

# Photovoltaic self-consumption

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## INTRODUCTION

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### **Photovoltaic self-consumption**

The drop in solar photovoltaic installation costs, combined with rising electricity costs for consumers over recent years, has increased the use of self-consumption installations in many parts of the world. By knowing how to exploit the synergic relationship between an understanding of how to measure, manage and improve the quality of electrical energy and how to take full advantage of the renewable resources that generate it, Circutor has designed systems which combine the power supplied by the network with both instantaneous and deferred self-consumption devices for industrial use, or to be used in public service and even residential buildings.

# A solution tailored to every need

Given that each consumer has a different energy demand curve, as well as individual network access availability, Circutor has designed custom solutions to meet individual needs, which optimise solar energy efficiency, simplify management and maximise cost reduction.

The available solutions are divided into the following categories, depending on solar power production and electrical consumption time ratio in each case:



Type	Installation	Application
Instantaneous self-consumption	Installations connected to the electrical network with high daytime consumption. With energy injection to the grid or $\emptyset$ injection (CDP).	Residential Agricultural Industrial
Self-consumption isolated from the network	For all types of installations isolated from the electrical network, with power supply generator backup.	Residential Agricultural
Deferred self-consumption with accumulation and DC coupling	Installations connected to the electrical network whose objective is to increase solar power self-sufficiency by using a surplus energy accumulator during peak sun hours.	Residential
Deferred self-consumption with accumulation and AC coupling	Installations connected to the electrical network that are already fitted with a photovoltaic power generation system, whose solar power production we want to transfer to times of low solar radiation.	Residential



## Description

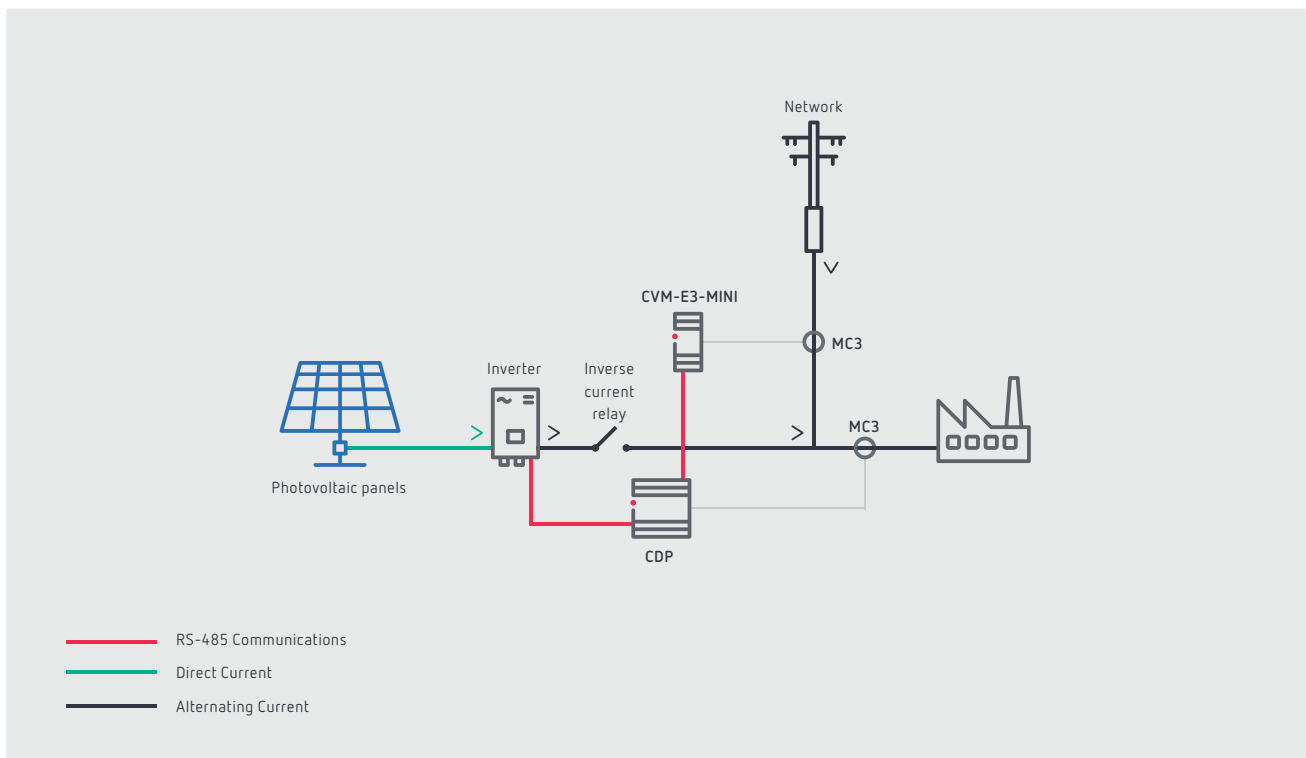
Circutor has photovoltaic kits for self-consumption installations connected to the electrical network with injection to the grid or  $\emptyset$  injection. These kits include all the necessary parts for installation.

## Components

- > Photovoltaic modules
- > Anodised aluminium structure and anchors
- > Power inverter for network connection

Optionally:

- > Dynamic power controller **CDP**
- > AC/DC protection switchboards.



## Advantages

- > Easy-to-organise order using a single reference and supplier. Circutor Guarantee.
- > Pre-assembled cabinet compatibility (**Combiner Box**) to simplify installation.
- > Includes the option of kits in different sizes for other powers and configurations (*upon request*).
- > Full component compatibility.
- > Remote monitoring (via built-in **CDP** web server) and data log storage.
- > Energy flow measurement for the installation.
- > Documentation and connection diagrams for each kit.

## CDP



The **CDP** (Dynamic Power Control) controllers continuously match the maximum power produced by the photovoltaic inverters to the power consumed in the building. This guarantees that no surplus energy is injected into the grid; on the other hand, where appropriate, it allows the system to inject the power fraction permitted by each country's legislation into the electrical grid. Certificate in compliance with the **UNE-EN 217001 Standard**.

# Instantaneous self-consumption PVing Parks

## Description

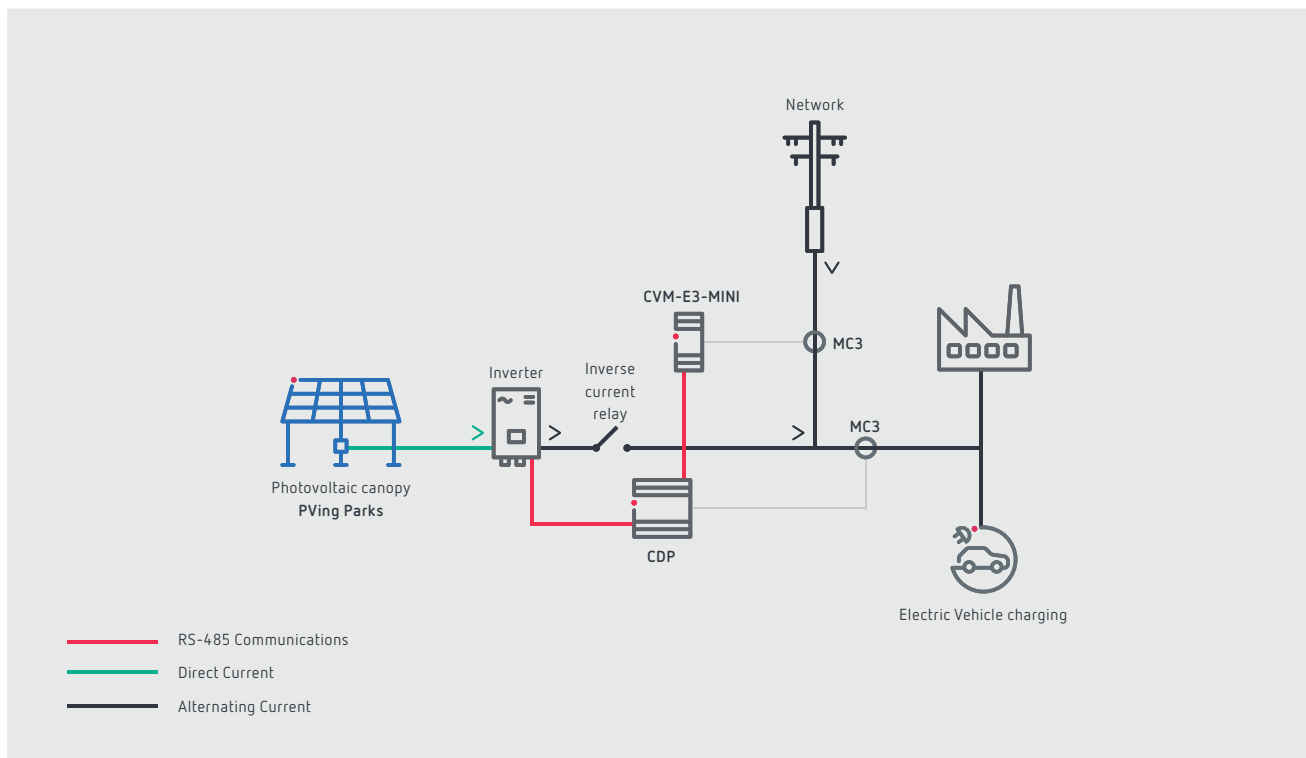
Circutor has **PVing Parks** kits for self-consumption installations connected to the network. This solar canopies allows to integrate within its own structure the photovoltaic installation with the recharging of electric vehicles

## Components

- > Photovoltaic modules
- > Galvanised steel canopy structure
- > Power inverter for network connection

Optionally:

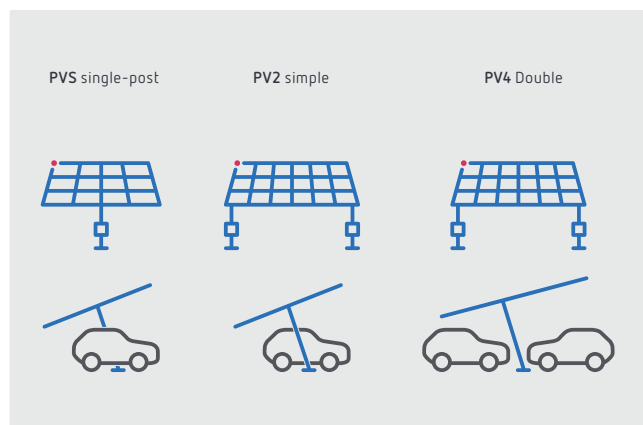
- > Dynamic power controller **CDP**
- > AC/DC protection switchboards.



## Advantages

- > Structural certification under **CTE** and **Eurocode standards**.
- > Easy mechanical assembly of PV modules.
- > Channeling of all wiring.
- > Adaptable to available parking lots.
- > The photovoltaic modules are ideal for roofless places or open areas.
- > Reduces peak charging consumption of vehicles.
- > Remote monitoring (via built-in **CDP** web server) and data log storage.
- > Installation measurement and Energy Management System integration option using **PowerStudio SCADA SOFTWARE**.

## PVing Parks



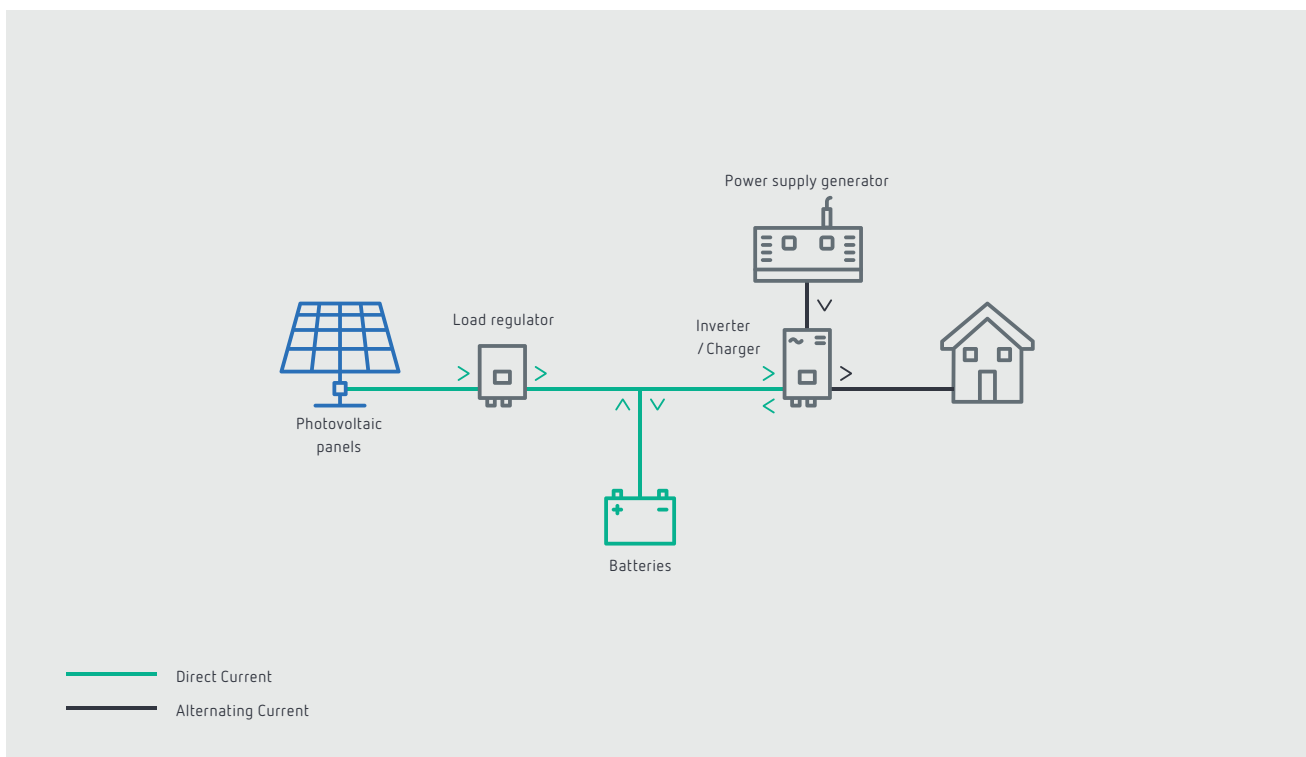
# Self-consumption isolated from the network

## Description

Circutor has photovoltaic kits for self-consumption installations isolated from the electrical network. These kits include all necessary components to consume energy autonomously in systems isolated from distribution lines.

## Components

- › Photovoltaic modules
- › Anodised aluminium structure and anchors
- › MPPT load regulator (*according to kit*)
- › Dual Inverter/Charger (*according to kit*)
- › Maintenance-free lead-acid batteries with gel
- › Battery temperature sensor
- › AC/DC protection switchboards.



## Advantages

- › Easy-to-organise order using a single reference and supplier.
- › Minimal solar installation maintenance, reliability and simple assembly.
- › Remote website monitoring and data log storage option (*upon request*).
- › Includes the option of kits in different sizes for other powers and configurations (*upon request*).

## PV-ISLAND Kit

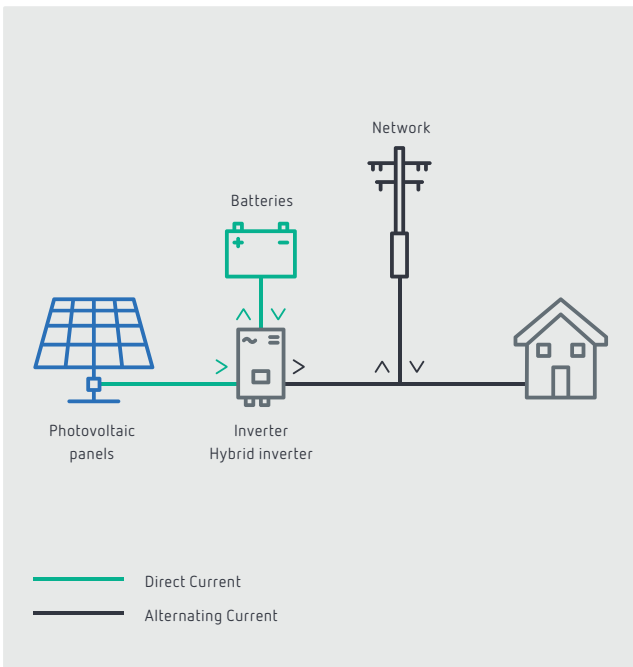


# Deferred self-consumption with accumulation

Facilities that mainly consume energy at times of low or zero solar radiation may optimise self-consumption by transferring surplus energy to electrochemical batteries. This type of system is called self-consumption with AC or DC coupling.

## Description

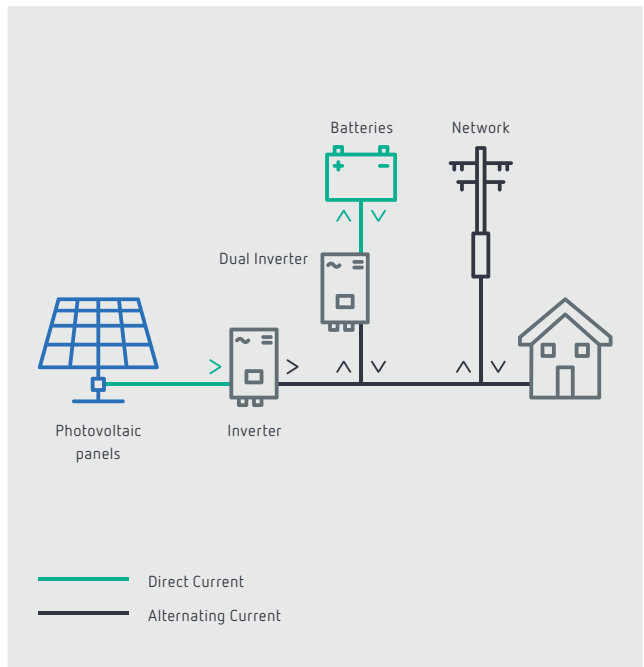
DC Coupling is where energy coming from the photovoltaic modules is managed to the battery in its original direct current form, without having been previously converted into alternating current.



# AC Coupling

## Description

AC Coupling is particularly suitable for buildings with an existing grid-connected photovoltaic installation for the sale of energy with the objective of transferring a part of the production in order that it can be consumed when solar radiation decreases.



## DC Advantages

- > Self-consumption with grid-assisted accumulation.
- > Power supply with guaranteed loads.
- > Energy cost control.
- > Support for weak grids.

## AC Advantages

- > Self-consumption with grid-assisted accumulation.
- > Power supply with guaranteed loads.
- > Energy cost control.
- > Support for weak grids.
- > Autonomous installations isolated from the network.



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