ENGLISH

Steca Elektronik

PV OFF GRID

»CAPTURE THE SUN'S ENERGY UNSING INTELLIGENT SYSTEMS FROM STECA.«

Two billion people in rural areas still have no access to an electricity grid. Steca has set itself the target of improving the quality of life of these people. To this end, Steca develops and manufactures top-quality products which, thanks to their long lifetime, ensure extremely low costs.

EXPLANATION OF SYMBOLS FOR INSIDE PAGES

Solar home system
This device is particularly suitable for solar home systems.

Inverter system
This device is suitable for applications of higher performance classes or for supplying entire villages.

Hybrid system
Suitable for hybrid systems in which additional generators are used.

Night light function
This device is suitable for night light systems.

Uninterruptible power supply
This device can also charge the battery from an external AC source.

SOC
This device calculates the state of charge of the battery using the AtonIC processor.

Telecom
This device is specially suitable for all kinds of telecommunication applications.

Remote monitoring
This device can transfer data using wires, telephone cables or wirelessly.

Sea water
This device is particularly protected against moisture and corrosion.

Solar module performance
Maximum input power of the connected solar modules.

LCD display
This device has a digital display which allows different system information to be shown.

Camping
This device is particularly suitable for use in mobile homes or for camping applications.

Energy efficiency class
This device is highly energy efficient – highest qualification A^{+++}.

CONTENT

»WE ARE THINKING OF TOMORROW.«

Environmental protection in series

»Simple business processes, fair partnerships and transparent communication contribute to our joint success.«

Services and production have an ecological future at the Memmingen electronics specialist company Steca. The company makes a worldwide contribution to reducing power consumption and allowing alternative energy sources to be used efficiently by providing high-performance products.

Steca has established a wide base in order to achieve these goals. The company offers electronic services for residential, automotive, agricultural, environmental, traffic and building technology and also for the industrial and medical sectors. The company also develops products for the environmentally friendly use of solar energy under the brand name of Steca. Steca Elektronik is one of the few manufacturers that cover all three segments of the solar market: PV grid feeding systems, off-grid PV systems and solar thermal systems. Steca also produces battery charging systems that extract the maximum potential from the energy storage system.

Steca sets a good example in its own production methods: the company uses only manufacturing processes that conform to strict ecological criteria. Steca is actively involved in research projects for efficient energy use and climate protection. In 2007, the German federal government therefore listed Steca as an authority for energy generation in the environmental technology atlas „Green Tech made in Germany".

Steca's environmental policy is based on sustainability and environmental compatibility, with a view to providing services and producing products for an ecological future. The company considers the whole value-added chain from this perspective and also involves its suppliers and customers. Steca is certified in accordance with ISO 14001:2004 and organised in accordance with the EU Environmental Management and Audit Scheme.

Full power for you: Management board Michael, Dietmar and Peter Voigtsberger

»GROWTH BASED ON RELIABILITY – IN USE ALL OVER THE WORLD.«

As a central control element in off-grid photovoltaic systems, Steca solar charge controllers control the entire energy flow while ensuring optimal battery maintenance. The products developed and manufactured by Steca ensure extremely low costs due to their long service lives. Steca solar charge controllers and sine wave inverters are the best choice for a modern and professional power supply - all over the world.

PRODUCTS

- Solar charge controllers
- Sine wave inverters
- Voltage converters
- Solar refrigerator / freezer
- Energy-saving lights
- Accessories

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.

The circuit board is completely electronically protected and with the LED user interface it is easy to check the battery state of charge at any time. Large terminals guarantee a simple connection of solar panels, battery and load. The Steca Solsum F works on PWM as a low loss series controller.

BASIC

Product features
- Series controller
- Voltage regulation
- Automatic detection of voltage
- PWM control
- Multistage charging technology
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Common positive grounding or negative grounding on one terminal
- Monthly maintenance charge

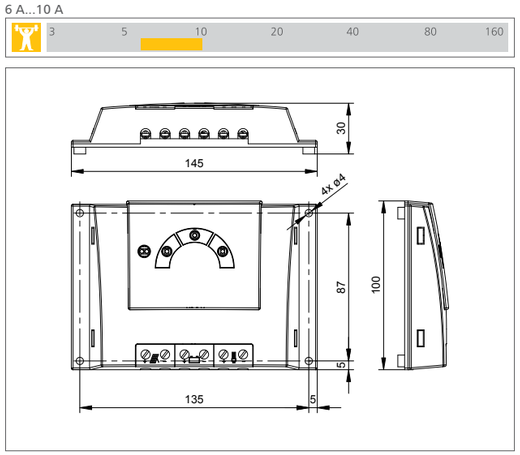
Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load, module and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
-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

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

Options
- 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
- Developed in Germany
- Manufactured according to ISO 9001 and ISO 14001

6 A...10 A



	6.6F	8.8F	10.10F
Characterisation of the operating performance			
System voltage	12 V (24 V)		
Own consumption	< 4 mA		
DC input side			
Open circuit voltage solar module	< 47 V		
Module current	6 A	8 A	10 A
DC output side			
Load current	6 A	8 A	10 A
End of charge voltage	13.9 V (27.8 V)		
Boost charge voltage	14.4 V (28.8 V)		
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)		
Operating conditions			
Ambient temperature	-25 °C ... +50 °C		
Fitting and construction			
Terminal (fine / single wire)	4 mm² / 6 mm² - AWG 12 / 9		
Degree of protection	IP 32		
Dimensions (X x Y x Z)	145 x 100 x 30 mm		
Weight	approx. 150 g		

Technical data at 25 °C / 77 °F

Steca PA RC100
Remote control
(page 35)

Areas of application:

Steca Solarix PRS

PRS 1010, PRS 1515, PRS 2020, PRS 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 emulate a tank display, which gives 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.

BASIC

Product features
- Series controller
- Automatic detection of voltage
- Voltage and current regulation
- PWM control
- Multistage charging technology
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Common positive grounding or negative grounding on one terminal
- Integrated self test
- Monthly maintenance charge

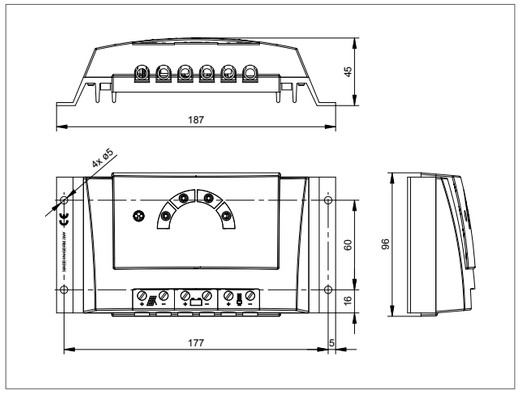
Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load, module and battery
- Automatic electronic fuse
- Short circuit protection of load and module
- Overvoltage protection at module input
- Open circuit protection without battery
-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

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

Options
- 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 Germany
- Developed in Germany
- Manufactured according to ISO 9001 and ISO 14001

10 A...30 A



	PRS 1010	PRS 1515	PRS 2020	PRS 3030
Characterisation of the operating performance				
System voltage	12 V (24 V)			
Own consumption	< 4 mA			
DC input side				
Open circuit voltage solar module	< 47 V			
Module current	10 A	15 A	20 A	30 A
DC output side				
Battery voltage	9 V ... 17 V (17.1 V ... 34 V)			
Load current	10 A	15 A	20 A	30 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)			
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)			
Operating conditions				
Ambient temperature	-25 °C ... +50 °C			
Fitting and construction				
Terminal (fine / single wire)	16 mm² / 25 mm² - AWG 6 / 4			
Degree of protection	IP 32			
Dimensions (X x Y x Z)	187 x 96 x 45 mm			
Weight	345 g			

Technical data at 25 °C / 77 °F

Steca PA RC100
Remote control
(page 35)

Areas of application:

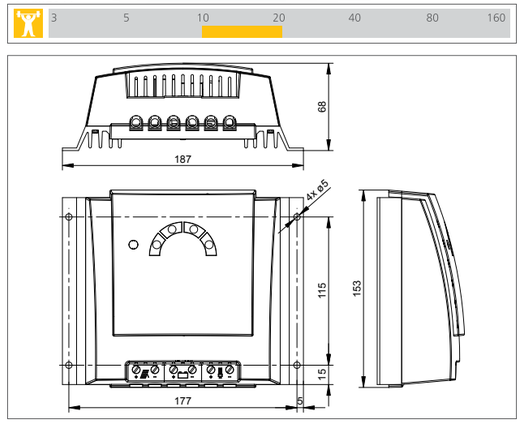
Steca Solarix MPPT

MPPT 1010, MPPT 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.

BASIC

10 A...20 A



Product features
- Maximum Power Point Tracker (MPP tracker)
- Voltage and current regulation
- PWM control
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Monthly maintenance charge

Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load, module 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
- Battery overvoltage shutdown

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

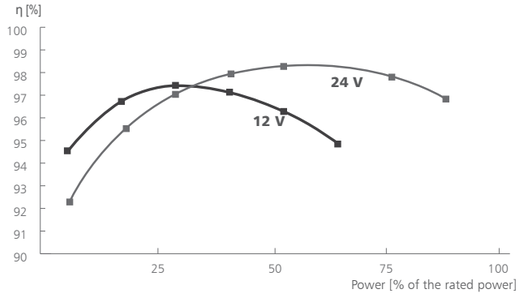
Options
- Night light function pre-set in the factory or adjustable via Steca PA RC 100
- Parameterisation of function values via Steca PA RC 100
- External temperature sensor

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

	MPPT 1010	MPPT 2010
Characterisation of the operating performance		
System voltage	12 V (24 V)	
Nominal power	125 W (250 W)	250 W (500 W)
Max. efficiency	> 98 %	
Own consumption	10 mA	
DC input side		
MPP voltage	15 V (30 V) < V_{module} < 75 V	15 V (30 V) < V_{module} << 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
DC output side		
Charge current	10 A	20 A
Load current	10 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)	
Reconnection voltage (LVR)*	12.5 V (25 V)	
Deep discharge protection (LVD)*	11.5 V (23 V)	
Operating conditions		
Ambient temperature	-25 °C ... +40 °C	
Fitting and construction		
Terminal (fine / single wire)	16 mm² / 25 mm² - AWG 6 / 4	
Degree of protection	IP 32	
Dimensions (X x Y x Z)	187 x 153 x 68 mm	
Weight	approx. 900 g	

* see options — Technical data at 25 °C / 77 °F

**CAUTION: If an open circuit voltage of more than 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 100 V over the entire working temperature range. When using solar modules with a maximum open circuit voltage of between 75 and 100 V (over the entire temperature range), all installation steps must be carried in accordance with protection class II.



Areas of application:

Steca PA TS10
External temperature sensor
(page 31)

Steca PA RC100
Remote control
(page 35)

Steca PR

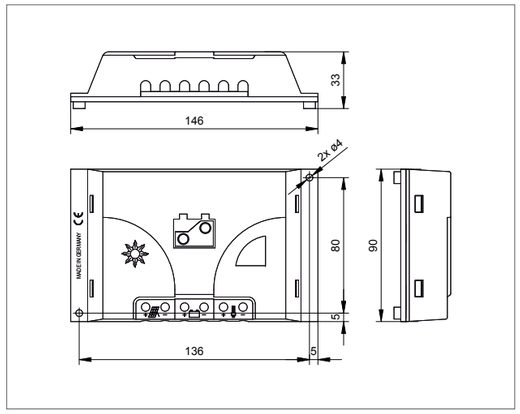
PR 0303, PR 0505

The Steca PR 0303 and PR 0505 solar charge controllers are optimally suited for use in small solar home systems with module currents up to 5 A.

A 75 Wp module can be connected, which easily allows operation of lamps, radios and a small television. All loads can be switched off using the manual load switch on the controller. The extremely low own consumption makes the Steca PR especially suitable for professional applications in telecommunications and traffic management technology. Since this is a serial controller, it is extremely flexible in the type of power source that can be connected. The electronic fuse makes the controller completely maintenance-free and robust.

CLASSIC

3 A...5 A



Product features
- Series controller
- Voltage regulation
- PWM control
- Multistage charging technology
- Current compensated load disconnection
- Automatic load reconnection
- Temperature compensation
- Common positive grounding or negative grounding on one terminal

Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load, module 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
- Battery overvoltage shutdown

Displays
- Multi-coloured LED
- 3 multi-coloured LEDs show operating states
  ~ for operation, state of charge, fault messages

Operation
- Manual load switch

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

	PR 0303	PR 0505
Characterisation of the operating performance		
System voltage	12 V	
Own consumption	3 mA	
DC input side		
Open circuit voltage solar module	< 47 V	
Module current	3 A	5 A
DC output side		
Load current	3 A	5 A
End of charge voltage	13.7 V	
Boost charge voltage	14.4 V	
Reconnection voltage (LVR)	12.5 V	
Deep discharge protection (LVD)	11 V ... 11.5 V	
Operating conditions		
Ambient temperature	-25 °C ... +50 °C	
Fitting and construction		
Terminal (fine / single wire)	6 mm² / 10 mm² - AWG 10 / 8	
Degree of protection	IP 32	
Dimensions (X x Y x Z)	146 x 90 x 33 mm	
Weight	160 g	

Technical data at 25 °C / 77 °F

Areas of application:

Steca PR

PR 1010, PR 1515, PR 2020, PR 3030

The Steca PR 10-30 series of charge controllers is the highlight in the range.

The latest charging technologies, combined with a Steca-AtonIC state of charge determination which has been significantly improved once again, result in optimal battery maintenance and control of the module output of up to 900 Wp which can be connected to it. 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 tank display. 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.

CLASSIC

Product features
- Hybrid controller
- 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
- Common positive grounding or negative grounding on one terminal
- Integrated data logger
- Night light and morning light function
- Integrated self test
- Monthly maintenance charge

Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load, module 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
- Battery overvoltage shutdown

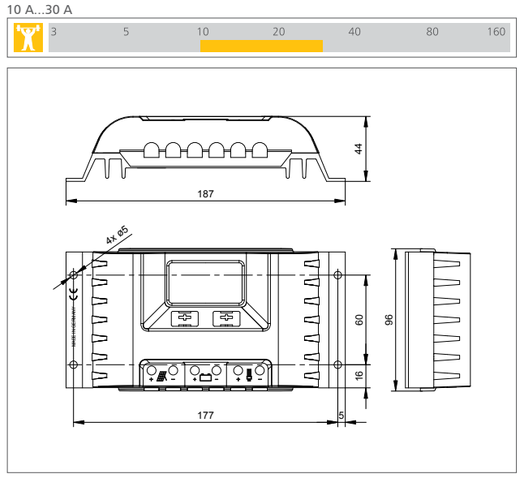
Displays
- Graphical LCD display
  - ~ for operating parameters, fault messages, self test

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

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

Options
- Prepayment interface
- External temperature sensor
- Alarm contact (page 31)

10 A...30 A



	PR 1010	PR 1515	PR 2020	PR 3030
Characterisation of the operating performance				
System voltage	12 V (24 V)			
Own consumption	12.5 mA			
DC input side				
Open circuit voltage solar module	< 47 V			
Module current	10 A	15 A	20 A	30 A
DC output side				
Load current	10 A	15 A	20 A	30 A
End of charge voltage	liquid 13.9 V (27.8 V); gel 14.1 V (28.2 V)			
Boost charge voltage	14.4 V (28.8 V)			
Equalisation charge	14.7 V (29.4 V)			
Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)			
Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)			
Operating conditions				
Ambient temperature	-10 °C … +50 °C			
Fitting and construction				
Terminal (fine / single wire)	16 mm² / 25 mm² - AWG 6 / 4			
Degree of protection	IP 32			
Dimensions (X x Y x Z)	187 x 96 x 44 mm			
Weight	350 g			

Technical data at 25 °C / 77 °F

Steca PA TS10
External temperature sensor
(page 31)

Areas of application:

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 graphically in the form of a tank. The key component of the charge controller is the state of charge determination, which has been significantly improved. The auto-adaptive state of charge algorithm results in optimal battery maintenance and control over the module output of up to 480 Wp which can be connected to it. The Steca PR 2020 IP has been specially designed for operation in difficult environments with high salt, moisture and dust content.

CLASSIC

Product features
- Hybrid controller
- 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
- Common positive grounding or negative grounding on one terminal
- Integrated data logger
- Night light and morning light function
- Integrated self test
- Monthly maintenance charge
- Integrated energy meter

Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load, module 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
- Battery overvoltage shutdown

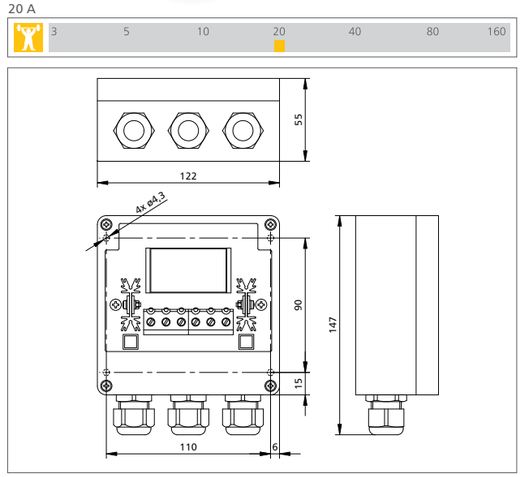
Displays
- Graphical LCD display
  - ~ for operating parameters, fault messages, self test

Operation
- Programming by buttons
- Manual load switch

Options
- External temperature sensor (page 31)
- Alarm contact* (page 31)

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

20 A



	PR 2020-IP
Characterisation of the operating performance	
System voltage	12 V (24 V)
Own consumption	12 mA
DC input side	
Open circuit voltage solar module	< 47 V
Module current	20 A
DC output side	
Load current	20 A
End of charge voltage	liquid 13.9 V (27.8 V); gel 14.1 V (28.2 V)
Boost charge voltage	14.4 V (28.8 V)
Equalisation charge	14.7 V (29.4 V)
Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)
Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)
Operating conditions	
Ambient temperature	-10 °C … +50 °C
Fitting and construction	
Terminal (fine / single wire)	16 mm² / 25 mm² - AWG 6 / 4
Degree of protection	IP 65
Dimensions (X x Y x Z)	122 x 147 x 55 mm
Weight	350 g

Technical data at 25 °C / 77 °F

*special version, if the alarm option is needed, this needs to be mentioned on the purchase order.

Areas of application:

Steca Tarom (new Generation)

245, 445

The new design for the Steca Tarom sets new standards in this power class. A graphic display informs the user about all important system data and enables configuration and adjustment of the controller to the specific requirements of the individual system.

Numerous clever functions allow the user to adjust the controller to the particular features of the system in question. 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 best choice for system sizes of up to 2,400 Wp at three voltage levels (12 V, 24 V, 48 V).

The integrated data logger stores all important system data which can be read via an open Steca RS232 interface. As an option, an external temperature sensor can also be connected.

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

ADVANCED

Product features
- Hybrid controller
- 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
- Common positive grounding or negative grounding on one terminal
- Integrated data logger
- Night light function with Steca PA 15
- Integrated self test
- Monthly maintenance charge
- Integrated energy meter
- Two configurable multifunctional contacts

Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load and module
- Reverse polarity protection by internal fuse
- Automatic electronic fuse
- Short circuit protection of load and module
- Open circuit protection without battery
- Reverse current protection at night
- Overtemperature and overload protection
- Battery overvoltage shutdown

Displays
- Multifunction graphical LCD display with backlighting
  ~ for operating parameters, fault messages, self test

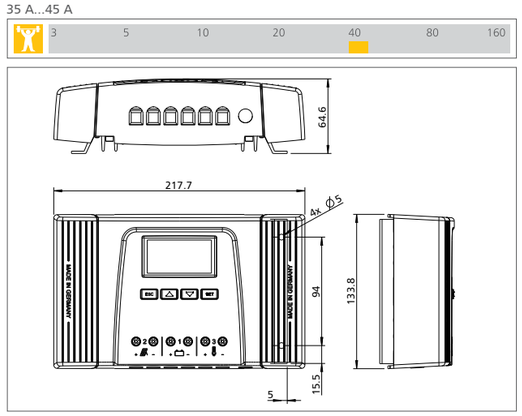
Operation
- Simple menu-driven operation
- Programming by buttons
- Manual load switch

Interfaces
- Steca RS485 bus
- Open Steca RS232 interface

Options
- External temperature sensor
- Alarm contact (page 31)

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

35 A...45 A



	245	445
Characterisation of the operating performance		
System voltage	12 V (24 V)	48 V
Own consumption	20 mA	
DC input side		
Module current	45 A	
DC output side		
End of charge voltage	45 A	
programmable: Boost charge voltage	13.7 V (27.4 V)	54.8 V
programmable: Equalisation charge	14.4 V (28,8 V)	57.6 V
programmable: Reconnection voltage (SOC / LVR)	14.7 V (29.4 V)	58.8 V
programmable: Deep discharge protection (SOC / LVD)	> 50 % / 12.6 V (25.2 V)	> 50 % / 50.4 V
programmable: Deep discharge protection (SOC / LVD)	< 30 % / 11,1 V (22.2 V)	< 30 % / 44.4 V
Operating conditions		
Ambient temperature	-10 °C … +60 °C	
Fitting and construction		
Terminal (fine / single wire)	25 mm² / 35 mm² - 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

Steca PA TSK10
External temperature sensor
(page 31)

Areas of application:

Steca Tarom

235, 245, 440

The Steca Tarom is a solar charge controller specifically designed for use in telecommunications applications or in hybrid photovoltaic systems.

Numerous clever functions allow the user to adjust the controller to the particular features of the system in question. Thanks to the significantly improved state of charge determination, the system is optimally controlled and batteries are protected. The Steca Tarom charge controller is the best choice for system sizes of up to 2,400 Wp at three voltage levels (12 V, 24 V, 48 V).

There is the option of connecting additional devices such as a temperature sensor, a data logger and a remote control for configuring and monitoring the system. An integrated Ah meter also provides the user with information on the energy budget of the application.

ADVANCED

Product features
- Hybrid controller
- 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
- Common positive grounding or negative grounding on one terminal
- Integrated data logger
- Night light function with Steca PA 15
- Integrated self test
- Monthly maintenance charge
- Integrated energy meter

Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load and module
- 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
- Battery overvoltage shutdown

Displays
- Text LCD display
  ~ for operating parameters, fault messages, self test

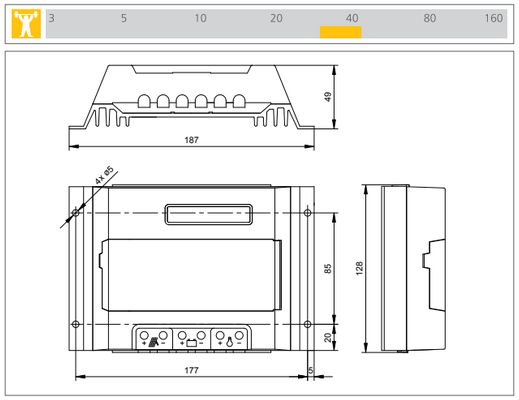
Operation
- Simple menu-driven operation
- Programming by buttons
- Manual load switch

Interfaces
- RJ45 interface

Options
- External temperature sensor
- Alarm contact
- System monitoring via a Steca CAB1 Tarcom

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

35 A...45 A



	235	245	440
Characterisation of the operating performance			
System voltage	12 V (24 V)		48 V
Own consumption	14 mA		
DC input side			
Module current	35 A	45 A	40 A
DC output side			
Load current	35 A	45 A	40 A
programmable: End of charge voltage	13.7 V (27.4 V)		54.8 V
programmable: Boost charge voltage	14.4 V (28.8 V)		57.6 V
programmable: Equalisation charge	14.7 V (29.4 V)		58.8 V
programmable: Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)		> 50 % / 50.4 V
programmable: Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)		< 30 % / 44.4 V
Operating conditions			
Ambient temperature	-10 °C … +60 °C		
Fitting and construction			
Terminal (fine / single wire)	16 mm² / 25 mm² - AWG 6 / 4		
Degree of protection	IP 32		
Dimensions (X x Y x Z)	187 x 128 x 49 mm		
Weight	550 g		

Technical data at 25 °C / 77 °F

Steca PA Tarcom data logger and Steca PA CAB1 Tarcom data cable
(page 32 and 37)

Steca PA HS200
Shunt
(page 33)

Steca PA 15
Remote control
(page 36)

Steca PA TSK10
External temperature sensor
(page 31)

Areas of application:

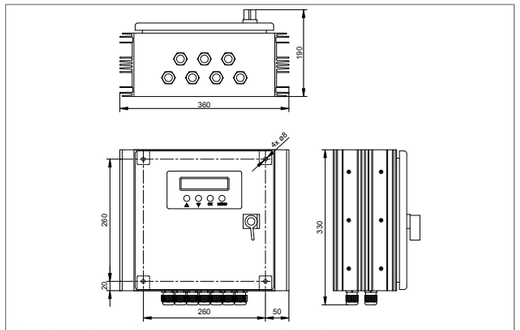
Steca Power Tarom

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 can be used to control system sizes of up to 8,400 Wp 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 a hybrid system. This allows an output of over 20 kWp to be reached.

55 A...140 A



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

Product features
- Hybrid controller
- 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
- Common positive grounding or negative grounding on one terminal
- Integrated data logger
- Night light function with Steca PA 15
- Integrated self test
- Monthly maintenance charge
- Integrated energy meter

Electronic protection functions
- Overcharge protection
- Deep discharge protection
- Reverse polarity protection of load, module 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
- Battery overvoltage shutdown

Displays
- Text LCD display
  ~ for operating parameters, fault messages, self test

Operation
- Simple menu-driven operation
- Programming by buttons
- Manual load switch
- Interfaces
- RJ45 interface

Options
- External temperature sensor (included)
- Alarm contact (page 31)
- System monitoring via a Steca PA CAB1 Tarcom (page 37)

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
- Developed in Germany
- Manufactured according to ISO 9001 and ISO 14001

	2070	2140	4055	4110	4140
Characterisation of the operating performance					
System voltage	12 V (24 V)		48 V		
Own consumption	14 mA				
DC input side					
Open circuit voltage solar module	< 50 V		< 100 V		
Module current	70 A	140 A	55 A	110 A	140 A
DC output side					
Load current	70 A	70 A	55 A	55 A	70 A
programmable: End of charge voltage	13.7 V (27.4 V)		54.8 V		
programmable: Boost charge voltage	14.4 V (28.8 V)		57.6 V		
programmable: Equalisation charge	14.7 V (29.4 V)		58.8 V		
programmable: Reconnection voltage (SOC / LVR)	> 50 % / 12.6 V (25.2 V)		> 50 % / 50.4 V		
programmable: Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)		< 30 % / 44.4 V		
Operating conditions					
Ambient temperature	-10 °C … +60 °C				
Fitting and construction					
Terminal (fine / single wire)	50 mm² - AWG 1	95 mm² - AWG 000	50 mm² - AWG 1	70 mm² - AWG 00	95 mm² - 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

Steca PA Tarcom data logger and Steca PA CAB1 Tarcom data cable
(page 32 and 37)

Steca PA HS200
Shunt
(page 33)

Steca PA 15
Remote control
(page 36)

Areas of application:

Steca PLI-300

The Steca PLI-300 is a low-cost 300 W sine wave inverter for supplying small AC appliances. It has a manual on/off switch allowing the inverter to be switched off to reduce own consumption. The device is especially suitable for use in solar home systems where manually switched small AC appliances are occasionally used in addition to the normal DC appliances. The device is supplied with DC cables and has a European AC power socket.

Product features
- True sine wave voltage
- Optimal battery protection
- Protective insulation according to protection class II

Electronic protection functions
- Deep discharge protection
- Battery overvoltage shutdown
- Overtemperature and overload protection
- Short circuit protection on the AC output side

Displays
- 2 LEDs show operating states

Operation
- Main switch

Certificates
- Compliant with European Standards (CE)

300 W

	300
Characterisation of the operating performance	
System voltage	12 V
Continuous power	300 VA
Power 30 min.	300 VA
Power 5 sec.	350 VA
Power asymmetric	250 VA
Max. efficiency	85 %
Own consumption standby / ON	0.5 W / 9 W
DC input side	
Battery voltage	10.5 V … 15 V
Reconnection voltage (LVR)	12.5 V
Deep discharge protection (LVD)	10.5 V
AC output side	
Output voltage	230 V AC +/-10 %
Output frequency	50 Hz
Safety	
Protection class	II (double insulated)
Electrical protection	No reverse polarity protection for the battery, reverse polarity AC, over voltage, over current, over temperature
Operating conditions	
Ambient temperature	-20 °C … +50 °C
Fitting and construction	
AC output side connection	European plug
Cable cross-section battery	4 mm² (AWG 12)
Degree of protection	IP 20
Dimensions (X x Y x Z)	245 x 117 x 62 mm
Weight	1.2 kg

Technical data at 25 °C / 77 °F

Areas of application:

Steca Solarix PI

550, 550-L60, 600, 600-L60, 1100, 1100-L60, 1200, 1200-L60

In developing the Solarix PI sine wave inverter, Steca has brought about some innovations which are unprecedented in this form. These are, above all, parallel connection, the novel operating concept which uses a single rotary switch, direct communication in order to calculate the state of charge (SOC) with Steca Tarom and Steca Power Tarom, and the electronic fuse. Furthermore, our 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.

Product features
- True sine wave voltage
- Can be connected to the Steca Power Tarom with a Steca PAx4 parallel switch box
- 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

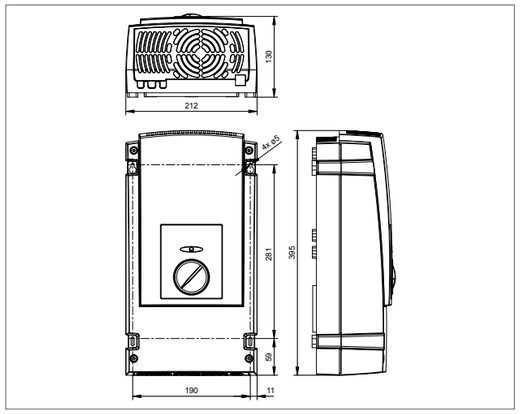
Displays
- Multi-coloured LED shows operating states

Operation
- Main switch
- Adjustable load detection

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

Areas of application:

550 W...4,400 W



	550	550-L60	600	600-L60	1100	1100-L60	1200	1200-L60
Characterisation of the operating performance								
System voltage	12 V		24 V		24 V		48 V	
Continuous power	500 VA				1,000 VA			
Power 30 min.	550 VA				1,110 VA			
Power 5 sec.	1,500 VA				3,000 VA			
Power asymmetric	350 VA				500 VA			
Max. efficiency	93 %				94 %			
Own consumption standby / ON	0.5 W / 6 W				0.7 W / 10 W			
DC input side								
Battery voltage	10.5 V … 16 V		21 V … 32 V		21 V … 32 V		42 V … 64 V	
Reconnection voltage (LVR)	12.5 V		25 V		25 V		50 V	
Deep discharge protection (LVD)	current driven or by Steca Power Tarom							
AC output side								
Output voltage	230 V AC +/-10 %	115 V AC +/-10 %	230 V AC +/-10 %	115 V AC +/-10 %	230 V AC +/-10 %	115 V AC +/-10 %	230 V AC +/-10 %	115 V AC +/-10 %
Output frequency	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Load detection (standby)	adjustable: 2 W … 50 W							
Safety								
Protection class	II (double insulated)							
Electrical protection	reverse polarity battery, reverse polarity AC, over voltage, over current, over temperature							
Operating conditions								
Ambient temperature	-20 °C … +50 °C							
Fitting and construction								
Cable length battery / AC	1.5 m / 1.5 m							
Cable cross-section battery / AC	16 mm² / 1,5 mm²							
Degree of protection	IP 20							
Dimensions (X x Y x Z)	212 x 395 x 130 mm							
Weight	6.6 kg				9 kg			

Technical data at 25 °C / 77 °F

One Steca PI set – All components

Parallel connection made easy

The days of combining individual components to create a parallel connection of sine wave inverters have come to an end: All devices and elements required for the desired power class are now supplied in a single package. One package – and your order is complete!

You can choose from four Steca Solarix PI sets for off-grid systems – with one, two, three or four Steca Solarix PI inverters with outputs of up to 4,400 W. The sets include all the cables required and the Steca PAx4 parallel switch box. The data cable for connecting the appropriate charge controller is also included in the set.

The Steca Solarix PI set greatly simplifies the ordering process. Fully integrated packaged solutions are supplied.

Steca Solarix PI set components:

Steca Solarix PI set:	550	1100	1200	550-L60	1100-L60	1200-L60	Steca PAx4
Steca Solarix PI 1100-12 12 V, 1,100 W, 230 V / 50 Hz	2x						1x
Steca Solarix PI 1600-12 12 V, 1,600 W, 230 V / 50 Hz	3x						1x
Steca Solarix PI 2200-12 12 V, 2,200 W, 230 V / 50 Hz	4x						1x
Steca Solarix PI 2200-24 24 V, 2,200 W, 230 V / 50 Hz		2x					1x
Steca Solarix PI 3300-24 24 V, 3,300 W, 230 V / 50 Hz		3x					1x
Steca Solarix PI 4400-24 24 V, 4,400 W, 230 V / 50 Hz		4x					1x
Steca Solarix PI 2200-48 48 V, 2,200 W, 230 V / 50 Hz			2x				1x
Steca Solarix PI 3300-48 48 V, 3,300 W, 230 V / 50 Hz			3x				1x
Steca Solarix PI 4400-48 48 V, 4,400 W, 230 V / 50 Hz			4x				1x
Steca Solarix PI 1100-12-L60 12 V, 1,100 W, 115 V / 60 Hz				2x			1x
Steca Solarix PI 1600-12-L60 12 V, 1,600 W, 115 V / 60 Hz				3x			1x
Steca Solarix PI 2200-12-L60 12 V, 2,200 W, 115 V / 60 Hz				4x			1x
Steca Solarix PI 2200-24-L60 24 V, 2,200 W, 115 V / 60 Hz					2x		1x
Steca Solarix PI 3300-24-L60 24 V, 3,300 W, 115 V / 60 Hz					3x		1x
Steca Solarix PI 4400-24-L60 24 V, 4,400 W, 115 V / 60 Hz					4x		1x
Steca Solarix PI 2200-48-L60 48 V, 2,200 W, 115 V / 60 Hz						2x	1x
Steca Solarix PI 3300-48-L60 48 V, 3,300 W, 115 V / 60 Hz						3x	1x
Steca Solarix PI 4400-48-L60 48 V, 4,400 W, 115 V / 60 Hz						4x	1x

Steca Solarix PI: flexible and versatile

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 PAx4.

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 PAx4 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.

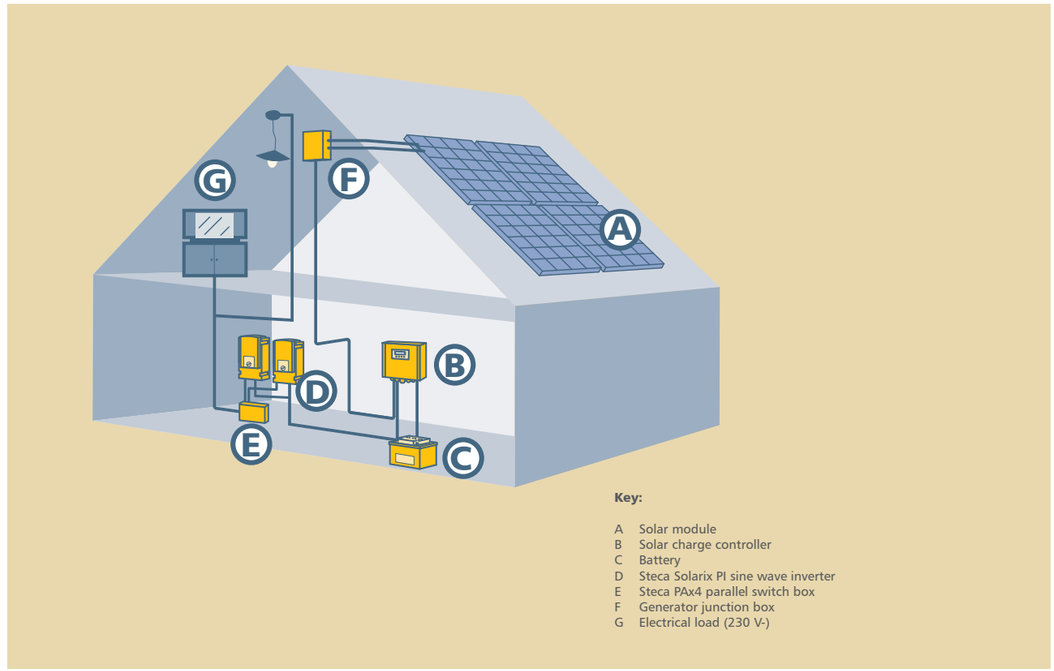
The use of the rotary switch makes it possible to see very quickly which mode of operation the inverter is in.

Electronic fuse
One innovation in sine wave inverters is the electronic fuse as it is employed by Steca in solar charge controllers. With this fuse, the Steca Solarix PI is protected against overloads, and also against the accidental connection of the AC output to the public grid. Because the fuse is electronic, it does not need to be replaced after it has been triggered, as is the case with mechanical fuses. As soon as the problem has been remedied, the inverter automatically reverts back to its selected mode of operation.

The Steca Solarix PI is also internally protected against an incorrect wiring of the battery. In case of reverse polarity, the device remains undamaged, and there is no need to replace the fuse.

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 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.



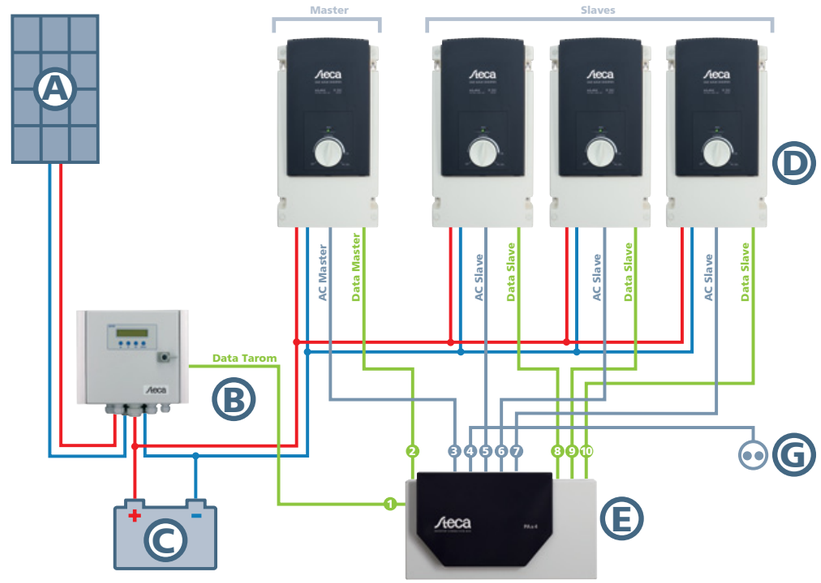
Steca Solarix PI with Steca Power Tarom

Communication with Steca Power Tarom solar charge controllers
A further innovation that has gone into the Steca Solarix PI is the communication with the Steca Steca Power Tarom solar charge controllers. A data connection to the charge controller can be created via the Steca PAx4 parallel switch box.

In this case, the inverter connected directly to the battery communicates the amount of energy that has been withdrawn to the solar charge controller. The controller is thus able to calculate the correct state of charge (SOC).

This means that these systems no longer need to be switched to voltage-controlled operation or an additional current shunt.

If the switch-off threshold of 30 % SOC is reached, the Steca Solarix PI receives a signal from the solar charge controller and subsequently switches itself off in order to protect the battery from deep discharge. It turns itself back on again once the SOC has reached the 50 % mark.



Steca AJ

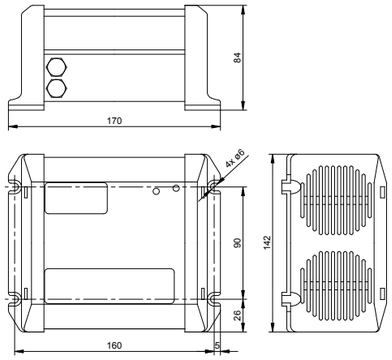
275-12, 350-24, 400-48, 700-48, 1000-12, 2100-12, 2400-24

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.

275 W...2,400 W

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



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
- Terminal for connection of a remote control (On/Off) for the types Steca AJ 275-12 to Steca AJ 700-48
- Remote control JT8 (On/Off, LED) for connection to Steca AJ 1000-12 to Steca AJ 2400-24

Certificates
- Compliant with European Standards (CE)
- RoHS compliant

	275-12	350-24	400-48	700-48	1000-12	2100-12	2400-24
Characterisation of the operating performance							
System voltage	12 V	24 V	48 V	48 V	12 V	12 V	24 V
Continuous power	200 VA	300 VA	300 VA	500 VA	800 VA	2,000 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 %	94 %	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
DC input side							
Battery voltage	10.5 V … 16 V	21 V … 32 V	42 V … 64 V	42 V … 64 V	10.5 V … 16 V	10.5 V … 16 V	21 V … 32 V
AC output side							
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			
Operating conditions							
Ambient temperature	-20 °C … +50 °C						
Fitting and construction							
Cable length battery / AC	1.2 m / 1 m			1.5 m / 1m		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

Areas of application:

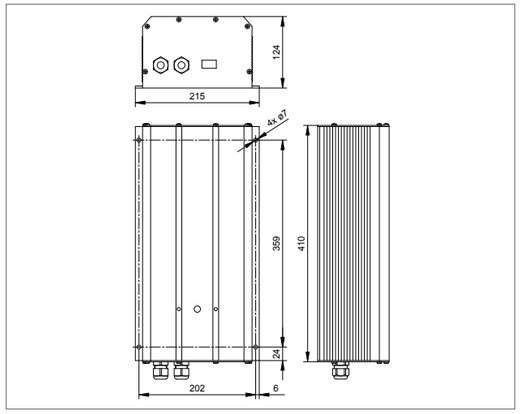
Steca XPC

1400-12, 2200-24, 2200-48

The Steca XPC series of inverters combine a very high overload capacity with the capability to operate highly critical loads.

Other important features of these high-quality inverters are their powerful device protection and their low own consumption. The Steca XPCs combine a sine wave inverter, four-stage battery charger and transfer system in one device, therefore making them also suitable for hybrid systems. The built-in multifunctional contact enables you, for example, to switch on and off diversion loads for excess power or start a diesel generator to recharge batteries.

1,400 W...2,200 W



Product features
- True sine wave voltage
- Excellent overload capabilities
- Optimal battery protection
- Adjustable integrated battery charger
- Automatic load detection
- Best reliability
- Can be used as a back-up system or uninterruptible power supply (UPS)
- Multifunction contact
- Ultra-fast transfer relay

Electronic protection functions
- Deep discharge protection
- Battery overvoltage shutdown
- Overtemperature and overload protection
- Short circuit protection
- Reverse polarity protection by internal fuse
- Acoustic alarm at deep discharge or overheating

Displays
- 7 LEDs show operating states
  ~ for operation, fault messages

Operation
- Main switch
- Adjustable load detection
- Programming by buttons

Options
- Type with 230 V / 60 Hz
- Type with 115 V / 60 Hz
- Model with protective lacquered mainboard
- Protection cover C-IP23 to raise the degree of protection
- Remote control RCC-01
- CFC-01 cable entry for strain relief and protection of connections
- Temperature sensor CT35 to correct the voltage thresholds according to the current battery temperature

Certificates
- Compliant with European Standards (CE)
- RoHS compliant

	1400-12	2200-24	2200-48
Characterisation of the operating performance			
System voltage	12 V	24 V	48 V
Continuous power	1,100 VA	1,600 VA	1,600 VA
Power 30 min.	1,400 VA	2,200 VA	2,200 VA
Power 5 sec.	3,300 VA	4,800 VA	4,800 VA
Max. efficiency	94 %	95 %	95 %
Own consumption standby / ON	0.6 W / 4 W	0.9 W / 7 W	1.3 W / 7 W
Input side			
Input voltage	adjustable: 150 V AC … 230 V AC		
Charging current adjustable	0 A … 45 A	0 A … 37 A	0 A … 20 A
Max. current on transfer system	16 A		
Switching time transfer relay	< 40 ms		
Battery side			
Battery voltage	9.5 V … 16 V	19 V … 32 V	38 V … 64 V
Battery monitoring	LVD, HVD, floating and equalisation voltage adjustable by user via optional remote control RCC-01		
AC output side			
Output voltage	230 V AC +0 / -10 % (true sine wave)		
Output frequency	50 Hz +/-0.05 % (crystal controlled)		
Load detection (standby)	adjustable: 1 W … 25 W		
Operating conditions			
Ambient temperature	-20 °C … +55 °C		
Fitting and construction			
Cable length battery	165 cm		
Degree of protection	IP 20 / with optional top cover: IP 22		
Dimensions (X x Y x Z)	215 x 410 x 124 mm		
Weight	11.7 kg	12.6 kg	

Technical data at 25 °C / 77 °F

Areas of application:

Steca Xtender XTS, XTM and XTH

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

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.

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
  ~ for operation, fault messages

Operation
- Main switch
- Adjustable load detection

Options
- Type with 115 V / 60 Hz (except Steca Xtender XTH 8000-48)
- Model with protective lacquered mainboard
- Temperature sensor BTS-01 to correct the voltage thresholds according to the current battery temperature

Certificates
- Compliant with European Standards (CE)
- RoHS compliant

Areas of application:


Steca Xtender XTS


Steca Xtender XTM

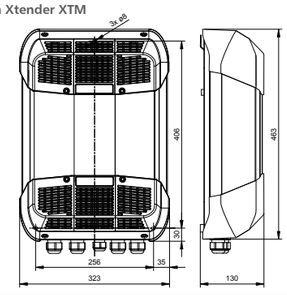

Steca Xtender XTH

3,000 W...72,000 W

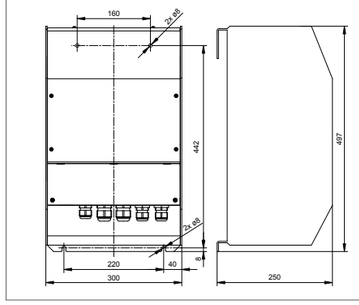
Multifunction contacts
These potential-free contacts can be programmed for many different applications. They can react to any event outside or inside of the inverter (grid availability, battery voltage, fault message ...) They can also be programmed on a timer or can be switched on during particular 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 land 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.

Steca Xtender XTM



Steca Xtender XTH



	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
Characterisation of the operating performance													
System voltage	12 V	24 V	48 V	12 V	12 V	24 V	24 V	48 V	48 V	12 V	24 V	48 V	48 V
Continuous power	500 VA / 650 VA*	650 VA / 800 VA*	750 VA / 900 VA*	1,500 VA	2,000 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*	1,000 VA / 1,200 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
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 %	93 %	93 %	93 %	93 %	94 %	94 %	96 %	96 %	93 %	94 %	96 %	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)												
Input side													
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									
Input frequency	45 Hz … 65 Hz												
Battery side													
Battery voltage	9.5 V … 17 V	19 V … 34 V	38 V … 68 V	9.5 V … 17 V	9.5 V … 17 V	19 V … 34 V	19 V … 34 V	38 V … 68 V	38 V … 68 V	9.5 V … 17 V	19 V … 34 V	38 V … 68 V	38 V … 68 V
AC output side													
Output voltage	230 V AC +/-2 % / 190 V AC … 245 V AC (true sine wave)												
Output frequency	50 Hz, adjustable: 45 Hz … 65 Hz +/-0.05 % (crystal controlled)												
Total harmonic distortion	< 2 %												
Load detection (standby)	2 W … 25 W												
Operating conditions													
Ambient temperature	-20 °C … +55 °C												
Fitting and construction													
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)	210 x 310 x 110 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	-			fan from 55 °C									
Parallel connection possible	3 x 1 phase and three-phase												

Technical data at 25 °C / 77 °F

*Steca Xtender XTS in conjunction with ECF-01
**Steca Xtender XTS in conjunction with TCM-01

Steca RCC-02
Remote control and display (incl. 2 m cable)
Suitable for wall-mounting.
(see page 34)

Steca X-Connect system
Prewired mounting structure
for devices from the Steca Xtender XTH series.

Not illustrated:

Steca RCC-03
Remote control and display (incl. 2 m cable)
Suitable for rack installation.

Steca BTS-01
Battery temperature sensor (incl. 5 m cable)
This sensor allows the battery voltages to be adjusted to the battery temperature.

Communications cable
Connection to the three-phase system or to the parallel connection CAB-RJ45-2 (2 m)
This is used to connect several inverters together to a three-phase system or a system connected in parallel.

ECF-01
Integrated cooling unit
for devices from the Steca Xtender XTS series.

TCM-01
Time and communication module
for devices from the Steca Xtender XTS series.

Steca Solsum VC

Voltage converter

When appliances such as cassette recorders or radios which are designed to use dry batteries are connected to 12 V or 24 V batteries, they normally require a lower voltage than that supplied by the system battery.

These appliances can be powered using the Steca Solsum VC adjustable voltage converter. The Solsum VC is also suitable for operating a 12-V appliance with a 24-V battery. The maximum output current for doing so is 1.5 A. When developing this converter, the greatest value was placed in safety and reliability. Five programmed output voltages enable universal usage.

Product features
- Wide input voltage range
- Low own consumption
- Screw terminals allow universal and rapid installation

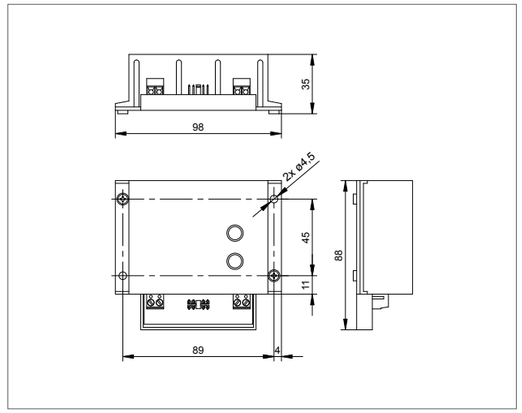
Electronic protection functions
- Overtemperature and overload protection
- Reverse polarity protection
- Short circuit protection

Displays
- 2 multi-coloured LEDs show operating states
  ~ for operation and polarity

Operation
- Configuration by jumpers

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

10 W...18 W



	VC
Characterisation of the operating performance	
System voltage	12 V (24 V)
Own consumption	2 mA (Ue = 12 V)
DC input side	
Input voltage[1)]	5 V … 30 V
DC output side	
Output voltage	3 V; 6 V; 7.5 V; 9 V; 12 V
Output current[2)]	< 1,500 mA
Fitting and construction	
Terminal (fine / single wire)	1.5 mm² / 2.5 mm² - AWG 16 / 14
Dimensions (X x Y x Z)	98 x 88 x 35 mm
Weight	50 g

Technical data at 25 °C / 77 °F

Determining the output current					
Output current	3 V	6 V	7.5 V	9 V	12 V
System voltage 12 V	1,000 mA	1,500 mA	1,500 mA	1,500 mA	1,500 mA[1)]
System voltage 24 V	400 mA	500 mA	500 mA	600 mA	700 mA

[1)] The input voltage has to be at least 2 V higher than the output voltage.
[2)] The max. current depends on the input and output voltage.

Areas of application:

Steca MDC / MDCI

DC-DC-voltage converters

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 Steca MDC and MDCI voltage converters are designed for use in photovoltaic systems. The models with an output voltage of 13.6 V can also be used as battery chargers for a 12-V battery in a 24-V system.

For safety reasons, the Steca MDCI series is electrically insulated to protect the user. Both the Steca 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.

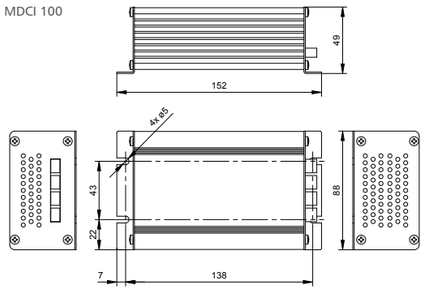
Product features
- High efficiency
- Automatic detection of voltage
- Wide input voltage range
- Best reliability

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

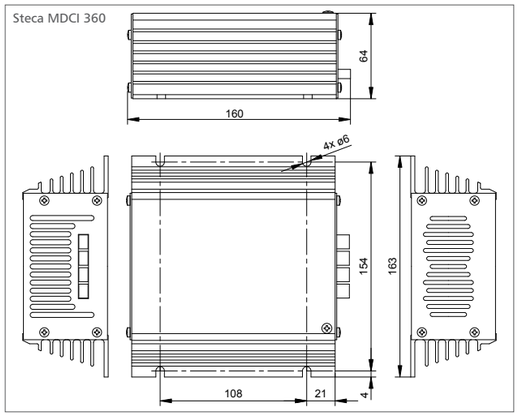
Certificates
- Compliant with European Standards (CE)

70 W...360 W

Steca MDCI 100



Steca MDCI 360



	MDC						MDCI		
	2412-5	2412-8	2412-12	2412-20	2412-30	1224-7	100	200	360
Characterisation of the operating performance									
Nominal power	65 W	105 W	160 W	275 W	415 W	170 W	100 W	200 W	360 W
Max. efficiency	90 %						85 %		
DC input side									
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		
DC output side									
Output voltage	13.2 V			13.8 V		24 V	12.5 V / 24 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
Operating conditions									
Ambient temperature	-20 °C … +40 °C						-20 °C … +45 °C		
Fitting and construction									
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

Areas of application:

Steca PF 166 and Steca PF 240

Solar refrigerator/freezer

The Steca PF 166 and Steca PF 240 are the most efficient DC energy-saving refrigerators ever to be developed. They can be used as either a refrigerator or a freezer.

The Steca PF 166 and Steca PF 240 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. Thanks to the latest A^{+++} energy efficiency class, together with optimal electronic control and an RPM control of the compressor, it is possible to ensure that the energy is used extremely efficiently. 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 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. This maintenance-free appliance can work with an input voltage of either 12 V or 24 V.

Steca PF 240

Steca PF 166

Product features
- A^{+++} energy efficiency class
- Fast cooling due to compressor speed control
- Freezer runs on a 70 W 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
- Auto-dimming for reduction of own consumption

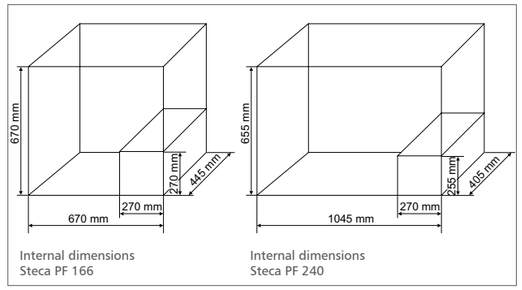
Electronic protection functions
- Reverse polarity protection
- Deep discharge protection
- Power breakdown display
- Temperature alarm

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)
- Developed in Germany
- Manufactured according to ISO 9001 and ISO 14001

40 W...100 W



Internal dimensions Steca PF 166

Internal dimensions Steca PF 240

	PF 166	PF 240
Certificates		
Energy efficiency class	A^{+++} [Steca PF 240 as freezer: A^{++}]	
Characterisation of the operating performance		
System voltage	12 V (24 V)	
Nominal power	40 W … 100 W	
Cooling volume	166 litres	240 litres
Refrigerator temperature	+2 °C … +12 °C	
Freezer temperature	-20 °C … -10 °C	
DC input side		
Input voltage	10 V … 17 V (17 V … 31.5 V)	
DC output side		
Reconnection voltage (LVR)	11.7 V (24.2 V)	
Deep discharge protection (LVD)	10.4 V (22.8 V)	
Operating conditions		
Ambient temperature	+10 °C … +43 °C	
Fitting and construction		
Dimensions (X x Y x Z)	917 x 872 x 709 mm	1,288 x 919 x 760 mm
Weight	47 kg	62 kg
Cooling principle	compressor	
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 Steca PF 166 [Wh / day]					
Ambient temperature	20 °C	25 °C	30 °C	35 °C	40 °C
Interior temperature +8 °C	44	72	109	156	216
Interior temperature +3 °C	72	109	156	216	291
Interior temperature -10 °C	190	259	346	454	589
Interior temperature -20 °C	346	454	589	756	946
Consumption Steca PF 240 [Wh / day]					
Ambient temperature	20 °C	25 °C	30 °C	35 °C	40 °C
Interior temperature +8 °C	49	82	125	183	256
Interior temperature +3 °C	82	125	183	256	351
Interior temperature -10 °C	225	311	421	561	739
Interior temperature -20 °C	421	561	739	964	1,246

Areas of application:

Steca Solsum ESL

5 W, 7 W, 11 W / 12 V energy-saving lights

The electronics of these 12 V DC energy-saving compact fluorescent lamps (CFLs) was developed by Steca and continuously improved.

Preheating, a high electronic efficiency and low thermal losses increase the service life of these CFLs to about 100,000 switch cycles. The Steca energy-saving lights feature a much higher efficiency (lm/W) than LEDs or incandescent bulbs.

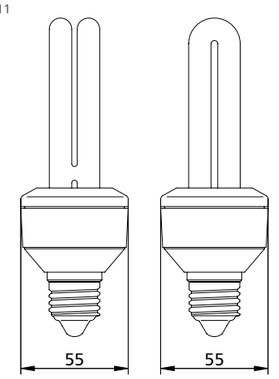
Product features
- Brightness of 11 W CFL is comparable with a 60 W incandescent bulb
- Saves up to 80 % of energy compared to an incandescent bulb
- Greatest switch cycle stability
- Best reliability
- Easy to install by a E27 or bayonet socket
- Compact and robust product design

Electronic protection functions
- Reverse polarity protection

Certificates
- Approved by the World Bank for China and Sri Lanka
- Compliant with European Standards (CE)
- Developed in Germany
- Manufactured according to ISO 9001 and ISO 14001

5 W...11 W

Steca ESL 7, ESL 11



	ESL 5	ESL 7	ESL 11
Characterisation of the operating performance			
Nominal voltage	12 V		
Nominal power	5 W	7 W	11 W
Rated current	420 mA	580 mA	920 mA
Luminus flux	250 lm	370 lm	650 lm
Luminus efficiency	50 lm / W	52 lm / W	60 lm / W
Life span	> 9,000 h		
Switching cycles	100,000		
DC input side			
Input voltage	10 V … 15 V		
Operating conditions			
Ambient temperature	-20 °C … +50 °C		
Fitting and construction			
Dimensions (X x Y x Z)	123 x 55 mm	133 x 55 mm	163 x 55 mm
Weight	125 g		135 g
Socket	E27 / bayonet		
Light colour	cool white (6,400K) / warm white (2,700K)		

Technical data at 25 °C / 77 °F

Areas of application:

Steca ULED

ULED 11, ULED 3, ULED 5

Steca ULEDs are compact LEDs for 12 V DC applications The stable glass-ceramic housing means that it can even be used in critical environments. These are an optimum solution for use in remote locations due to their very long service life that makes replacement seldom necessary.

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

1.1 W...5 W

	ULED 11	ULED 3	ULED 5
Characterisation of the operating performance			
Nominal voltage	12 V		
Nominal power	1.1 W	3 W	5 W
Rated current	92 mA	250 mA	400 mA
Luminus flux	45 lm	120 lm ... 150 lm	200 lm
Luminus efficiency	42 lm / W	40 lm / W ... 50 lm / W	40 lm / W
Life span	> 30,000 h		> 25,000 h
DC input side			
Input voltage	10.5 V ... 14.5 V		10.5 V ... 14 V
Operating conditions			
Ambient temperature	-30 °C ... +60 °C	-20 °C ... +40 °C	-30 °C ... +40 °C
Fitting and construction			
Dimensions (X x Y x Z)	75 x 50 mm	50 x 50 mm	
Weight	70 g	40 g	83 g
Socket	E27	GU5.3.	GU5.3.
Light colour	warm white (3,300 K)	cold white (6,400 K)	

Technical data at 25 °C / 77 °F

Light sockets

A range of different light sockets are available for Steca Solsum ESL and Steca ULED lights. Both the standard E27 base and GU4/5.3 mounts are available. These are supplied with an 20 cm cable for connection to the solar charge controller output.

The Steca light sockets allow quick and easy installation of all Steca lights.

Areas of application:

GU4/5.3 mount for Steca ULED 3 (large retaining spring) and Steca ULED 5 (small retaining spring)

E27 base for Steca Solsum ESL and Steca ULED 11

Options for Steca solar charge controllers

Accessories for Steca PR 10-30, Steca Solarix MPPT, Steca PR 2020 IP and Steca Tarom

Steca PA TS10, Steca PA TSIP10 and Steca PA TSK10

External temperature sensors

The Steca PA TS10, Steca PA TSIP10 and Steca PA TSK10 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 Steca PA TS10, Steca PA TSIP10 and Steca PA TSK10 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, Steca PA TSIP10 and Steca PA TSK10 are supplied with a plug for connection to the solar charge controller and ring eyelets for connection to the battery screw.

The external temperature sensors are suitable for use with Steca PR 10-30, Steca Solarix MPPT, Steca PR 2020 IP and Steca Tarom solar charge controllers.

Product features
- Low weight
- Very long lifetime
- Simple installation
- Maintenance-free
- Low own consumption
- Best reliability

Certificates
- Compliant with European Standards (CE)
- RoHS compliant

	PA TS10 / PA TSK10	PA TSIP10
Characterisation of the operating performance		
Measurement accuracy	+/-5 %	
Operating conditions		
Ambient temperature	-25 °C ... +125 °C	
Fitting and construction		
Battery connection	ring eyelet Ø 10 mm	
Charge controller connection	plug	twice a 2-pole luster terminal
Cable	3.75 m	without cable
Degree of protection	IP 22	
Weight	95 g	30 g

Technical data at 25 °C / 77 °F

Solar charge controller	Type	Connection
Steca PR 10-30 Steca Solarix MPPT	Steca PA TS10	spring connector strip
Steca PR 2020 IP	Steca PA TSIP10	twice a 2-pole luster terminal
Steca Tarom	Steca PA TSK10	RJ45

Optional alarm contact

Steca solar charge controllers provide alarm contacts which allow to process this information in any other application. In case of an alarm such as low battery voltage, over temperature, overvoltage or other alarms a signal is processed which can be used for any purpose. The alarm codes are different among the Steca solar charge controllers. Each controller has its own alarm code table. In case an alarm is active either a 5 V signal to ground is active on the alarm contact or a galvanic isolated switch is closed. As soon as the alarm is no longer active the signal goes back to 0 V. The following table provides an overview on the available alarm options for Steca solar charge controllers.

Steca solar charge controller	Signal	Dry contact	Additional electronics necessary
Steca PR 10-30	0 V / 5 V	no	yes, for: - signal processing - galvanic isolation
Steca PR 2020 IP	switch contact max. 50 V / 100 mA	yes	no
Steca Tarom	0 V / 5 V	no	yes, for: - signal processing - galvanic isolation
Steca Power Tarom	switch contact max. 50 V / 100 mA	yes	no

Steca PA Tarcom

Accessories for Steca Power Tarom

Data logger

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

The data logger is available in several different versions: as a simple RS232 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.

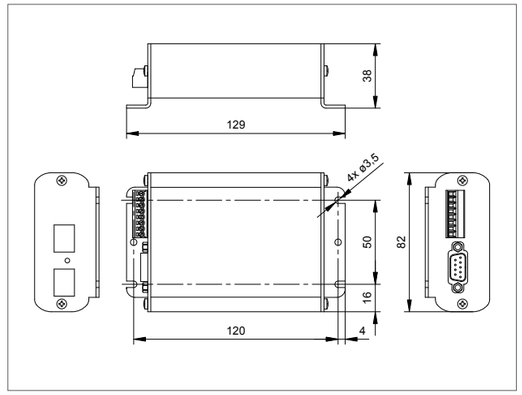
Product features
- 4 years maximum storage capacity (1 Mbit)
- Adjustable logging intervals
- Stores 8 data sets at programmed intervals
- Freely programmable alarm states

Displays
- LED shows operating states

Interfaces
- RJ45 communication interface to Steca Power Tarom
- RS232 serial interface to PC
- Analogue sensor input e.g. for radiation or wind speed
- Alarm contact

Tarcom software
- Data transfer by modem or by text message
- Downloads data from the logger to a PC
- List of data sets can be exported to MS-EXCEL
- Graphic visualisation of data sets (values/time)
- Analyzes energy flows (Ah) within a PV hybrid system
- Activation and selection of alarm types
- Setting the interval for calls and for sending text messages
- Configures the telephone number and text message recipient
- Tells the data logger at what time it has to call
- Alarms can be set by text message

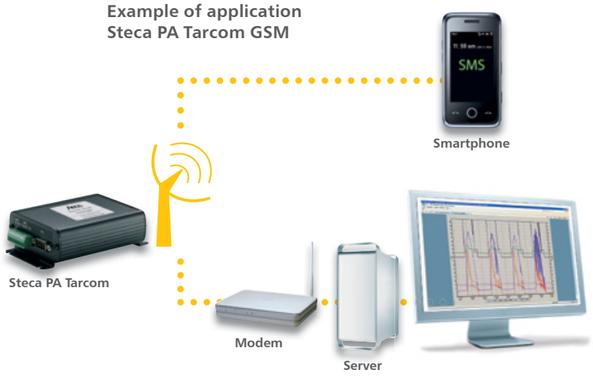
Certificates
- Compliant with European Standards (CE)
- Made in Germany
- Developed in Germany



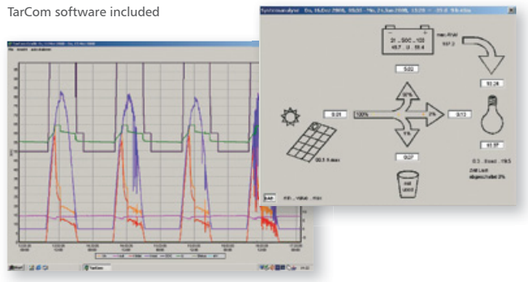
	01	RMT	GSM	Ethernet
Characterisation of the operating performance				
System voltage	12 V / 24 V / 48 V			
Logger capacity	1 Mbit = 2 min. (11 days) ➞ 4 h (4 years)			
Own consumption	< 10 mA			30 mA
Recorded values	relative time, total charge current, battery current, solar module current, load current, SOC, battery voltage, system status, analog sensor			
System status information	night, overload, load disconnect, overvoltage, low voltage, over temperature, no module			
DC output side				
Battery voltage	8 V ... 65 V			
Safety				
Alarm output	for all recorded parameters programmable			
Fitting and construction				
Interfaces	RS232	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

Example of application
Steca PA Tarcom GSM



TarCom software included



Areas of application:

Steca PA HS200

Accessories for Steca Power Tarom

Shunt

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

The Steca PA HS200 comes into play when (e.g.) an inverter is directly connected to the battery and the Steca Power Tarom 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 without being connected to a Steca Power Tarom charge controller. The current is measured contact-free via a Hall-effect sensor. The data is transmitted to the charge controller over a cable connection. Up to two Steca PA HS200 shunts can be connected and the measured currents can be selectively added to the charging current, battery current or load current as desired.

Product features
- Automatic detection of voltage
- Wide current measuring range
- Potential free current measurement
- Communicates and stores data in the Steca PA Tarcom
- Integrated Hall sensor

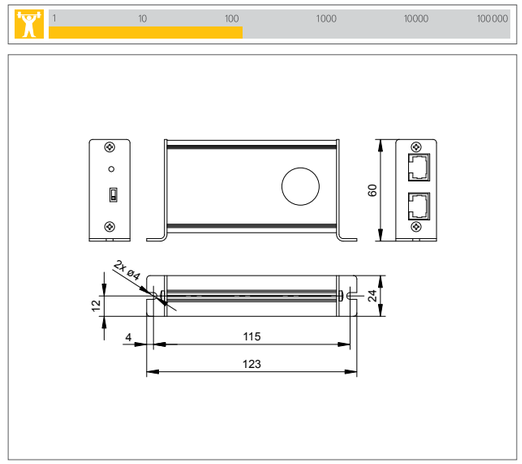
Displays
- LED shows operating states
- Messages via Steca Power Tarom LCD display

Interfaces
- Two RJ45 cable sockets

Modes of operation
- »Battery«: measures currents which flow through the battery cable
- »Load«: measures currents of external loads not connected to the charge controller
- »Charge«: measures currents of back-up generators

Certificates
- Compliant with European Standards (CE)
- Made in Germany
- Developed in Germany

0 A...200 A



	PA HS200
Characterisation of the operating performance	
System voltage	10 V ... 65 V
Own consumption	< 9 mA
Measurement accuracy	(-20 A ... +20 A) +/-1 % (-200 A ... +200 A) +/-3 %
Operating conditions	
Ambient temperature	-15 °C ... +50 °C
Relative humidity	75 %
Fitting and construction	
Current range "battery" mode	-200 A ... +200 A
Current range "charge" mode	0 A ... +200 A
Current range "load" mode	-200 A ... 0 A
Degree of protection	IP 22
Dimensions (X x Y x Z)	100 x 60 x 25 mm
Weight	120 g
Max. diameter for battery cable	19 mm

Technical data at 25 °C / 77 °F

Areas of application:

Steca PAx4

Accessories for Steca Solarix PI

Parallel switch box

Up to four Steca Solarix PI can be operated in parallel. The connections are made via an external box, the Steca PAx4.

A further innovation that has gone into the Steca Solarix PI is the communication with the solar charge controllers from the Steca Power Tarom series. A data connection to the charge controller can be created via the Steca PAx4.

	PAx4
Operating conditions	
Ambient temperature	-20 °C … +45 °C
Relative humidity	0 % … 95 %
Fitting and construction	
Cable	data cable master: 0.5 m red data cable slave 1: 0.5 m grey data cable slave 2: 1m grey data cable slave 3: 1m grey data cable Steca Power Tarom: 3 m black
Interfaces	6 x RJ45 (4 x inverter, 2 x Steca Power Tarom)
Degree of protection	IP 20
Dimensions (X x Y x Z)	206 x 117 x 64 mm
Weight	800 g

Technical data at 25 °C / 77 °F

Steca RCC-02

Accessories for Steca Xtender XTS*, XTM and XTH

Remote control and display

Lots of information on the status of the system can be retrieved using the graphic display of the Steca RCC-02. 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-02, 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 to save parameters, for transferring data or updating the software.

Displays
- Multifunction graphical LCD display with backlighting

Operation
- Programming by buttons

Certificates
- Compliant with European Standards (CE)
- RoHS compliant

*in conjunction with TCM-01

	RCC-02
Fitting and construction	
Degree of protection	IP 20
Dimensions (X x Y x Z)	170 x 170 x 46 mm
Weight	400 g

Technical data at 25 °C / 77 °F

Areas of application:

Steca PA RC100

Remote control

Steca PA RC100 remote control 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.

Product features
- Low weight
- Simple installation
- Maintenance-free
- Low own consumption
- Best reliability

	PA RC100
Characterisation of the operating performance	
Supply voltage	4.5 V (3 x 1.5 V AAA / R03 batteries)
Adjustable parameters	– Type of battery: gel / liquid – Night-light function – End of charge voltages (float / boost / equal) – Deep discharge protection (LVD) – LVD factor – Switch-on threshold
Suitable for the following Steca charge controllers	– Steca Solsum F – Steca PRS – Steca Solarix MPPT 2010
Fitting and construction	
Dimensions (X x Y x Z)	115 x 57 x 20 mm
Weight	90 g

Technical data at 25 °C / 77 °F

Areas of application:

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
Characterisation of the operating performance	
Own consumption	6 mA
Turn on time	1 min. … 5 min.
DC output side	
Battery voltage	12 V
Load current	5 A
Fitting and construction	
Reach / detection area	7 m / 180°
Degree of protection	IP 65

Technical data at 25 °C / 77 °F

Areas of application:

Steca PA 15

Accessories for Steca Power Tarom

Remote control

The Steca Power Tarom charge controllers send out signals (125 kHz on 300 Baud) which are modulated on the DC cable and received by the Steca PA 15 remote control.

These signals contain information on the batteries' state of charge (SOC). The Steca PA 15 features five different operating modes (see below) which can be set using five different jumper positions. The maximum switching capacity of 15 A can be increased with a Steca PA EV200 DC relay to up to 200 A if desired.

Product features
- Receives information on SOC and time (day/night)
- Load control via priority assignment
- Adjustable SOC thresholds
- Connects a maximum of 9 solar arrays in parallel
- Current surge switch function

Electronic protection functions
- Switches off load if there is no signal
- Reverse polarity protection by internal fuse
- Overtemperature and overload protection

Operation
- Configuration by jumpers

Modes of operation
- Management of parallel solar generators
- When the battery is full, excess energy is redirected to additional loads such as pumps, water heaters
- Automatic start / stop of diesel or wind back-up generators
- Night light function
- Acoustic alarm at deep discharge or overheating

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

	PA 15
Characterisation of the operating performance	
Power supply	10.5 V … 60 V DC, 5 mA
Data transmission	300 Baud
Transmission frequency	125 kHz signal frequency, 450 kHz intermediate frequency
DC output side	
Load current	15 A; 10 A at 40°C; 100 A pulse < 10 μs
Safety	
Overload protection	by 15 A fuse
Wrong polarity protection	fuse
Operating conditions	
Ambient temperature	-10 °C … +50 °C
Fitting and construction	
Terminal (fine / single wire)	2.5 mm² / 4 mm² - AWG 14 / 12
Degree of protection	IP 22
Dimensions (X x Y x Z)	98 x 87 x 34 mm
Weight	110 g

Technical data at 25 °C / 77 °F

Areas of application:

Steca PA EV200 DC

12 V / 24 V, 36 V / 48 V DC relay

The Steca PA EV200 relay increases the switching capacity of the Steca PA 15 remote control from 15 A to 200 A (up to 10 kW). The relay is connected to the Steca PA 15 remote control at the load output and, for example, interrupts the battery voltage to a back-up generator when the end-of-charge voltage is reached. The relay is hermetically sealed and operates safely in difficult environmental conditions such as dust, salt and moisture.

0 A...200 A

1 10 100 1000 10000 100000

Product features
- Low own consumption
- Ready for connection to the Steca PA 15 remote control

	type A	type B
Characterisation of the operating performance		
System voltage	12 V (24 V)	36 V (48 V)
Coil voltage	9 V ... 36 V	32 V ... 95 V
Rated current	200 A	200 A
Life span	1 million switching cycles	
Contact resistance	0.1 mΩ … 0.3 mΩ	
Operating conditions		
Ambient temperature	-40 °C … +85 °C	
Fitting and construction		
Dimensions (X x Y x Z)	63 x 80 x 72 mm	
Weight	430 g	

Technical data at 25 °C / 77 °F

Areas of application:

Steca PA CAB1 Tarcom

Data cable

The Steca PA CAB1 Tarcom data cable is used to connect a Steca Power Tarom solar charge controller to a PC via an 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.

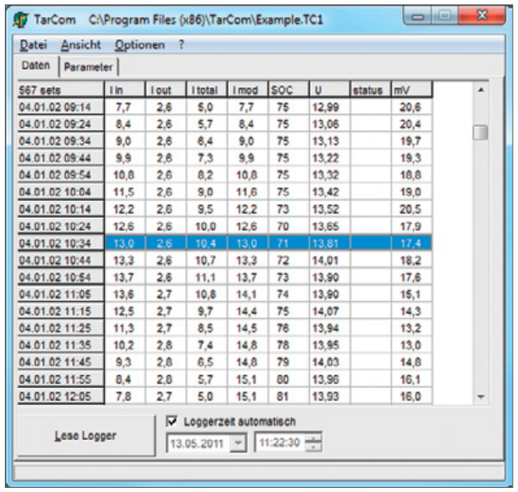
To use this convenient data transfer system a driver and the Steca TarCom software must first be installed on the PC (Download available at **www.stecasolar.de**).

„Tarom RJ45 in" can be selected under options/settings/extra in the Steca TarCom software menu system. The software then directly accesses the data from the Steca Power Tarom solar charge controller and displays this on the PC.

Product features
- Connection cable 1.8 m
- FTDI chip as USB-RS232 converter

Interfaces
- Connection to Steca Power Tarom via RJ45 plug
- Connection to PC via USB

Installation software (Windows)
- Steca TarCom PC-Software
- Virtual COM port (by FTDI driver)
- Driver for FTDI chip (by FTDI driver)
- Configuration of the Steca Power Tarom for data transfer



Software Steca TarCom

Areas of application:

Steca top-hat rail mounting kit

The Steca top-hat rail mounting kit allows easy mounting of Steca solar charge controllers on a top-hat rail. The set consists of two retaining brackets and two screws.

The retaining brackets are screwed to the solar charge controller using one screw per bracket. This then allows the solar charge controller to be positioned on the top-hat rail and clicked into place.

The brackets can be easily retrofitted to Steca solar charge controllers.

Product features
- Simple installation
- Best reliability

Fitting and construction	
Dimensions (X x Y x Z)	7.2 mm
Weight	2.4 g

Areas of application:

»POWER FROM THE SUN FOR RURAL ELECTRIFICATION - ALL OVER THE WORLD.«

Today, modern and professional electricity supplies are necessary in every part of the world. For these supplies, the focus is on high industrial demands, flexibility, environmental sustainability and reliability. Steca system technology for hybrid and telecommunication systems unites these aspects, thereby creating a basis for the forthcoming multimedia and communication age.

SYSTEM OVERVIEW

South Africa

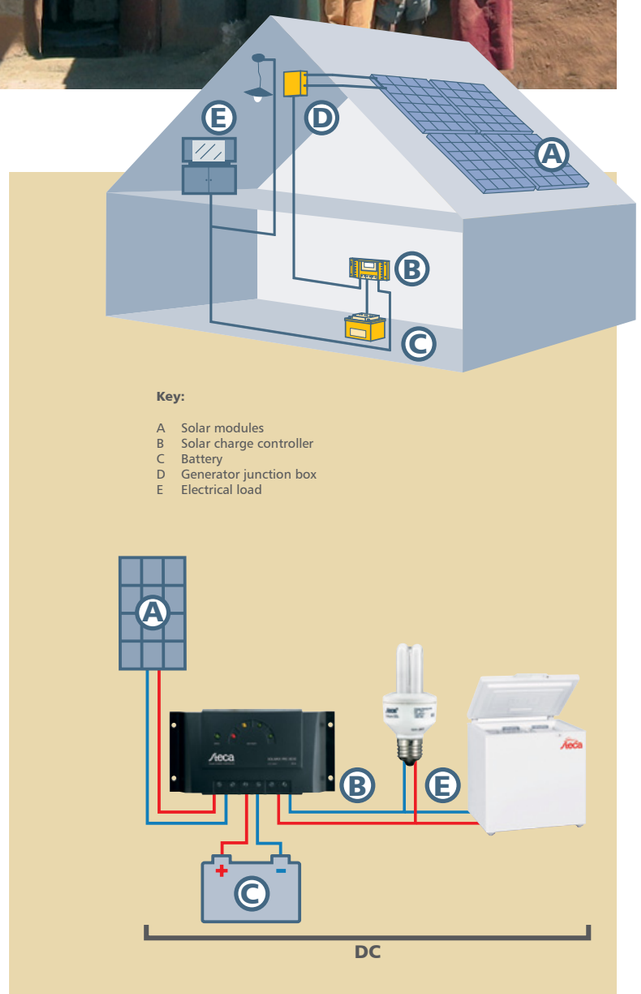
SOLAR HOME SYSTEMS

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.



Key:

A Solar modules
B Solar charge controller
C Battery
D Generator junction box
E Electrical load

Overview of devices:

Steca Solsum F
Solar charge controller
6 - 10 A, 12 / 24 V
(page 8)

Steca PR
Solar charge controller
3 - 5 A, 12 V
(page 11)

Steca Solsum ESL
Energy-saving light
5 W, 7 W, 11 W / 12 V
(page 29)

Steca ULED
Energy-saving light
1.1 W, 3 W, 5 W / 12 V
(page 30)

Steca Solarix PRS
Solar charge controller
10 - 30 A, 12 / 24 V
(page 9)

Steca PR
Solar charge controller
10 - 30 A, 12 / 24 V
(page 12)

Steca PF 166
Solar refrigerator/freezer
12 / 24 V (page 28)

Steca PF 240
Solar refrigerator/freezer
12 / 24 V (page 28)

Steca Solarix MPPT
Maximum Power Point Tracker
10 - 20 A, 12 / 24 V
(page 10)

Steca Solsum VC
Voltage converter
1.5 A, 3 / 6 / 7.5 / 9 / 12 V
(page 26)

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.

Sri Lanka

Australia

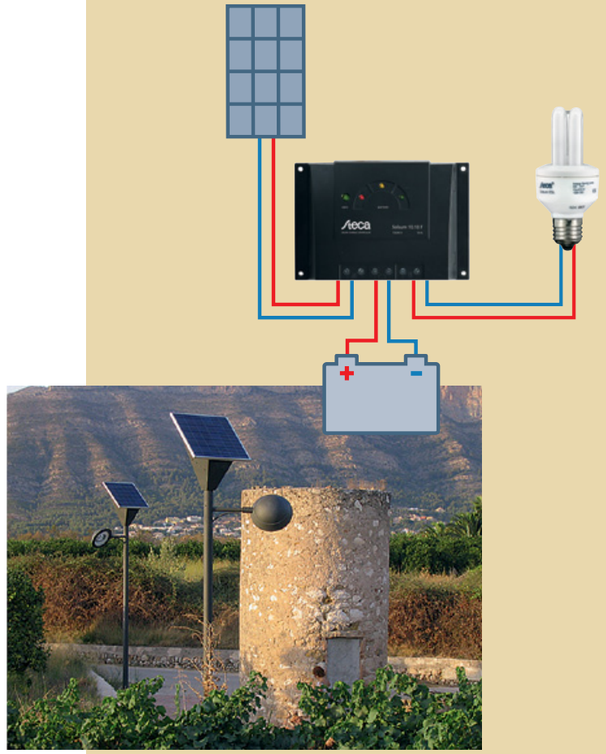
Greece

NIGHT LIGHT SYSTEMS

an important special application of solar home systems.

These fit with the design of the solar home systems, but are equipped with a special Steca solar 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.



Spain

Overview of devices:

Steca Solsum F
Solar charge controller
6 - 10 A, 12 / 24 V
(page 8)

Steca Solarix PRS
Solar charge controller
10 - 30 A, 12 / 24 V
(page 9)

Steca Solarix MPPT
Maximum Power Point Tracker
10 - 20 A, 12 / 24 V
(page 10)

Steca PR
Solar charge controller
10 - 30 A, 12 / 24 V
(page 12)

Steca PR 2020 IP
Solar charge controller
20 A, 12 / 24 V
(page 13)

Steca Tarom
Solar charge controller
45 A, 12 / 24 / 48 V
(page 14)

Steca Power Tarom
Solar charge controller
55 - 140 A, 12 / 24 / 48 V
(page 16)

Steca PA EV200 DC
DC relay
12 / 24 / 48 V
(page 36)

Steca PA IRS 1008/180
Motion detector
(page 35)

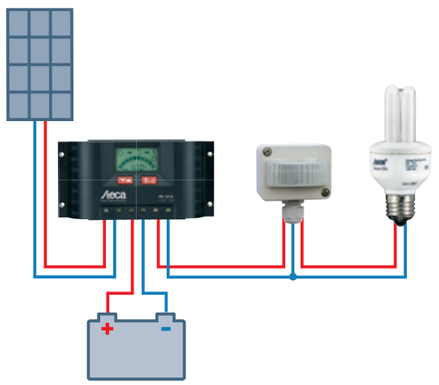
Steca Solsum ESL
Energy-saving light
5 W, 7 W, 11 W / 12 V
(page 29)

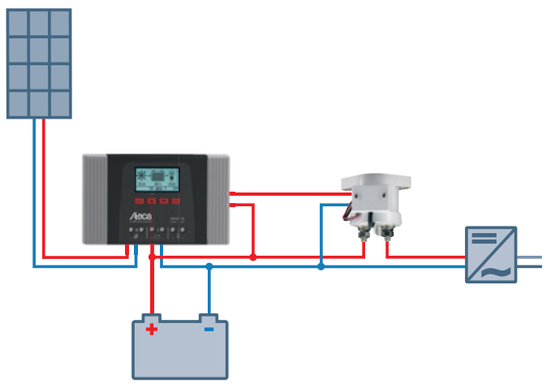
Steca ULED
Energy-saving light
1.1 W, 3 W, 5 W / 12 V
(page 30)

Steca PA 15
Remote control
720 W
(page 36)

Duration of night light function "Light on":	All night	After sunset	Before sunrise	Turn-on time delay	Maximum light current	Catalogue page
Solar charge controller:						
Steca Solsum F	■*	0 - 12 h*	–	–	10 A	*8*
Steca PR	■	0 - 12 h	0 - 12 h	–	30 A	*12*
Steca PR 2020 IP	■	0 - 12 h	0 - 12 h	–	30 A	*13*
Steca Solarix PRS	■*	0 - 12 h*	–	–	30 A	*9*
Steca Solarix MPPT	■*	0 - 12 h*	–	–	20 A	*10*
Steca Tarom (new)	■	0 - 12 h	0 - 12 h	0 - 12 h	45 A	*14*
Steca Power Tarom Steca PA 15 / Steca PA 15 with PA EV200 DC relay	■	0 - 12 h	–	0 - 3 h	 15 A 200 A	*16* *36* *36*

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





INVERTER SYSTEMS

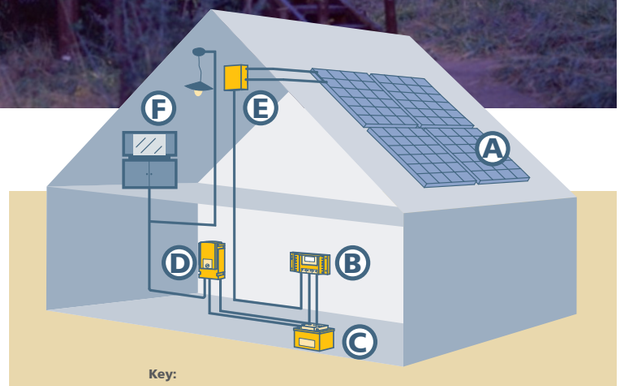
for both AC and DC.

Inverter systems are designed as solar home systems. The central 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 Electrical load
(12 V ... 48 V DC, 115 V ... 230 V AC)

Overview of devices:

Steca PR
Solar charge controller
10 - 30 A, 12 / 24 V
(page 12)

Steca Solarix PRS
Solar charge controller
10 - 30 A, 12 / 24 V
(page 9)

Steca Solarix PI
Sine wave inverters
550 - 4,400 W, 12 / 24 V
(page 18)

Steca PLI-300
Sine wave inverter
300 W, 12 V
(page 17)

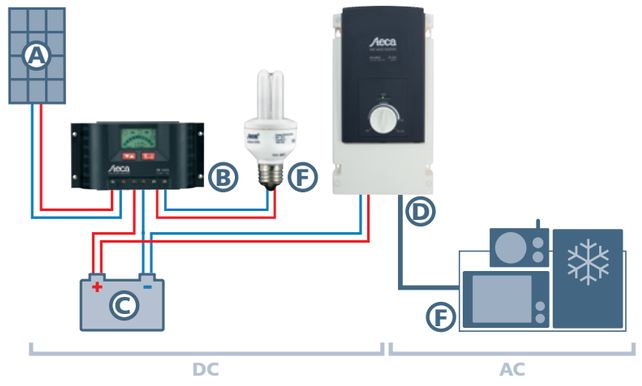
Steca Solarix MPPT
Maximum Power Point Tracker
10 - 20 A, 12 / 24 V
(page 10)

Steca Tarom
Solar charge controller
45 A, 12 / 24 / 48 V
(page 14)

Steca AJ
Sine wave inverter
500 - 2,400 W, 12 / 24 / 48 V
(page 22)

DC AC

Madagascar



Greece

HYBRID SYSTEMS

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.

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
- Data logger function with automatic alarm and remote monitoring (GSM)
- Optimised system efficiency through DC and AC bus

Overview of devices:

Steca Tarom
Solar charge controller
45 A, 12 / 24 / 48 V
(page 14)

Steca Power Tarom
Solar charge controller
55 - 140 A, 12 / 24 / 48 V
(page 16)

DC

Steca Xtender XTS
Sine wave inverter
1,000 W - 12,600 W
(page 24)

Steca Xtender XTM
Sine wave inverter
1,500 W - 36,000 W
(page 24)

Steca Xtender XTH
Sine wave inverter
3,000 W - 72,000 W
(page 24)

AC

Steca PA 15
Remote control
720 W
(page 36)

Steca PA HS200
Shunt
10 - 65 V
(page 33)

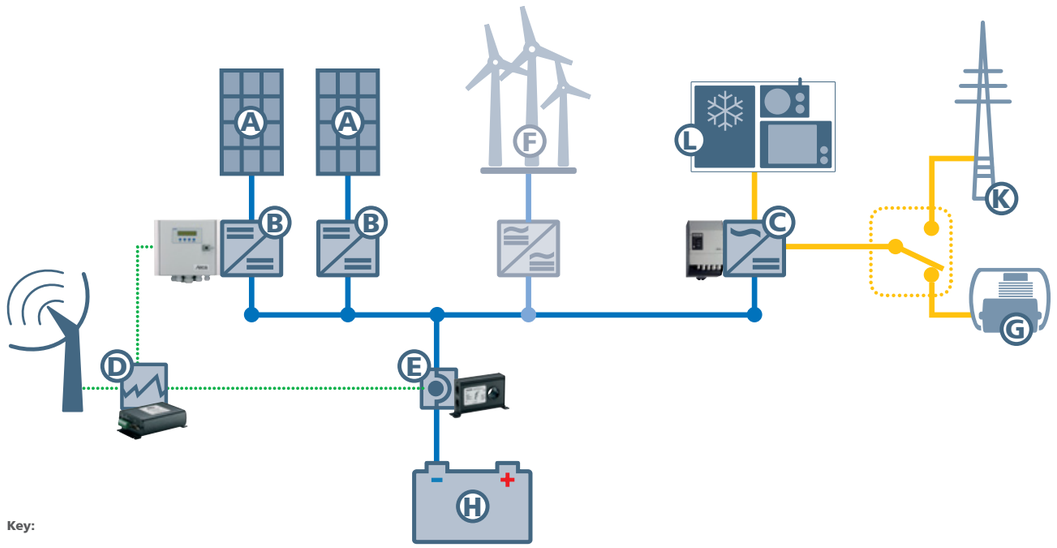
Steca PA Tarcom
Data logger
12 / 24 / 48 V
(page 32)

Steca RCC-02
Remote control and display
(page 34)

South Africa

United Kingdom

Morocco



Key:

A Solar modules
B Solar charge controller Steca Power Tarom
C Sine wave inverter
Steca Xtender (XTS, XTM, XTH)
D Data logger Steca PA Tarcom
E Current sensor (shunt) Steca PA HS200
F Wind turbines with inverter
G Diesel generator
H Battery
K Public grid
L Electrical load (230 V AC)

SINGLE-PHASE DC HYBRID SYSTEMS

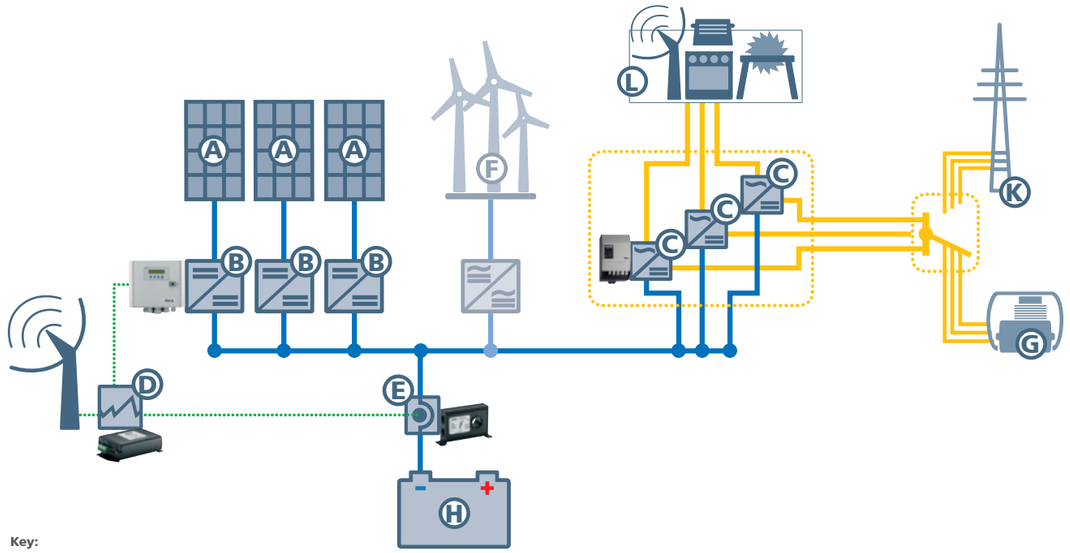
The central, intelligent element within the system is the Steca Tarom or Power Tarom solar charge controller (B): it controls the energy flow and protects the battery against critical states. Steca Tarom/ Power Tarom is directly connected to the battery, just as the DC bus is. Using a shunt, the Steca PA HS200 (E), which is situated on the minus cable attached to the battery, the battery current is measured and this information is passed on to the Steca Tarom / Power Tarom (B). Further components, such as an inverter or the Steca PA 15 remote control, are directly connected to the DC bus. In order to automatically start a diesel generator (G) if the battery's state of charge (SOC) falls below an adjustable threshold, the output of the Steca PA 15 is connected to a relay. The normally open contact of the relay switches the diesel generator on, and subsequently switches it off again.

The Steca Tarom / Power Tarom controls the DC hybrid system. The Steca PA HS200 current sensor (E) transfers all infor mation on the charge and discharge currents at the DC bus to the Steca Tarom / Power Tarom. With the aid of this data, the controller is able to calculate the current state of charge of the battery. This information is transferred via the DC cabling (powerline modulation) to all connected Steca PA 15. Every Steca PA 15 can be independently configured to a certain switch-on and switch-off threshold of the state of charge.

If, in the above example, the inverter is discharging the battery, then this information is transferred to the Steca Tarom / Power Tarom, which calculates the state of charge. As soon as the state of charge falls below the appointed threshold value of the connected Steca PA 15 (e.g. 30 %), the controller switches on the diesel generator via a relay. The load is now being supplied from the generator (G), and at the same time the battery is being recharged. After the state of charge has reached the Steca PA 15's appointed upper value (e.g. 90 %), the diesel generator is switched off again.

In order to create an automatic energy management system, the AC output of the diesel generator is connected to the AC input of the inverter (with integrated battery charger). The load is always connected to the output of the inverter. If the diesel generator is running, and this current flows to the inverter, then the inverter automatically switches to transfer mode. The loads are supplied from the diesel generator whilst the battery recharges via the inverter. If the AC output voltage of the diesel generator falls under a certain voltage level, which can be adjusted on the inverter, then battery operation is automatically switched back on.

This system allows for automatic energy management which gets optimum use from the available solar energy, maintains the batteries reliably, and ensures electricity supply around the clock.



Key:

A Solar modules
B Solar charge controller Steca Power Tarom
C 3 Sine wave inverters
Steca Xtender (XTS, XTM, XTH)
D Data logger Steca PA Tarcom
E Current sensor (shunt) Steca PA HS200
F Wind turbines with inverter
G Diesel generator
H Battery
K Public grid
L Electrical load (400 V AC)

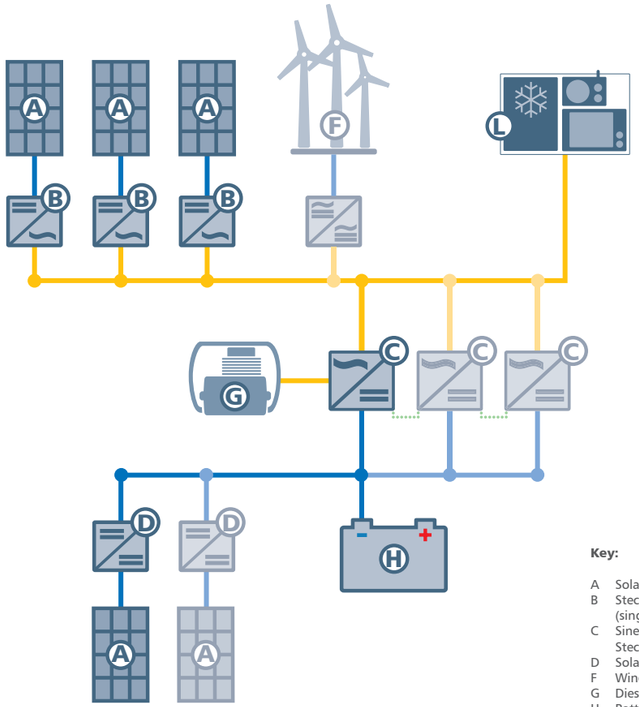
THREE-PHASE DC HYBRID SYSTEMS

The control concept is similar to that of the single-phase system. If more than one Steca Tarom / Power Tarom is employed, one of the devices must be designated as the master Tarom. All other charge controllers are then automatically designated as slave Taroms. The master Tarom / Power Tarom is directly connected to the battery and all slaves are connected to the DC bus. Only the master Tarom / Power Tarom shows the correct state of charge on its display and controls the energy flow around the system. Slave Taroms / Power Taroms perform the function of controlling the charging from the connected PV modules.

In order to assemble a three-phase energy supply, three inverters are connected to the DC bus. Various three-phase generators can be connected to the three inverters for controlled recharging of the battery via a Steca PA 15 and a relay. These may be wind, water, or diesel generators; or the public grid. Suitable inverters with integrated battery chargers in three-phase mode are the Steca Xtender devices (XTS, XTM, XTH). In total, a maximum of 72 kW can be supplied.

Australia

Both single-phase and three-phase hybrid system concepts are based on the same principles of energy management. With the help of the Steca PA HS200 current sensor, the charge and discharge currents of the components, such as slave Taroms / Power Taroms, inverters etc., are determined and communicated to the master Tarom / Power Tarom. Based on the calculated state of charge of the battery, the Steca PA 15 switches the extra generator on or off. The three single-phase inverters switch off if the voltage falls below a given threshold in order to protect the battery from deep discharge.



Key:

A Solar modules
B StecaGrid inverter (single-phase or three-phase)
C Sine wave inverter Steca Xtender (XTS, XTM, XTH)
D Solar charge controller Steca Power Tarom
F Wind turbines with inverter
G Diesel generator
H Battery
L Electrical load (230 V AC or 400 V AC))

SINGLE-PHASE AND THREE-PHASE AC HYBRID SYSTEMS

With very large load requirements, AC-coupled hybrid systems can provide a sensible alternative to the very effective and cheap to implement DC hybrid systems. This topology is beneficial if the largest part of the loading is required on the AC side (L) during the day. Steca AC hybrid systems can be implemented using the Steca grid and sine wave inverters (B and C).

Various generators (A and F) are coupled to the AC bus. In addition, bi-directional sine wave inverters (C) are deployed, which are used for charging the batteries and can also be used for supplying the load if the AC generators (A and F) supply insufficient power. In addition, it is also possible to couple solar generators via a Steca solar charge controller (D) directly to the batteries (H) on the DC side.

If not enough energy should be available in the system in order to supply the load, a diesel generator (G) can be started automatically. When the diesel generator is running, it must be ensured that all grid inverters (B) have been disconnected from the grid. This is necessary in order to prevent the inverters (B) from feeding back into the diesel generator and destroying it when the battery is full. As soon as the diesel generator has been switched off, the grid inverters (B) can again be automatically connected to the grid. The loads are then again supplied by the PV generators (A) via the grid inverters (B).

The Steca Xtender battery inverters (C) here create the grid into which the grid inverters (B) feed, and from which the loads (L) are supplied. If the PV generators (A) produce a higher output than the loads (L) take up, the battery inverters (C) charge the batteries (H) with the excess power difference.

Steca droop mode

When the batteries (H) have reached the cut-off voltage, they can no longer fully take up this power difference. There is then more output available in the system than can be used. The battery inverters (C) then activate the Steca droop mode.

The StecaGrid 3000/3600 grid inverters with the droop mode are specially designed to meet the demands of AC-coupled hybrid systems and interact perfectly with the Steca Xtender battery inverters (C). These increase the frequency of the AC grid in a linear fashion, depending on the excess output of the grid inverters. The more excess output available, the higher the grid frequency. The grid inverters then restrict the feed output to precisely the feed output which fully supplies the loads (L) and maintains the batteries (H) at the cut-off voltage. In this way, they create a balanced output level in the hybrid system. If the level of the load changes, the grid inverters immediately adjust their feed output and continuously offset the output balance so that the batteries (H) can be fully loaded in an optimum manner. As soon as the excess output from the grid inverters decreases, the batter inverter (C) again reduces the grid frequency until the standard grid frequency with a balanced output level has been reached. If not enough output is provided by the grid inverters (B) to supply the loads (L), the necessary difference comes from the battery inverters (C) in the batteries.


South Africa

With very large outputs, this kind of Steca AC hybrid system can also be designed as a three-phase system in order to supply corresponding loads directly. Here the StecaGrid grid inverters (B) provide direct three-phase feeding on the AC side.

The required bi-directional Steca Sinus inverters Steca Xtender (C) can be used in both single-phase and three-phase cases. Up to three devices can be connected in parallel per phase. This means that a total of 24 kW per phase is available, with a maximum of 72 kW in three-phase operation.

Diesel generators (G) can be used to produce approx. 100 kW, while grid inverters (B) are used for up to 70 kW. Thus, loads of up to 70 kW can be supplied.


Africa

Overview of devices:

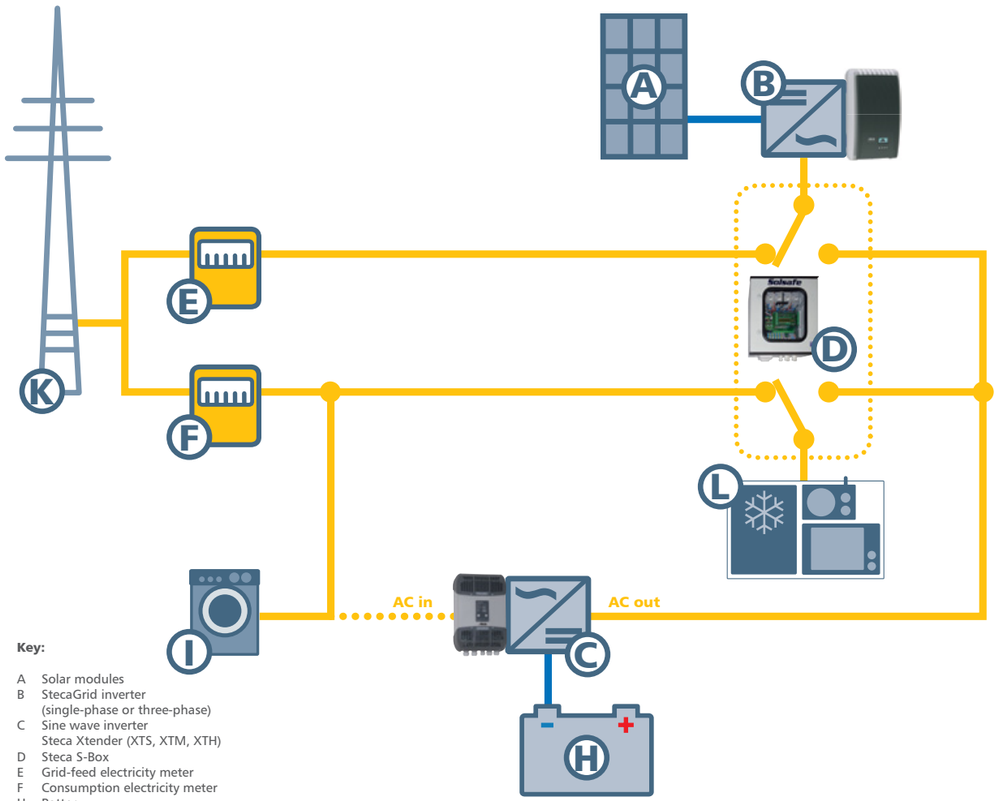

Steca Power Tarom
Solar charge controller
55 - 140 A, 12 / 24 / 48 V
(page 16)


Steca Xtender XTH
Sine wave inverter
3,000 W - 72,000 W
(page 24)

PV Netzeinspeisung:


StecaGrid 3600
Grid inverter
2,000 W up to several 10,000 W


StecaGrid 10000 3ph
Grid inverter
10,000 W up to several 1,000,000 W



Key:

A Solar modules
B StecaGrid inverter (single-phase or three-phase)
C Sine wave inverter Steca Xtender (XTS, XTM, XTH)
D Steca S-Box
E Grid-feed electricity meter
F Consumption electricity meter
H Battery
I Unsupplied loads (230 V AC)
K Public grid
L Electrical load (230 V AC)

STECA SOLSAFE

Blackout - and yet there's light!

Large-scale power supply failures are becoming increasingly common. With emergency systems such as generators or uninterruptible power supplies (UPS), the power supply can be assured.

Yet, in the event of a power outage, the grid-connected PV system also stops working. This means that although power may be available, it cannot be used. The Solsafe system offers a simple, efficient and cost-effective solution to this problem.

Installing one of our combined inverters Steca Xtender (XTS, XTM, XTH) with a battery system turns any grid-connected PV system into an emergency power supply in the event of a power outage. If the public grid is available, the electrical output generated by the solar modules is fed directly into the grid by the grid inverter (B) and the grid-feed electricity meter (E). In parallel to this, the unsupplied loads (I) receive power directly from the grid, via the consumption electricity meter (F). The batteries are kept fully charged from the public grid via the hybrid system inverter (C), and, if necessary, they are recharged. Furthermore, the supplied loads (L) receive power directly from the public grid.

If there is a grid outage, the hybrid system inverter (C) automatically switches mode by means of the Steca S-Box (D) to operate as a sine wave inverter, and continues to feed power to the supplied loads (L) without any interruption. Because the grid inverter can no longer supply power to the grid, its output is channelled directly to the supplied loads (L). In this way, the loads can receive power directly from the grid inverter of the solar modules. At the same time, the battery can be recharged with the available solar energy, which increases the length of time for which the supplied loads can receive power during the night.

With this set-up, the capacity of the battery can be kept small, allowing for an optimal design of system costs. The Solsafe system is fully automatic, and can be integrated into any new or existing PV system. Solsafe ensures the power supply, and furthermore allows the solar energy to be fully utilised.

Why choose Steca Solsafe?

- It allows great system flexibility. The grid inverter is designed according to the PV generator, and the sine wave inverter according to the desired emergency power supply.
- The PV system's output and operating voltage can be freely selected, and do not depend on the size and battery voltage of the emergency power supply.
- It should be noted, however, that the AC output of the grid inverter may never be greater than the rated output of the sine wave inverter.
- The PV voltage of the grid inverter does not depend on the battery voltage.
- Existing grid-connected solar power systems can be fitted with Steca Solsafe without alterations of any kind.
- The available PV capacity is added to that of the sine wave inverter in the event of a power outage, or the solar power is stored in the battery.

Overview of devices:

Steca Xtender XTS
Sine wave inverter
1,000 W - 12,600 W
(page 24)

Steca Xtender XTM
Sine wave inverter
1,500 W - 36,000 W
(page 24)

Steca Xtender XTH
Sine wave inverter
3,000 W - 72,000 W
(page 24)

Steca RCC-02
Remote control and display
(page 34)

Solsafe S-Box
Anti-blackout system for Steca sine wave inverters
S-Box 25-X (without ENS)
S-Box 25-X-E (with ENS)

StecaGrid 300 and StecaGrid 500
Grid inverter
300 W - 3,600 W
(Steca PV Grid Connected)

StecaGrid 2010+
Grid inverter
2,000 W up to several 10,000 W
(Steca PV Grid Connected)

not shown:
StecaGrid 2000+

StecaGrid 3600
Grid inverter
2,000 W up to several 10,000 W
(Steca PV Grid Connected)

not shown:
StecaGrid 2020, StecaGrid 3000, StecaGrid 4200

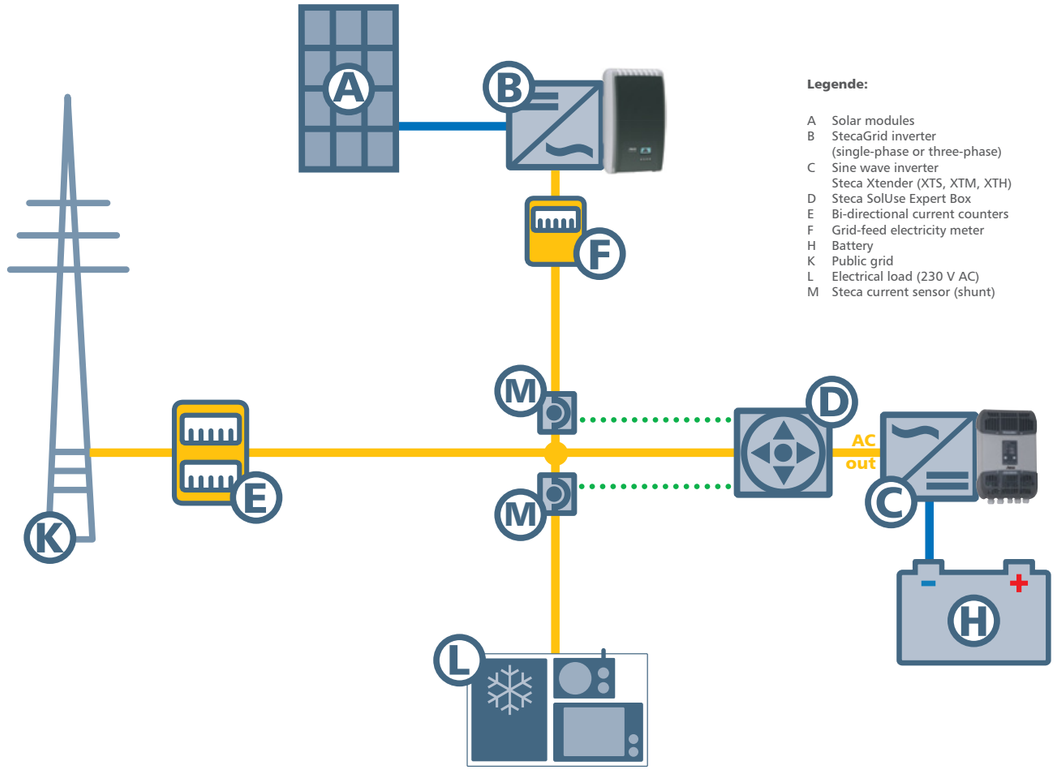
StecaGrid 10000 3ph
Grid inverter
10,000 W up to several 1,000,000 W
(Steca PV Grid Connected)

not shown:
StecaGrid 8000 3ph

StecaGrid 10000+ 3ph
Grid inverter
10,000 W up to several 1,000,000 W
(Steca PV Grid Connected)

not shown:
StecaGrid 8000+ 3ph

Simple wiring with the Steca S-Box
The Steca S-Box offers a professional solution for simple wiring of a Steca Solsafe system. It contains all power switches necessary for implementation. The grid inverters and all inputs and outputs on the Steca Xtender inverters (XTS, XTM and XTH) are connected to the Steca S-Box. This means that installation errors are virtually impossible.



Legende:

A Solar modules
B StecaGrid inverter (single-phase or three-phase)
C Sine wave inverter Steca Xtender (XTS, XTM, XTH)
D Steca SolUse Expert Box
E Bi-directional current counters
F Grid-feed electricity meter
H Battery
K Public grid
L Electrical load (230 V AC)
M Steca current sensor (shunt)

STECA SOLUSE EXPERT

System optimising by increasing own consumption

The Steca SolUse Expert system is both a standard grid-connected system and an autonomous, battery-supported photovoltaic (PV) system.

If PV systems are installed in areas in which a public grid is available, while at the same time, feeding is not desirable due to local conditions or an unsuitable remuneration situation, the own consumption share of the PV power should be as large as possible.

The Steca SolUse Expert system is ideally suited to this purpose: The grid-connected system is extended by a battery bank and a bi-directional Steca Xtender (XTS, XTM or XTH) stand-alone inverter. A cleverly designed operation management strategy optimises the energy flow according to requirements. In this way, users with this system can ensure that the PV power generated in the system is to a large extent consumed in the system itself. The energy exchange with the public grid is minimised. This results in major cost savings.

The Steca SolUse Expert system consists of a PV generator with StecaGrid grid inverter (B), a bi-directional battery inverter (C), a battery bank (H) and the Steca SolUse Expert Box (D). The entire system is controlled by the Steca SolUse Expert Box (D). The information relating to the current output of the grid inverter (B) and the level of the load (L) required is provided by two Steca PS HS200 (M) current sensors.

The aim of the control system is to minimise the energy flow via the bi-directional counter (E). Ideally, the current flowing through the counter (E) is always zero.

Usually, all components are in operation. If the current feed output of the PV system is higher than the total of all loads (L), precisely the level of the excess energy is stored in the battery bank (H) via the bi-directional battery inverter (C). In this case, the current flowing through the counter (E) is zero. If the battery bank (H) is fully loaded, the excess current in the system can no longer be used and is fed into the public grid (K) via the counter (E). The battery bank (H) is here maintained precisely at its necessary end-of-charge voltage.

As soon as the total of all the loads (L) is higher than the current feed output of the PV system, the necessary energy is provided via the bi-directional battery inverter (C) and the Steca SolUse Expert Box (D) from the battery bank (H). Only so much output is discharged from the batteries (H) as to ensure that the loads (L) can be fully supplied and the current flowing through the counter (E) is zero. Only when the minimum battery voltage has been reached is the discharge current from the battery bank (H) reduced by the Steca SolUse Expert Box (D). In order to prevent a deep discharge of the battery, the Steca SolUse Expert Box (D) can also reduce the discharge current to zero. The difference required in order to supply the load is in this case drawn from the public grid (K) via the counter (E). If the lower voltage limit of the battery bank (H) has been reached, the bank is charged via the output of the PV system. During longer periods with a low output from the PV system, the battery bank can as an option also be manually recharged via the public grid (K) and the counter (E), in order to prevent the battery bank (H) from remaining in deep discharge for a long period of time.

Full flexibility with practical functions make the Steca SolUse Expert system stand out:

Installation
One key advantage of the Steca SolUse Expert solution is the high degree of flexibility of the system. The battery section of the system – the Steca SolUse Expert Box (D), the Steca Xtender battery inverters (C) and the battery bank (H) – can be installed completely separately from the actual PV grid feed system. Since both system sections are continuously connected to the same grid, they do not have to be installed at the same site. The Steca SolUse Expert system can simply be connected using an existing plug or installation node.
Installation is simple: The Steca SolUse Expert Box contains all the components you need and is delivered ready for installation. The box is connected to the battery bank on the DC side. The AC input is connected to the local grid node, while the AC output is connected to the Steca Xtender. There is no further need to configure the system.

Retrofitting and dimensioning
A Steca SolUse Expert system can be retrofitted to every existing grid-connected PV system. In general, no consideration of the size of the components is required, since these operate fully autonomously and independently of one another. This important feature makes it possible to slightly increase own consumption with very small, low-cost systems. It is also possible to increase own consumption up to a maximum level with a larger system.

Battery type
The Steca SolUse Expert systems can be operated with all lead-based battery types with fluid and fixed electrolytes. The system can also be operated with Li ion batteries (LiFePo4). The battery voltage remains at 48 V.

MSD
The Steca SolUse Expert box contains an MSD and can therefore be directly connected to any grid node.

Backup option
Every Steca SolUse Expert system has as an option an AC backup output on the output side of the Steca Xtender. As a result, an emergency power supply is available when the power fails. The output of this supply is limited to the maximum output of the Steca Xtender used. The maximum level of energy which can be used is limited by the residual capacity in the battery.

AC connection
Every Steca SolUse Expert system is in general delivered as a three-phase model and can be used as a single-phase or three-phase system. If the owner wishes to optimise the system to own consumption in a three-phase manner, 3 Steca Xtenders are required. Each Steca Xtender then regulates one phase.

Overview of devices:

Steca Xtender XTS
Sine wave inverter
1,000 W - 12,600 W
(page 24)

Steca Xtender XTM
Sine wave inverter
1,500 W - 36,000 W
(page 24)

Steca Xtender XTH
Sine wave inverter
3,000 W - 72,000 W
(page 24)

Steca RCC-02
Remote control and display
(page 34)

Steca SolUse Expert Box

StecaGrid 300 and StecaGrid 500
Grid inverter
300 W - 3,600 W
(Steca PV Grid Connected)

StecaGrid 2010+
Grid inverter
2,000 W up to several 10,000 W
(Steca PV Grid Connected)

not shown:
StecaGrid 2000+

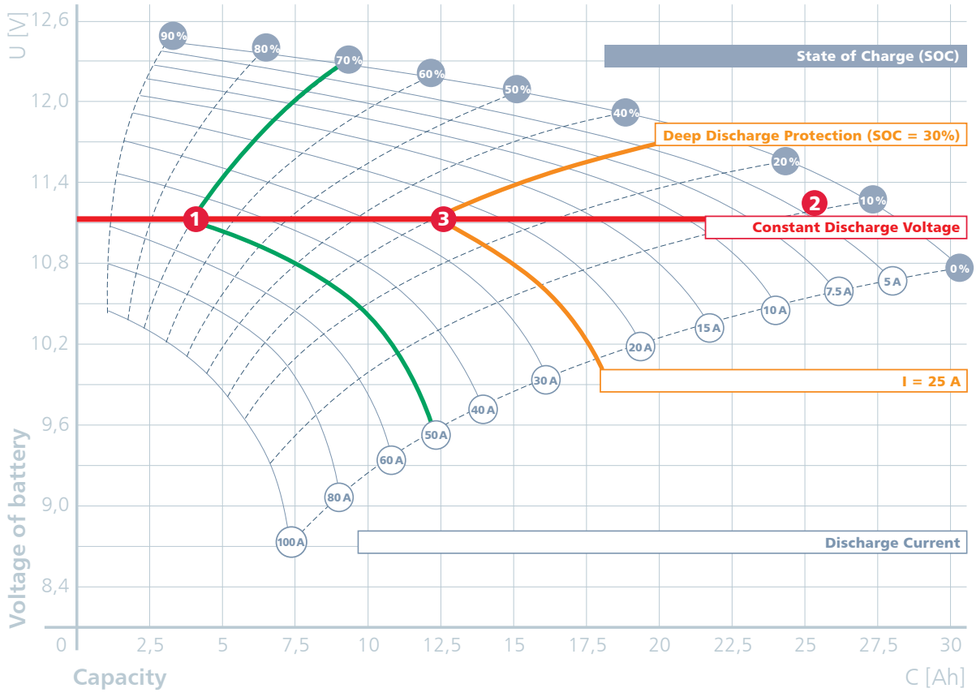
StecaGrid 3600
Grid inverter
2,000 W up to several 10,000 W
(Steca PV Grid Connected)

not shown:
StecaGrid 2020, StecaGrid 3000, StecaGrid 4200

StecaGrid 10000+ 3ph
Grid inverter
10,000 W up to several 1,000,000 W
(Steca PV Grid Connected)

not shown:
StecaGrid 8000+ 3ph

Steca X-Connect system
Prewired mounting structure for devices from the Steca Xtender XTH series



STECA'S CHARGING TECHNOLOGY

The Steca products stand out thanks to an optimal state of charge determination. This is the key to the batteries having a long service life.

What does SOC mean?
SOC means the current ‚state of charge' of the battery. This is given as a percentage. A battery is fully charged when the SOC is at 100%. The lowest value which can be reached is 0%. In theory, all other values in between can be reached, but most types of batteries should not reach state of charge values of less than 30%. Such values can quickly lead to dangerous deep discharges which decrease the service life of the batteries or destroy them directly. A battery's state of charge should not be confused with its remaining available capacity. The actual remaining capacity depends on many parameters such as the temperature, age and history of the battery and many others. It is possible to gain a rough estimate of a battery's current remaining capacity by multiplying the correct state of charge of the battery by its rated capacity. As the age of the battery increases, however, the rated capacity can change significantly, which means that the prediction of the available capacity can be strongly distorted.

Figure above
...shows the characteristics of a 12 V lead-acid battery with a rated capacity of 28 Ah. Its voltage changes in relation to the charge and discharge currents and the state of charge. If a fixed discharge cut-off voltage of 11.1 V is now specified, this means that, at a discharge current of 50 A, a full battery is disconnected when its state of charge is still 70% *(point 1)*. This is represented in the diagram by the green line. The majority of the capacity which is still available cannot be used in this case.

If the same battery is discharged with 5 A, however, the system disconnects it at the same fixed voltage of 11.1 V, which in this case means at a state of charge of around 10% *(point 2)*.

This is already a dangerously low state of charge which can result in significant damage to the battery. Only with a discharge current of 25 A would the battery in this case be correctly disconnected at an SOC of 30% *(point 3)*.

Using the Steca state of charge algorithm the charger is able to disconnect the battery at the correct threshold with any discharge current. The cut-off voltage is determined by the point at which the 30% line crosses the discharge current line (Steca SOC deep-discharge protection). Only a method of this kind can ensure that the battery is maintained correctly, and thus has a long service life.

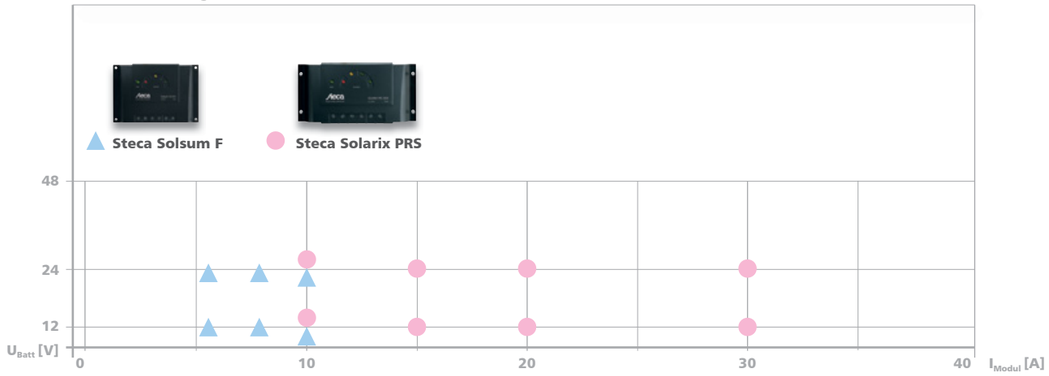
Why is a state of charge determination so important?
During charging, the solar charge controller has to know when the battery is fully charged so that it can protect it against overcharging at the right moment and in the correct manner. When discharging the battery it is equally important to know the state of charge in order to protect the battery against harmful deep discharge. In order to carry out this function, there are various criteria which can indicate how full the battery is at a given time. Some of these criteria are better suited than others. The simplest and most common criterion is the voltage of the battery. With this method, a fixed charge cut-off voltage is defined. When this voltage is reached, charging is stopped. A fixed deep discharge threshold is also defined. If the battery voltage falls below this value, the load is switched off. This method is simple, since the voltage of the battery is easy to measure precisely, yet it is not ideal for most types of batteries because their state of charge does not change in direct proportion to the voltage. Low discharge currents are common in solar power systems in particular. This leads to inadequate battery maintenance if fixed voltage values determine the charging or discharging processes. The full-charge and deep-discharge thresholds provide better solutions, for the battery currents are taken into account alongside the voltage. But this method does not allow the state of charge to be determined accurately either, since many important factors are not considered. Only if the state of charge is calculated precisely is it possible for the solar charge controller to treat the battery correctly, to end a charge cycle using the solar module at the correct time and to switch off a load neither too early nor not too late. For this reason, Steca has developed a high-performance algorithm with which the state of charge can be calculated with a sufficient degree of accuracy and the battery can be optimally protected.

How does Steca's state of charge determination work?
Steca's algorithm for determining a battery's state of charge is a combination of various methods which ensure that the SOC is calculated accurately enough and delivers reliable, stable values over a long period of time. Furthermore, attention is paid to making a calculation method which can be carried out simply and at a low cost in various solar charge controllers. Years of experience in the research and development of battery state of charge algorithms has led to an auto-adaptive ‚fuzzy logic' algorithm. This includes the age and usage history of the battery in the calculation as well as the other important parameters. The battery voltage and its currents and the temperature are constantly measured as accurately as possible by the solar charge controller. During a learning phase, the solar charge controller estimates the state of charge on the basis of experience values. At the same time, the controller monitors the behaviour of the battery and adjusts various parameters to the current system. The learning phase lasts for a few cycles. The advantage of this method is that it makes it possible to respond dynamically to the requirements of the system and individually adjust the battery maintenance to the requirements of every individual system. This feature explains the high performance and reliability of the Steca battery state of charge algorithm. At the same time, this algorithm guarantees optimum battery maintenance, which is reflected in the long service life of the battery. In addition, the user benefits from the fact that the battery's current state of charge can be displayed, which means the user constantly has optimal control over the system.

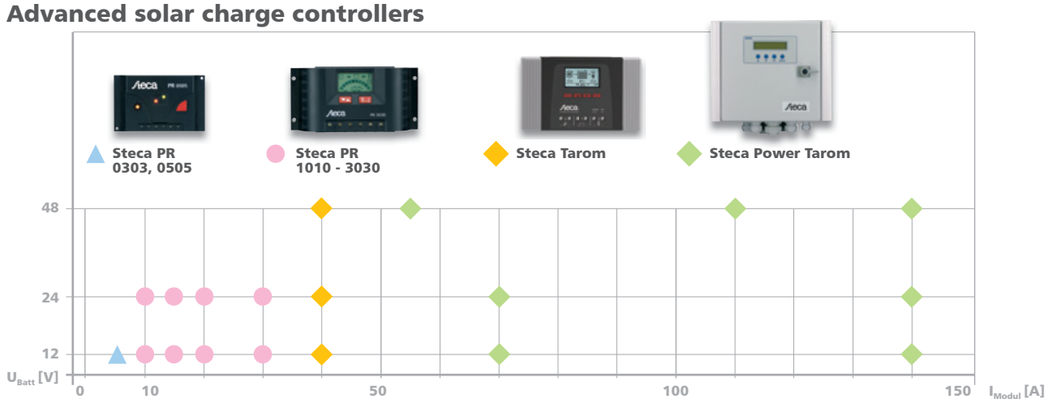
Which chargers from Steca carry the optimised algorithm?
The Steca product range is divided into two lines. One is optimised for use in simple applications with less demand and equipped with the minimum necessary features. The other line is designed to cover high-end demand to supply a good communication interface to the user and optimised battery maintenance features. For both lines there exist solar charge controllers in a wide power range. All chargers equipped with the special Steca State of Charge algorithm are marked with the SOC symbol in this catalogue (see overview page 2).

SELECTING THE SOLAR CHARGE CONTROLLER

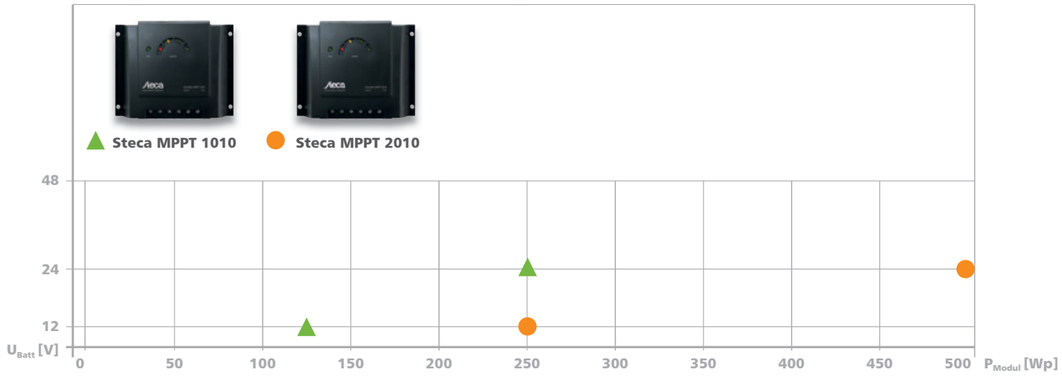
Basic solar charge controllers



Advanced solar charge controllers



Solar charge controllers with MPP tracking



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 (Isc) 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.

Two criteria are decisive on charge controllers with MPP tracking: Firstly, the total output of all connected solar modules (in Wp) must not exceed the maximum input power of the solar charge controller. Secondly, the open circuit voltage (Uoc) on all solar modules (also series-connected) must not exceed the maximum input voltage of the solar charge controller under any circumstances. Care must be taken here, especially due to the temperature dependence of the open circuit voltage on the solar modules. This voltage increases as the temperature decreases. Based on the lowest temperature which occurs during the application, the open circuit voltage of the solar module must be calculated using the temperature coefficients from the module data sheet. The maximum input voltage of the solar charge controller must be higher than this voltage.

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

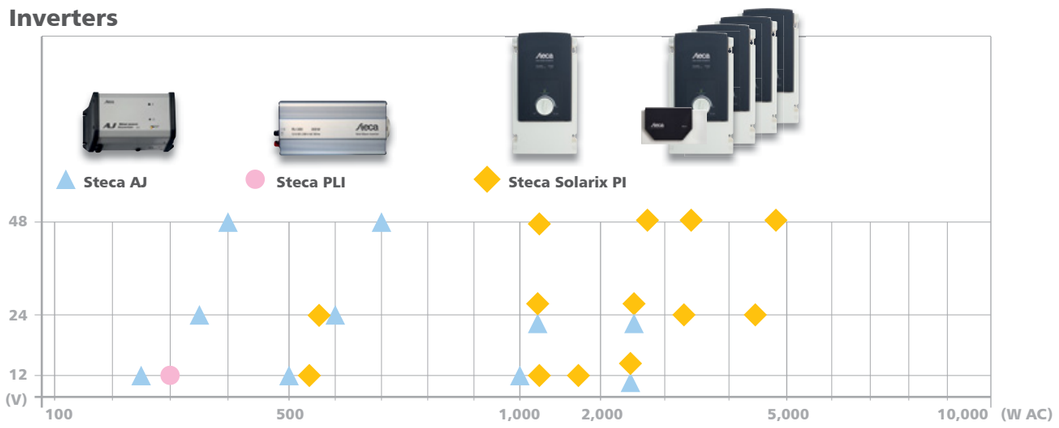
In order to ensure a long service life, it is important to use a robust solar charge controller with short, thick cables for connecting it to the battery. The device should always be screwed to a non-flammable wall directly above the battery. It is important that there is enough free space around the 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

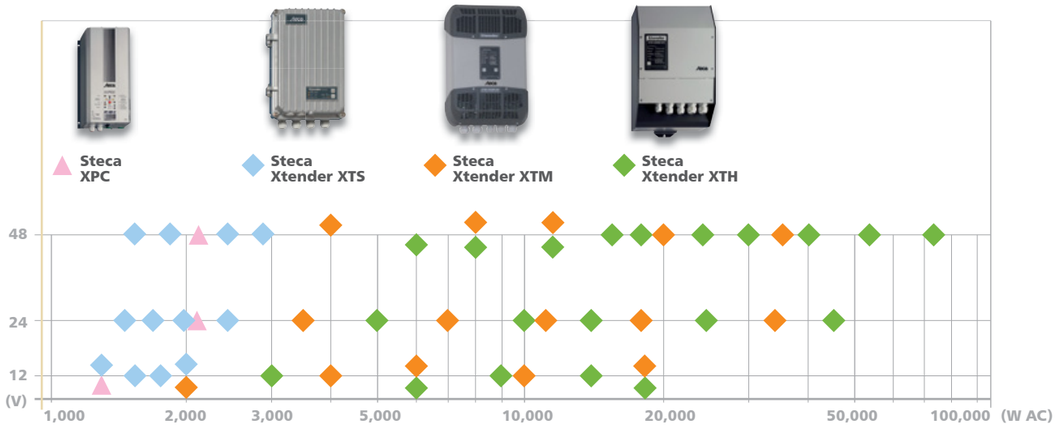
It makes sense to use solar charge controllers with additional functions in applications with stand-alone inverters or hybrid systems. The possibility of connecting to the stand-alone inverters for communication and synchronisation of the devices is a requirement for effective inverter systems or hybrid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

INVERTER SELECTION

Inverters



Inverters with battery chargers

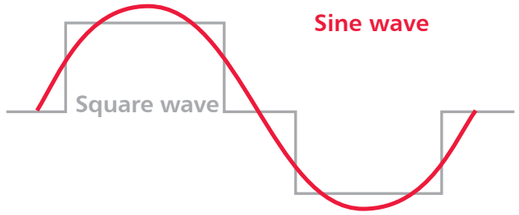


GENERAL RECOMMENDATIONS

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.

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

P_{nom} is the rated power of the inverter in watts and
U_{nom} is the rated voltage of the battery.

P_{nom} inverter	U_{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.

»STECA SOLAR ELECTRONICS PRODUCTS AND SOLUTIONS FOR AN ECOLOGICAL FUTURE.«

Steca has long stood for ideas and innovations as an electronic manufacturing services (EMS) provider and manufacturer of Steca brand product lines in solar electronics and battery charging systems. As a leading supplier of products for the solar electronics industry, Steca sets the international standard for the regulation and control of solar energy systems. In the three market segments PV grid connected, PV off grid and Solar thermal, the Steca brand is synonymous with innovation and vision. In conception, development, production and marketing, the company is committed to the highest quality standards.

OTHER PRODUCT AREAS

PV GRID CONNECTED

Small systems

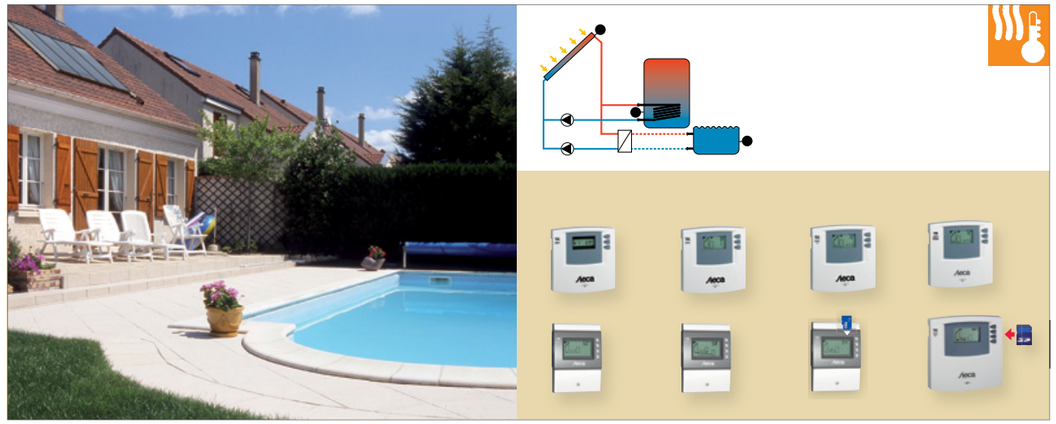
Systems for difficult roofs

Residential systems

Commercial systems

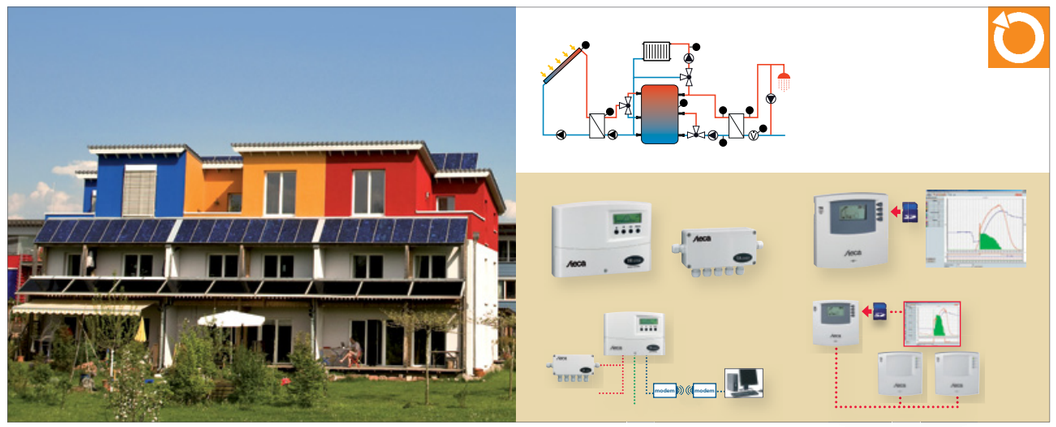
SOLAR THERMAL

Solar controllers



Heating and domestic hot water controllers

System controllers



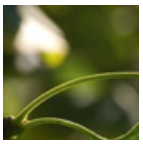
BATTERY CHARGING SYSTEMS

Mobile use

Stationary use

Equipment

ROOM FOR NOTES



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