

ENGLISH

**steca**  
Elektronik

# **PV OFF GRID BATTERY CHARGING SYSTEMS**

Taking control for you.





Steca  
**STRONG SOLUTIONS  
POWERFUL PARTNERS**

## CONTENT

<b>Innovative Electronics Company</b>	<b>4</b>
<b>PV Off Grid</b>	<b>6</b>
Solar charge controllers   Basic	12
Solar charge controllers   Classic	18
Solar charge controllers   Advanced	26
Sine wave inverters	32
DC loads	42
Accessories	48
Solar home systems	56
Night light systems	60
Inverter systems	64
Mini-grid   Hybrid systems	68
<b>Battery charging systems</b>	<b>76</b>
Steca   EMS Provider	86
Steca   International network	88

Having posted sustained growth as an innovated electronic company, we pool many years of experience and innovative strength both as a manufacturer of Steca-branded product lines in solar electronics and as an electronics service provider.

Nowadays, we are highly diversified as an electronics service provider and supply our partners around the globe. We carry out our production operations on an area measuring over 29,000 square metres with more than 750 employees. Our plant at the Memmingen site and a plant in Bulgaria ensure your product's success.

As part of the PRIMEPULSE Group, Steca has an international network and a firm foundation for strategic growth.

# Innovative **ELECTRONICS COMPANY**



Steca  
**PV OFF GRID**



# GENERAL RECOMMENDATIONS

## selecting the solar controller

The solar charge controller is the central component in a stand-alone system. It controls the energy flow in the entire system and determines the system function and service life. This means that a suitable solar charge controller must be selected carefully.

The solar charge controller only accounts for between 3 % and 5 % of the total cost of a stand-alone system, and yet it is the most important component. A high-quality, reliable solar charge controller in a higher price class pays for itself very quickly, as it increases the battery life and thus leads to a significant saving in system costs.

### Selecting the topology

Steca solar charge controllers are available as professional hybrid-shunt controllers, serial charge controllers or MPP trackers. A suitable topology should be selected depending on the requirements of the application.

Switch charge controllers such as shunt and serial charge controllers can only be used on 12 V systems in connection with 36-cell solar modules. On 24 V or 48 V systems, two 36-cell solar modules (24 V) or two 72-cell solar modules (48 V) must be wired serially as a string.

Serial charge controllers are well suited to small applications and solar home systems. Shunt controllers are recommended for larger-scale applications and hybrid systems, as these have a lower power loss during charging.

Due to their good electromagnetic compatibility, shunt controllers are also recommended for use in telecommunication applications.

A solar charge controller with MPP tracking must be used when solar modules which are not comprised of 36 or 72 cells are used. These include most optimised solar modules for grid-connected systems and all thin-film modules.

The use of an MPP tracker is also increasingly recommended depending on the coldness of the average annual temperature and importance of efficient charging at low battery charges (even when standard 36-cell modules are used).

### Dimensioning the solar charge controller

The short-circuit current ( $I_{sc}$ ) of the solar module is decisive when dimensioning solar charge controllers (under standard test conditions). Steca recommends always dimensioning the solar charge controller generously. The rated current on the solar charge controller should be approximately 20 % higher than the total short-circuit current on all connected solar modules.

### User interface

If the solar charge controller is used in an application where persons have access to the system, it is important that the controller is equipped with a large LCD screen for displaying the operating statuses using symbols. The solar charge controller should be equipped with an integrated energy meter for notifying the user of the system and its operation.

On pure technical systems (such as night-light systems), a solar charge controller with a simple LED display is sufficient.

### Cables and design

In order to ensure a long service life, it is important to use a robust solar charge controller with short, thick cables for connecting it to the battery. The device should always be screwed to a non-flammable wall directly above the battery. It is important that there is enough free space around the solar charge controller so that it can be cooled sufficiently by the ambient air. The guidelines in the instruction manuals must be adhered to in all cases.

### Additional functions

It makes sense to use solar charge controllers with additional functions in applications with stand-alone inverters or hybrid systems. The possibility of connecting to the stand-alone inverters for communication and synchronisation of the devices is a requirement for effective inverter systems or hybrid systems. Special energy management functions remain of key importance on hybrid systems.

# SELECTING THE SOLAR CHARGE CONTROLLER

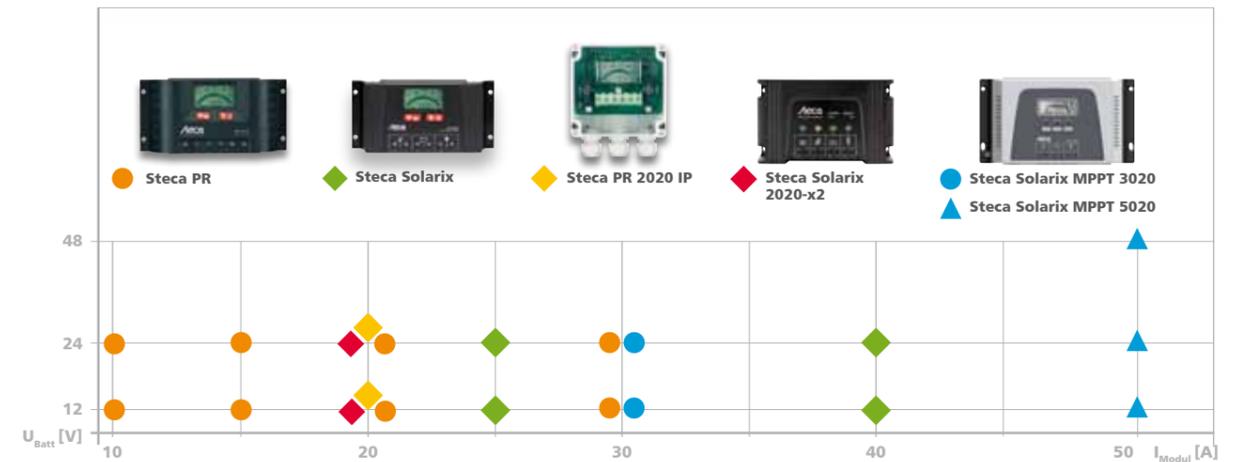
## BASIC

### Basic solar charge controllers



## CLASSIC

### Classic solar charge controllers



## ADVANCED

### Advanced solar charge controllers

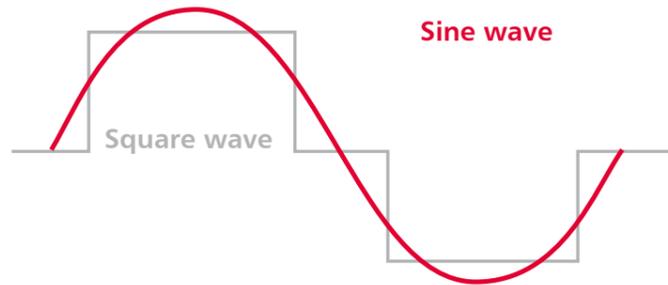


# GENERAL RECOMMENDATIONS

## for alternating current and hybrid systems

### Sine wave inverters

In contrast to so-called square wave or trapezoidal inverters (grey square curve), Steca sine wave inverters produce a real and precisely controlled sine wave (red sine wave) at their output. The sine wave inverters assure that all loads which are suitable for grid operation can also be operated on a solar home system without any problems. Furthermore, they offer the advantage that no significant noises are produced in the inverter and there is no loud background noise to be heard on a connected radio, for example.



### Selecting an inverter

The power of the inverter must be selected according to the way it will be used. The sum of the power of all loads must not exceed the rated power of the inverter. The maximum power of the inverter must be able to cover the starting currents of the loads.

In order to allow the connection of more loads, Steca recommends overdimensioning the inverter.

### Selecting the PV generator and solar charge controller

The solar module array has to be adjusted to the local sunlight conditions and the system's energy requirement. In order to avoid stagnation times, the PV generator must also provide enough power during months with little solar radiation in order to cover the requirement of the connected loads.

The chosen solar charge controller must also be suitable for the maximum short-circuit current of the PV generator and the maximum load current. In some applications, however, technical properties also play an important role in the choice of solar charge controller. This may mean that a high-performance solar charge controller with corresponding additional functions is used in a system with a low output.

In order to keep the initial investment small, we recommend planning the size of the PV generator and battery according to the current energy consumption and choosing a solar charge controller which will allow the system to be expanded later.

### Selecting the battery

In order to also be able to supply loads with high requirements without any problems, the size of the battery must be chosen with care. Some critical loads such as fridges, freezers, pumps and motors need extremely high starting currents in their start-up phases. In order to be able to power such loads, it is important to use a high-performance inverter with a high overload capacity, particularly in the start-up phase. The battery must also possess a large enough capacity so that sufficient currents are made available to the inverter in the start-up phase. We recommend choosing the battery size according to the following formula: the battery capacity should be at least five times as large as the rated power of the inverter divided by the rated voltage of the battery.

$$C_{\text{batt}} \geq 5 \text{ h} * P_{\text{nom}} / U_{\text{nom}}$$

$P_{\text{nom}}$  is the rated power of the inverter in watts and

$U_{\text{nom}}$  is the rated voltage of the battery.

$P_{\text{nom}}$ inverter	$U_{\text{nom}}$ battery	Battery capacity
200 W	12 V	> 100 Ah
500 W	12 V	> 200 Ah
1,000 W	12 V	> 400 Ah
2,000 W	12 V	> 800 Ah
2,000 W	24 V	> 400 Ah
3,500 W	24 V	> 700 Ah
3,500 W	48 V	> 350 Ah
5,000 W	48 V	> 500 Ah
7,000 W	48 V	> 700 Ah

### Selecting the system voltage

The power requirement of the loads should be the decisive factor when choosing the system voltage. The higher the power, the higher the system voltage. If no 12 V DC loads are connected to the system, a higher system voltage of 24 V or 48 V should be chosen in order to reduce the alternating currents, and thus the losses on the DC side. Inverters also generally work more effectively with a higher input voltage. All in all, a higher system voltage leads to the system having a greater efficiency, since losses are reduced

### Cable lengths and cross sections

Direct currents in inverter systems are typically large. For this reason, it is important to dimension the cables between the battery and the inverter appropriately. Always connect the inverter directly to the battery. The cable you use should be as short as possible. In addition, the cable cross section should match the expected flow of current. In case of doubt, a thicker cable should be chosen. This can have a significant influence on the overall behaviour of the system. Using thick and short cables can limit losses and thus allow you to create a system with a better level of efficiency and/or better performance. If the cables on the direct current side of the inverter are included in the delivery, these should not be lengthened, and a smaller cross section should not be used.

# STECALINK BUS: THE NEW COMMUNICATION SYSTEM

## for Steca solar charge controllers



Communication between Steca Tarom MPPT 6000-M, Steca Tarom MPPT 6000-S, Steca Tarom 4545/4545-48 and Steca PA HS400

Steca offers an innovative, integrated RS-485 communication interface, the StecaLink bus.

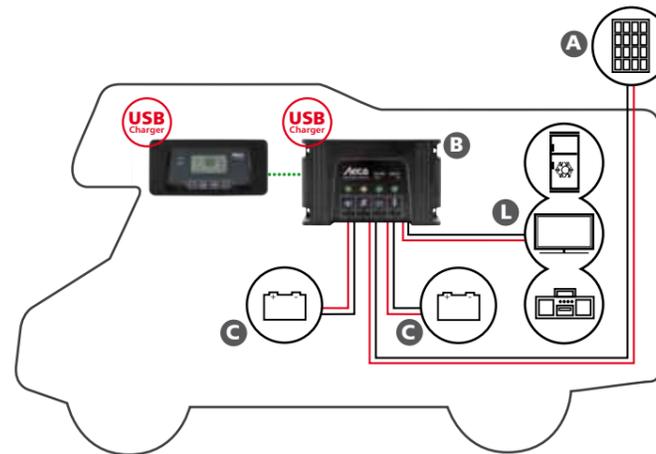
This interface allows a charge controller to act as a communication master (e.g. Steca Tarom MPPT 6000-M) to exchange measurements and setting information with other devices (e.g. Tarom MPPT 6000-S, Steca Tarom 4545/4545-48 and/or PA HS400). In the StecaLink communication system, the master collects all relevant data of the other controllers or electricity sensors, to record them in the data logger. Optionally, it can also calculate the battery's state of charge as a percentage (SOC).

This ability to link multiple devices and their data creates a connected system which collects and records all information centrally. At the same time, it achieves a high level of redundancy.

An overview of the StecaLink bus communication options is shown in the table opposite.

Slave \ Master	Tarom MPPT 6000-S	Tarom 4545 Tarom 4545-48	PA HS400	Solarix 2020-x2
Tarom MPPT 6000-M	✓	✓	✓	
Tarom 4545 Tarom 4545-48			✓	
PA LCD1				✓

### Communication between Steca Solarix 2020-x2 and Steca PA LCD1



Key:

- A Solar modul
- B Solar charge controller Steca Solarix 2020-x2
- C Battery
- L Loads

The innovative dual battery charge controller Steca Solarix 2020-x2 with remote display PA LCD1 is particularly appealing for leisure applications with high demands around professional battery management and visual appearance in the visible part.

Numerous application options exist for the dual battery charge controller aside from the recreational market: any small to medium-sized stationary PV system designed to charge two independent batteries via one module field represents a potential application for the controller.



Steca  
**SOLAR CHARGE CONTROLLERS |  
BASIC**

# STECA SOLSUM F

6.6F | 8.8F | 10.10F

The Steca Solsum F-Line continues the huge success of one of the most used SHS controllers. With a power range of up to 10 A at automatically recognized 12 V or 24 V it fits to a system sizes of maximum 240 W.

Full circuit board protection with LED display for simple recognition of battery status. Various connections make it possible to connect easily to solar panels, battery and load. The Steca Solsum F works on PWM as a low loss series controller.

## Product features

- Serial topology with MOSFETs
- Automatic detection of voltage
- Voltage regulation
- PWM control
- Multistage charging technology
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Monthly equalisation charge

## Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module ( $\leq 36$  V), load and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

## Displays

- Multifunction LED display
- Multi-coloured LED
- 4 LEDs show operating states  
~ for operation, state of charge, fault messages

## Options

- Evening or night light function pre-set in the factory or adjustable via Steca PA RC 100
- Parameterisation of function values via Steca PA RC 100

## Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

## Steca accessories

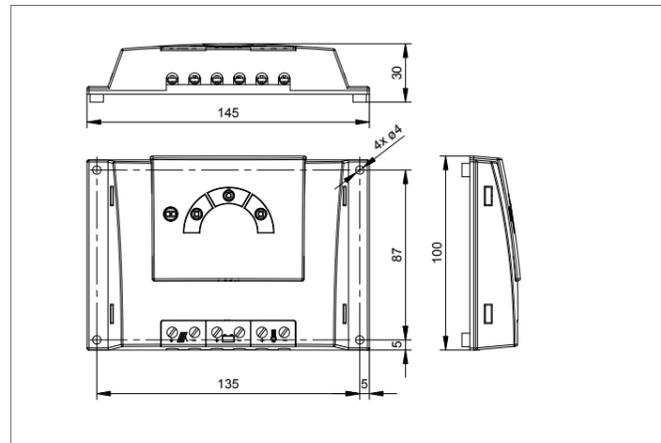
- Remote control Steca PA RC100

## BASIC



STECA Quality

6 A...10 A



	6.6F	8.8F	10.10F
<b>Characterisation of the operating performance</b>			
System voltage	12 V (24 V)		
Own consumption	< 4 mA		
<b>DC input side</b>			
Open circuit voltage solar module (at minimum operating temperature)	< 47 V		
Module current	6 A	8 A	10 A
<b>DC output side</b>			
Load current**	6 A	8 A	10 A
Reconnection voltage (LVR)*	12.4 V ... 12.7 V (24.8 V ... 25.4 V)		
Deep discharge protection (LVD)*	11.2 V ... 11.6 V (22.4 V ... 23.2 V)		
<b>Battery side</b>			
End of charge voltage*	13.9 V (27.8 V)		
Boost charge voltage*	14.4 V (28.8 V)		
Set battery type*	gel		
<b>Operating conditions</b>			
Ambient temperature	-25 °C ... +50 °C		
<b>Fitting and construction</b>			
Terminal (fine / single wire)	4 mm <sup>2</sup> / 6 mm <sup>2</sup> - AWG 12 / 9		
Degree of protection	IP 31		
Dimensions (X x Y x Z)	145 x 100 x 30 mm		
Weight	approx. 150 g		

Technical data at 25 °C / 77 °F  
\* adjustable via Steca PA RC100  
\*\* Inverters must not be connected to the load output.

# STECA SOLARIX PRS

1010 | 1515 | 2020 | 3030

The simplicity and high performance of the Steca Solarix PRS solar charge controller make it particularly appealing. At the same time, it offers a modern design and a convenient display, all at an extremely attractive price.

Several LEDs in various colours give information on the battery's state of charge. Here, Steca's latest algorithms are employed, resulting in optimal battery maintenance. The Solarix PRS charge controllers are equipped with an electronic fuse, thus making optimal protection possible. They operate on the serial principle, and separate the solar module from the battery in order to protect it against overcharging.

For larger projects, the charge controllers can also be equipped with special functions: e.g. with night light function and selectable charging plateau and deep-discharge protection voltages.

## Product features

- Serial topology with MOSFETs
- Automatic detection of voltage
- Voltage regulation
- PWM control
- Multistage charging technology
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Monthly equalisation charge

## Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module ( $\leq 36$  V), load and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

## Displays

- Multifunction LED display
- Multi-coloured LED
- 5 LEDs show operating states  
~ for operation, state of charge, fault messages

## Options

- Evening or night light function pre-set in the factory or adjustable via Steca PA RC 100
- Parameterisation of function values via Steca PA RC 100

## Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

## Steca accessories

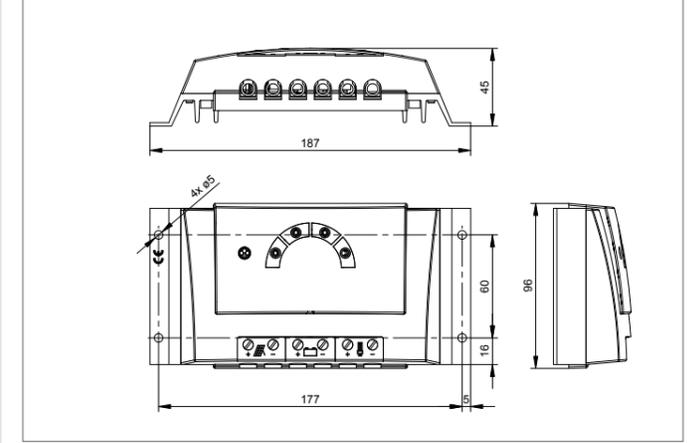
- Remote control Steca PA RC100

## BASIC



STECA Quality

10 A...30 A



	1010	1515	2020	3030
<b>Characterisation of the operating performance</b>				
System voltage	12 V (24 V)			
Own consumption	< 4 mA			
<b>DC input side</b>				
Open circuit voltage solar module (at minimum operating temperature)	< 47 V			
Module current	10 A	15 A	20 A	30 A
<b>DC output side</b>				
Load current**	10 A	15 A	20 A	30 A
Reconnection voltage (LVR)*	12.4 V ... 12.7 V (24.8 V ... 25.4 V)			
Deep discharge protection (LVD)*	11.2 V ... 11.6 V (22.4 V ... 23.2 V)			
<b>Battery side</b>				
Battery voltage	9 V ... 17 V (17.1 V ... 34 V)			
End of charge voltage*	13.9 V (27.8 V)			
Boost charge voltage*	14.4 V (28.8 V)			
Equalisation charge*	14.7 V (29.4 V)			
Set battery type*	liquid			
<b>Operating conditions</b>				
Ambient temperature	-25 °C ... +50 °C			
<b>Fitting and construction</b>				
Terminal (fine / single wire)	16 mm <sup>2</sup> / 25 mm <sup>2</sup> - AWG 6 / 4			
Degree of protection	IP 31			
Dimensions (X x Y x Z)	187 x 96 x 45 mm			
Weight	345 g			

Technical data at 25 °C / 77 °F  
\* adjustable via Steca PA RC100  
\*\* Inverters must not be connected to the load output.

# STECA SOLSUM

## 2525 | 4040

Solar charge controllers Steca Solsum 2525 and 4040 are newly developed products based on the internationally renowned controller family Solarix PRS. With increased module and load current, the controllers are now also suitable for even larger systems. The devices also feature an integrated USB charging port for charging smartphones and tablets. The controllers demonstrate impressive performance, are simple to use and offer unbeatable value for money.

Several LEDs in various colours give information on the battery's state of charge. Here, Steca's latest algorithms are employed, resulting in optimal battery maintenance. The Steca Solsum charge controllers are equipped with an electronic fuse, thus making optimal protection possible. They operate on the serial principle, and separate the solar module from the battery in order to protect it against overcharging.

For larger projects, the charge controllers can also be equipped with special functions: e.g. with night light function and selectable charging plateau and deep-discharge protection voltages.

### Product features

- Serial topology with MOSFETs
- Automatic detection of voltage
- Voltage regulation
- PWM control
- Multistage charging technology
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Monthly equalisation charge
- USB charge socket for smartphones and tablets

### Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module ( $\leq 36$  V), load and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

### Displays

- Multifunction LED display
- Multi-coloured LED
- 5 LEDs show operating states
- ~ for operation, state of charge, fault messages

### Options

- Evening or night light function pre-set in the factory or adjustable via Steca PA RC 100
- Parameterisation of function values via Steca PA RC 100

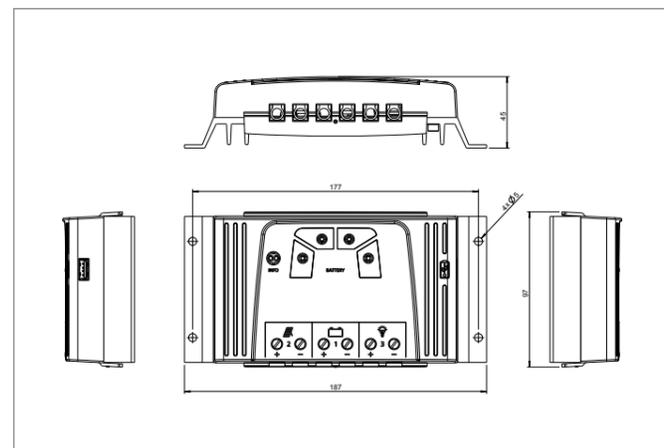
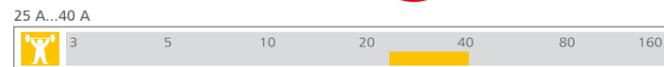
### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

### Steca accessories

- Remote control Steca PA RC100

## BASIC



	2525	4040
<b>Characterisation of the operating performance</b>		
System voltage	12 V (24 V)	
Own consumption	< 10.5 mA	
<b>DC input side</b>		
Open circuit voltage solar module (at minimum operating temperature)	< 47 V	
Module current	25 A	40 A
<b>DC output side</b>		
Load current**	25 A	40 A
USB charge socket	5.2 V / 1.5 A	
Reconnection voltage (LVR)*	12.4 V ... 12.7 V (24.8 V ... 25.4 V)	
Deep discharge protection (LVD)*	11.2 V ... 11.6 V (22.4 V ... 23.2 V)	
<b>Battery side</b>		
Charge current	9 V ... 17 V (17.1 V ... 34 V)	
End of charge voltage*	13.9 V (27.8 V)	
Boost charge voltage*	14.4 V (28.8 V)	
Equalisation charge*	14.7 V (29.4 V)	
Set battery type*	liquid	
<b>Operating conditions</b>		
Ambient temperature	-25 °C ... +50 °C	
<b>Fitting and construction</b>		
Terminal (fine / single wire)	16 mm <sup>2</sup> / 25 mm <sup>2</sup> - AWG 6 / 4	
Degree of protection	IP 30	
Dimensions (X x Y x Z)	187 x 97 x 45 mm	
Weight	345 g	

Technical data at 25 °C / 77 °F  
 \* adjustable via Steca PA RC100  
 \*\* Inverters must not be connected to the load output.

# STECA SOLARIX MPPT

## 1010 | 2010

Steca Solarix MPPT is a solar charge controller with Maximum Power Point Tracking. It is specially designed to work with all established module technologies and is optimized for solar systems with module voltages higher than the battery voltage. The Steca Solarix MPPT is especially qualified in combination with grid tied solar modules. The advanced MPP-tracking algorithm from Steca assures that the maximum available power of the solar generator is charged to the batteries. The Steca Solarix MPPT with latest technology ensures full performance in all conditions, a professional battery care combined with modern design and excellent protection.

### Product features

- Maximum Power Point Tracker (MPP tracker)
- Voltage and current regulation
- Automatic load reconnection
- Temperature compensation
- Positive earthing of one or negative earthing of several terminals possible
- Monthly equalisation charge

### Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module, load and battery
- Reverse polarity protection by internal fuse
- Automatic electronic fuse
- Short circuit protection
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

### Displays

- Multifunction LED display | Multi-coloured LED
- 5 LEDs show operating states
- ~ for operation, state of charge, fault messages

### Options

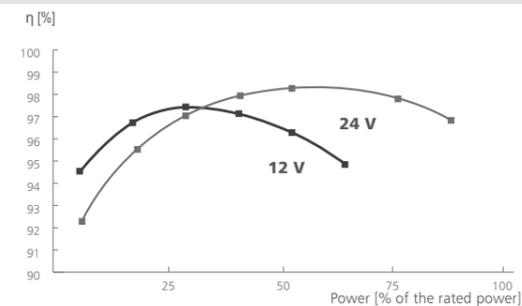
- Evening or night light function pre-set in the factory or adjustable via Steca PA RC 100
- Parameterisation of function values via Steca PA RC 100

### Certificates

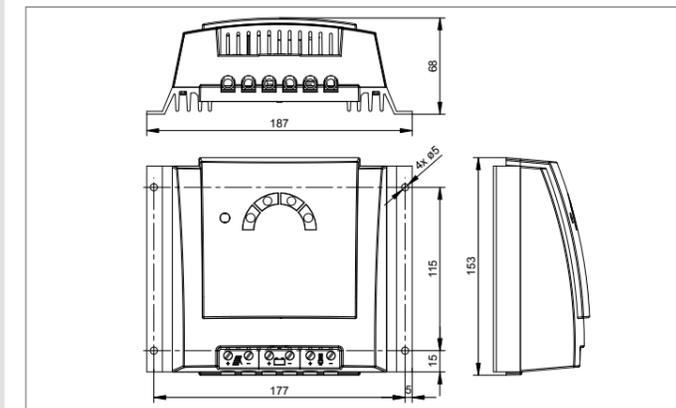
- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

### Steca accessories

- External temperature sensor Steca PA TS10
- Remote control Steca PA RC100



## BASIC



	1010	2010
<b>Characterisation of the operating performance</b>		
System voltage	12 V (24 V)	
Nominal power	125 W (250 W)	250 W (500 W)
Max. DC-DC efficiency	98.3 % ( $U_{Batt}=24$ V; $U_{in}=30$ V; $P=0.6 \cdot P_{nom}$ )	
European efficiency	94.7 % ( $U_{Batt}=12$ V; $U_{in}=30$ V) 96.7 % ( $U_{Batt}=24$ V; $U_{in}=30$ V)	
European efficiency (weighted across all $U_{Batt}$ and $U_{in}$ )	95.2 %	
Static MPP efficiency	99.9 % (DIN EN 50530)	
Dynamic MPP efficiency	97.7 % (DIN EN 50530)	
Weighted REW (Realistic Equally Weighted efficiency)	92.8 %	
Own consumption	10 mA	
<b>DC input side</b>		
MPP voltage	15 V (30 V) < $U_{Modul}$ < 75 V	15 V (30 V) < $U_{Modul}$ << 100 V
Open circuit voltage solar module (at minimum operating temperature)	17 V ... 75 V (34 V ... 75 V)	17 V ... 100 V (34 V ... 100 V)***
Module current	9 A	18 A
<b>DC output side</b>		
Load current**	10 A	
Reconnection voltage (LVR)*	12.5 V (25 V)	
Deep discharge protection (LVD)*	11.5 V (23 V)	
<b>Battery side</b>		
Charge current	10 A	20 A
End of charge voltage*	13.9 V (27.8 V)	
Boost charge voltage*	14.4 V (28.8 V)	
Equalisation charge*	14.7 V (29.4 V)	
Set battery type*	liquid	
<b>Operating conditions</b>		
Ambient temperature	-25 °C ... +40 °C	
<b>Fitting and construction</b>		
Terminal (fine / single wire)	16 mm <sup>2</sup> / 25 mm <sup>2</sup> - AWG 6 / 4	
Degree of protection	IP 32	
Dimensions (X x Y x Z)	187 x 153 x 68 mm	
Weight	approx. 900 g	

\* adjustable via Steca PA RC100  
 \*\* Inverters must not be connected to the load output.  
 \*\*\* CAUTION: If an open circuit voltage of more than 75 V or 100 V is supplied to the connected solar module, the controller will be destroyed. When selecting the solar module, it is important to bear in mind that the open circuit voltage should never exceed 75 V or 100 V over the entire working temperature range. When using solar modules with a maximum open circuit voltage of between 60 and 100 V (over the entire temperature range), all installation steps must be carried in accordance with protection class II.



Steca  
**SOLAR CHARGE CONTROLLERS |  
CLASSIC**

# STECA PR

1010 | 1515 | 2020 | 3030

The Steca PR 10-30 series of charge controllers is the highlight in the range. Use of the latest charging technologies combined with state of charge determination enable optimal battery maintenance and module power monitoring. A large display informs the user about all operating modes with the aid of symbols. The state of charge is represented visually in the form of a level meter. Data such as voltage, current and state of charge can also be displayed digitally as figures on the display. In addition, the controller has an energy meter which can be reset by the user.

## Product features

- Shunt topology with MOSFETs
- State of charge determination with Steca AtonIC (SOC)
- Automatic detection of voltage
- PWM control
- Multistage charging technology
- Load disconnection depending on SOC
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Integrated data logger (energy meter)
- Evening, night light and daylight functions
- Integrated self test
- Monthly equalisation charge

## Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module, load and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

## Displays

- Graphical LCD
- ~ for operating parameters, fault messages, self test

## Operation

- Simple menu-driven operation
- Programming by buttons
- Manual load switch

## Options

- Alarm contact

## Certificates

- Approved by the World Bank for Nepal
- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

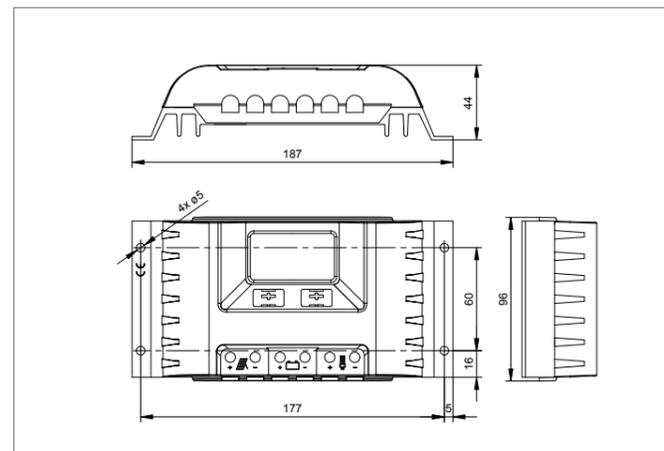
## Steca accessories

- External temperature sensor Steca PA TS10

## CLASSIC



STECA Quality



	1010	1515	2020	3030
<b>Characterisation of the operating performance</b>				
System voltage	12 V (24 V)			
Own consumption	12.5 mA			
<b>DC input side</b>				
Open circuit voltage solar module (at minimum operating temperature)	< 47 V			
Module current	10 A	15 A	20 A	30 A
<b>DC output side</b>				
Load current*	10 A	15 A	20 A	30 A
Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)			
Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)			
<b>Battery side</b>				
End of charge voltage	13.9 V (27.8 V)			
Boost charge voltage	14.4 V (28.8 V)			
Equalisation charge	14.7 V (29.4 V)			
Set battery type	liquid (adjustable via menu)			
<b>Operating conditions</b>				
Ambient temperature	-10 °C ... +50 °C			
<b>Fitting and construction</b>				
Terminal (fine / single wire)	16 mm <sup>2</sup> / 25 mm <sup>2</sup> - AWG 6 / 4			
Degree of protection	IP 31			
Dimensions (X x Y x Z)	187 x 96 x 44 mm			
Weight	350 g			

Technical data at 25 °C / 77 °F  
\*Inverters must not be connected to the load output.

# STECA SOLARIX

2525 | 4040

Solar charge controllers Steca Solarix 2525 and 4040 are newly developed products based on the internationally renowned controller family Steca PR. With increased module and load current, the controllers are now also suitable for even larger systems. The devices also feature an integrated USB charging port for charging smartphones and tablets.

Use of the latest charging technologies combined with state of charge determination enable optimal battery maintenance and module power monitoring. A large display informs the user about all operating modes with the aid of symbols. The state of charge is represented visually as a level meter. Data such as voltage, current and state of charge can also be displayed digitally as figures on the display. In addition, the controller has an energy meter which can be reset by the user.

## Product features

- Shunt topology with MOSFETs
- State of charge determination with Steca AtonIC (SOC)
- Automatic detection of voltage
- PWM control
- Multistage charging technology
- Load disconnection depending on SOC
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Integrated data logger (energy meter)
- Evening, night light and daylight functions
- Integrated self test
- Monthly equalisation charge
- USB charge socket for smartphones and tablets

## Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module, load and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

## Displays

- Graphical LCD
- ~ for operating parameters, fault messages, self test

## Operation

- Simple menu-driven operation
- Programming by buttons
- Manual load switch

## Options

- Alarm contact

## Certificates

- CE compliant
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

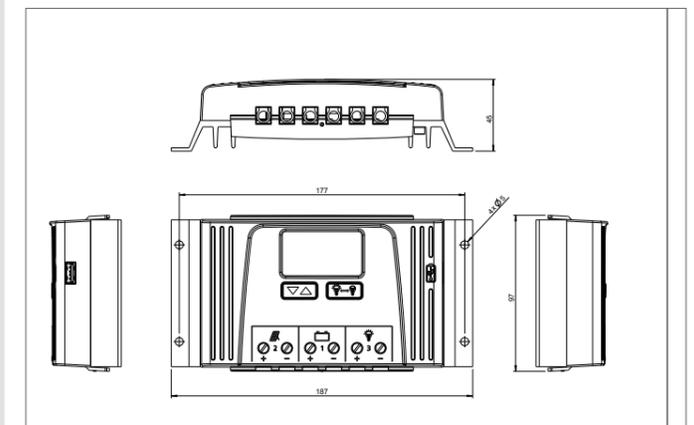
## Steca accessories

- External temperature sensor Steca PA TS10

## CLASSIC



USB Charger STECA Quality



	2525	4040
<b>Characterisation of the operating performance</b>		
System voltage	12 V (24 V)	
Own consumption	< 18.5 mA	
<b>DC input side</b>		
Open circuit voltage solar module (at minimum operating temperature)	< 47 V	
Module current	25 A	40 A
<b>DC output side</b>		
Load current*	25 A	40 A
USB charge socket	5.2 V / 1.5 A	
Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)	
Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)	
<b>Battery side</b>		
End of charge voltage	13.9 V (27.8 V)	
Boost charge voltage	14.4 V (28.8 V)	
Equalisation charge	14.7 V (29.4 V)	
Set battery type	liquid (adjustable via menu)	
<b>Operating conditions</b>		
Ambient temperature	-10 °C ... +50 °C	
<b>Fitting and construction</b>		
Terminal (fine / single wire)	16 mm <sup>2</sup> / 25 mm <sup>2</sup> - AWG 6 / 4	
Degree of protection	IP 30	
Dimensions (X x Y x Z)	187 x 97 x 45 mm	
Weight	350 g	

Technical data at 25 °C / 77 °F  
\* Inverters must not be connected to the load output.

# STECA SOLARIX MPPT

## 3020 | 5020

Steca Solarix MPPT are solar charge controllers with maximum power point tracking. These are suitable for all common module technologies and are optimally suited for solar systems with module voltages higher than the battery voltage. In particular, such inexpensive PV modules that are used for grid-connected systems can also be used off-grid.

Steca's efficient MPP tracking algorithm always provides the maximum usable power of the module, significantly increasing energy yield, especially in poor weather conditions (cloud cover, winter, diffused light). The Steca Solarix MPPT charge controllers combine state-of-the-art charging technology with high efficiency, professional battery care with numerous programming options, modern design, excellent protection functions and an intuitive LC display with menu guidance.

For remote monitoring, Steca provides the cost-efficient item PA WiFi1 as an optional accessory.

### CLASSIC



#### Product features

- Maximum Power Point Tracker (MPP-Tracker)
- High power and efficiency with small dimensions
- Voltage and current regulation
- Automatic load dis- and reconnection
- Multistage charging technology
- Monthly equalisation charge

#### Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module, load and battery
- Automatic electronic fuse
- Short circuit protection
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

#### Displays

- Graphical LCD
- ~for operating parameters, fault messages

#### Operation

- Simple menu-driven operation
- Programming by buttons
- Manual load switch

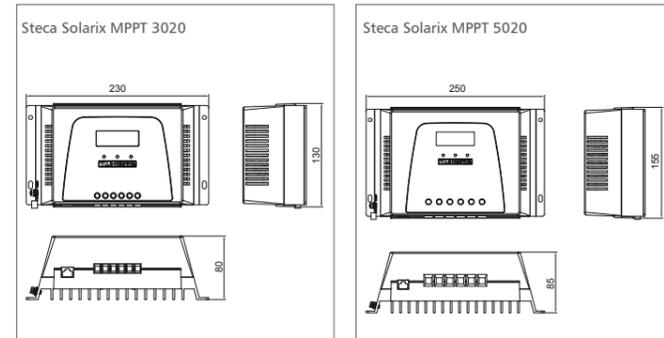
#### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Manufactured according to ISO 9001 and ISO 14001

#### Steca accessories

- Webportal through PA WiFi1

20 A...50 A



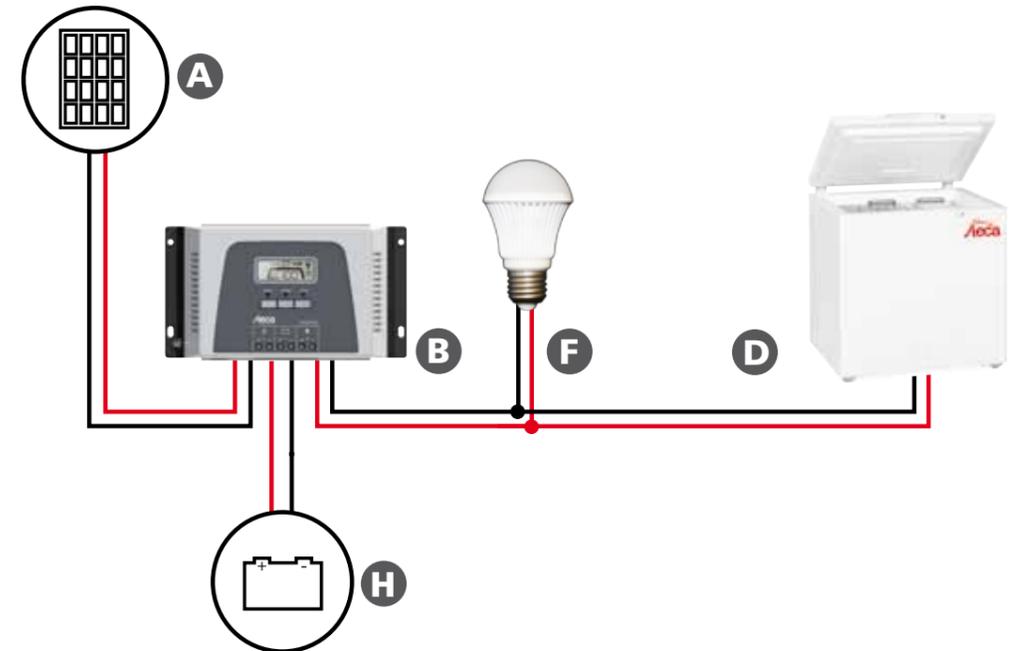
	3020	5020
<b>Characterisation of the operating performance</b>		
System voltage	12 V (24 V)	12 / 24 / 48 V
Nominal power	450 W (900 W)	750 / 1500 / 3000 W
<b>DC input side</b>		
MPP voltage	15 V (30 V) <math>U_{Modul} < 100 V</math>	15 V / 30 V / 60 V <math>U_{Modul} < 150 V</math>
Open circuit voltage solar module (at minimum operating temperature)	17 V ... 100 V** (34 V ... 100 V)**	17 V / 34 V / 68 V ... 150 V**
Module current	30 A	50 A
<b>DC input side</b>		
Load current	20 A	
Reconnection voltage (LVR)*	12,5 V (25 V)	12,5 V / 25 V / 50 V
Deep discharge protection (LVD)*	11,5 V (23 V)	11,5 V / 23 V / 46 V
<b>Battery side</b>		
Charge current	30 A	50 A
End of charge voltage	14,1 V (28,2 V)	14,1 V / 28,2 V / 56,4 V
Boost charge voltage	14,4 V (28,8 V)	14,4 V / 28,8 V / 57,6 V
Equalisation charge	15,0 V (30,0 V)	15,0 V / 30,0 V / 60,0 V
Set battery type	liquid	
<b>Operating conditions</b>		
Ambient temperature	-25 °C ... +40 °C	
<b>Fitting and construction</b>		
Dimensions (X x Y x Z)	230 x 130 x 80 mm	250 x 155 x 85 mm
Terminal (fine / single wire)	16 mm <sup>2</sup> - AWG 6	35 mm <sup>2</sup> - AWG 2
Degree of protection	IP 20	

Technical data at 25 °C / 77 °F

\* Inverters must not be connected to the load output.

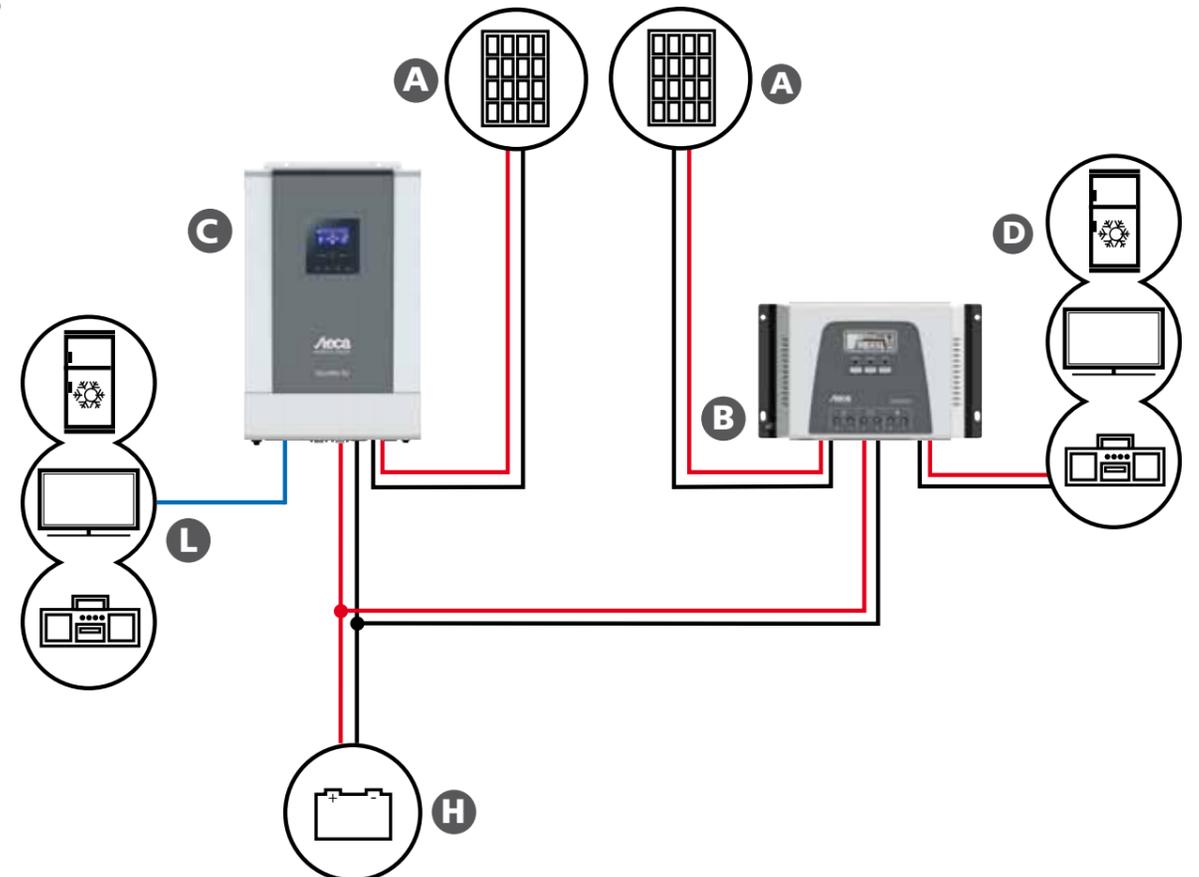
\*\* CAUTION: If an open circuit voltage of more than 100 V or 150 V is supplied to the connected solar module, the controller will be destroyed. When selecting the solar module, it is important to bear in mind that the open circuit voltage should never exceed 100 V or 150 V over the entire working temperature range.

#### Examples of application



#### Key:

- A Solar modules
- B Solar charge controller Steca Solarix MPPT
- D Steca PF 166-H / 240-H
- F Steca LED
- H Battery



#### Key:

- A Solar modules
- B Solar charge controller Steca Solarix MPPT
- C Steca Solarix PLI
- D Load (48 V DC)
- L Load (230 V AC)
- H Battery

# STECA PR 2020 IP

## IP 65 version

The functionality of the Steca PR 2020 IP is based on the Steca PR line of solar charge controllers. This is equipped with a large display which shows the current state of charge (SOC) as a percentage and visually as a level meter. State of charge recognition forms the core of the charge controller. The auto-adaptive state of charge algorithm results in optimal battery maintenance and control. The Steca PR 2020 IP has been specially designed for operation in difficult environments with high salt, moisture and dust content.

### Product features

- Shunt topology with MOSFETs
- State of charge determination with Steca AtonIC (SOC)
- Automatic detection of voltage
- PWM control
- Multistage charging technology
- Load disconnection depending on SOC
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Integrated data logger (energy meter)
- Evening, night light and daylight functions
- Integrated self test
- Monthly equalisation charge

### Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module, load and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

### Displays

- Graphical LCD
- ~ for operating parameters, fault messages, self test

### Operation

- Simple menu-driven operation
- Programming by buttons
- Manual load switch

### Options

- Alarm contact (special version, needs to be mentioned on the purchase order)

### Certificates

- Fit for use in tropical areas (DIN IEC 68 part 2-30)
- Compliant with European Standards (CE)
- RoHS compliant
- Made in Germany
- Manufactured according to ISO 9001 and ISO 14001

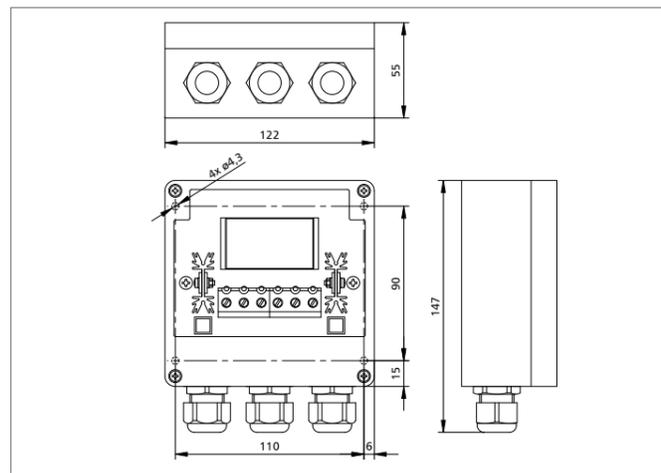
### Steca accessories

- External temperature sensor Steca PA TS20IP10

## CLASSIC



STECA Quality



	PR 2020 IP
<b>Characterisation of the operating performance</b>	
System voltage	12 V (24 V)
Own consumption	12 mA
<b>DC input side</b>	
Open circuit voltage solar module (at minimum operating temperature)	< 47 V
Module current	20 A
<b>DC output side</b>	
Load current*	20 A
Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)
Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)
<b>Battery side</b>	
End of charge voltage	13.9 V (27.8 V)
Boost charge voltage	14.4 V (28.8 V)
Equalisation charge	14.7 V (29.4 V)
Set battery type	liquid (adjustable via menu)
<b>Operating conditions</b>	
Ambient temperature	-10 °C ... +50 °C
<b>Fitting and construction</b>	
Terminal (fine / single wire)	16 mm <sup>2</sup> / 25 mm <sup>2</sup> - AWG 6 / 4
Degree of protection	IP 65
Dimensions (X x Y x Z)	122 x 147 x 55 mm
Weight	410 g

Technical data at 25 °C / 77 °F  
\* Inverters must not be connected to the load output.

# STECA SOLARIX 2020-X2

## Dual battery charge controller

The Steca Solarix 2020-x2 is a state-of-the-art dual battery charge controller that is ideal for use in leisure applications. It is equipped with a solar module input suitable for all 72-cell crystalline solar modules in 24 V systems and for all 36-cell crystalline solar modules in 12 V systems. Both main battery and starter battery are charged simultaneously and continuously by the solar module. 90 percent of the available power flows into the main battery while 10 percent of the power is retained to keep the auxiliary battery fully-charged. The charge power split can be adapted using the Steca PA LCD1 remote display. The charge controller is equipped with a high-power load output fed by the main battery only. The charge controller has a USB charge socket, which can be used to charge smartphones and tablets. Connection of the Steca PA LCD1 remote display is optional.

### Product features

- Serial topology with MOSFETs
- Automatic detection of voltage
- Voltage and current regulation
- PWM control
- Multistage charging technology
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Positive earthing of one or negative earthing of several terminals possible
- Integrated self test
- Monthly equalisation charge
- USB charge socket for smartphones and tablets

### Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module ( $\leq 36$  V), load and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

### Displays

- 4 LEDs show operating states

### Interfaces

- StecaLink Bus

### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

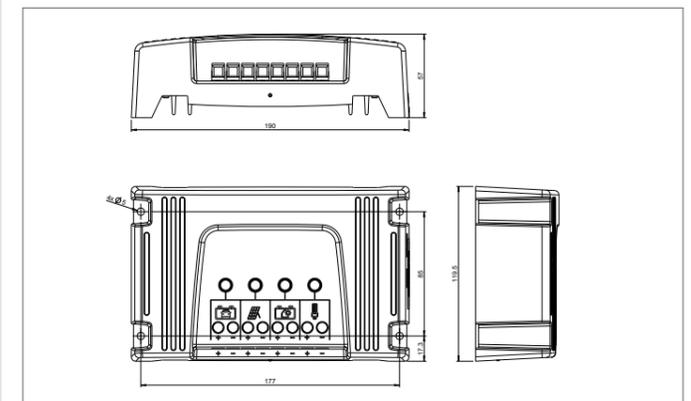
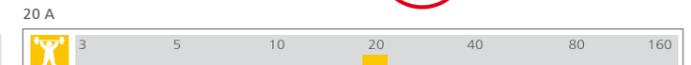
### Steca accessories

- Remote display Steca PA LCD1

## CLASSIC



USB Charger STECA Quality



	Solarix 2020-x2
<b>Characterisation of the operating performance</b>	
System voltage	12 V (24 V)
Own consumption	22 mA
<b>DC input side</b>	
Open circuit voltage solar module (at minimum operating temperature)	< 60 V
Module current	20 A
<b>DC output side</b>	
Load current	20 A
USB charge socket	5 V / 1.5 A
Reconnection voltage (LVR)*	12.5 V
Deep discharge protection (LVD)*	11.7 V
<b>Battery side</b>	
End of charge voltage*	14.1 V (28.2 V)
Boost charge voltage*	14.4 V (28.8 V)
Equalisation charge*	15 V (30 V)
Set battery type*	gel
Main / auxiliary battery charging ratio	90 % / 10 %
<b>Operating conditions</b>	
Ambient temperature	-10 °C ... +60 °C
<b>Fitting and construction</b>	
Terminal (fine / single wire)	6 mm <sup>2</sup> / 10 mm <sup>2</sup> - AWG 10 / 8
Degree of protection	IP 31
Dimensions (X x Y x Z)	190 x 120 x 57 mm
Weight	500 g

Technical data at 25 °C / 77 °F  
\* adjustable via Steca PA LCD1



Steca  
**SOLAR CHARGE CONTROLLERS |  
ADVANCED**

# STECA TAROM

4545 | 4545-48

The new design for the Steca Tarom sets new standards in this power class. The graphic display informs the user of all important system data. The data are saved by the integrated data logger.

Thanks to the significantly improved state of charge determination, the system is optimally controlled and the batteries are protected. The Steca Tarom charge controller is the ideal choice for larger systems at three voltage levels (12 V, 24 V, 48 V).

Two additional switching contacts can be freely configured as a timer, a night light function, to start generators or as surplus management.

## Product features

- Shunt topology with MOSFETs
- State of charge determination (SOC)
- Automatic detection of voltage
- PWM control
- Multistage charging technology
- Load disconnection depending on SOC
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Real-time clock (date, time)
- Innovative, comprehensive data logger with energy meter
- Evening, night light and daylight functions
- Four freely programmable timers with week day function
- Integrated self test
- Monthly equalisation charge
- Two configurable multifunctional contacts

## Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

## Displays

- Multifunction graphical LCD with backlighting

## Interfaces

- StecaLink Bus
- Open Steca UART interface

## Options

- Alarm contact

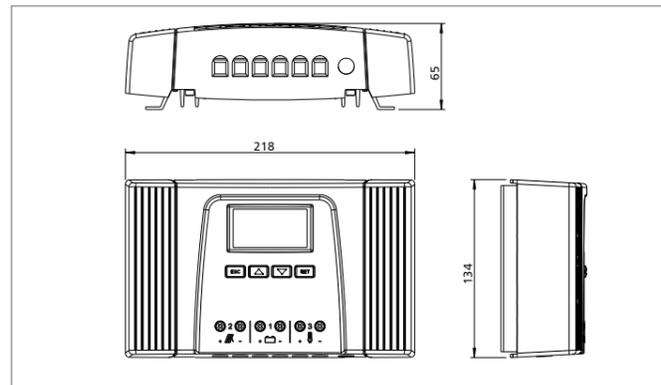
## Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

## Steca accessories

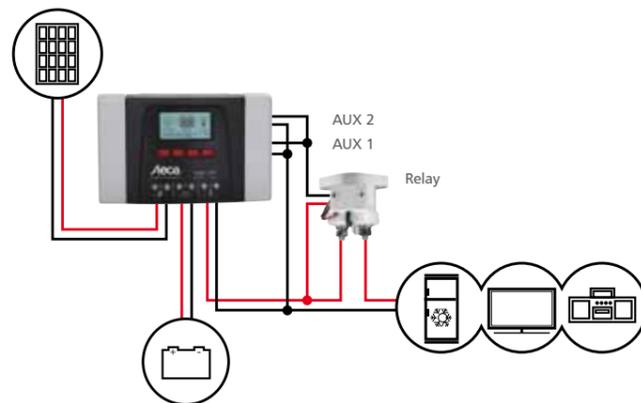
- External temperature sensor Steca PA TS-S
- Data cable Steca PA CAB2 Tarcom
- Current sensor PA HS 400

## ADVANCED



	4545	4545-48
<b>Characterisation of the operating performance</b>		
System voltage	12 V (24 V)	12 / 24 / 48 V
Own consumption		30 mA
<b>DC input side</b>		
Circuit voltage solar module (at minimum operating temperature)	< 60 V	< 100 V
Module current		45 A
<b>DC output side</b>		
Load current*		45 A
Reconnection voltage (SOC / LVR)	> 50 % / 12.5 V (25 V)	> 50 % / 50 V
Deep discharge protection (SOC / LVD)	< 30 % / 11.7 V (23.4 V)	< 30 % / 46.8 V
<b>Battery side</b>		
End of charge voltage	14.1 V (28.2 V)	56.4 V
Boost charge voltage	14.4 V (28.8 V)	57.6 V
Equalisation charge	15 V (30 V)	60 V
Set battery type	liquid (adjustable via menu)	
<b>Operating conditions</b>		
Ambient temperature	-10 °C ... +60 °C	
<b>Fitting and construction</b>		
Terminal (fine / single wire)	25 mm <sup>2</sup> / 35 mm <sup>2</sup> - AWG 4 / 2	
Degree of protection	IP 31	
Dimensions (X x Y x Z)	218 x 134 x 65 mm	
Weight	800 g	

Technical data at 25 °C / 77 °F  
\* Inverters must not be connected to the load output.



# STECA POWER TAROM

2070 | 2140 | 4055 | 4110 | 4140

Specially designed for industrial and outdoor applications, the Steca Power Tarom comes with an IP 65 casing made of powder-coated steel.

This solar charge controller is capable of regulating large systems at three voltage levels (12 V, 24 V, 48 V). The Steca Power Tarom is based on the technology of the Steca Tarom controller. When connected in parallel, several controllers from this series can be operated via a standard DC bus in a simple solar home system or in complex hybrid systems.

## Product features

- Shunt topology with MOSFETs
- State of charge determination with Steca AtonIC (SOC)
- Automatic detection of voltage
- PWM control
- Multistage charging technology
- Load disconnection depending on SOC
- Automatic load reconnection
- Temperature compensation
- Negative earthing of one or positive earthing of several terminals possible
- Integrated data logger (energy meter)
- Integrated self test
- Monthly equalisation charge

## Electronic protection functions

- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of module, load and battery
- Reverse polarity protection by internal fuse
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Load disconnection on battery overvoltage

## Displays

- Text LCD

## Interfaces

- RJ45 interface to PA Tarcom / PA HS200

## Options

- External temperature sensor (included in the scope of delivery)
- Alarm contact

## Certificates

- Approved by the World Bank for Nepal
- Fit for use in tropical areas (DIN IEC 68 part 2-30)
- Compliant with European Standards (CE)
- Made in Germany
- Manufactured according to ISO 9001 and ISO 14001

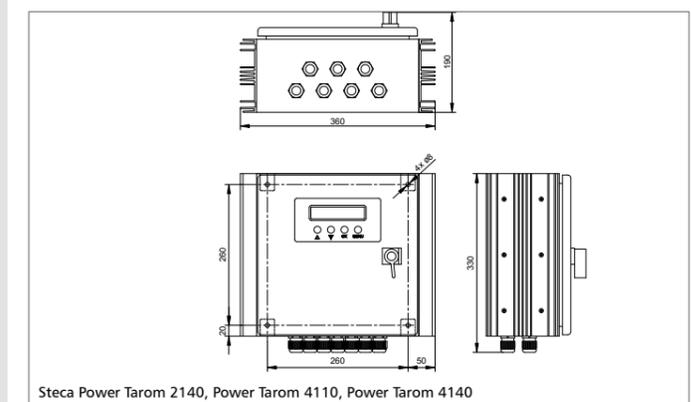
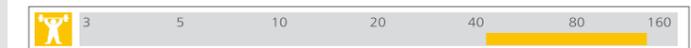
## Steca accessories

- External temperature sensor Steca PA TS10
- Steca PA Tarcom data logger and Steca PA CAB1 Tarcom data cable
- Current sensor Steca PA HS200

## ADVANCED



55 A...140 A



Steca Power Tarom 2140, Power Tarom 4110, Power Tarom 4140

	2070	2140	4055	4110	4140
<b>Characterisation of the operating performance</b>					
System voltage	12 V (24 V)		48 V		
Own consumption	14 mA				
<b>DC input side</b>					
Open circuit voltage solar module (at minimum operating temperature)	< 50 V		< 100 V		
Module current	70 A	140 A	55 A	110 A	140 A
<b>DC output side</b>					
Load current*	70 A	70 A	55 A	55 A	70 A
Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)		> 50 % / 50.4 V		
Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)		< 30 % / 44.4 V		
<b>Battery side</b>					
End of charge voltage	13.7 V (27.4 V)		54.8 V		
Boost charge voltage	14.4 V (28.8 V)		57.6 V		
Equalisation charge	14.7 V (29.4 V)		58.8 V		
Set battery type	liquid (adjustable via menu)				
<b>Operating conditions</b>					
Ambient temperature	-10 °C ... +60 °C				
<b>Fitting and construction</b>					
Terminal (fine / single wire)	50 mm <sup>2</sup> - AWG 1	95 mm <sup>2</sup> - AWG 000	50 mm <sup>2</sup> - AWG 1	70 mm <sup>2</sup> - AWG 00	95 mm <sup>2</sup> - AWG 000
Degree of protection	IP 65				
Dimensions (X x Y x Z)	330 x 330 x 190 mm	360 x 330 x 190 mm	330 x 330 x 190 mm	360 x 330 x 190 mm	
Weight	10 kg				

Technical data at 25 °C / 77 °F  
\* Inverters must not be connected to the load output.

# STECA TAROM MPPT

## 6000-S | 6000-M

The Steca Tarom MPPT solar charge controller sets new standards in the area of Maximum Power Point trackers. Outstanding efficiency along with unique safety features make it a universal top-grade charge controller.

There are two inputs that can be connected in parallel or used separately. Each input has its own MPP tracker. So there are two charge controllers available in one device. Different module arrays can be flexibly combined in one charge controller.

With an input voltage of up to 200 V, all kinds of solar modules can be used in various connection schemes. This charge controller combines high flexibility, maximum yields, professional battery care and an appealing design on the basis of advanced technology. One Steca Tarom MPPT 6000-M can communicate with up to 22 Steca Tarom MPPT 6000-S units.

ADVANCED



STECA Quality

### Product features

- Two independent maximum power point trackers (MPP trackers)
- Comprehensive data logging of energy values for up to 20 years
- MicroSD slot for data logging of all minute values (6000-M only)
- Voltage and current regulation
- Temperature compensation
- Monthly equalisation charge
- Three configurable multifunctional contacts (6000-M only)
- Adjustable cut-off voltages
- Battery type: gel/liquid lead battery (for 6000-M also Li and NiCd batteries)
- Integrated, automatic module switch
- 36 V and 60 V batteries can be charged with special settings in expert menu level
- Parallel connectable

### Electronic protection functions

- Overcharge protection
- Reverse polarity protection of module and battery
- Automatic electronic fuse
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- PE connection

### Displays

- Multifunction graphical LCD with backlighting

### Interfaces

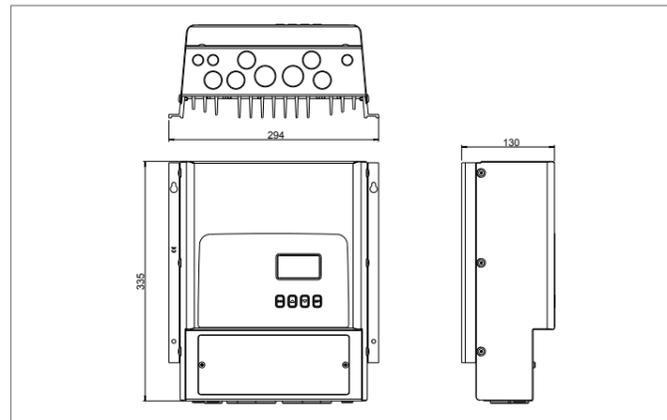
- StecaLink Bus
- Open Steca RS-232 interface (6000-M only)
- Battery emergency off signal connection (optional, 6000-M only)

### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

### Steca accessories

- External temperature sensor Steca PA TS-S (for 6000-M included in the scope of delivery)
- Data cable Steca PA CAB3 Tarcom (6000-M only)
- Current sensor Steca PA HS400 (6000-M only)



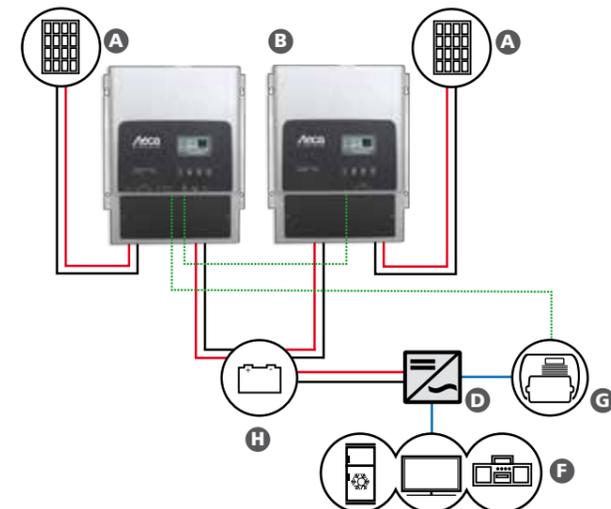
6000-S / 6000-M	
<b>Characterisation of the operating performance</b>	
System voltage	12 V / 24 V / 48 V
Nominal power	900 W / 1,800 W / 3,600 W
Max. DC-DC efficiency	99.4 % ( $U_{\text{Batt}}=48 \text{ V}; U_{\text{in}}=70 \text{ V}; P=0,65 \cdot P_{\text{nom}}$ )
European efficiency	96.6 % ( $U_{\text{Batt}}=24 \text{ V}; U_{\text{in}}=30 \text{ V}$ ) 98.9 % ( $U_{\text{Batt}}=48 \text{ V}; U_{\text{in}}=70 \text{ V}$ )
European efficiency (weighted across all $U_{\text{Batt}}$ and $U_{\text{in}}$ )	96.4 %
Static MPP efficiency	99.9 % (DIN EN 50530)
Dynamic MPP efficiency	99.8 % (DIN EN 50530)
Weighted REW (Realistic Equally Weighted efficiency)	94.8 %
Own consumption	< 1 W
<b>DC input side</b>	
Min. MPP voltage / input	17 V / 34 V / 68 V
Max. MPP voltage / input	180 V
Min. open circuit voltage solar module / input (at minimum operating temperature)	20 V / 40 V / 80 V
Max. open circuit voltage solar module / input (at minimum operating temperature)	200 V
Module current	2 x 30 A / 1 x 60 A
<b>Battery side</b>	
Charge current	60 A
End of charge voltage	14.1 V / 28.2 V / 56.4 V
Boost charge voltage	14.4 V / 28.8 V / 57.6 V
Equalisation charge	15 V / 30 V / 60 V
Set battery type	liquid (adjustable via menu)
<b>Operating conditions</b>	
Ambient temperature	-25 °C ... +50 °C
<b>Fitting and construction</b>	
Terminal (fine wire)	35 mm <sup>2</sup> - AWG 2
Degree of protection	IP 31
Dimensions (X x Y x Z)	294 x 335 x 130 mm
Weight	approx. 6,300 g

Technical data at 25 °C / 77 °F

### Overview of functions

	Tarom MPPT 6000-S	Tarom MPPT 6000-M
Comprehensive, integrated data logger for 20 years of data recording	✓	✓
Buzzer for alarms	✓	✓
Three configurable multifunctional contacts for... <ul style="list-style-type: none"> <li>• ... programmable deep discharge protection (LVD)</li> <li>• ... generator/surplus manager</li> <li>• ... automatic switch functions (day, evening, night)</li> <li>• ... four timers</li> </ul>	✓	✓
Unique lithium-ion battery charge strategy		✓
Innovative charge strategy for NiCd batteries (PA HS400 required)		✓
Battery capacity test during operation (PA HS400 required)		✓
Optimised SOC algorithm (PA HS400 required)		✓
IUIa charging for increased battery capacity (optional)		✓
By - the - minute datalogging to micro SD card		✓

### Examples of Application



#### Key:

- A Solar modules
- B Solar charge controller
- D Inverter / Charger
- F Load (115 V...230 V AC)
- G Diesel generator
- H Battery



**Revolutionary innovative algorithms for lead batteries**

#### State of charge (SOC):

The Steca Tarom MPPT 6000-M is equipped with a new type of highly flexible algorithm for precise SOC calculations for nearly all lead-acid batteries enabling automatic adaptation to battery and user behaviour. This enables the current state of charge to be assessed at any time.

#### Battery capacity test

The Steca Tarom MPPT 6000-M has an entirely new and professional battery capacity measurement system, which determines the actual capacity of the battery. To date, capacity generally had to be measured by the battery manufacturer in a complex process or locally with additional measuring equipment. In the Steca Tarom MPPT 6000-M, the Steca PA HS400 electricity sensor can measure the capacity and supply information on battery ageing.

This revolutionary new development provides advanced inspection options for users, operators and manufacturers – e.g. for awarding battery warranties based on the actual residual capacity.

#### IUIa charging:

Depending on the battery type and its condition, the battery capacity can be increased by up to 20 percent with a constant current charging phase following a full charge of the lead-acid batteries (IUIa charge). This function is now available for the first time for stand-alone PV systems too in the Steca Tarom MPPT 6000-M.



**Professional charging strategy for all lithium-ion batteries**

The Steca Tarom MPPT 6000-M is the first MPPT charge controller to also offer the option of charging lithium-ion batteries professionally using PV current. The latest research results in this area were used in its development, which took place in close cooperation with renowned, international research institutes. A self-developed charge strategy can be perfectly adapted to all available lithium chemistries using a wide range of parameters.



**Professional charging of NiCd batteries**

Alkaline chemicals like NiCd batteries can also be charged using the innovative Steca Tarom MPPT 6000-M (Steca PA HS400 required). A professional, configurable charging characteristic curve is available for this, which can be adapted to special battery and system prerequisites. Particularly with professional use, this charge strategy opens up entirely new possibilities.



A close-up photograph of a person's hand adjusting a grey knob on a control panel. The panel is white and features several other knobs and buttons. Below the knobs, several white cables with connectors are plugged into the panel. The background is blurred, showing what appears to be a server rack or industrial equipment. The lighting is bright, highlighting the textures of the hand and the equipment.

Steca

# **SINE WAVE INVERTERS**

# STECA SOLARIX PI

500-12 | 550-24 | 1100-24 | 1500-48

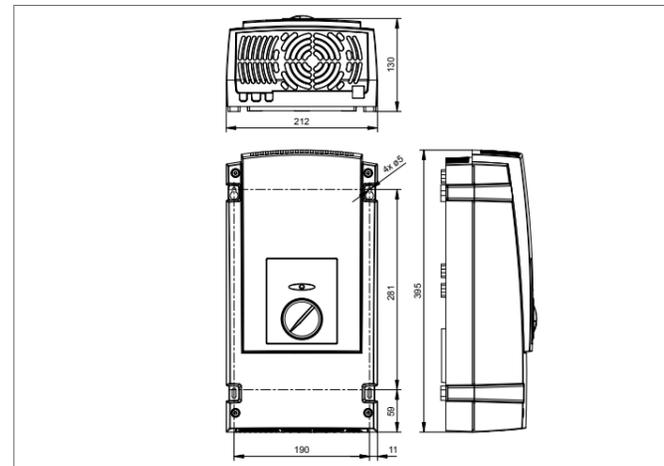
The new generation of sine wave inverters, Steca Solarix PI, demonstrates robustness. Existing safety features have also been made more customer-friendly and robust. The new generation of the Steca Solarix PI possess different technical properties to predecessor models and may not be suitable to replace these.

In developing the Solarix PI sine wave inverter, Steca has brought about some innovations. In particular these include the ability to connect all Steca Solarix PI models in parallel, the innovative operating concept using a single rotary switch and the electronic fuse. Furthermore, many years of experience have come into play for deploying these inverters specifically in photovoltaic systems. This comes through, for instance, in the way that a most diverse range of appliances is provided with a low operating consumption and a stable energy supply.

The power of the new generation Steca Solarix PIs is only extensible with the new parallel connection box Steca PA Link1. Mixing older generation Steca Solarix PIs and new generation Steca Solarix PIs is not possible.



500 W...5.500 W



	500-12	550-24	1100-24	1500-48
<b>Characterisation of the operating performance</b>				
System voltage	12 V	24 V	48 V	
Continuous power	450 VA	450 VA	900 VA	900 VA
Power 30 min.	500 VA	550 VA	1,100 VA	1,500 VA
Power 5 sec.	500 VA	1,000 VA	1,400 VA	2,800 VA
Max. efficiency	93 %		94 %	
Own consumption standby / ON	0.5 W / 6 W		0.7 W / 10 W	
<b>DC input side</b>				
Battery voltage	10.5 V ... 16 V	21 V ... 32 V	42 V ... 64 V	
Reconnection voltage (LVR)	12.5 V	25 V	50 V	
Deep discharge protection (LVD)	10.5 V	21 V	42 V	
<b>AC output side</b>				
Output voltage	230 V AC +/-10 %			
Output frequency	50 Hz			
Load detection (standby)	adjustable: 2 W ... 50 W			
<b>Safety</b>				
Protection class	II (double insulated)			
Electrical protection	reverse polarity battery, reverse polarity AC, over voltage, over current, over temperature			
<b>Operating conditions</b>				
Operating temperature	0 °C ... +50 °C			
Storage temperature	-20 °C ... +70 °C			
Rel. humidity	< 95 %, non-condensing			
Maximum altitude	2000 m above sea level			
<b>Fitting and construction</b>				
Cable length battery / AC	1.5 m / 1.5 m			
Cable cross-section battery / AC	16 mm <sup>2</sup> / 1.5 mm <sup>2</sup>			
Degree of protection	IP 20			
Dimensions (X x Y x Z)	212 x 395 x 130 mm <sup>1)</sup>			
Weight	6.6 kg <sup>1)</sup>		9 kg <sup>1)</sup>	

Technical data at 25 °C / 77 °F  
<sup>1)</sup> per inverter

## Product features

- True sine wave voltage
- Excellent overload capabilities
- Optimal battery protection
- Automatic load detection
- Parallel connectable
- Best reliability
- Protective insulation according to protection class II
- Control by digital signal processor (DSP)

## Electronic protection functions

- Deep discharge protection
- Battery overvoltage shutdown
- Overtemperature and overload protection
- Short circuit protection
- Reverse polarity protection
- Automatic electronic fuse

## Displays

- Multi-coloured LED shows operating states

## Operation

- Main switch
- Adjustable load detection

## Options

- Type with 230 V / 60 Hz
- Type with 115 V / 60 Hz

## Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in Germany
- Manufactured according to ISO 9001 and ISO 14001

## Steca accessories

- PA Link1 parallel switch box

# STECA SOLARIX PI

Flexible and versatile



Inverter type (2x)	PI 500-12	PI 550-24	PI 1100-24	PI 1500-48
Continuous power	900 VA	900 VA	1.800 VA	1.800 VA
Power 30 min.	950 VA	1.000 VA	2.000 VA	2.800 VA
Power 5 sec.	950 VA	1.350 VA	2.700 VA	4.100 VA



Inverter type (3x)	PI 500-12	PI 550-24	PI 1100-24	PI 1500-48
Continuous power	1.350 VA	1.350 VA	2.700 VA	2.700 VA
Power 30 min.	1.400 VA	1.500 VA	3.000 VA	4.150 VA
Power 5 sec.	1.400 VA	2.050 VA	4.100 VA	5.400 VA



Inverter type (4x)	PI 500-12	PI 550-24	PI 1100-24	PI 1500-48
Continuous power	1.800 VA	1.800 VA	3.600 VA	3.600 VA
Power 30 min.	1.850 VA	2.010 VA	4.000 VA	5.500 VA
Power 5 sec.	1.850 VA	2.750 VA	5.500 VA	6.600 VA

## Parallel connection

A stand-alone PV system is relatively difficult to size, since often the loads and their average running times are not adequately known, or because, when the system is subsequently expanded, more loads are added.

This is where the simple expandability of the Steca Solarix PI inverters pays off. Up to four devices can be operated in parallel. The connections are made via an external box, the Steca PA Link1.

From the outside, the combination of two, three or four inverters functions like one device with a correspondingly higher capacity. Internally, in case of open-circuit operation or low output, e.g. for the lighting, only one inverter continues to operate. This has a positive effect on the electricity consumption, since the devices which are not turned on do not consume any power. Only when a higher capacity is called for, for example when a refrigerator is turned on, are all the inverters automatically switched on, thus ensuring trouble-free operation.

In this regard, Steca Solarix PI inverters are all the same. Only via the connection to the Steca PA Link1 parallel switch box is one inverter designated as the master. This device then has control over the system, whilst the other Steca Solarix PI inverters operate as slaves.

## Rotary switch

Operating the Steca Solarix PI is made very easy by the large rotary switch on the front of the device.

If the Steca Solarix PI is being used as a single device, three different modes of operation are possible, and these may be selected using the rotary switch. The load detection section follows on from the 'off' setting on the far left. In this section, the switch can be turned continuously to match the power consumption of the smallest load. In order to reduce power consumption, the inverter is then turned off, and it checks periodically whether a load has been turned on. Only if this is the case does the inverter switch itself on. The 'on' setting on the rotary switch follows on from the load detection section. In this operating status, the inverter makes the output voltage continually available.

If several inverters are connected in parallel, the desired mode of operation is selected using the rotary switch of the device connected to the 'master socket'. In addition to the modes of operation described above, there is also the setting 'all on'. This means that not only the master device is continually switched on, but all other connected inverters as well.

## Quick and robust control

The Steca Solarix PI inverter was developed to supply power to a wide range of loads. Even critical loads can be operated, thanks to the quick control. At the heart of the controller is a DSP (digital signal processor) which takes on the extensive calculation work. The inverter's necessary robustness is supplied by a control software program which was developed in cooperation with a renowned research institute.

## Low own consumption

The sine wave inverter has benefited from Steca's 15 years of experience in the field of stand-alone PV systems. This is reflected, for instance, in the low own consumption of the Steca Solarix PI. When used in solar home systems, the inverter is connected to the battery 24 hours a day, and is designed to consume as little as possible of the solar-generated energy whilst in load-detection or open-circuit modes.

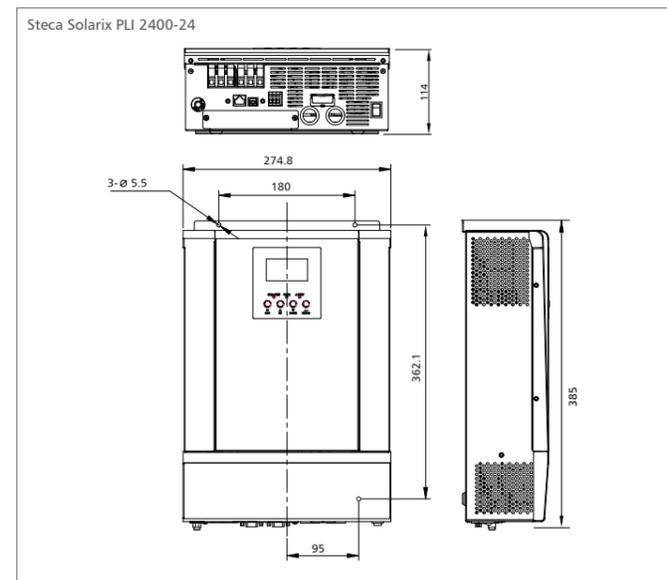
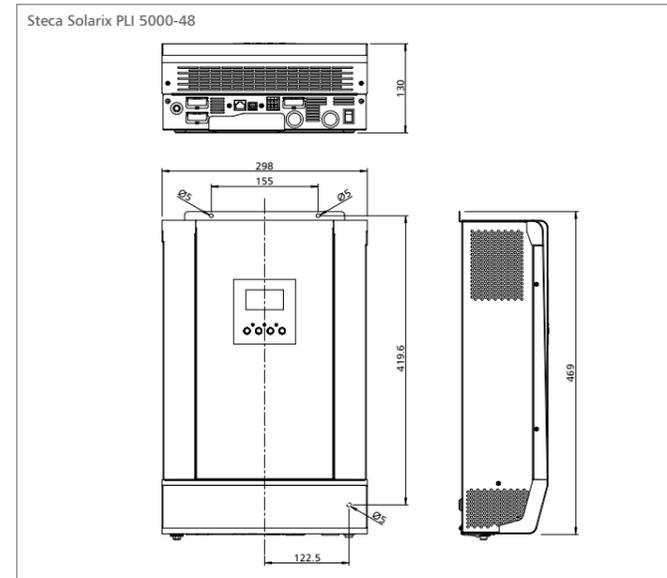
# STECA SOLARIX PLI

## 5000-48 | 2400-24

The Steca Solarix PLI is the first product from Steca Elektronik to offer an all-in-one package. It allows users to supply consumers with 230 V AC power, charges the battery with an integrated MPPT charge controller, and at the same time permits connection to a generator or an available electricity grid. Everything in a single device.

This means that solar energy can be used as the top priority, for example. And if that isn't enough, a generator can be started or the supply can be switched to the public grid. At the same time, the battery can also be recharged by either the generator or the grid. Given its very quick switchover time of up to 10 ms and its flexible energy priority selection, the Solarix PLI also acts as an uninterruptible power supply.

Even difficult consumers, such as large AC motors, can be started reliably with dual overload capacity. The maximum power point tracker in the integrated charge controller ensures that, even in adverse weather conditions, the maximum output is obtained from the PV modules in order to optimally charge the battery and supply the consumers with power at the same time.



### Product features

- True sine wave voltage
- High overload capacity
- Integrated MPP tracker
- Multi-stage charge technology
- Monthly equalising charging
- Auxiliary contact for starting a generator
- Adjustable charging end voltages
- Battery type: gel / liquid lead battery
- Lightweight construction
- Easy installation

### Electronic protection functions

- Overload protection
- Reverse polarity protection of modules, for battery via fuse
- Deep discharge protection
- Short-circuit protection for load
- Reverse current protection at night
- Overtemperature and overload protection
- Acoustic alarm
- PE connection

### Displays

- Graphic LC display and three LEDs show operating states

### Operation

- Simple menu-guided operation
- Button-based programming

### Interfaces

- Current data is output via RS-232

### Options

- Interconnectable in parallel or in three phases (parallel kit required)

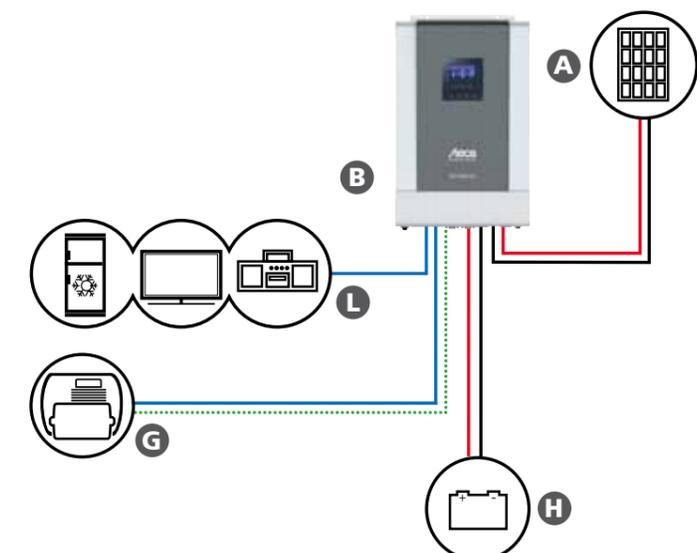
### Certificates

- CE-compliant
- RoHS-compliant
- Manufactured under the terms of ISO 9001 and ISO 14001

	PLI 5000-48	PLI 2400-24
<b>Characterisation of the operating performance</b>		
System voltage	48 V	24 V
Continuous power	5 kW / 5 kVA	2.4 kW / 3 kVA
Power 5 sec.	10 kW / 10 kVA	4.8 kW / 6 kVA
Max. efficiency sine wave	> 93 %	> 91 %
Max. efficiency charge controller	> 98 %	
Own consumption standby / ON	< 15 W / < 50 W	< 14 W / < 45 W
<b>AC input side</b>		
Input voltage	90 V AC ... 280 V AC	
Input frequency	40 ... 65 HZ, 50 / 60 Hz (automatic detection)	
Max. current on transfer system	40 A	30 A
Transfer time	10 ms typical (UPS mode)	
<b>AC output side</b>		
Output voltage	230 V AC +/- 5 %	220 V AC ... 240 V AC +/- 5 %
Output frequency	50 / 60 Hz	
<b>Battery side</b>		
Battery voltage	38.4 V ... 66 V	20 V ... 30 V
Max. charge current of PV	80 A	40 A
Max. charge current of AC	60 A	
End of charge voltage	54.0 V	27.0 V
Boost charge voltage	56.4 V	28.2 V
Equalisation charge	60.0 V	29.2 V
Set battery type	liquid	
<b>DC input side charge controller</b>		
Min. MPP voltage	60 V	30 V
Max. MPP voltage	115 V	80 V
Min. open circuit voltage solar module (at minimum operating temperature)	72 V	36 V
Max. open circuit voltage solar module (at minimum operating temperature)	145 V	100 V
Max. module current	80 A	40 A
Nominal charge power	4800 W	1168 W
Own consumption controller	< 2 W	
<b>Operating conditions</b>		
Operating temperature	0 °C ... + 55 °C	
Storage temperature	- 15 °C ... + 60 °C	
Rel. humidity	< 95 %, non-condensing	
Maximum altitude	2000 m a.s.l	
<b>Fitting and construction</b>		
Terminal (AC - fine / single wire)	8 mm <sup>2</sup> - AWG 8	8 mm <sup>2</sup> - AWG 8
Terminal (PV - fine / single wire)	12 mm <sup>2</sup> - AWG 6	8 mm <sup>2</sup> - AWG 8
Battery connection (M6 ring terminal included)	35 mm <sup>2</sup> ... 50 mm <sup>2</sup> AWG 2 ... AWG 0	
Double throw signal contact	3 A / 250 V AC (max. 150 W), 3 A / 30 V DC	
Degree of protection	IP 21	
Dimensions (X x Y x Z)	298 x 469 x 130 mm	275 x 385 x 114 mm
Weight	11.5 kg	7.6 kg
Cooling principle	fan	

Technical data at 25 °C / 77 °F

### Examples of application

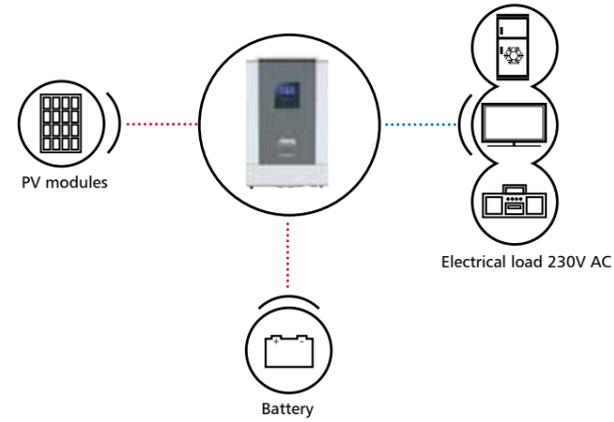


#### Key:

- A Solar modules
- B Sine wave inverter Steca Solarix PLI
- G Diesel generator
- H Battery
- L Load (230 V AC)

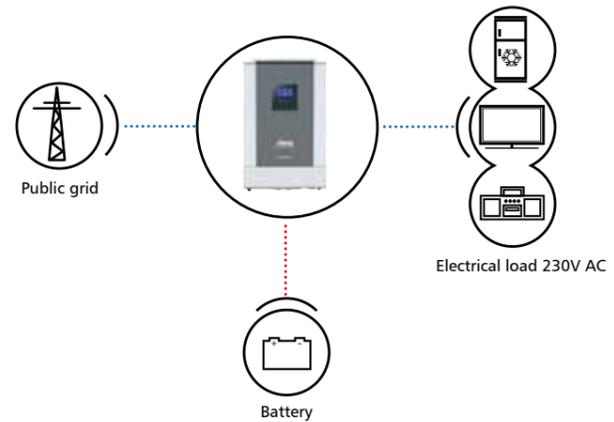
### Off Grid Solar inverter system:

- Pure off-grid system (no AC input)
- PV as only energy source



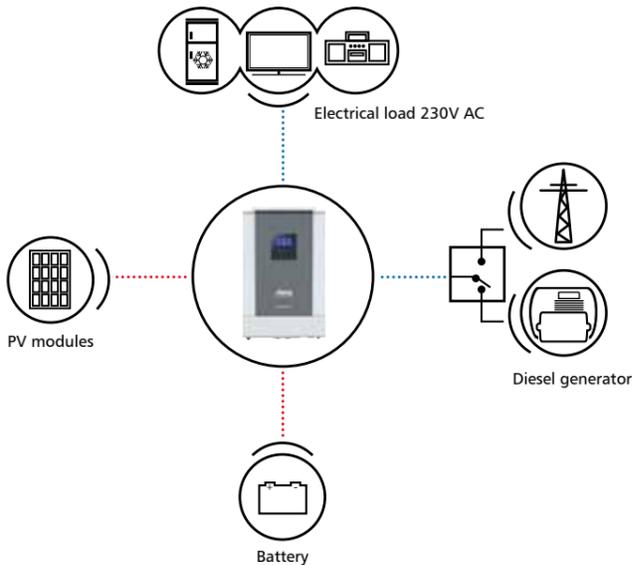
### Uninterruptible power supply:

- Pure on-grid system
- No PV as only energy source, only grid
- Battery is charged from the grid whenever the grid is available
- Useful when grid fails as backup (10 ms switchover time)



### Solar priority with grid connection and/or generator:

- Grid-connected system or off-grid with AC generator (external source selector required if both are used)
- PV is priority, alternatively grid / generator can be selected as priority
- Optional charging from the grid / generator



## STECA AJ

275-12 | 350-24 | 400-48 | 700-48 | 1000-12 | 2100-12 | 2400-24

The Steca AJ inverter series stands out with its wide range of available power classes and DC input voltages. This enables the optimal inverter to be used for any application. The cables for connecting the battery and the load are already mounted on the Steca AJ, thus making it easier to install the device. The automatic standby mode considerably reduces the inverter's own consumption. The Steca AJ inverter's excellent overload capacity ensures that even critical loads can be operated easily.



### Product features

- True sine wave voltage
- Excellent overload capabilities
- Optimal battery protection
- Automatic load detection
- Best reliability

### Electronic protection functions

- Deep discharge protection
- Battery overvoltage shutdown
- Overtemperature and overload protection
- Short circuit protection
- Reverse polarity protection by internal fuse (except Steca AJ 2100-12)
- Acoustic alarm at deep discharge or overheating

### Displays

- Multi-coloured LED shows operating states

### Operation

- Main switch
- Adjustable load detection

### Options

- Types with 115 V / 50 Hz, 115 V / 60 Hz or 230 V / 60 Hz
- Model with protective lacquered mainboard

### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in Europe
- Manufactured according to ISO 9001 and ISO 14001

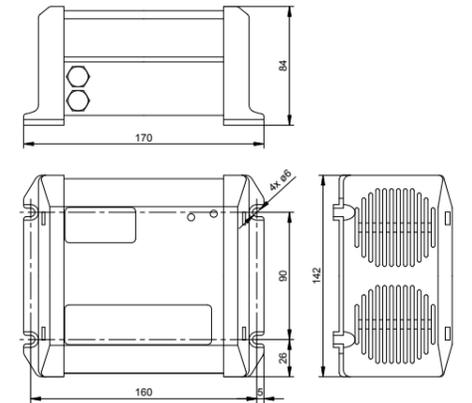
### Steca accessories

- Remote control JT8 (On/Off, LED) for connection to Steca AJ 1000-12 to Steca AJ 2400-24 (for AJ 275-12 to AJ 700-48 special variant, please state when ordering!)

275 W...2.400 W



Steca AJ 275-12, AJ 350-24, AJ 400-48



	275-12	350-24	400-48	700-48	1000-12	2100-12	2400-24
<b>Characterisation of the operating performance</b>							
System voltage	12 V	24 V	48 V		12 V		24 V
Continuous power	200 VA	300 VA	500 VA	800 VA	2,000 VA		
Power 30 min.	275 VA	350 VA	400 VA	700 VA	1,000 VA	2,100 VA	2,400 VA
Power 5 sec.	450 VA	650 VA	1,000 VA	1,400 VA	2,200 VA	5,000 VA	5,200 VA
Max. efficiency	93 %	94 %		93 %	92 %	94 %	
Own consumption standby / ON	0.3 W / 2.4 W	0.5 W / 3.5 W	1.1 W / 5.2 W	1.5 W / 12 W	0.7 W / 10 W	0.7 W / 16 W	1.2 W / 16 W
<b>DC input side</b>							
Battery voltage	10.5 V ... 16 V	21 V ... 32 V	42 V ... 64 V		10.5 V ... 16 V		21 V ... 32 V
<b>AC output side</b>							
Output voltage	230 V AC +0 / -10 % (true sine wave)						
Output frequency	50 Hz +/- 0.05 % (crystal controlled)						
Load detection (standby)	2 W			adjustable: 1 W ... 20 W			
<b>Operating conditions</b>							
Ambient temperature	-20 °C ... +50 °C						
<b>Fitting and construction</b>							
Cable length battery / AC	1.2 m / 1 m		1.5 m / 1 m		1.7 m / 1 m		
Degree of protection	IP 30				IP 20		
Dimensions (X x Y x Z)	170 x 142 x 84 mm		252 x 142 x 84 mm	455 x 142 x 84 mm	406 x 273 x 117 mm		
Weight	2.4 kg	2.6 kg	4.5 kg	8.5 kg	19 kg	18 kg	

Technical data at 25 °C / 77 °F

# STECA XTENDER

XTS 900-12 | 1200-24 | 1400-48  
 XTM 1500-12 | 2000-12 | 2400-24 | 3500-24 | 2600-48 | 4000-48  
 XTH 3000-12 | 5000-24 | 6000-48 | 8000-48



Steca Xtender XTS      Steca Xtender XTM      Steca Xtender XTH

## Product features

- True sine wave voltage
- Excellent overload capabilities
- Optimal battery protection
- Adjustable integrated battery charger
- Multistage programmable battery charger with PFC
- Automatic load detection
- Standby load detection adjustable over a wide range, starting from a low value
- Parallel connectable
- Best reliability
- Can be used as a back-up system or uninterruptible power supply (UPS)
- Multifunction contact
- Adjustable power sharing
- Reliable and noiseless with any kind of load
- Support of sources of alternating current (Smart Boost)
- Automatic support for peak loads (Power Shaving)
- Ultra-fast transfer relay
- High efficiency
- Control by digital signal processor (DSP)

## Electronic protection functions

- Deep discharge protection
- Battery overvoltage shutdown
- Overtemperature and overload protection
- Short circuit protection
- Reverse polarity protection by internal fuse (except Steca Xtender XTH 3000)
- Acoustic alarm at deep discharge or overheating

## Displays

- 5 LEDs show operating states

## Options

- Type with 115 V / 60 Hz (except Steca Xtender XTH 8000-48)
- Model with protective lacquered mainboard

## Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in Europe
- Manufactured according to ISO 9001 and ISO 14001

## Steca- accessories

- Remote control and display Steca RCC-02/03
- Additional accessories on request:
  - Prewired mounting structure Steca X-Connect-System,
  - Battery temperature sensor Steca BTS-01,
  - Integrated cooling unit ECF-01, Current Sensor BSP-500/1200,
  - Communications cable, Connection to the three-phase system / parallel connection CAB-RJ45-2

The basic functions of the combined inverters Steca Xtender are the inverter, the battery charger, the switching function and the support of external sources of alternating current. These functions can be combined and controlled fully automatically. The inverters offer outstanding user-friendliness and very good exploitation of the energy available.

All the settings of the Steca Xtender can be remote controlled. When a software with new functions is available, it can be loaded into the system, so the Steca Xtender always stays up to date. Several Steca Xtender can be connected in parallel or to form a three-phase system. That means that up to nine Steca Xtender can work together.

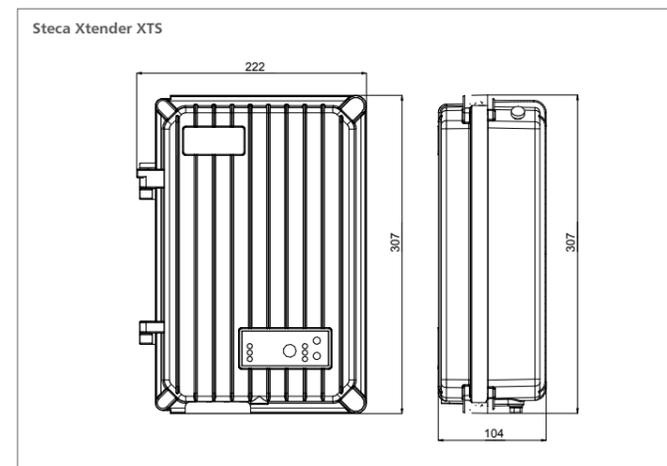
## Multifunction contacts

These potential-free contacts can be programmed for many different applications. They can react to any event outside or inside of the inverter (grid availability, battery voltage, fault message ...). They can also be programmed on a timer or can be switched on during particular times (at night, at the weekend ...). In this way, they can serve to start up a generator, to switch off less important loads, to signal a fault, to charge batteries depending on the situation, etc.

## Smart-boost function

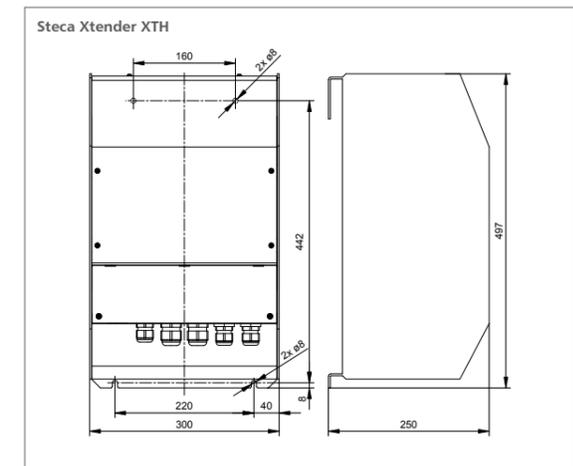
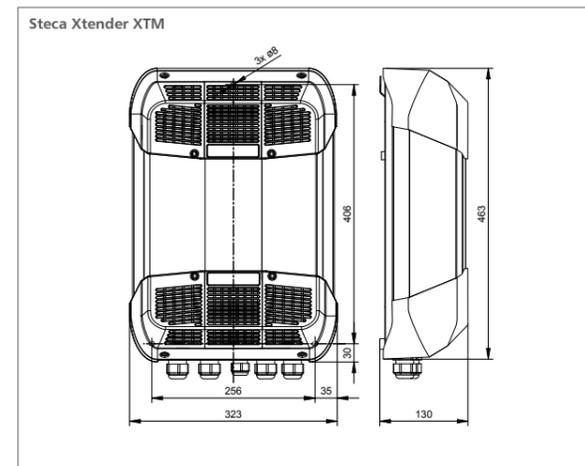
With the smart-boost function, the output of another source of alternating current, such as a power generator or a charger connection, can be increased; even when special loads are being used (inductive, asymmetric, with high switch-on current). It is also possible to combine the Steca Xtender with almost all inverters which are already present in order to increase the available output.

700 W...72.000 W



	XTS 900-12	XTS 1200-24	XTS 1400-48	XTM 1500-12	XTM 2000-12	XTM 2400-24	XTM 3500-24	XTM 2600-48	XTM 4000-48	XTH 3000-12	XTH 5000-24	XTH 6000-48	XTH 8000-48	
<b>Characterisation of the operating performance</b>														
System voltage	12 V	24 V	48 V	12 V		24 V		48 V		12 V	24 V	48 V		
Continuous power	500 VA / 650 VA <sup>1)</sup>	650 VA / 800 VA <sup>1)</sup>	750 VA / 900 VA <sup>1)</sup>	1,500 VA	2,000 VA		3,000 VA	2,000 VA	3,500 VA	2,500 VA	4,500 VA	5,000 VA	7,000 VA	
Power 30 min.	700 VA / 900 VA <sup>1)</sup>	1,000 VA / 1,200 VA <sup>1)</sup>	1,200 VA / 1,400 VA <sup>1)</sup>	1,500 VA	2,000 VA	2,400 VA	3,500 VA	2,600 VA	4,000 VA	3,000 VA	5,000 VA	6,000 VA	8,000 VA	
Power 5 sec.	2.3 kVA	2.5 kVA	2.8 kVA	3.4 kVA	4.8 kVA	6 kVA	9 kVA	6.5 kVA	10.5 kVA	7.5 kVA	12 kVA	15 kVA	21 kVA	
Max. efficiency	93 %			94 %			96 %		93 %	94 %	96 %			
Own consumption standby / ON	1.4 W / 7 W	1.5 W / 8 W	1.6 W / 8 W	1.4 W / 8 W	1.4 W / 10 W	1.6 W / 9 W	1.6 W / 12 W	2 W / 10 W	2.1 W / 14 W	1.4 W / 14 W	1.8 W / 18 W	2.2 W / 22 W	2.4 W / 30 W	
Power Factor Correction (PFC)	according EN 61000-3-2													
Acoustic level	< 40 dB / < 45 dB (without / with ventilation)													
<b>Input side</b>														
Input voltage	< 265 V AC (adjustable: 150 V AC ... 265 V AC)													
Charging current adjustable	0 A ... 35 A	0 A ... 25 A	0 A ... 12 A	0 A ... 70 A	0 A ... 100 A	0 A ... 55 A	0 A ... 90 A	0 A ... 30 A	0 A ... 50 A	0 A ... 160 A	0 A ... 140 A	0 A ... 100 A	0 A ... 120 A	
Max. current on transfer system	16 A			50 A					50 A					
Input frequency	45 Hz ... 65 Hz													
<b>Battery side</b>														
Battery voltage	9.5 V ... 17 V	19 V ... 34 V	38 V ... 68 V	9.5 V ... 17 V		19 V ... 34 V		38 V ... 68 V		9.5 V ... 17 V	19 V ... 34 V	38 V ... 68 V		
<b>AC output side</b>														
Output voltage	230 V AC +/-2 % / 190 V AC ... 245 V AC (true sine wave) / 120 V AC <sup>2)</sup>													
Output frequency	50 Hz, adjustable: 45 Hz ... 65 Hz +/-0.05 % (crystal controlled)													
Total harmonic distortion	< 2 %													
Load detection (standby)	2 W ... 25 W													
<b>Operating conditions</b>														
Ambient temperature	-20 °C ... +55 °C													
<b>Fitting and construction</b>														
Power Smart-Boost 30 min.	900 VA	1,200 VA	1,400 VA	1,500 VA	2,000 VA	2,400 VA	3,500 VA	2,600 VA	4,000 VA	3,000 VA	5,000 VA	6,000 VA	8,000 VA	
Input current balance adjustment	2 A ... 16 A			1 A ... 50 A										
Multifunction contact adjustable	2 independent contacts 16 A / 250 V AC (potential free change-over contacts)													
Degree of protection	IP 54			IP 20										
Dimensions (X x Y x Z)	222 x 307 x 104 mm			323 x 463 x 130 mm					300 x 497 x 250 mm					
Weight	8.2 kg	9 kg	9.3 kg	15 kg	18.5 kg	16.2 kg	21.2 kg	16.2 kg	22.9 kg	34 kg	40 kg	42 kg	46 kg	
Cooling principle	convection			fan from 55 °C										
Parallel connection possible	3 x 1 phase and three-phase													

Technical data at 25 °C / 77 °F  
<sup>1)</sup> Steca Xtender XTS in conjunction with ECF-01  
<sup>2)</sup> Special version, please note on order.



Steca  
**DC LOADS**



# DC-DC-VOLTAGE CONVERTERS

MDC | MDCI

DC-DC voltage converters are used when the DC-output voltage of the PV system does not match the requirements of the appliance.

Since a voltage level of 12 V is required for most low-voltage appliances such as lamps, multimedia devices, radios or mobile phones, the various models of the voltage converters deliver a stable supply of 12 V. For instance, if a 12 V energy-saving light is operated in a 24 V or 48 V system, then a suitable DC-DC voltage converter must be inserted between the load output of the charge controller and the 12-V energy-saving light.

The MDC and MDCI voltage converters are designed for use in photovoltaic systems. The models with an output voltage of 13.8 V can also be used as battery chargers for a 12 V battery in a 24 V system.

For safety reasons, the MDCI series is electrically insulated to protect the user. Both the MDCI and the Steca MDC series are protected against high voltage spikes at the input, thus preventing harmful voltage spikes at the input of the loads.

## Product features

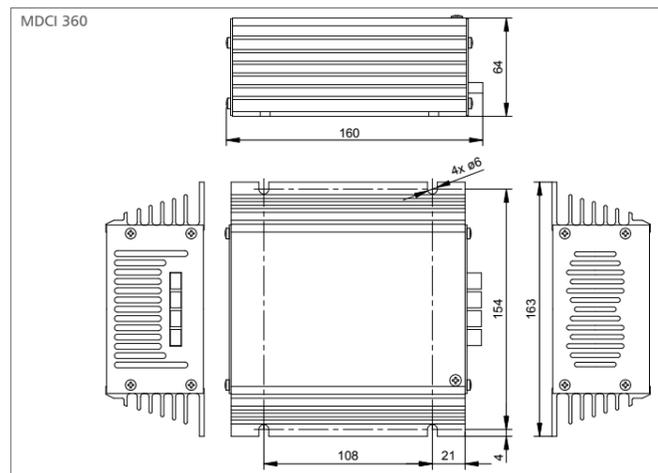
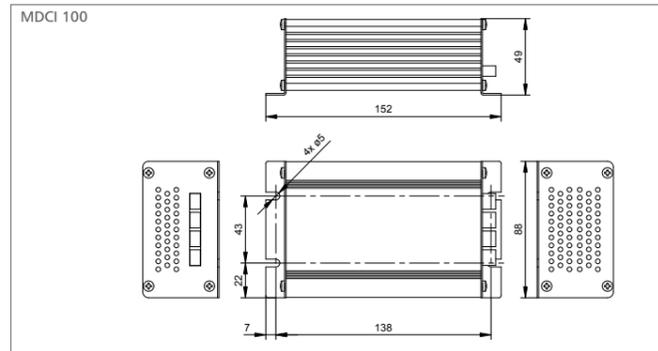
- High efficiency
- Automatic detection of voltage
- Wide input voltage range
- Best reliability
- Parallel switching of up to two MDCI

## Electronic protection functions

- Overtemperature and overload protection
- Reverse polarity protection
- Short circuit protection

## Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU



65 W...360 W



	MDC						MDCI		
	2412-5	2412-8	2412-12	2412-20	2412-30	1224-7	100	200	360
<b>Characterisation of the operating performance</b>									
Nominal power	65 W	105 W	160 W	275 W	415 W	170 W	100 W	200 W	360 W
Max. efficiency	90 %						85 %		
<b>DC input side</b>									
Input voltage	18 V ... 35 V		20 V ... 35 V			9 V ... 18 V	9 V ... 18 V / 20 V ... 35 V / 30 V ... 60 V / 60 V ... 120 V		
<b>DC output side</b>									
Output voltage	13.2 V			13.8 V		24 V	12.5 V / 24.5 V		
Output current	5.5 A	8 A	12 A	20 A	30 A	7 A	8 A / 4 A	16.5 A / 8 A	30 A / 15 A
<b>Operating conditions</b>									
Ambient temperature	-20 °C ... +40 °C						-20 °C ... +45 °C		
<b>Fitting and construction</b>									
Galvanic isolation	no						yes		
Dimensions (X x Y x Z)	87 x 55 x 49 mm	87 x 85 x 49 mm		87 x 115 x 49 mm	87 x 125 x 49 mm	87 x 115 x 49 mm	88 x 152 x 49 mm	88 x 182 x 49 mm	163 x 160 x 64 mm
Weight	170 g	250 g	260 g	480 g	600 g	300 g	500 g	600 g	1.4 kg
Cooling principle	convection					fan	convection	convection	fan

Technical data at 25 °C / 77 °F

# STECA LEDS

LED 4 | LED 6 | LED 8 | LED 12

Steca LEDs are modern, compact LED lamps that are specially developed for all 12 V and 24 V direct voltage applications. This makes them ideal for all lighting in leisure, caravan and home applications. Their high efficiency and excellent light yield make them particularly suitable for solar home systems.

## Product features

- High efficiency
- Low weight
- Very long lifetime
- Simple installation
- Maintenance-free
- Low own consumption
- Best reliability

## Electronic protection functions

- Reverse polarity protection

## Certificates

- Compliant with European Standards (CE)
- RoHS compliant

## Steca accessories

- E27 socket



STECA Quality

4 W...12 W



	LED 4	LED 6	LED 8	LED 12
<b>Characterisation of the operating performance</b>				
Nominal voltage	12 / 24 V			
Nominal power	4.4 W	5.6 W	7.8 W	11.5 W
Rated current	0.36 A / 0.18 A	0.42 A / 0.21 A	0.62 A / 0.31 A	0.90 A / 0.45 A
Luminous flux	500 lm	600 lm	800 lm	1,100 lm
Luminous efficiency	110 lm / W	105 lm / W	100 lm / W	95 lm / W
Life span	> 30,000 h			
<b>DC input side</b>				
Input voltage	10 V ... 30 V			
<b>Operating conditions</b>				
Ambient temperature	-10 °C ... +50 °C			
<b>Fitting and construction</b>				
Degree of protection	IP 20			
Dimensions (X x Y x Z)	60 x 105 mm	65 x 135 mm	75 x 135 mm	94 x 151 mm
Weight	110 g	120 g	152 g	328 g
Socket	E27			
Light colour	neutral white (5,700 K)			

Technical data at 25 °C / 77 °F

# SOLAR REFRIGERATOR / SOLAR FREEZER

## STECA PF 166-H | STECA PF 240-H

Steca PF refrigerators are some of the most efficient DC energy-saving refrigerators ever developed. Now filled with an even more climate-friendly refrigerant, they can be used as either a refrigerator or a freezer.

The Steca PF 166-H and Steca PF 240-H are fully programmable. The inside temperature and each of the other configuration values can be set by the user. They are therefore perfectly suited for all DC applications including even the refrigeration of medicines in hospitals. The optimal electronic control and speed regulation of the compressor guarantees extremely efficient use of energy. This leads to significant cost reductions.

This product stands out for its user-friendliness, thanks to a large digital display with setting options, the highest standards of quality and reliability, energy efficient interior LED lamp and a long service life. The refrigerator or freezer is easy to clean as it has a sealing plug on the bottom for draining water.



### Product features

- Fast and efficient cooling due to compressor speed control
- The freezers can be operated via an off-grid battery system with a 70 Wp photovoltaic module in most climates
- Automatic detection of voltage
- Temperature fully programmable
- Adjustable refrigerator or freezer function
- Suitable for all DC applications
- Low maintenance and easy to clean
- Lock with two keys
- Also suitable for mobile use
- Climate-friendly refrigerant
- Energy-efficient LED interior lamp

### Electronic protection functions

- Reverse polarity protection
- Deep discharge protection
- Power breakdown display
- Temperature alarm

### Displays

- Multifunction LED display
- Digital temperature display

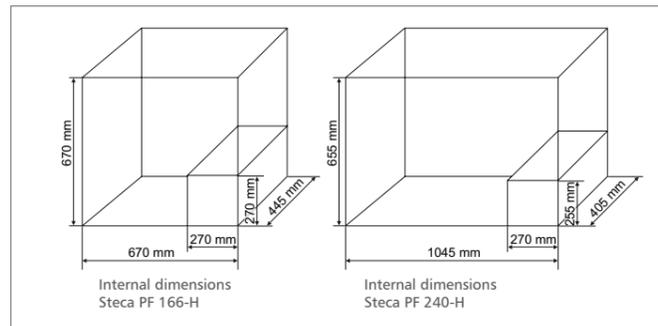
### Operation

- Programming by buttons

### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Abstinence of ozone destroying materials according EC 1005/2009 (CFC-free)
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

50 W...72 W



	PF 166-H	PF 240-H
<b>Characterisation of the operating performance</b>		
System voltage	12 V (24 V)	
Nominal power	50 W ... 72 W	
Cooling volume (net)	166 litres	240 litres
Refrigerator temperature	+2 °C ... +12 °C	
Freezer temperature	-20 °C ... -10 °C	
<b>DC input side</b>		
Input voltage	10 V ... 17 V (17 V ... 31.5 V) 12 V (24 V) battery	
<b>DC output side</b>		
Reconnection voltage (LVR)	11.7 V (24.2 V)	
Deep discharge protection (LVD)	10.4 V (22.8 V)	
<b>Operating conditions</b>		
Ambient temperature	+10 °C ... +43 °C	
<b>Fitting and construction</b>		
Dimensions (X x Y x Z)	872 x 917 x 709 mm	1,288 x 919 x 760 mm
Insulation strength	11 cm	12 cm
Weight	47 kg	62 kg
Cooling principle	compressor	
Refrigerant	60 g R290	70 g R290
Celsius / Fahrenheit temperature display	adjustable	
Display brightness	adjustable	
Hanging baskets	2	
Freezer trays	3	
Cold battery	1	
Automatic energy-saving mode	yes	

Technical data at 25 °C / 77 °F

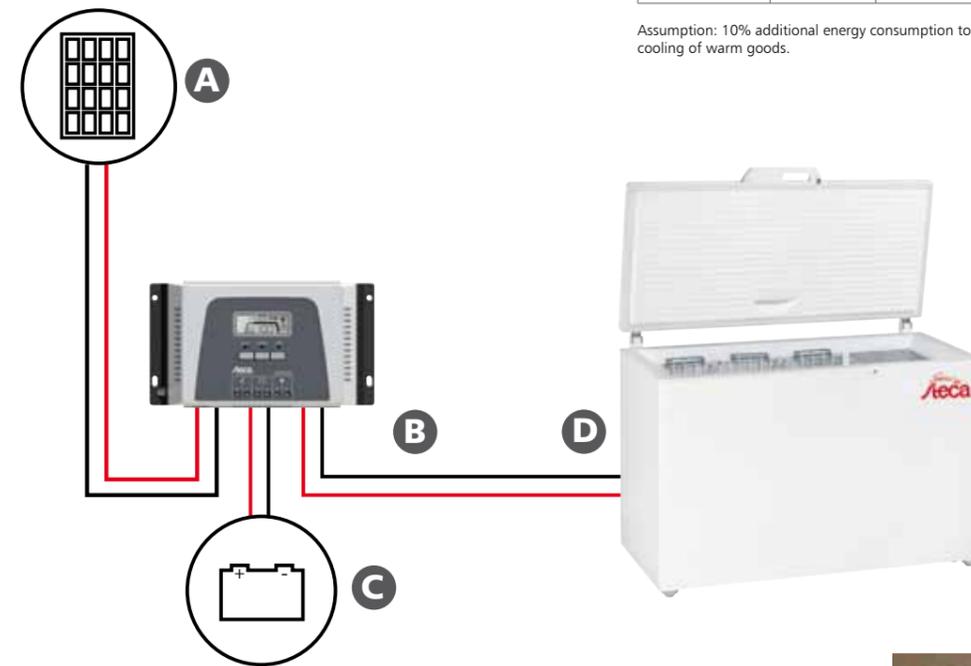
Consumption [Wh / Tag]	Steca PF 166-H		Steca PF 240-H	
Ambient temperature	25 °C	40 °C	25 °C	40 °C
Interior temperature +8 °C	87	232	93	266
Interior temperature +3 °C	113	303	136	361
Interior temperature -10 °C	277	624	370	878
Interior temperature -20 °C	525	1215	764	1794

### Example applications

The application areas of the Steca PF 166-H and Steca PF 240-H solar refrigerators and freezers are diverse: solar refrigerators and freezers by Steca cater for the most demanding requirements at all times, whether for cooling drinks, in solar home systems, for storing medication in hospitals supplied by stand-alone systems or for storage of frozen food. The most important parameters for the planning of such applications are summarized at a glance in the table opposite.

	Minimum system size Steca PF 166-H	Steca PF 166-H refrigerator	Steca PF 166-H freezer	Steca PF 240-H refrigerator	Steca PF 240-H freezer
Irradiation	2,5 kWh / m <sup>2</sup> / d	5 kWh / m <sup>2</sup> / d	5 kWh / m <sup>2</sup> / d	5 kWh / m <sup>2</sup> / d	5 kWh / m <sup>2</sup> / d
Ambient temperature	25 °C	35 °C	35 °C	35 °C	35 °C
Inside temperature	8 °C	8 °C	-20 °C	8 °C	-20 °C
PV power required	50 Wp	50 Wp	276 Wp	57 Wp	402 Wp
Battery power required	12 V, 50 Ah	24 V, 80 Ah	24 V, 220 Ah	12 V, 90 Ah	24 V, 320 Ah
Duration of battery independence	4,4 days	3,5 days	3,5 days	3,5 days	3,5 days

Assumption: 10% additional energy consumption to compensate daily opening and cooling of warm goods.



### Key:

- A Solar modules
- B Solar charge controller Steca Solarix MPPT 3020
- C Battery
- D Steca PF 166-H or Steca PF 240-H



Mobile use, India



Sale of drinks, Burkina Faso



Cooled drinks, Caribbean



Hospital, Nigeria



Steca  
**ACCESSORIES**

# STECA PA WiFi1

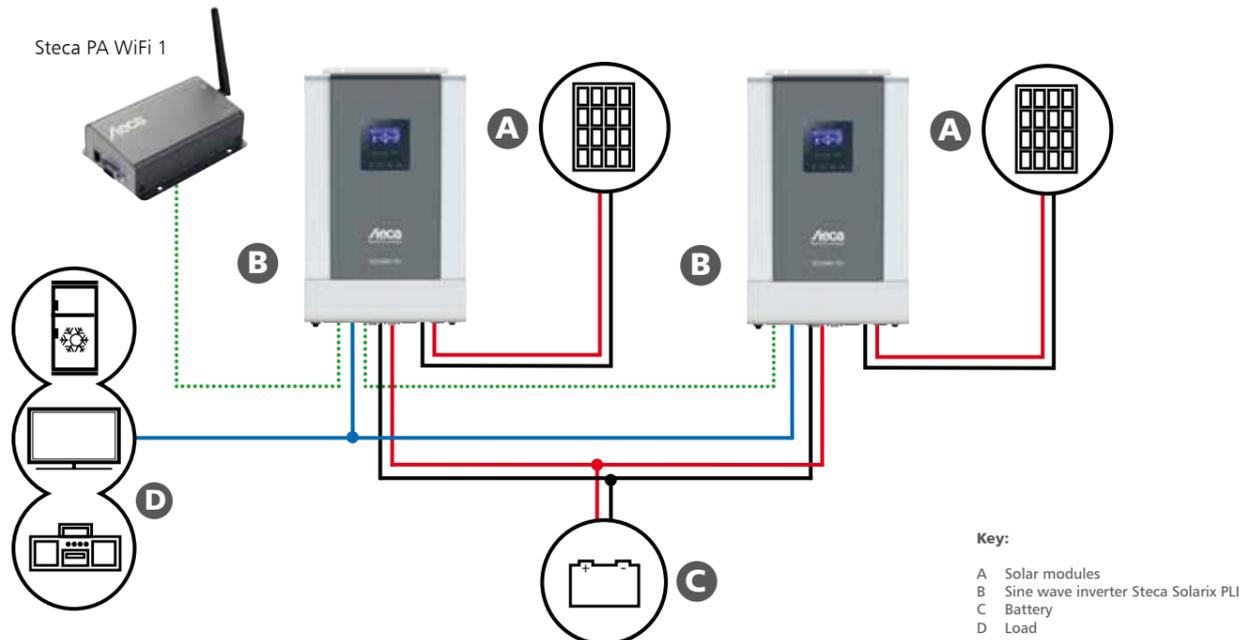
## WLAN-Box

The Steca PA WiFi1 Wi-Fi Box provides an interface to the Steca internet portal. It thus allows access to up to nine Solarix PLI 2400-24 or Solarix PLI 5000-48, or a Solarix MPPT 3020 or Solarix MPPT 5020 from any point in the world. All that is needed is an internet connection. Thus, a complete monitoring of the entire PV system is also possible from a distance, without any additional devices. The portal access is possible with PCs as well as smartphones and tablets with all operating systems (browser-based). The use of the Steca portal is free of charge.

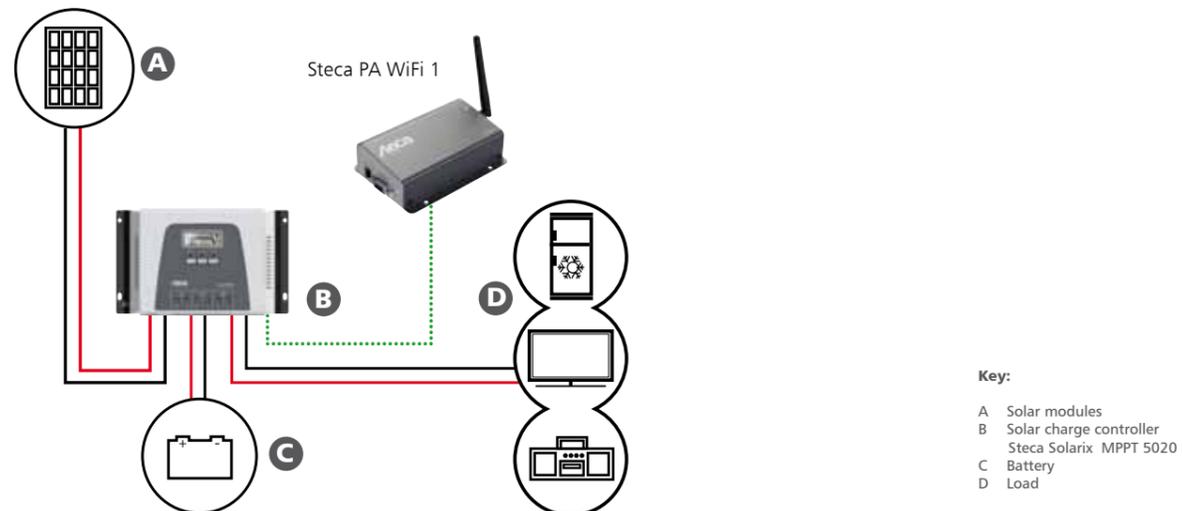


### Product features

- Compatible with Solarix PLI 2400-24 and 5000-48 as well as Solarix MPPT 3020 and 5020
- Access to free Steca internet portal
- Powered by included power supply for Solarix PLI or via data connection to Solarix MPPT



- Key:
- A Solar modules
  - B Sine wave inverter Steca Solarix PLI
  - C Battery
  - D Load



- Key:
- A Solar modules
  - B Solar charge controller Steca Solarix MPPT 5020
  - C Battery
  - D Load

# STECA PA LCD1

## Remote display, accessories for Steca Solarix 2020-x2

The Steca PA LCD1 is a remote graphical display for the Steca Solarix 2020-x2 solar charge controller. All system information is shown at a glance, with the energy flow displayed as a graphic, rendering it intuitively comprehensible. The remote display is equipped with a comprehensive data logger with a graphical display, which enables full monitoring of the entire system. Virtually all charge controller parameters can be set and modified using the remote display. This enables the distribution of charge power between the two batteries to be adjusted. For the load output, all automatic time and battery voltage functions are fully programmable. A USB charge socket for smartphones and tablets is also available.



### Product features

- Simple installation
- Fully-fledged integrated data logger
- Four freely programmable timers with week day function
- Evening, night light and daylight functions
- Generator manager
- Surplus manager
- Automatic shutdown when not in use for more than week
- USB charge socket for smartphones and tablets

### Displays

- Multifunction graphical LCD with backlighting

### Operation

- Simple menu-driven operation
- Programmable via 4 buttons

### Interfaces

- StecaLink Bus

### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in EU
- Manufactured according to ISO 9001 and ISO 14001

PA LCD 1	
<b>Characterisation of the operating performance</b>	
System voltage	10 V ... 60 V
Own consumption	30 mA
Adjustable parameters	– End of charge voltages (float / boost / equal) – Distribution of the charge power between main and auxiliary battery – Type of battery – LVD / LVR load output
<b>Safety</b>	
Alarm output	for all recorded parameters programmable
<b>Operating conditions</b>	
Ambient temperature	-10 °C ... + 60 °C
Relative humidity	0 % ... 95 %, non-condensating
<b>Fitting and construction</b>	
Interfaces	1x RJ45, StecaLink Bus
USB charger socket	5 V / 500 mA ... 800 mA
Degree of protection	IP 21
Mounting	surface-mounted / flush-mounted
Dimensions (X x Y x Z)	90 x 180 x 30 mm
Weight	approx. 400 g

Technical data at 25 °C / 77 °F

# STECA PA LINK1

## Parallel switch box, accessories for Steca Solarix PI

Up to four Steca Solarix PI can be operated in parallel. The connections are made via this external box, the Steca PA Link1. The Steca PA Link1 is compatible with all Solarix PI inverters of the actual generation.



PA Link1	
<b>Operating conditions</b>	
Ambient temperature	-20 °C ... +50 °C
Relative humidity	0 % ... 95 %
<b>Fitting and construction</b>	
Cable	1 x data cable master 3 x data cable slave
Interfaces	4 x inverter (RJ45)
Dimensions (X x Y x Z)	200 x 110 x 54 mm
Weight	830 g

Technical data at 25 °C / 77 °F

## STECA RCC-02/03

Remote control and display (incl. 2m cable), accessories for Steca Xtender XTS, XTM and XTH

Lots of information on the status of the system can be retrieved using the graphic display of the Steca RCC. Any incidents within the system are also saved and displayed. This means that any problems which might occur are identified early.

Many values of the Steca Xtender can be set using the Steca RCC, such as the charging process of the battery charger, the programming of the multifunctional contacts and the various operating modes.

An SD card slot can be used for saving parameters, for the data logger or for updating the software.



	RCC-02	RCC-03
<b>Fitting and construction</b>		
Degree of protection	IP 20	
Mounting	Surface-mounted	Flush-mounted
Dimensions (X x Y x Z)	170 x 170 x 46 mm	120 x 130 x 43 mm
Weight	400 g	268 g

Technical data at 25 °C / 77 °F

### Displays

- Multifunction graphical LCD with backlighting

### Operation

- Programming by buttons

### Certificates

- Compliant with European Standards (CE)
- RoHS compliant
- Made in Europe

## STECA PA TARCOM

Data logger, accessories for Steca Power Taron

STECA Quality

The Steca PA Tarcom data logger is connected to the RJ45 interface of the Steca Power Taron charge controller, or via the Steca PA HS200.

The data logger is available in several different versions: as a simple RS-232 interface to directly save and read data on the PC or Laptop (Steca PA Tarcom 01), as a data logger with an integrated analogue modem (Steca PA Tarcom RMT), as a data logger with an integrated GSM modem for remote monitoring (Steca PA Tarcom GSM) and as a data logger with an Ethernet interface for connection to a PC network (Steca PA Tarcom Ethernet). The Steca PA Tarcom is delivered with its accompanying software.



	01	RMT	GSM	Ethernet
<b>Characterisation of the operating performance</b>				
System voltage	12 V / 24 V / 48 V			
Logger capacity	1 Mbit = 2 min. (11 days) → 4 h (4 years)			
Own consumption	< 10 mA		30 mA	
Recorded values	relative time, total charge current, battery current, solar module current, load current, SOC, battery voltage, system voltage, analog sensor			
System status information	night, overload, load disconnect, overvoltage, low voltage, over temperature, no module			
<b>DC output side</b>				
Battery voltage	8 V ... 65 V			
<b>Safety</b>				
Alarm output	for all recorded parameters programmable			
<b>Fitting and construction</b>				
Interfaces	RS-232	analog modem	gsm modem	ethernet
Configurable analog auxiliary input	0 mV ... 150 mV			
Dimensions (X x Y x Z)	129 x 82 x 38 mm			
Weight	150 g			

Technical data at 25 °C / 77 °F

## STECA PA RC100

Programming unit

The programming unit Steca PA RC100 allows to program Steca solar charge controllers. The values can be adjusted with the help of switches. After a restart of the charge controller the new settings can be activated by pressing the program-button on the Steca PA RC100. An LED will transfer the values to the controller.



	PA RC100
<b>Characterisation of the operating performance</b>	
Supply voltage	3 V (2 x 1.5 V AAA / R03 batteries)
Adjustable parameters	<ul style="list-style-type: none"> <li>- Type of battery: gel / liquid</li> <li>- Night light function</li> <li>- End of charge voltages (float / boost / equal)</li> <li>- Deep discharge protection (LVD)</li> <li>- LVD factor</li> <li>- Switch-on threshold</li> </ul>
Suitable for the following Steca charge controllers	<ul style="list-style-type: none"> <li>- Steca Solsum F</li> <li>- Steca Solarix PRS</li> <li>- Steca Solarix MPPT 1010/2010</li> <li>- Steca Solsum 2525/4040</li> </ul>
<b>Fitting and construction</b>	
Dimensions (X x Y x Z)	115 x 57 x 20 mm
Weight	90 g

Technical data at 25 °C / 77 °F

### Product features

- Low weight
- Simple use
- Maintenance-free
- Low own consumption
- Best reliability

## STECA PA IRS 1008/180

Motion detector

The Steca PA IRS 1008/180 motion detector is connected to the load output of the night light charge controller. This supplies power to the light, which is then turned on for a few minutes when some movement is detected. The Steca PA IRS 1008/180 stands out, above all, with its extremely low own consumption, and is therefore optimal for use in solar power systems.



0 A...5 A



	PA IRS 1008/180	PA IRS 1008/180-24
<b>Characterisation of the operating performance</b>		
Own consumption	6 mA	2 mA
Turn on time	1 min. ... 5 min.	
<b>DC output side</b>		
Battery voltage	12 V	24 V
Load current*	5 A	
<b>Fitting and construction</b>		
Reach / detection area	7 m / 180°	
Degree of protection	IP 65	

Technical data at 25 °C / 77 °F

\* Inverters must not be connected to the load output.

# STECA PA HS200/400

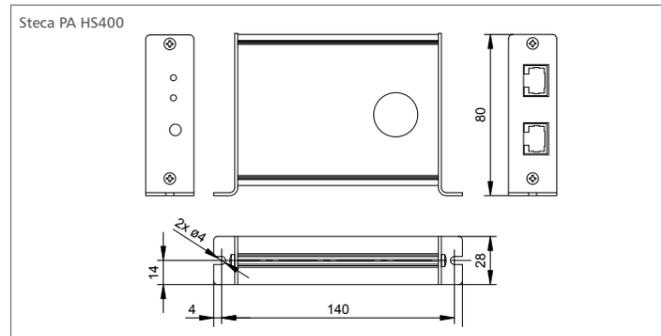
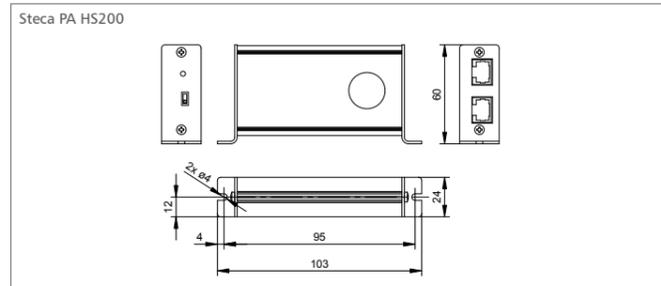
Current sensor, accessories for Steca Tarom MPPT 6000-M and Steca Power Tarom

The Steca PA HS200/400 is a highly intelligent current sensor with extremely low own consumption.

The Steca PA HS200/400 comes into play when (e.g.) an inverter is directly connected to the battery and the charge controller cannot measure the current consumption. A shunt is also required when an additional generator (e.g. PV, wind or diesel) directly charges the battery. The current is measured contact-free via a Hall-effect sensor. The data is transmitted to the charge controller over a cable connection. All types of current flows can be detected: charge current, load current and battery and DC-side inverter current flows.



0 A...400 A



	PA HS200	PA HS400
<b>Characterisation of the operating performance</b>		
System voltage	10 V ... 65 V	12 V ... 65 V
Own consumption	< 9 mA	≤ 9 mA
Measurement accuracy	(-20 A ... +20 A) +/- 1 % (-200 A ... +200 A) +/- 3 %	(-40 A ... +40 A) +/- 1 % (-400 A ... +400 A) +/- 3 %
Measuring interval	60 s	1 s
<b>Operating conditions</b>		
Ambient temperature	-15 °C ... +50 °C	-25 °C ... +50 °C
Relative humidity	75 %	
<b>Fitting and construction</b>		
Interfaces	Power Tarom	StecaLink Bus (Tarom 4545/4545-48, Tarom MPPT 6000-M)
Current range "battery" mode	-200 A... +200 A	-400 A... +400 A
Current range "charge" mode	0 A ... +200 A	0 A ... +400 A
Current range "load" mode	-200 A ... 0 A	-400 A ... 0 A
Degree of protection	IP 22	
Dimensions (X x Y x Z)	103 x 60 x 24 mm	140 x 80 x 28 mm
Weight	120 g	250 g
Max. diameter for battery cable	19 mm	20 mm

Technical data at 25 °C / 77 °F

## Product features

- Robust metal casing
- Automatic detection of voltage
- Wide current measuring range
- Potential free current measurement
- Communicates and transfers current flows to the charge controller
- Integrated Hall sensor

## PA HS400 only:

- Convenient configuration via charge controller
- Enhanced measuring precision due to multiple winding possible
- Zero calibration possible via charge controller

## Displays

- 1 or 2 LEDs indicate operating states
- Display via charge controller screen

## Interfaces

- Two RJ45 cable sockets
- StecaLink Bus (only Steca PA HS400)

## Modes of operation

- »Battery«: measures all battery current flows
- »Load«: measures currents of external loads not connected to the charge controller
- »Charge«: measures currents of generators
- »Charge/discharge procedure«: measures incoming and outgoing currents, e.g. for inverters with battery charger

## Certificates

- Compliant with European Standards (CE)
- Made in EU

Solar charge controller	Type
Steca Power Tarom	Steca PA HS200
Steca Tarom 4545/4545-48	Steca PA HS400
Steca Tarom MPPT 6000-M	Steca PA HS400

# DATA CABLE

STECA PA CAB1 Tarcom | STECA PA CAB2 Tarcom | STECA PA CAB3 Tarcom

Steca data cables are used to connect the Steca Tarom 4545/4545-48 (PA CAB2), Steca Tarom MPPT 6000-M (PA CAB3) and Steca Power Tarom (PA CAB1) solar charge controllers to a PC via a USB port. This allows direct monitoring of a system without using a data logger. This feature is especially suitable for short-term system monitoring and on-site testing. The most important system information is transferred to the PC in real time and can be conveniently analysed and graphically visualised using the Steca TarCom software. To use this convenient data transfer system a driver and the Steca TarCom software must first be installed on the PC (Download available at [www.stecasolar.com](http://www.stecasolar.com)).

## Product features

- Connection cable 1.8 m
- FTDI chip as USB-RS-232 converter

## Interfaces

- Connection to Steca Tarom 4545/4545-48 and Tarom MPPT 6000-M via connector block
- Connection to Steca Power Tarom via RJ45 plug
- Connection to PC via USB

## Installation software (Windows)

- Steca TarCom PC-Software (only Steca Power Tarom and Steca Tarom 4545/4545-48)
- Virtual COM port (by FTDI driver)
- Driver for FTDI chip (by FTDI driver)
- Configuration of the Steca Power Tarom and Steca Tarom 4545/4545-48 for data transfer



Steca PA CAB1 Tarcom



Steca PA CAB2 Tarcom  
Steca PA CAB3 Tarcom



Steca PA TS-S

# TEMPERATURE SENSORS

STECA PA TS10 | STECA PA TS20IP10 | STECA PA TS-S

The Steca PA TS10, Steca PA TS20IP10 and Steca PA TS-S external temperature sensors are used for monitoring the battery temperature. All Steca solar charge controllers have an integrated temperature sensor that makes them capable of adjusting the charging strategy to suit the current temperature conditions. The external temperature sensors are only required when the battery must be installed in a different room to the solar charge controller. The Steca PA TS10 is supplied with a plug for connection to the solar charge controller and a ring eyelet for connection to the battery screw. The Steca PA TS20IP10 comes with plugs and a ring eyelet, making free cable selection possible. The external temperature sensors are suitable for use with Steca PR 10-30, Steca Solarix, Steca Solarix MPPT, Steca Power Tarom, Steca PR 2020 IP, Steca Tarom 4545/4545-48 and Steca Tarom MPPT 6000-S/6000-M solar charge controllers.

## Product features

- Passive sensor
- Low weight
- Very long lifetime
- Simple installation
- Maintenance-free
- No own consumption
- Best reliability

## Certificates

- Compliant with European Standards (CE)
- RoHS compliant

	PA TS10	PA TS20IP10	PA TS-S
<b>Characterisation of the operating performance</b>			
Measurement accuracy	+/- 5 %		
<b>Operating conditions</b>			
Ambient temperature	-25 °C ... +125 °C		
<b>Fitting and construction</b>			
Battery connection	ring eyelet Ø 10 mm	pin	
Charge controller connection	plug	twice a 2-pole luster terminal	2-pole cable, optional connector
Cable	3.75 m	without cable	1.8 m
Degree of protection	IP 22		
Weight	95 g	30 g	40 g

Technical data at 25 °C / 77 °F

Solar charge controller	Type	Connection
Steca Solarix MPPT 1010/2010, Steca Solarix 2525/4040, Steca PR 10-30, Steca Power Tarom	Steca PA TS10	spring connector strip
Steca PR 2020 IP	Steca PA TS20IP10	twice a 2-pole luster terminal
Steca Tarom 4545, Steca Tarom 4545-48	Steca PA TS-S	connector block
Steca Tarom MPPT 6000-S, Steca Tarom MPPT 6000-M	Steca PA TS-S	2-pole connector



Steca  
**SOLAR-HOME-SYSTEMS**

# SOLAR-HOME-SYSTEMS

## with Steca solar charge controllers

A solar home system consists of a Steca solar charge controller, one or more solar modules, a battery and the connected loads.

The Steca solar charge controllers control the energy flow of the entire system. They make sure that the solar module charges the battery quickly and effectively, but they also protect the battery against overcharging. If the loads discharge the battery, the solar charge controller, thanks to its precision in calculating the state of charge, switches off the load at exactly the right moment, thus protecting the battery from the dangers of deep discharge.

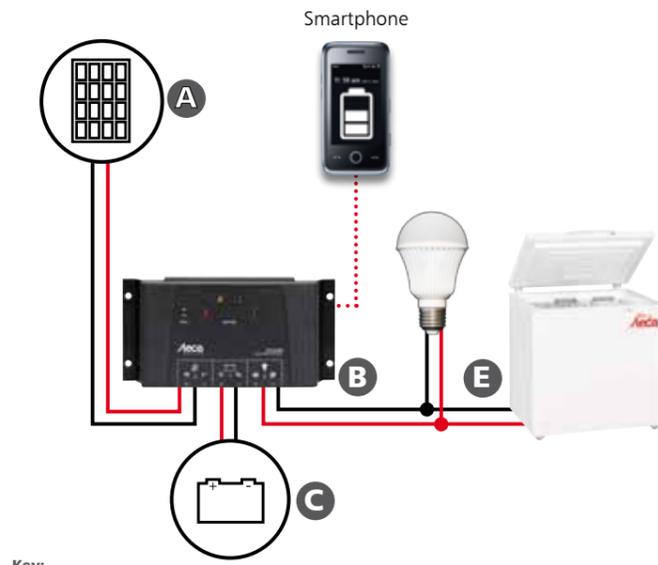
Furthermore, Steca solar charge controllers are equipped with an intelligent battery monitoring system. The most effective charging method is selected according to the requirements of the batteries. The solar charge controller is the central controlling component in solar home systems, for it affects all the functions of the system. For this reason, it is important to choose a reliable and high-performance solar charge controller.

The solar charge controller is connected directly to the battery using a cable as short as possible, and fixed to the wall near to the battery, so that it can be effectively cooled by the passing air flow.

In principle, the battery is always connected to the solar charge controller first. Then the solar module array is connected to the solar module input of the solar charge controller. Only direct current loads are used in solar home systems. They are connected directly to the load output of the solar charge controller. This means the Steca solar charge controllers always show the battery's exact state of charge, and thus ensure optimal battery maintenance in all situations. Various Steca energy-saving lights, Steca solar cooling units, DC-to-DC converters and other loads can be used.



Australia



Key:

- A Solar modules
- B Solar charge controller
- C Battery
- E Load

### Overview of devices



**Steca Solsum F**  
Solar charge controller  
6 - 10 A; 12 / 24 V



**Steca Solarix PRS**  
Solar charge controller  
10 - 30 A; 12 / 24 V



**Steca Solsum**  
Solar charge controller  
25 - 40 A; 12 / 24 V



**Steca Solarix MPPT**  
Maximum Power Point Tracker  
10 - 20 A; 12 / 24 V



**Steca PR**  
Solar charge controller  
10 - 30 A; 12 / 24 V



**Steca PR 2020 IP**  
Solar charge controller  
20 A; 12 / 24 V



**Steca Solarix**  
Solar charge controller  
25 - 40 A; 12 / 24 V



**Steca Solarix MPPT**  
Maximum Power Point Tracker  
30 - 50 A; 12 / 24 / 48 V



**Steca PF 240-H**  
Solar refrigerator/freezer  
240 l; 12 / 24 V

**Steca PF 166-H**  
Solar refrigerator/freezer  
166 l; 12 / 24 V



**Steca LED**  
LEDs  
4 W, 6 W, 8 W, 12 W  
12 / 24 V



Sweden



Burkina Faso



Botswana



Steca  
**NIGHT LIGHT SYSTEMS**

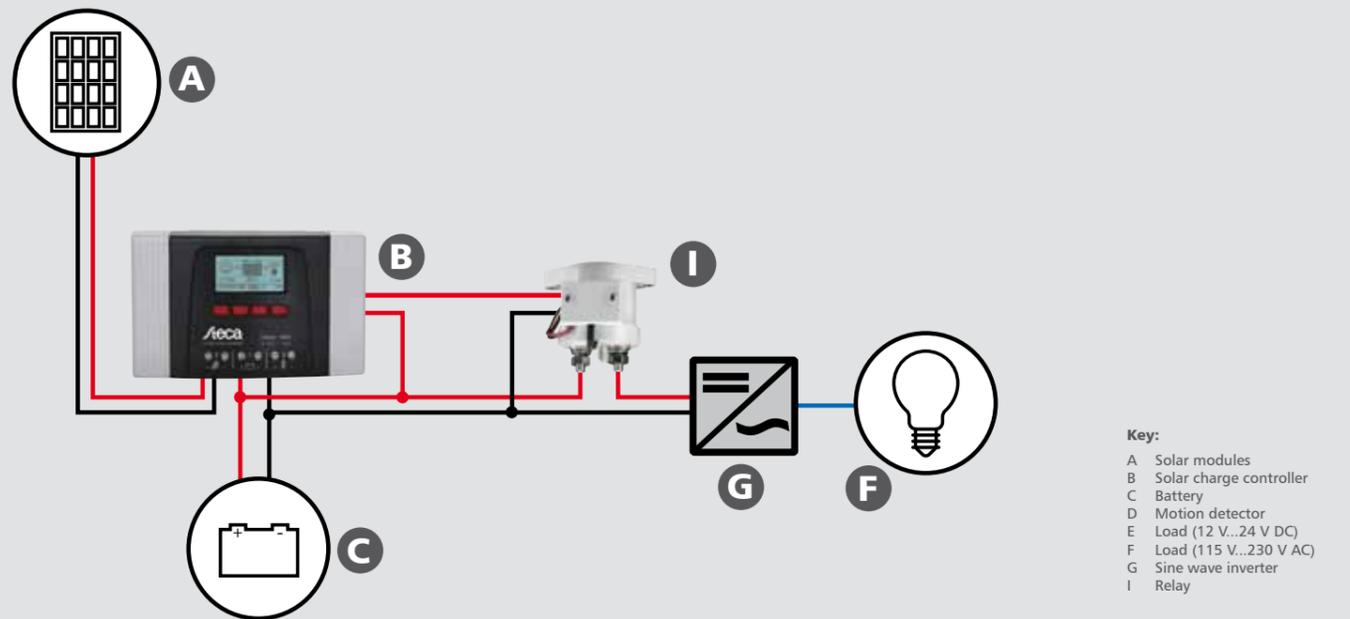
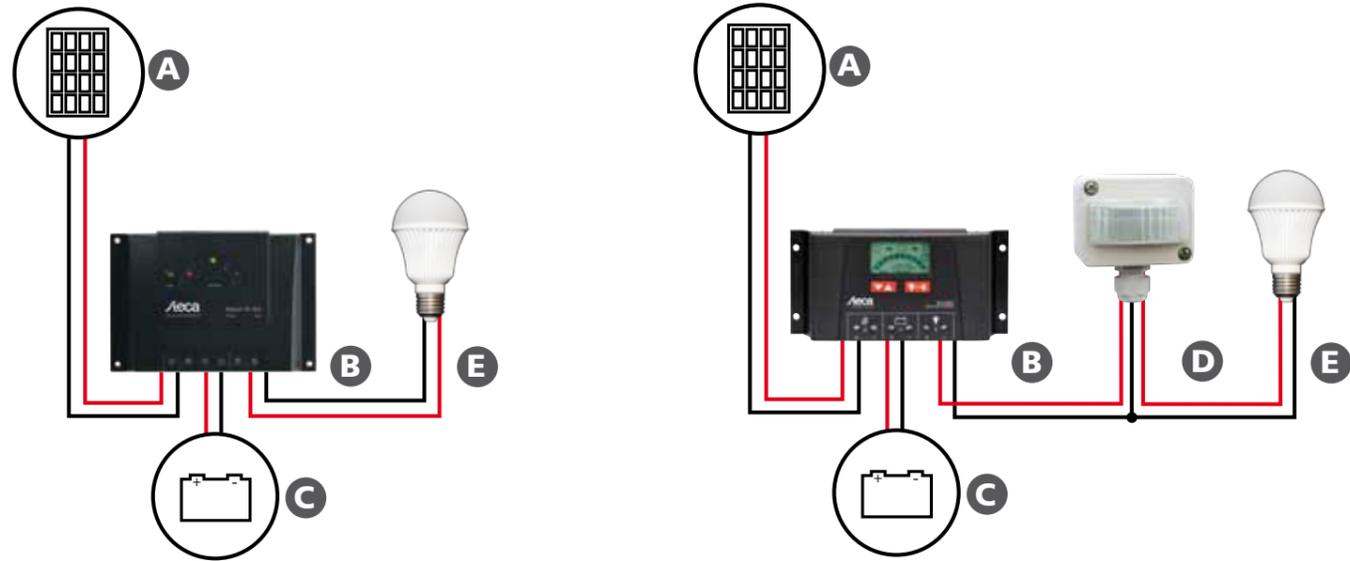
# NIGHT LIGHT SYSTEMS

an important special application of solar home systems

Night light systems match the structure of the solar home systems, but are equipped with any Basic, Classic or Advanced Steca charge controller, which automatically turns on the connected lights for a set time after sunset, and turns them off again the next morning at the latest. These systems are perfectly suited for street lamps and automatic night-time lighting. Another special model makes these systems to the ideal solution for bus stops and similar applications. Operating in conjunction with a motion detector, the lamp is only turned on at night time when movement is detected in a specified area. After a few minutes, the light is then automatically turned off again. This function can be implemented with any Steca night light charge controller by connecting it to an external motion detector.



Greece



- Key:
- A Solar modules
  - B Solar charge controller
  - C Battery
  - D Motion detector
  - E Load (12 V...24 V DC)
  - F Load (115 V...230 V AC)
  - G Sine wave inverter
  - I Relay

## Solar charge controller



**Steca Solsum F**  
Solar charge controller  
6 - 10 A; 12 / 24 V



**Steca Solarix PRS**  
Solar charge controller  
10 - 30 A; 12 / 24 V



**Steca Solsum**  
Solar charge controller  
25 - 40 A; 12 / 24 V



**Steca Solarix MPPT**  
Maximum Power Point Tracker  
10 - 20 A; 12 / 24 V



**Steca PR**  
Solar charge controller  
10 - 30 A; 12 / 24 V



**Steca PR 2020 IP**  
Solar charge controller  
20 A; 12 / 24 V



**Steca Solarix**  
Solar charge controller  
25 - 40 A; 12 / 24 V



**Steca Tarom**  
Solar charge controller  
45 A; 12 / 24 / 48 V



**Steca Solarix MPPT**  
Maximum Power Point Tracker  
30 - 50 A; 12 / 24 / 48 V



**Steca Tarom MPPT 6000-M**  
Maximum Power Point Tracker  
60 A; 12 / 24 / 48 V

## Accessories



**Steca PA IRS 1008/180**  
Motion detector



**Steca PA RC10**  
Programmiereinheit

## Loads



**Steca LED**  
LEDs  
4 W, 6 W, 8 W, 12 W  
12 / 24 V

Duration of night light function "Light on":	All night	After sunset	Before sunrise	Turn-on time delay	Maximum light current
<b>Solar charge controller:</b>					
Steca Solsum F	■*	0 - 8 h*	-	-	10 A
Steca Solarix PRS	■*	0 - 8 h*	-	-	30 A
Steca Solsum	■*	0 - 8 h*	-	-	40 A
Steca Solarix MPPT	■*	0 - 8 h*	-	-	20 A
Steca PR	■	0 - 12 h	0 - 12 h	-	30 A
Steca Solarix	■	0 - 12 h	0 - 12 h	-	40 A
Steca PR 2020 IP	■	0 - 12 h	0 - 12 h	-	30 A
Steca Solarix 2020-x2 (only with PA LCD1)	■	0 - 12 h	0 - 12 h	0 - 12 h	20 A
Steca Tarom 4545, Steca Tarom 4545-48	■	0 - 12 h	0 - 12 h	0 - 12 h	45 A
Steca Tarom MPPT 6000-M (only with external relay)	■	0 - 12 h	0 - 12 h	0 - 12 h	200 A

The type of night light function selected must be specified in the order.  
\* only for projects with larger order quantities.



Steca  
**INVERTER SYSTEMS**

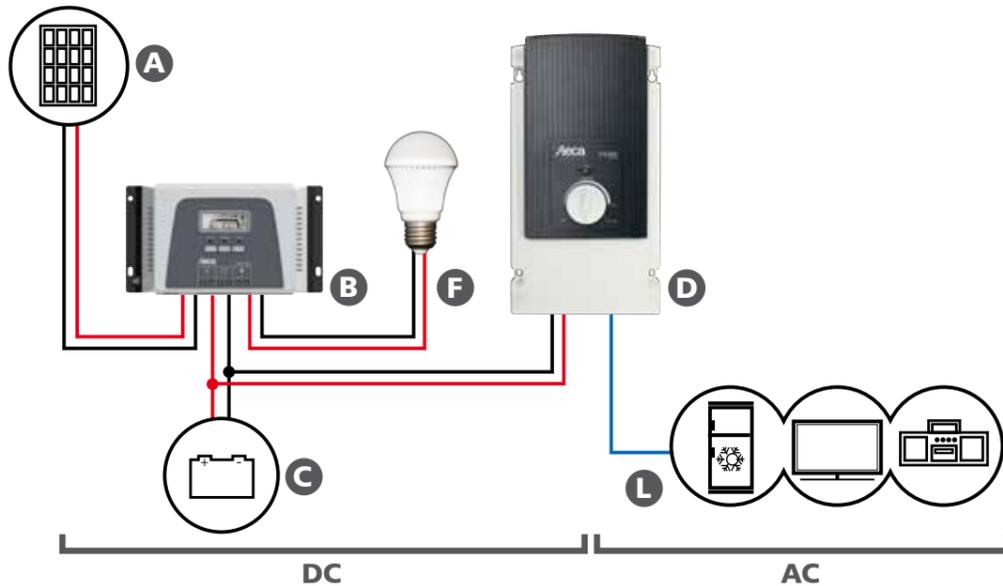
# INVERTER SYSTEMS

for both AC and DC



Inverter systems are designed as solar home systems. The central Steca solar charge controller ensures the battery is charged correctly and protects it against overcharging. In addition, a stand-alone inverter is connected directly to the battery in these systems so that AC appliances can be operated.

If DC appliances are also used, they can be connected directly to the charge controller. An AC system can be created with a system voltage or battery voltage of 12 V, and also with 24 V or 48 V for greater capacities. The simple system concept makes installation quick and easy.



Key:

- A Solar modules
- B Solar charge controller
- C Battery
- D Sine wave inverter
- E Generator junction box
- F Load (12 V...48 V DC)
- L Load (115 V...230 V AC)

## Overview of devices

DC			AC
 <b>Steca Solarix PRS</b> Solar charge controller 10 - 30 A; 12 / 24 V	 <b>Steca Solsum</b> Solar charge controller 25 - 40 A; 12 / 24 V	 <b>Steca Solarix PI</b> Hybrid-inverter 2.400 W - 45.000 W	 <b>Steca AJ</b> Sine wave inverter 500 - 2.400 W 12 / 24 / 48 V
 <b>Steca Solarix MPPT</b> Maximum Power Point Tracker 10 - 20 A; 12 / 24 V	 <b>Steca PR</b> Solar charge controller 10 - 30 A; 12 / 24 V		 <b>Steca Xtender XTM, XTS, XTH</b> Hybrid-inverter 700 - 72.000 W 12 / 24 / 48 V
 <b>Steca Solarix</b> Solar charge controller 25 - 40 A; 12 / 24 V	 <b>Steca Tarom</b> Solar charge controller 45 A; 12 / 24 / 48 V		 <b>Steca Solarix PI</b> Sine wave inverter 500 - 5.500 W 12 / 24 / 48 V
 <b>Steca Solarix MPPT</b> Maximum Power Point Tracker 30 - 50 A; 12 / 24 / 48 V	 <b>Steca Tarom MPPT 6000-S</b> <b>Steca Tarom MPPT 6000-M</b> Maximum Power Point Tracker 60 A; 12 / 24 / 48 V		



Philippines



Italy



Steca

**MINI-GRID AND  
HYBRID-SYSTEMS**

# MINI-GRID

for a smart energy mix



## What is a mini-grid?

Mini-grids, which, depending on their size, are also known as micro-grids, have increasingly developed in many countries into a trend for off-grid electrification. With the aid of a so-called village power supply system, a range from individual households up to complete villages can be supplied with electricity in this way using photovoltaics units.

From Steca's point of view a mini-grid is an autonomous grid which is centrally constructed independently of the public grid.

The power classes mostly vary between at least 10 kWp and larger. Energy generation takes place to a great extent using DC photovoltaics units and is immediately centrally converted into AC current.

The distribution and supply of the complete mini-grid then takes place exclusively or mainly using AC current, in many cases even three-phase.

## Advantages of mini-grids.

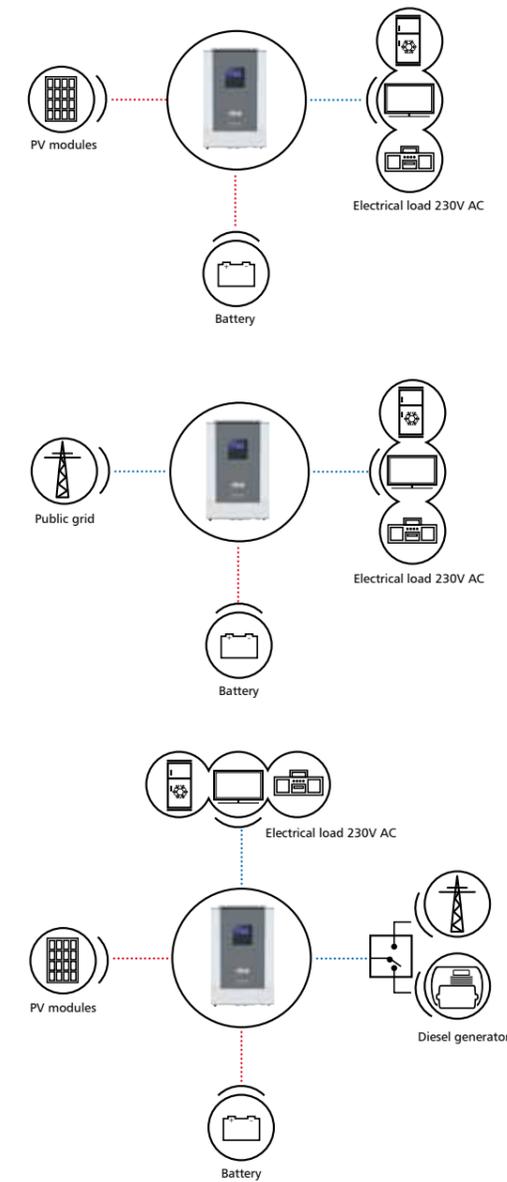
The more powerful a PV off-grid system becomes, the more sense it makes to carry out the conversion from DC to AC at an early stage. It has practical advantages in particular for supplies over greater distances, as is the case in the electrification of a complete village.

Significantly lower-priced components, such as cabling which possibly already exists, can be thus utilised, in particular as a result of the high voltages in the AC range. This mostly involves standard equipment which can be easily obtained and is familiar.

This is now even easier and more affordable with the Steca Solarix PLI 2400-24 and 5000-48.



## Systemvarianten



## Autarkes Solar Wechselrichter System:

- Pure off-grid system (no AC input)
- PV as only energy source



## Unterbrechungsfreie Stromversorgung:

- Pure on-grid system
- No PV as only energy source, only grid
- Battery is charged from the grid whenever the grid is available
- Useful when grid fails as backup (10 ms switchover time)



## Solar-Priorität mit Netzanschluss und/oder Generator:

- Grid-connected system or off-grid with AC generator (external source selector required if both are used)
- PV is priority, alternatively grid / generator can be selected as priority
- Optional charging from the grid / generator



## Advantages of mini-grids with Steca Solarix PLI 2400-24 and Steca Solarix PLI 5000-48.

You can exploit all these advantages with the Steca Solarix PLI hybrid inverter and at the same time significantly reduce the complexity and costs of your system.

The Steca Solarix PLI contains both the MPPT charge controller to which the solar modules are connected and the inverter which converts the generated power from DC to AC – everything in one device.

Even a diesel generator, the public grid or another AC source can all be alternately connected to the Steca Solarix PLI hybrid inverter. Where required, the system can thus be re-charged using this power source or, depending on the setting, the consumers can be supplied at times directly from this power source.

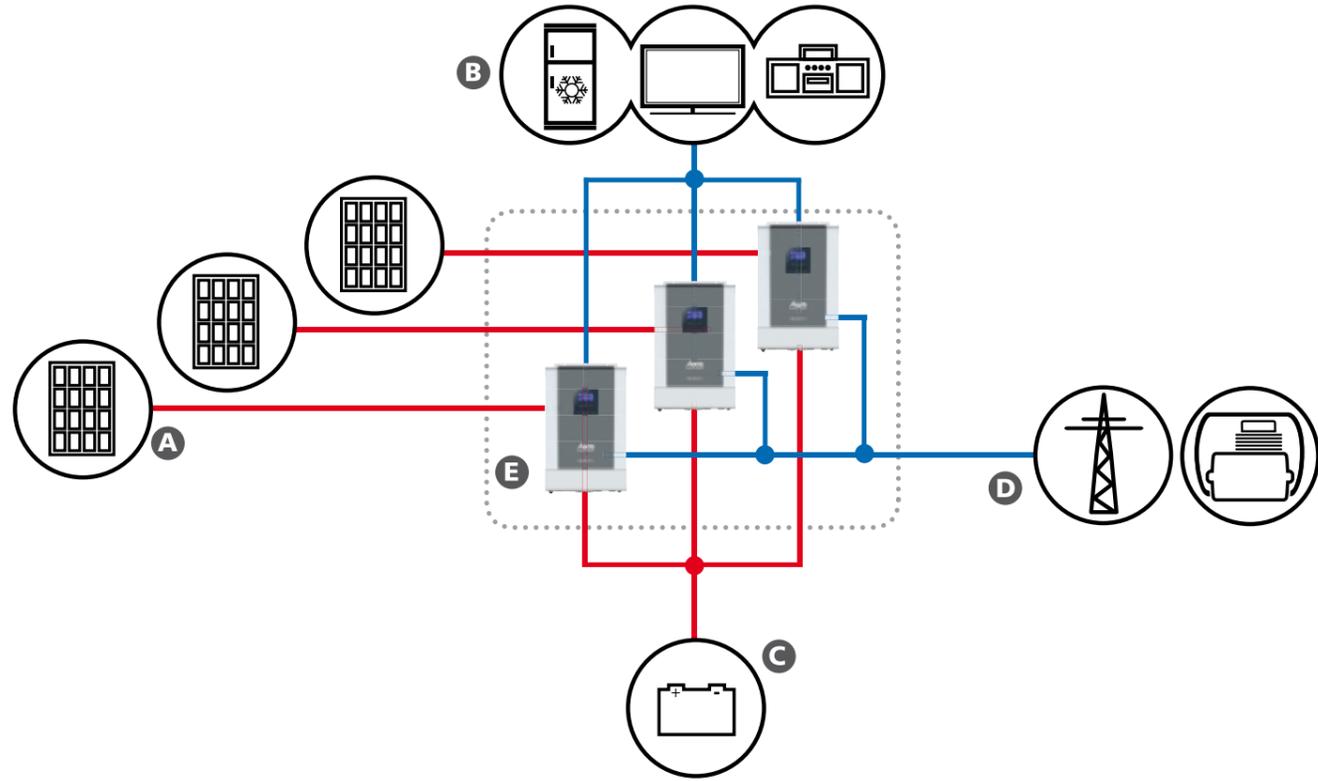
Up to 9 inverters can be interconnected either in parallel and/or three-phase as a result of which systems of up to 21.6 kW or 45 kW can be realised. The parallel or three-phase interconnection takes place simply using a communication card for each device.

The Steca Solarix PLI hybrid inverter thus has logistical advantages: Complex, powerful mini-grids can be easily and inexpensively achieved with only one model and one accessory. Warehousing, ordering and even the layout can thus be made significantly simplified.

# MINI-GRID

Now even easier and cheaper.

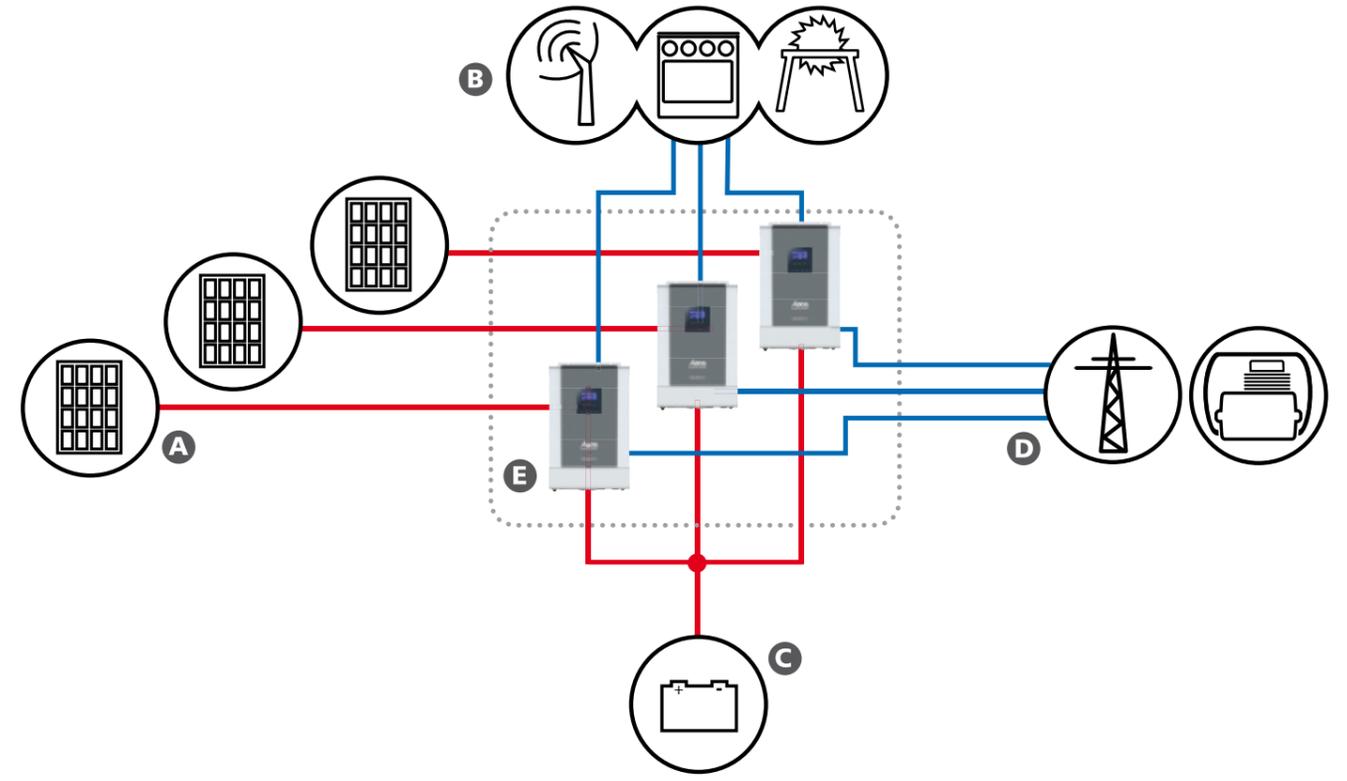
## Single-phase Mini-Grid-systems



**Key:**

- A Solar modules
- B Load (230 V AC)
- C Battery
- D Public grid alternative genset
- E Steca Solarix PLI

## Three-phase Mini-Grid-systems



**Key:**

- A Solar modules
- B Load (400 V AC)
- C Battery
- D Public grid alternative genset
- E Steca Solarix PLI

### The simple and cost efficient solution for self consumption and hybrid system solutions

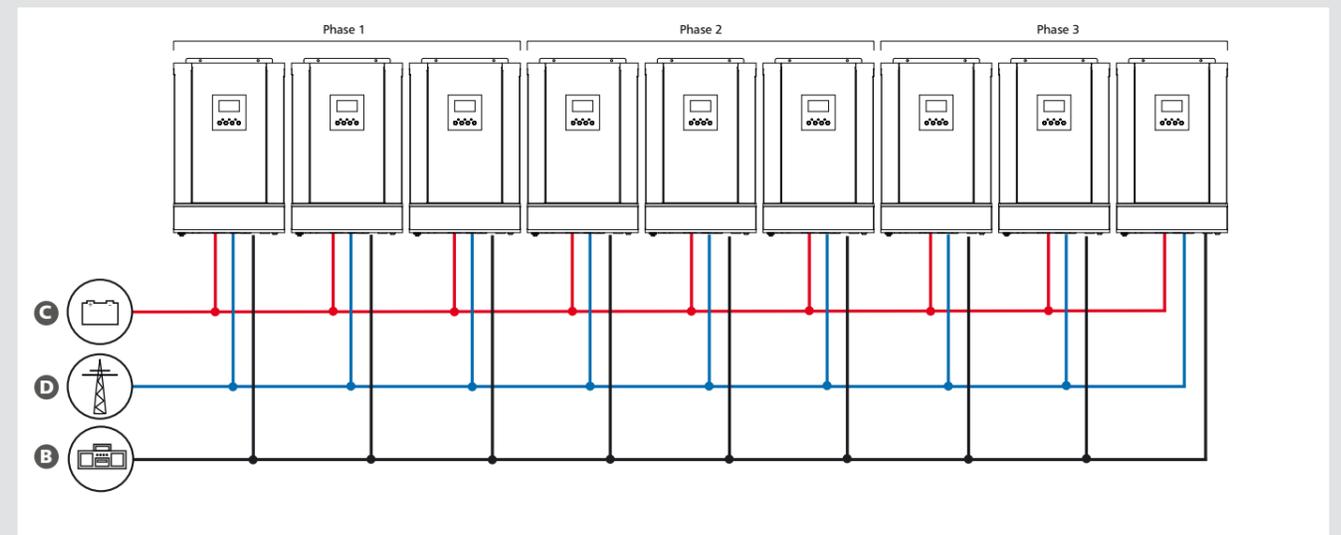
Because grid feed-in is becoming increasingly uneconomical in many countries and involves higher expenditure, self consumption and power storage are becoming more important.

The new Solarix PLI hybrid inverter is tailor-made for this application. The hybrid inverter is suited for an autonomous solar system, and for an uninterruptible power supply as well as for a solar system which can obtain power from the grid or from a diesel generator where required.

The Solarix PLI is, however, also attractive for the traditional off-grid markets. Solar home systems generally dominate these markets. Here too there are new solutions. Several hybrid inverters can be connected in parallel and, as a result, village power supply systems ("mini-grids") or even power systems for the supply of small factories and craftsman businesses ("small commercial systems") are provided.



Belgium



Up to 9 inverters can be connected in parallel and/or three-phase.

# HYBRID SYSTEMS

Overview of devices



The main feature of a hybrid system is the use of two or more different electricity sources.

Alongside solar energy, photovoltaic hybrid systems generally employ a diesel generator, a wind turbine or the public grid as a further electricity source. The inverters used in hybrid systems, which have integrated battery chargers, supply the connected AC loads according to demand from the battery bank of solar energy or the second electricity source. These devices also allow the batteries to be recharged from the extra energy source.

Photovoltaic hybrid systems offer the advantage that the solar generator does not have to be significantly oversized for periods of low sunlight. This avoids substantial costs. When selecting its energy source, the system always gives priority to the energy provided by the module. In combination with a controllable second source, the energy supply remains reliable and available 24 hours a day, all year round.



Australia

## Important features for single-phase and three-phase hybrid systems

- Combination of different power sources such as PV, wind, diesel generators
- 400 V AC three-phase and 230 V AC single-phase available 24 hours a day
- 12 V, 24 V or 48 V overall DC bus
- Automatic energy management based on the state of charge calculation of the battery, including automatic start of controllable power sources like e.g. diesel generators
- Optimised battery charging algorithm
- Optimised system efficiency through DC and AC bus

**DC**



**Steca Tarom**  
Solar charge controller  
45 A; 12 / 24 / 48 V



**Steca Tarom MPPT 6000-S**  
**Steca Tarom MPPT 6000-M**  
Maximum Power Point Tracker  
60 A; 12 / 24 / 48 V



**Steca Power Tarom**  
Solar charge controller  
55 - 140 A; 12 / 24 / 48 V



**Steca Solarix PLI**  
Hybrid inverter  
2.400 W - 45.000 W

**AC**



**Steca Xtender XTS**  
Hybrid-inverter  
700 W - 12.600 W  
12 / 24 / 48 V



**Steca Xtender XTM**  
Hybrid-inverter  
1.500 W - 36.000 W  
12 / 24 / 48 V



**Steca Xtender XTH**  
Hybrid-inverter  
3.000 W - 72.000 W  
12 / 24 / 48 V



Germany



Marocco



Steca

**BATTERY  
CHARGING SYSTEMS**

# BATTERY CHARGING SYSTEMS

efficient, intuitive and safe



Depot supply for bus depots and fire stations

Steca battery charging technology stands out from the start thanks to its high quality and durability. For decades we have been developing efficient and user-friendly charging technology in cooperation with leading battery manufacturers and institutes in order to allow you to use your batteries safely.

Our main focus is on making the charging devices easy to use and achieving the best battery charge possible. The charging process is fully automatic and the user has access to information about the charging behaviour of their battery at all times. Steca battery charging technology can even test batteries in terms of their charging capacity and remaining capacity. This way, the user knows whether or not the battery is still working efficiently and if it is suitable for the planned application. This avoids unexpected battery failures and the resulting costs.

In addition to battery charging devices and testing devices, we provide parking space supply systems for bus depots for example. If you are planning to construct a battery charging station, you will find that the charging technology in Steca battery charging devices conforms to all relevant standards.

## Consultation and planning

In connection with our battery chargers our staff will be glad to give you expert advice on all questions regarding batteries and battery use. We focus on finding the best solution for your application. This way, we can keep a constant eye on the applicable standards for the application in question and implement them. Our engineers and partners can plan your ideal configuration and help you draw up specifications.

## After-sales service

We are constantly expanding our network of service partners for distribution, maintenance and repairs. This allows us to react to your enquiries as quickly as possible. We are also happy to advise you over our customer hotline.

# PRODUCT OVERVIEW

## Battery chargers

Steca battery charging devices charge your batteries quickly and safely thanks to the processor-controlled charging processes. Fixed and programmable characteristic curves allow for flexibility during use. Highly efficient and advanced switching power supplies minimise energy losses. A wide range of features and ease of use make for trouble-free operation.

## Trickle charging system

With the Steca trickle charging system, up to ten lead-acid batteries can be connected simultaneously without being connected in parallel. Thanks to the integrated Steca long-life cycle, lasting operational readiness is a given. A visual error message appears if a connected battery is faulty. This ensures that only flawless batteries are connected for reuse.

## Small charging units

Even lead-acid batteries with small capacities need optimal charging. With our small charging units, we ensure this by controlled IU characteristic curves and a subsequent automatic trickle charging function.

## Parking space supply units

For many applications, vehicles must be ready for use at all times. Regardless of whether your application involves a fire engine, a bus or a driverless transport system (DTS), you have to be able to rely on your system. Parking space supply units from Steca provide the optimum charging technology. Our devices are already providing successful and reliable service in lots of areas. They are used at many local public transport depots, as stand-by systems in fire brigades and for charging driverless transport systems (DTS) during ongoing operation.

The bus depot is one of the main areas of application for parking space supply units. Parking space supply systems are available as individual devices or as charging posts. They charge the batteries of the connected vehicle and guarantee a charged battery at all times. The parking space supply system also charges parallel loads in the bus. This protects the battery set and improves the service lives of the batteries. With their internal communication interfaces, Steca parking space supply units are best prepared for application in depot management systems. We supply all necessary components as well as bus identification modules or our Steca gateway which transfers the data from the bus and charging post to depot management software. For example, a heating signal can be sent to the bus and the feedback can be monitored. The depot management system can display and process the battery charging parameters, parking space data and bus number.

## Examples of application



Mobile charging points: warning trailers, trolleys and supporting frames



Battery chargers in use



Parking space supply units for bus depots

# STECAMAT 860

## Processor-controlled charger for lead-acid batteries

The battery charger Stecamat 860 is available in a dust and hose-proof housing. The processor-controlled charging process ensures gentle and rapid charging of the battery. The Stecamat 860 also enables the processing of damaged or totally discharged batteries, ensuring long service life. A LED provides rapid information on the state of charge.

Maximum flexibility is provided by the extensive features. This and the easy handling of the device make for trouble-free operation.



# STECAMAT 861

## Processor-controlled charger for lead-acid batteries

The battery charger Stecamat 861 is available in a dust and hose-proof housing. The processor-controlled charging process ensures gentle and rapid charging of the battery. For individual adjustment of current, voltage, time and the ideal monitoring of the battery, the Stecamat 861 battery charger has a selection of preset battery profiles and the option of entering new battery profiles. The Stecamat 861 also enables the processing of damaged or totally discharged batteries, ensuring long service life. A backlit display provides rapid information on the state of charge.

Maximum flexibility is provided by the extensive features. This and the easy handling of the device make for trouble-free operation.



### Product features

- IP 65 jet waterproof case
- Half the charging time compared to simple, non-controlled chargers with the same rated current
- Optimal for charging batteries with liquid electrolyte and solid gel / absorbed electrolyte (AGM)
- Suitable for totally discharged batteries
- Constant battery operational readiness through integrated trickle charge
- Charging below the gassing voltage
- Optimal charging of damaged batteries
- Potential-free contact for ventilator control of the battery room venting system

### Electronic protection functions

- Protection in the case of wrong or damaged batteries
- Battery overcharge protection
- Charger output protected against short circuits, reverse polarity and over-voltage

### Display

- Multi-coloured LED shows operating statuses

### Operation

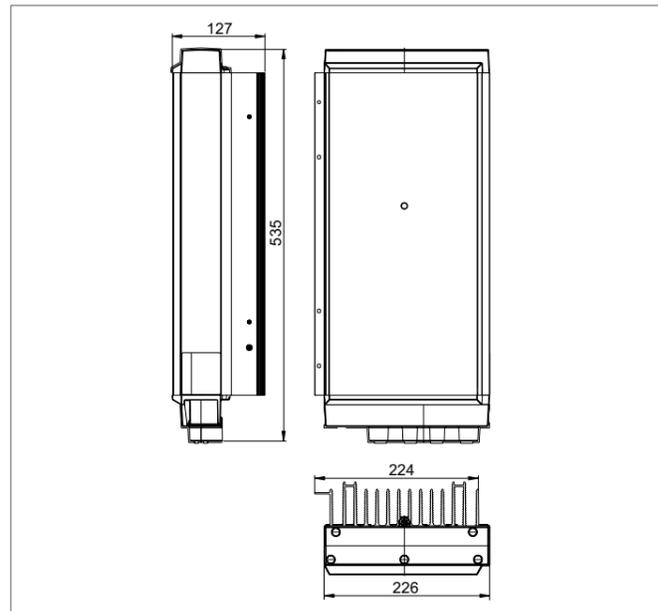
- Mains grid switch

### Interfaces

- Control contact for ventilation control system in accordance with DIN EN 50272

### Options

- IO box with mains plug and relay for ventilator control



Technical data			
Charging rated voltage	12 V	24 V	48 V
Charging current	50 A	35 A	18 A
End-of-charge voltage	14.4 V	28.8 V	57.6 V
Trickle charge voltage	13.8 V	27.6 V	55.2 V
Characteristic curve	UoIUoIU		
Grid voltage	230 V AC ± 10 %		
Grid frequency	50 Hz (45 Hz ... 65 Hz)		
Mains electricity	3.7 A (230 V)	5.5 A (230 V)	
Discharge current during grid failure	1 mA		
Protection class	I		
Casing / ingress protection	aluminium / plastic, IP 65		
Ambient temperature	-40 °C ... +60 °C		
Cooling	convection		
Dimensions X x Y x Z	226 x 535 x 127 mm		
Weight	approx. 11.5 kg		

Technical data at 25 °C / 77 °F

### Product features

- Besides preset battery profiles there is the option of entering new battery profiles
- IP 65 jet waterproof case
- Half the charging time compared to simple, non-controlled chargers with the same rated current
- Optimal for charging batteries with liquid electrolyte and solid gel / absorbed electrolyte (AGM)
- Adjustable rated capacity determines the charging current
- Suitable for totally discharged batteries
- Constant battery operational readiness through integrated trickle charge
- Charging below the gassing voltage
- Optimal charging of damaged batteries
- Potential-free contact for ventilator control of the battery room venting system

### Electronic protection functions

- Protection in the case of wrong or damaged batteries
- Battery overcharge protection
- Charger output protected against short circuits, reverse polarity and overvoltage
- Surge protection in on-board power supplies

### Display

- Multifunction graphical LCD with backlighting for voltage, current, charging capacity, charging phase, menu

### Operation

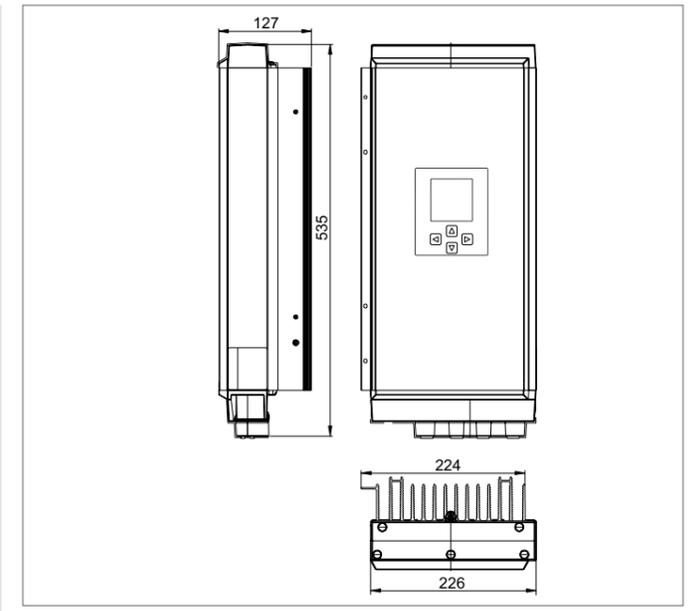
- Mains grid switch
- Four cursor buttons for menu selection

### Interfaces

- Control contact for ventilation control system in accordance with DIN EN 50272

### Options

- IO box with mains plug and relay for ventilator control



Technical data			
Charging rated voltage	12 V	24 V	48 V
Charging current	50 A	35 A	18 A
End-of-charge voltage	14.4 V	28.8 V	57.6 V
Trickle charge voltage	13.8 V	27.6 V	55.2 V
Characteristic curve	UoIUoIU		
Grid voltage	230 V AC ± 10 %		
Grid frequency	50 Hz (45 Hz ... 65 Hz)		
Mains electricity	3.7 A (230 V)	5.5 A (230 V)	
Discharge current during grid failure	1 mA		
Protection class	I		
Casing / ingress protection	aluminium / plastic, IP 65		
Ambient temperature	-20 °C ... +60 °C		
Cooling	Convection		
Dimensions X x Y x Z	226 x 535 x 127 mm		
Weight	approx. 11.5 kg		

Technical data at 25 °C / 77 °F

# STECAMAT 861 ES

## Processor-controlled charger / discharger for lead-acid batteries

The Stecamat 861 ES battery charger features a discharging stage of 140 W. It can recharge 12 V batteries with 720 W of power or discharge, charge and evaluate batteries in one automated test cycle.

For individual adjustment of current, voltage, time and the ideal monitoring of the battery, the Stecamat 861 ES battery charger has a selection of preset battery profiles and the option of entering new battery profiles. The Stecamat 861 ES also enables the processing of damaged or totally discharged batteries, ensuring long service life. A backlit display provides rapid information on the state of charge.

Maximum flexibility is provided by the extensive features. This and the easy handling of the device make for trouble-free operation.



### Product features

- IP 65 jet waterproof case
- Battery processing for wet, gel and AGM batteries possible
- Charges 12 V lead-acid batteries (max. 50 A)
- Adjustable rated capacity determines the charging current
- Charging below the gassing voltage
- Features 2 pre-set and 4 programmable charging characteristics
- Automated testing for 12 V lead-acid batteries (charge – discharge – charge)
- 12 V discharging stage with 10 A discharge current (you can select between 2.5 A, 5 A and 10 A)
- Capacity detection of 12 V lead-acid batteries
- Suitable for treating deep-discharged batteries
- Potential-free contact for ventilator control of the battery room venting system

### Electronic protection functions

- Protection in the case of wrong or damaged batteries
- Battery overcharge protection
- Charger output protected against short circuits, reverse polarity and overvoltage
- Surge protection in on-board power supplies

### Display

- Multifunction graphical LCD with backlighting for voltage, current, charged capacity (charging), spent capacity (discharging), charging phase, test phase, menu

### Operation

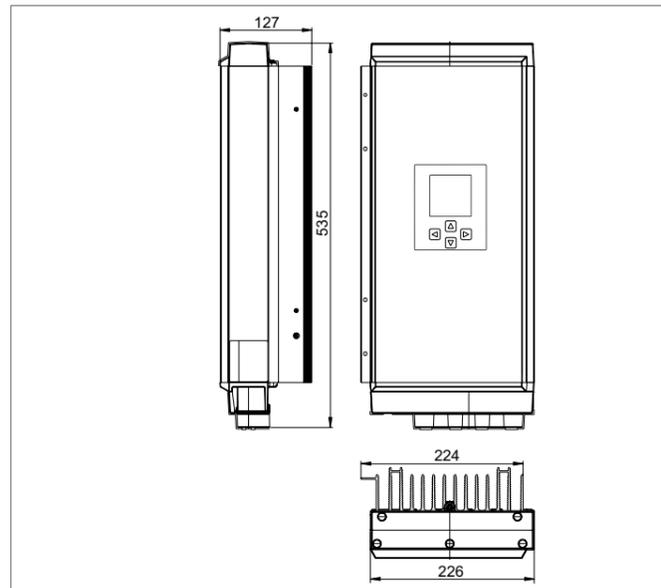
- Mains grid switch
- Four cursor buttons for menu selection
- Capacity test cycle: charge, discharge, charge

### Interfaces

- Control contact for ventilation control system in accordance with DIN EN 50272

### Options

- IO box with mains plug and relay for ventilator control



Technical data	
Charging rated voltage	12 V
Charging current	50 A
End-of-charge voltage	14.4 V
Trickle charge voltage*	13.8 V
Max. rated discharge voltage	12 V
Discharge cut-off voltage	10.5 V (10 V ... 11 V adjustable)
Discharge current	selectable: 2.5 A / 5 A / 10 A
Characteristic curve	UoIUoIU (charging), UoIUa (testing)
Capacity test cycle	charging / discharging / charging
Grid voltage	230 V AC ± 10 %
Grid frequency	50 Hz (45 Hz ... 65 Hz)
Mains electricity	3.7 A (230 V)
Discharge current during grid failure	1 mA
Protection class	I
Casing / ingress protection	aluminium / plastic, IP 65
Ambient temperature	-20 °C ... +60 °C
Cooling	convection
Dimensions X x Y x Z	226 x 535 x 127 mm
Weight	approx. 11.5 kg

Technical data at 25 °C / 77 °F  
\* only for charging programme

# STECAMAT 820

## Processor-controlled charger for lead-acid batteries

The battery charger Stecamat 820 is available in a light, compact housing. The processor-controlled charging process ensures gentle and rapid charging of the battery. The current, voltage, time and ideal monitoring of the battery are individually adjusted by the setting of the rated capacity. The Stecamat 820 also enables the processing of damaged or totally discharged batteries, ensuring long service life. A LED provides rapid information on the state of charge.

The wide range of features make for high flexibility of use. This and the easy handling make for trouble-free operation, even when wearing gloves.



### Product features

- Half the charging time compared to simple, non-controlled chargers with the same rated current
- Optimal for charging batteries with liquid electrolyte and solid gel / absorbed electrolyte (AGM)
- Adjustable rated capacity determines the charging current
- Suitable for totally discharged batteries
- Constant battery operational readiness through integrated trickle charge
- Ready for operation in just a few minutes
- Charging below the gassing voltage
- Optimal charging of damaged batteries

### Electronic protection functions

- Protection in the case of wrong or damaged batteries
- Battery overcharge protection
- Charger output protected against short circuits, reverse polarity and overvoltage

### Display

- Multi-coloured LED shows operating statuses

### Operation

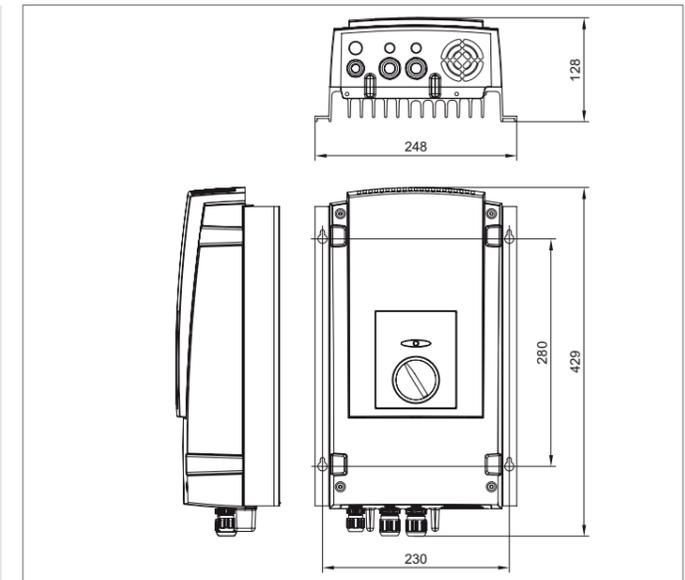
- Adjustable rated capacity via rotary switch

### Interfaces

- Control contact for ventilation control system in accordance with DIN EN 50272

### Options

- IO box with mains plug and relay for ventilator control



Technical data			
Charging rated voltage	12 V	24 V	48 V
Charging current	50 A	35 A	18 A
End-of-charge voltage	14.4 V	28.8 V	57.6 V
Trickle charge voltage	13.8 V	27.6 V	55.2 V
Characteristic curve	UoIUoIU		
Grid voltage	230 V AC ± 10 %		
Grid frequency	50 Hz		
Mains electricity	3.7 A (230 V)	5.5 A (230 V)	
Discharge current during grid failure	1 mA		
Protection class	I		
Casing / ingress protection	plastic, IP 20		
Ambient temperature	-20 °C ... +60 °C		
Cooling	regulated fan		
Dimensions X x Y x Z	248 x 429 x 128 mm		
Weight	approx. 6 kg		

Technical data at 25 °C / 77 °F

# STECAMAT 821

## Processor-controlled charger for lead-acid batteries

The battery charger Stecamat 821 is available in a light, compact housing. The processor-controlled charging process ensures gentle and rapid charging of the battery. For individual adjustment of current, voltage, time and the ideal monitoring of the battery, the Stecamat 821 battery charger has a selection of preset battery profiles and the option of entering new battery profiles. The Stecamat 821 also enables the processing of damaged or totally discharged batteries, ensuring long service life. A backlit display provides rapid information on the state of charge.

The wide range of features make for high flexibility of use. This and the easy handling of the device make for trouble-free operation.



### Product features

- Besides preset battery profiles there is the option of entering new battery profiles
- Half the charging time compared to simple, non-controlled chargers with the same rated current
- Optimal for charging batteries with liquid electrolyte and solid gel / absorbed electrolyte (AGM)
- Adjustable rated capacity determines the charging current
- Suitable for totally discharged batteries
- Constant battery operational readiness through integrated trickle charge
- Ready for operation in just a few minutes
- Charging below the gassing voltage
- Optimal charging of damaged batteries

### Electronic protection functions

- Protection in the case of wrong or damaged batteries
- Battery overcharge protection
- Charger output protected against short circuits, reverse polarity and overvoltage

### Display

- Multifunction graphical LCD with backlighting for voltage, current, charged capacity, charging phase, menu

### Operation

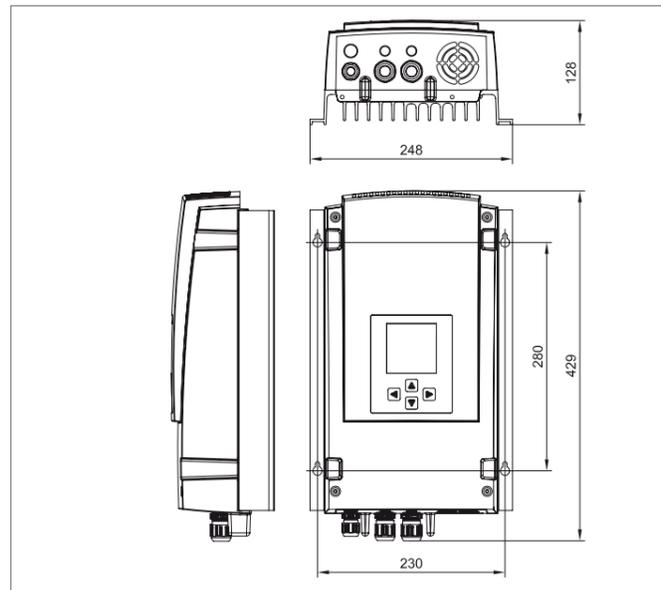
- Four cursor buttons for menu selection

### Interfaces

- Control contact for ventilation control system in accordance with DIN EN 50272

### Options

- IO box with mains plug and relay for ventilator control



Technical data			
Charging rated voltage	12 V	24 V	48 V
Charging current	50 A	35 A	18 A
End-of-charge voltage	14.4 V	28.8 V	57.6 V
Trickle charge voltage	13.8 V	27.6 V	55.2 V
Characteristic curve	UoIUoIU		
Grid voltage	230 V AC ± 10 %		
Grid frequency	50 Hz (45 Hz ... 65 Hz)		
Mains electricity	3.7 A (230 V)	5.5 A (230 V)	
Discharge current during grid failure	1 mA		
Protection class	I		
Casing / ingress protection	plastic, IP 20		
Ambient temperature	-20 °C ... +60 °C		
Cooling	regulated fan		
Dimensions X x Y x Z	248 x 429 x 128 mm		
Weight	approx. 6 kg		

Technical data at 25 °C / 77 °F

# STECAMAT 862

## Processor-controlled charger for lead-acid batteries with communication feature

The battery charger Stecamat 862 charges the battery gently and quickly thanks to a processor-controlled charging process. The Stecamat 862 thus enables the processing of damaged or totally discharged batteries, ensuring long service life. The IP 65-certified dust and splash-proof housing allows for outdoor installation. Data can be read and processed centrally thanks to the integrated RS-485 interface. With this communication interface, the various charging parameters can be adjusted and the charging current can be increased to a maximum of 35 A. The integrated interface allows for communication with buses that are equipped with an integrated bus identification module (BIM).



### Product features

- IP 65 jet waterproof casing
- Half the charging time compared to simple, non-controlled chargers with the same rated current
- Optimal for charging batteries with liquid electrolyte and solid gel / absorbed electrolyte (AGM)
- Suitable for totally discharged batteries
- Constant battery operational readiness through integrated trickle charge
- Charging below the gassing voltage
- Optimal charging of damaged batteries
- Communication with bus identification module for vehicle identification, heating control and query of ignition status
- Interface for bidirectional communication

### Electronic protection functions

- Protection in the case of wrong or damaged batteries
- Battery overcharge protection
- Charger output protected against short circuits, reverse polarity and overvoltage

### Displays

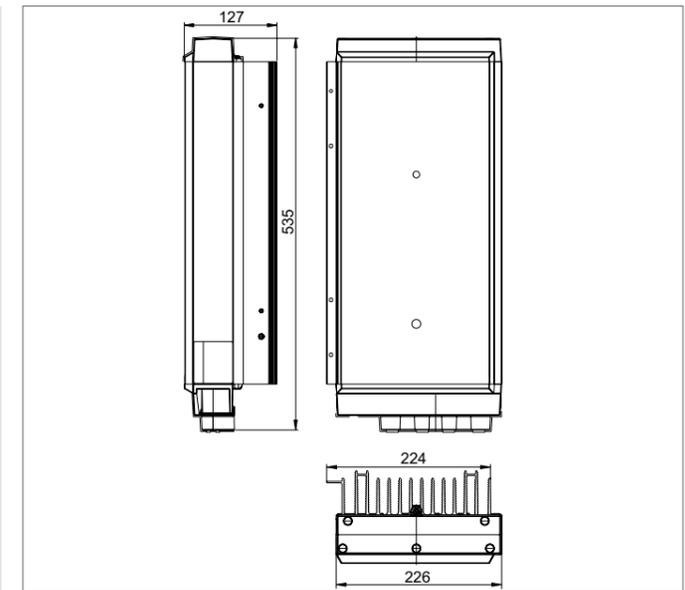
- Multi-coloured LED shows operating states

### Operation

- Charging parameters adjustable via RS-485

### Interfaces

- RS-485 for connection to the depot management software



Technical data	
Charging rated voltage	24 V
Charging current	20 A (max. 35 A)
End-of-charge voltage	27.6 V
Trickle charge voltage	27.2 V
Characteristic curve	UoIUoIU
Grid voltage	230 V AC ± 10 %
Grid frequency	50 Hz (45 Hz ... 65 Hz)
Mains electricity	4.0 A (230 V)
Discharge current during grid failure	1 mA
Protection class	I
Casing / ingress protection	aluminium / plastic, IP 65
Ambient temperature	-40 °C ... +60 °C
Cooling	convection
Dimensions X x Y x Z	226 x 535 x 127 mm
Weight	approx. 11.5 kg

Technical data at 25 °C / 77 °F

# Steca EMS PROVIDER

- Steca is certified according to
- ISO 9001
  - ISO 14001
  - ISO 50001
  - ISO/TS 16949
- Steca is audited according to
- EN ISO 13485



Steca guarantees top quality, safety and reliability, and places considerable emphasis on environmental compatibility during the development, construction, manufacture and distribution of its products. In order to reach these quality targets, Steca employs quality control and quality improvement strategies.



Use the synergies by the know-how from different business segments and product areas for which we deliver electronic components and modules:



#### HOME APPLIANCES & CONSUMER ELECTRONICS

- Refrigerators and freezers
- Electrical equipment
- Heating controllers
- Cable assemblies



#### AUTOMOTIVE

- Controls for auxiliary heating systems and sliding car roofs
- Power distribution modules / fuse modules
- LED lighting systems for car interior



#### MEDICAL TECHNOLOGY

- Dental technology for practice and laboratory facilities
- Mobile heart defibrillators
- Microscopy systems
- Pipette systems for analysing solids and fluids



#### INDUSTRIAL ELECTRONICS

- Step motor controls
- Pump controls
- Sensors
- Welding machines
- Packing machines
- Control units (HMI)



#### SOLAR & ENERGY

- Grid inverters for residential systems
- PV off grid
- Solar charge controllers
- Solar thermal controllers
- Heating and domestic hot water controllers
- Battery charging systems

# Steca INTERNATIONAL NETWORK

## MEMBER OF PRIMEPULSE

**Steca is part of the PRIMEPULSE network.**

PRIMEPULSE is the management holding company and group within which the experienced founders and managers of TecDAX-listed CANCOM SE and the AL-KO Group, which developed as a family business, actively guide their equity investments to success using their digital expertise and entrepreneurial skill. The efficient network includes international companies such as CANCOM, AL-KO and Stemmer Imaging.

The PRIMEPULSE Group operates in the IT, vision technology, electronics, e-business, automotive, air technology, garden tech and real estate segments. As a strategic investor, PRIMEPULSE takes a long-term, value-oriented approach to equity investment and is a safe long-term partner for companies and real estate projects.



### **For you on-site.**

With two locations, Steca can combine the quality and flexibility of a German provider with the advantages of low-cost production abroad. Enthusiastic and motivated staff on site, an experienced international and multilingual sales team as well as many sales partners and authorised wholesalers worldwide make Steca a significant company on both a national and international scale.



### **Memmingen | Germany**

**Foundation 1976 | 450 employees**

- Research and development
- Industrialisation
- Marketing, sales, purchasing
- Production
- Service



### **Saedinenie | Bulgaria**

**Foundation 2006 | 300 employees**

- Industrialisation
- Purchasing
- Production



732.238 | 25.2018

## Steca Elektronik GmbH

Mammostraße 1  
87700 Memmingen  
Germany  
T +49-(0)8331-8558-0  
F +49-(0)8331-8558-131  
info@steca.com  
www.steca.com



[facebook.com/StecaElektronik](https://facebook.com/StecaElektronik)



[youtube.com/c/StecaElektronik](https://youtube.com/c/StecaElektronik)