control
- Internet data monitoring and logging

## Applications

- Self-consumption with grid-assisted storage
- Power supply of guaranteed loads
- Control of energy cost
- Support for weak grids
- Installations isolated from the grid



# CDP CB

## Combiner Box for protecting and managing solar installations



### Description

Photovoltaic systems are composed of various separate DC circuits that must be combined in a single circuit before DC is transformed into AC, in order to use this AC power and inject it into the electrical network or use it for internal consumption of a dwelling or building. The Combiner boxes are used for such purposes. These connection cabinets group the different strings connected to the photovoltaic panels.

CIRCUTOR's **CDP CB** combiner boxes group all DC and AC electrical protection elements required, so that the user can have everything in a single cabinet.

In addition to the protection elements, the products of the CDP CB range come with a CDP-0, which guarantees that the user can manage zero injection into the electrical network, as well as a **CVM-MINI** power analyzer for measuring the electrical consumption.

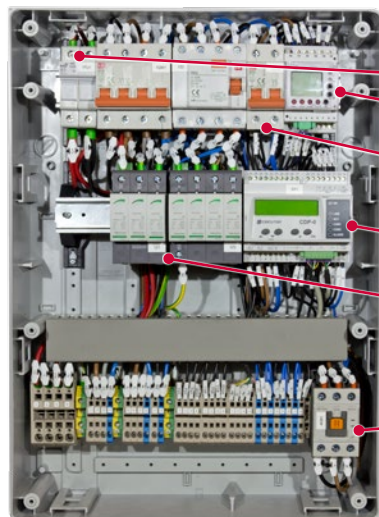
The **CDP CB** combiner boxes feature a web server, through which the user can connect to monitor both the installation's consumption and generation of electricity.

The **CDP CB** range of combiner boxes has been designed to complement the range of self-consumption kits with zero injection to the grid.



# CDP CB

## Combiner Box for protecting and managing solar installations



### About the kits

- 1 Fuses with removable DC fuse carrier.
- 2 CVM power analyzers.
- 3 AC Electrical protection for inverters.
- 4 CDP - Dynamic power control.
- 5 AC and DC overvoltage protection.
- 6 Reverse current protection relay.

### Combiner Box Models

KITS	EFM CDP 1,5-S, 1,5-S PRO, 2,5-S, 2,5-S PRO	EFM CDP 1,5-S, 1,5-S PRO, 2,5-S, 2,5-S PRO	EFM CDP 5-S, 5-S PRO	EFM CDP 5-S, 5-S PRO	EFM CDP 5-S-T, 5-S-PRO-T, 6-S, 6-S PRO	EFM CDP 8-S, 8-S PRO, 10-S, 10-S PRO	EFM CDP 15-M, 15-M PRO	EFM CDP 20-M, 20-M PRO, 24-M, 24-M PRO	EFM CDP 30-M, 30-M PRO
Type	CDP CB S-1-1-16-30	CDP CB S-1-1-1-16-300	CDP CB S-2-1-1-25-30	CDP CB S-2-1-1-25-300	CDP CB T-2-2-1-25-300	CDP CB T-0-0-1-25-300	CDP CB C-0-0-3-25-300	CDP CB T-0-0-2-25-300	CDP CB T-0-0-3-25-300
Code	E53112	E53117	E53214	E53219	E5354E	E5306E	E53089	E5307E	E5308E
Units	1	1	1	1	1	1	1	1	1
Installation	Single phase	Single phase	Single phase	Single phase	Three-phase	Three-phase	Three-phase	Three-phase	Three-phase
Inverter type	Single phase	Single phase	Single phase	Single phase	Three-phase	Three-phase	Single phase	Three-phase	Three-phase
No. of inverters	1	1	1	1	1	1	3	2	3
No. of DC Inputs	1	1	2	2	2	-	-	-	-
DC Input $I_{max}$	2 x 10 A	2 x 10 A	4 x 10 A	4 x 10 A	4 x 10 A	-	-	-	-
DC Output to inverter	1	1	1	1	1	-	-	-	-
DC Overvoltage protection ( $U_{d.c. max} = 1000 V$ )	1	1	1	2	2	-	-	-	-
AC Overvoltage protection ( $I_{max} = 40 kA$ )	1	1	1	1	1	1	1	1	1
Inverter AC inputs	1	1	1	1	1	1	3	2	3
$I_{max}$ AC for inverter	2 p 16 A	2 p 16 A	2 p 25 A	2 p 25 A	4 p 25 A	4 p 25 A	3 x 2 p 25 A	2 x 4 p 25 A	3 x 4 p 25 A
Earth leakage protection	30 mA	300 mA	30 mA	300 mA	300 mA	300 mA	300 mA	300 mA	300 mA
Power analyzer	-	-	-	-	Yes	Yes	Yes	Yes	Yes
Reverse current relay protection	40 A	40 A	40 A	40 A	40 A	40 A	40 A	63 A	63 A
Type	-	-	-	-	-	CDP SB 4-2-2	CDP SB 2-1-1	CDP SB 4-2-2	CDP SB 4-2-2
Code	-	-	-	-	-	E54422	E54211	E54422	E54422
Units	-	-	-	-	-	1	3	2	3
No. of DC Inputs	-	-	-	-	-	4	2	4	4
DC Input $I_{max}$	-	-	-	-	-	4 x 10 A	2 x 10 A	4 x 10 A	4 x 10 A
DC Output to inverter	-	-	-	-	-	2	1	2	2
DC Overvoltage protection ( $U_{c.c. max} = 1000 V$ )	-	-	-	-	-	2	1	2	2

# Instantaneous self-consumption

## CDP, Dynamic Power Controller



Type	Code	Description
CDP-0	E51001	Dynamic power controller, zero injection
CDP-G	E52001	Dynamic power controller with demand management

Requires current transformers of the **MC** series (.../250 mA)

# Time-delayed self-consumption

## CirPower, Inverter consumption charger solutions with battery bank



Type	Code	System	Nominal power	Input voltage max./min (Vcc max/min)	Maximum current input	Voltage / AC nominal frequency	Battery Voltage	Maximum battery current (charging / discharging)
CirPower HYB-4k-48	E15311	1 x 230 V single-phase	4000 W	600 V / 150 V	20 A	230 V / 50 Hz	48 V	50 / 80 A

## Dispenser, single-phase meter with EDA function (Energy Daily Allow)



Type	Code	Description
Dispenser-101	E41111	Single-phase universal dispenser with measurement of absolute value
Dispenser-104	E41311	4-quadrant single-phase universal dispenser
Dispenser-301	E41422	Three-phase universal dispenser with measurement of absolute value
Dispenser-304	E41622	4-quadrant three-phase universal dispenser
Reader writer	Q31100	RFID card writer
RFID CARD	E20001	RFID card for <b>universal dispenser</b>
DISPENSER-SOFT*	E42001	Software licence

\* Minimum requirements for Windows:  
64-bit Windows 8, Windows 8 Pro 64-bit, Windows 7 SP1 64-bit Ultimate, Enterprise, and Professional editions, Windows Server 2008 SP2 64-bit Datacenter, Enterprise, Standard, Foundation, and Web editions, Windows Vista SP2 64-bit Ultimate, Enterprise, and Business editions.

# Monitoring and supervision for PV

## TR Series, monitoring unit for PV with 230 Vac power supply / 24 Vdc power supply RS-485 / Modbus RTU



Type	Code	Current	Outputs	Description
TR8-RS485-25 *	E80000	25 A	8	1000 V <sub>dc</sub> voltage measurement
TR16-RS485-25 *	E80002	25 A	16	1000 V <sub>dc</sub> voltage measurement
M/TR-25 x2	E80010	Measuring module for 2 current circuits with max 25 A <sub>dc</sub>		
M/TR-25 x4	E80011	Measuring module for 4 current circuits with max 25 A <sub>dc</sub>		
TR8-RS485-100/200	E80001	Depending on transformer	8	1000 V <sub>dc</sub> voltage measurement
M/TR-100	E80012	Measuring module for 1 current circuit with max 100 A <sub>dc</sub>		
M/TR-200	E80013	Measuring module for 1 current circuit with max 200 A <sub>dc</sub>		

\*On demand, with **UL Certification**



# Other related products

**CVM MIN**, Three-phase power analyzer with display, DIN rail (3 modules), 86...276 Vac power supply



Type	Code	Isolated input	Digital output	Protocol	Comm.
CVM MINI-MC-ITF-HAR-RS485-C2	M52081	Yes	2	Modbus / RTU	RS-485

**CVM NET**, Three-phase power analyzer w/o display, DIN rail (3 modules), 230 Vac power supply



Type	Code	Isolated input	Digital output	Communic.	Protocol
CVM NET-MC-ITF-RS485-C2	M54B31	Yes	2	Modbus / RTU	RS-485

**CVM NET4+ -MC**, 4 Three-phase power analyzers, DIN rail (6 modules), 85...265 Vac power supply 95...300 Vdc



Type	Code	Isolated input	Digital output	Communic.	Protocol
CVM-NET4+-MC-RS485-C4	M55782	Yes	4	Modbus / RTU	RS-485

**CVM 1D**, Single-phase power analyzer with display, DIN rail (1 module), 85...276 Vac power supply



Type	Code	Nominal current	Class Power	Digital Output	Communic. (Protocol)
CVM 1D-RS485-C	M55511	250 mA...32 A	1	1	RS-485 (Modbus/RTU)

**MC1 / MC3**, Efficient single-phase **MC1** and three-phase **MC3** transformers



Type	Code	Amp. Max	Class 0.5 Power	Measurement	Ø int.
MC3-63	M73121	63	0,1 VA	3 phases	7,1
MC3-125	M73122	125	0,1 VA	3 phases	14,6
MC3-250	M73123	250	0,1 VA	3 phases	26
MC1-20-150/200/250	M73113	250	0,25 VA	1 phase	20
MC1-30-250/400/500	M73114	500	0,25 VA	1 phase	30
MC1-55-500/1000/1500	M73115	1500	0,25 VA	1 phase	55
MC1-80-1000/1500/2000	M73117	2000	0,25 VA	1 phase	80

# Solutions for self-consumption

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