Catalogue

Battery chargers

Inverter-chargers

Battery monitoring

Engineered power

Inverters

Battery splitters

Battery separators

MPPT solar charge controllers

DC/DC converters

SWISS made power

Summary

Photos credits
Robert Hofer, Céline Ribordy: Studer's products; Hacksss-Fotolia.com: p. 10; Getek AS: p. 18; Jeanneau: p. 8 top; Meteorisk: p. 3, 40; Perspective: p. 5, 28; PROSOL: p. 12; Siblik: p. 25; Steca: p. 6 bottom; Studer Innotec Ltd.: p. 15.

Graphism
Atelier Perspective, R. Gigon, Sion.

June 2013

Studer Innotec was established in 1987, not as a result of market research, but founded on my wish to improve solar systems. Therefore it was natural to focus on the main component of a battery system: the inverter.

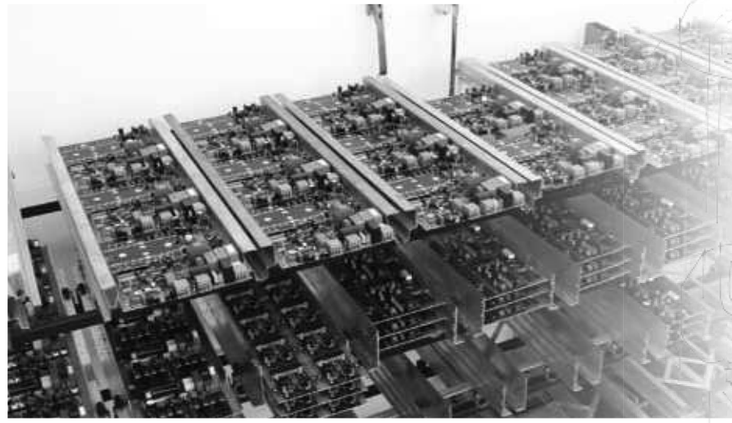
Three years later the company was manufacturing its first inverter models, eight years later it started to export them and then gradually opened up to new application areas (mobile applications, backup systems and industrial applications).

Today Studer Innotec provides an extensive product range with over 60 products that assure storage, conversion and management of energy, of which over 95% are exported through our distributor network with over 100 partners worldwide.

The key success factor in maintaining our competitive lead is constant innovation. Through its know-how and experience, Studer Innotec ensures the renewal of its product range as well as expanding into new applications such as self-consumption systems and mini-grids.

Our company's vision is the same as at its beginnings: more than a product, we offer innovative solutions to optimize any solar system whatever the application. These solutions are designed and manufactured at the same location, in Sion, Switzerland, as a result of the close collaboration and interaction with our customers.

Roland Studer
Founder and CEO of Studer Innotec SA



Production Integration and Flexibility

The company's philosophy has always been to master the complete process: from development to product sales. This is why Studer Innotec Ltd., since its beginning, is a company vertically integrated; therefore, capable of far greater flexibility than its competitors.

In other respects, to turn the markets expectations into products and services, a 10 people team is fully dedicated to Research & Development.

The Performance Choice

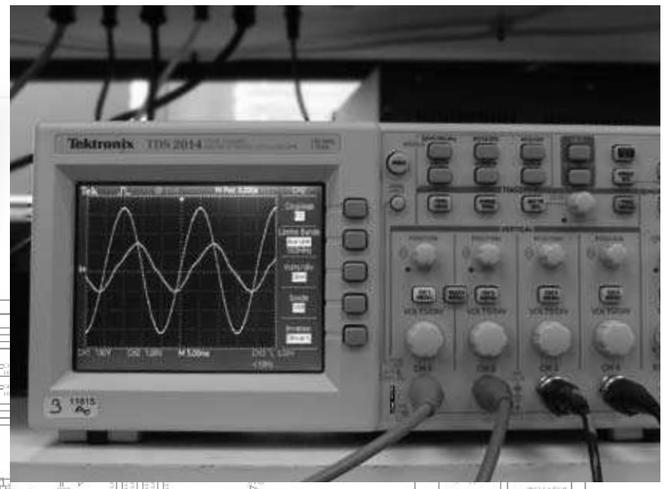
Studer Innotec's high-tech concept of its products as well as the performance and reliability selection, drive the company to choose its components with the greatest care. This is the reason why the Studer Innotec Ltd. has selected the latest technologies; such as digital signal processors (DSP) that provide higher efficiency to its inverters.

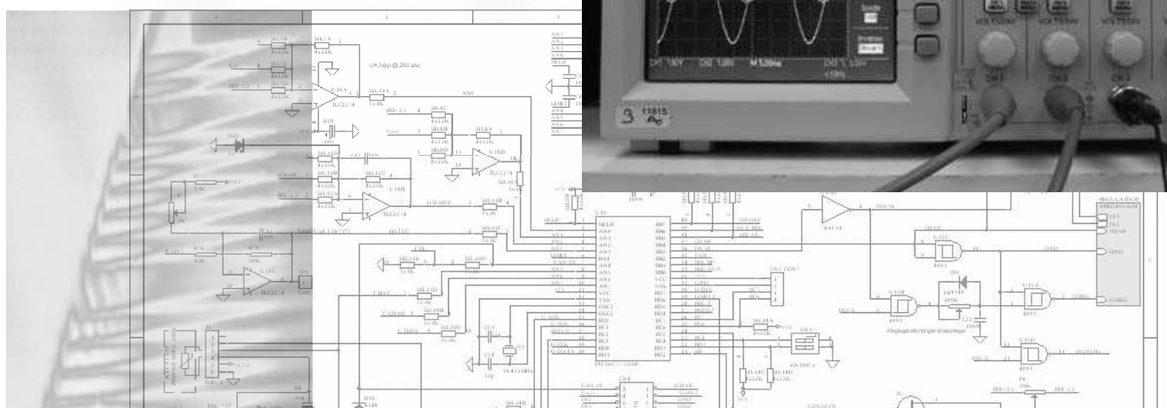
Ease in Use and Product Versatility

Quality choice will continue to guide Studer Innotec's strategic axis towards the future. Beyond performances, the next inverters will have increased ease in use and will offer greater versatility to the users.

Proximity with Clients

From research to industrialization, Studer Innotec Ltd. endeavors to carry on its human and financial investments in order to keep its lead in terms of global offer and proximity with clients. This closeness is maintained by a network of qualified service partners. Partner addresses can be found on the company website, under « Distributors ».





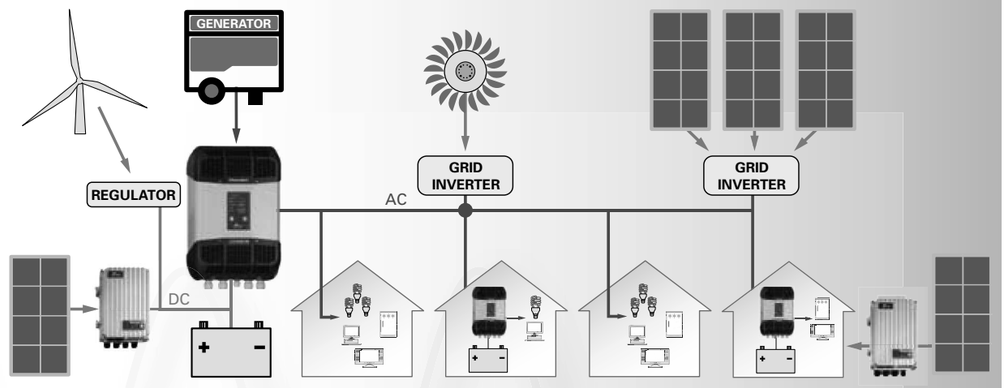
Applications in remote areas

Security and comfort (lighting, heating, household appliances, leisure electronics, telecoms...) can now be provided by autonomous energy systems; when far away from any electrical grid, either by choice or reason.

These systems consist firstly of an energy source; normally a genset, a solar generator, a wind turbine or a combination of these; secondly of a battery storage, and then thirdly of devices (inverter-charger, battery charger) able to charge the battery from this energy source and to supply users with AC voltage (inverter, inverter-charger).

The examples below show the products in some stand-alone applications.

Village electrification

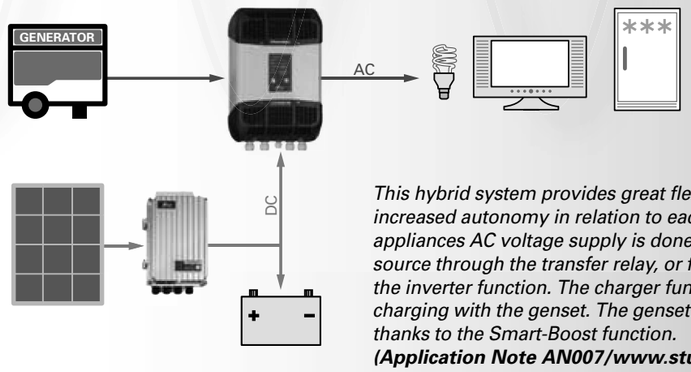


Various power sources supply energy to several consumer points.

Inverters
Xtender series p. 14
(900 - 72'000VA)

MPPT solar charge controller
VarioTrack series p. 26
(65 - 80A)

Hybrid system: more autonomy and flexibility



This hybrid system provides great flexibility in supply and increased autonomy in relation to each energy source. The appliances AC voltage supply is done directly from the energy source through the transfer relay, or from the battery through the inverter function. The charger function allows battery charging with the genset. The genset's size can be reduced thanks to the Smart-Boost function.
(Application Note AN007/www.studer-innotec.com)

Inverters
Xtender series p. 14
(900 - 72'000VA)

Compact series p. 22
(1'400 - 4'000VA)

MPPT solar charge controller
VarioTrack series p. 26
(65 - 80A)

A complete solar system can be built by combining an inverter from the AJ series and the «solar charge control» integrated function (as an option). One single device can then both supply alternating current (AC) and charge the battery with direct current (DC).

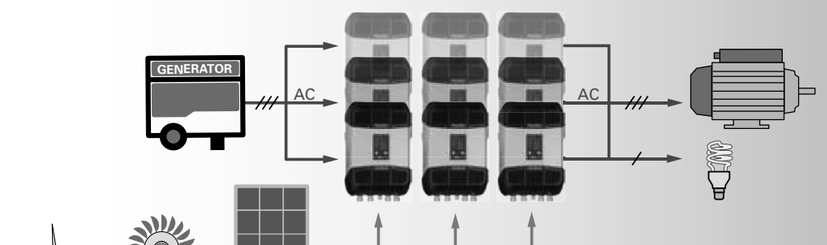
Inverters
AJ series p. 24
(275 - 2'400VA)

rical appliances

Inverters
Xtender series p. 14
(900 - 72'000VA)

Compact series p. 22

3-phase grid 3 x 400Vac for high power appliances



Mobile applications

A simple on-board energy system is often necessary to power the AC voltage appliances, while the vehicle or the boat is away from the electrical grid (port, garage, camping...).

In this case, energy is stored in the battery, which is actually charged by power sources on-board, such as a genset, solar generator, wind turbine, alternator or a combination of these. Studer Innotec offers the product range that secures the management and conversion of this energy, while securing an optimal power supply to the on-board appliances.

The examples below show our products in some mobile applications.

Applications

system

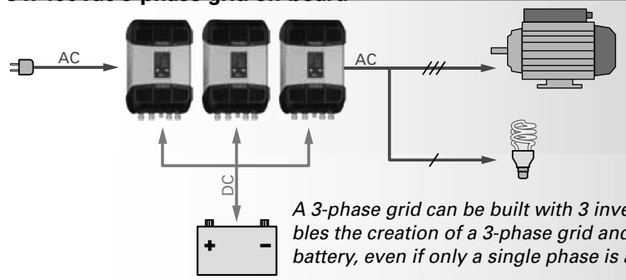
The inverter-charger charges the battery from the grid or from a genset, and powers any kind of electrical appliance. It converts the battery DC voltage to AC voltage. The models equipped with the Smart-Boost system enable the addition of the source's power to that of the inverter.

Inverters

Xtender series p. 14
(900 - 72'000VA)

Compact series p. 22
(1'400 - 4'000VA)

3 x 400Vac 3-phase grid on-board

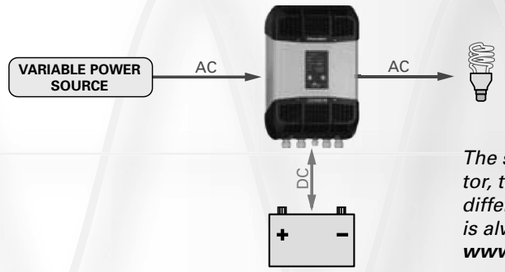


A 3-phase grid can be built with 3 inverters. The Xtender series enables the creation of a 3-phase grid and to simultaneously charge the battery, even if only a single phase is available as a power source.

Inverters

Xtender series p. 14
(900 - 72'000VA)

Variable power source assistance

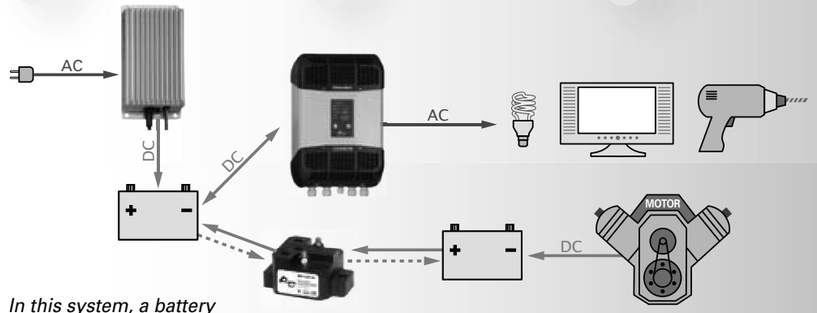


The source being a variable power alternator, the Smart-boost will supply the power difference in order that the power delivered is always the same ***(Application Note AN004/ www.studer-innotec.com).***

Inverters

Xtender series p. 14
(900 - 72'000VA)

Successive battery charging



In this system, a battery separator enables one or several auxiliary batteries to be charged, once the primary battery is charged.

Battery separators

MBR series p. 30

Battery chargers

MBC series p. 28

Simultaneous battery charging and DC/DC conversion

Backup applications

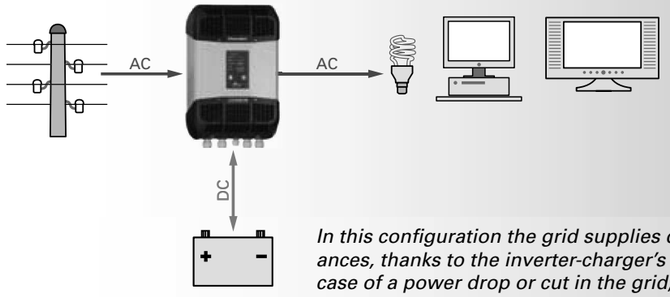
Appliances such as fridges, PCs, emergency lights, etc. which are supplied by the public grid and cannot afford any power cut, are electrically secured.

An inverter-charger with transfer relay or a combination of an inverter and a charger guarantees that the battery is well maintained and that an uninterrupted power supply to strategic appliances is sustained.

Studer Innotec Ltd. offers solutions from 275VA up to 72kVA with a one of a kind product choice that remains unchallenged on the market.

Applications

Uninterruptible power supply off-line



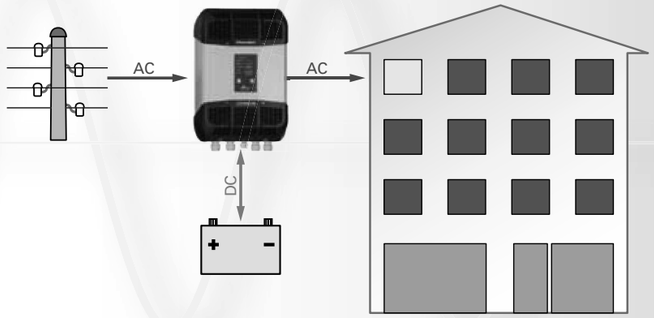
In this configuration the grid supplies directly to the appliances, thanks to the inverter-charger's by-pass function. In case of a power drop or cut in the grid, the inverter-charger guarantees the appliances' power supply.

Inverters

Xtender series p. 14
(900 - 72'000VA)

Compact series p. 22
(1'400 - 4'000VA)

Individual Home backup



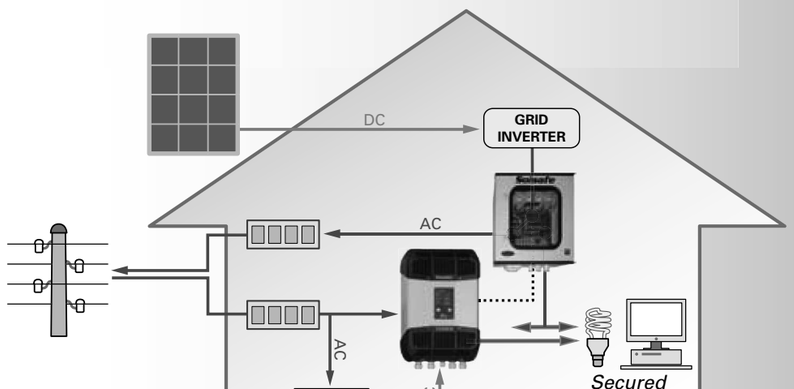
An inverter-charger is used there to provide a backup power in case of public grid outage. As soon as the power shuts off the inverter-charger switches on inverter mode and assures an uninterruptible power supply.

Inverters

Xtender series p. 14
(900 - 72'000VA)

Compact series p. 22
(1'400 - 4'000VA)

Solsafe – a backup system for grid connected solar installations



Anti-blackout system

Solsafe p. 26

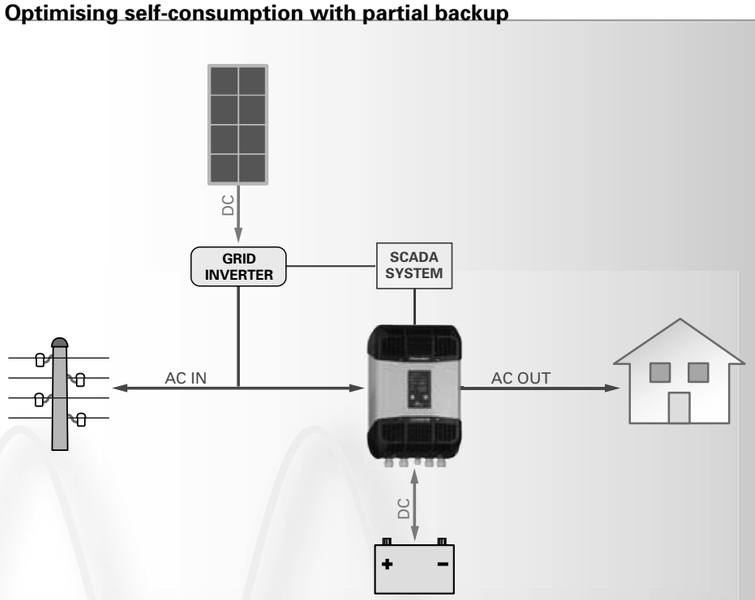
on-line

Self-consumption systems

In order to give priority to consumption of the energy generated from your own solar- or renewable installation, different systems including the Xtender inverter-chargers can be set up.

These systems store excess energy produced during daytime in batteries to be used at a later time, maximizing the self-consumption. The public grid will only be used to import or to export small amounts of energy if absolutely necessary.

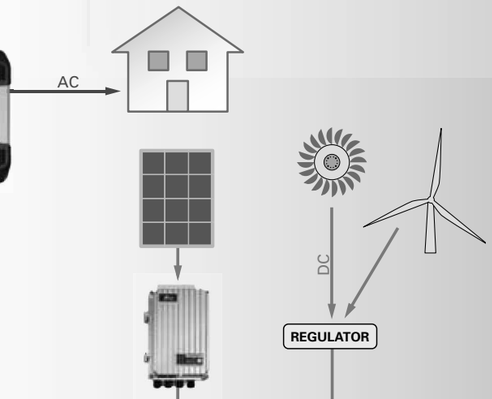
Optimising self-consumption with partial backup



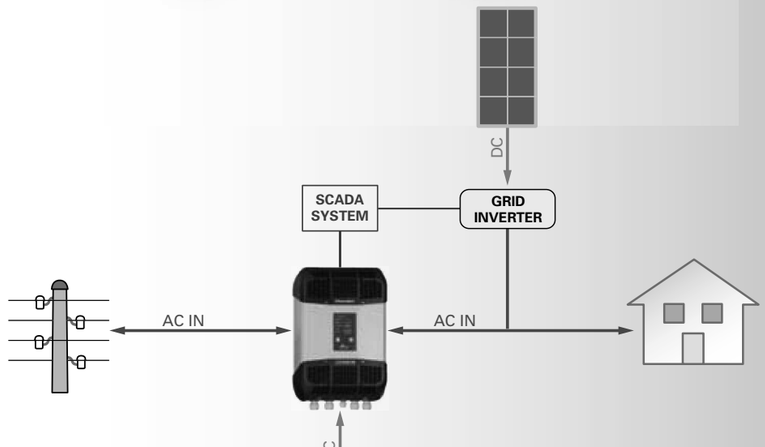
This system has the advantage of being easily integrated into an existing grid-feeding installation even when its power is higher to that of the Xtender. The self-consumption is optimized by means of an expert system (SCADA) supplied by partners of Studer Innotec.
This system also allows creating a separate secure grid adapted for selected backup appliances (e.g. lights, cooling systems and communication).

Inverters
Xtender series p. 14
(900 - 72'000VA)

ithout grid-injection



Optimising self-consumption with full backup



Xtender Series

The Xtender series provides unmatched freedom of use due to its many functions. In a basic application, it offers a total package: the functions of inverter, battery charger, transfer system and assistance to the source. These functions can be combined and controlled in a totally automatic way for exceptional ease and optimal management of available energy.

The Xtender is equipped with a command entry and 2 configurable auxiliary contacts. This allows an automatic control of the genset or a loadshedding when the battery voltage is too low. The flexibility then obtained makes it possible to implement special functionnalities, often necessary for a good energy management in standalone systems.

Features and performances

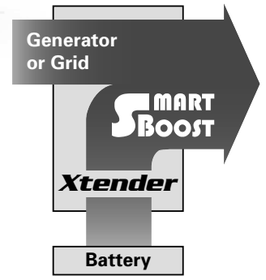
- Outstanding efficiency and overload.
- Perfect management and limitation of AC sources.
- Power shaving of the consumption peaks.
- Automatic allocation of the power available.
- Active filtering of the load steps on the genset.
- Automatic protection of the sources against overload.
- Battery priority (or to renewable sources).
- Parallel and three-phase setting, up to 9 units (72kVA).
- Powerful multi-stage PFC charger.
- Ultra-short transfer time (from 0 to 15ms max.).
- Automatic and efficient stand-by.
- 2 programmable auxiliary contacts (optional on the XTS).
- Compatible with AC coupling.
- XTS electronically protected against reverse polarity.
- Display, programming and data logging integrated in the remote control RCC.
- Interactive with the Battery Status Processor (BSP).
- RS-232 communication for remote supervision.

Xtender range	Battery voltage	AC voltage	Output power P30/Pnom	Power Smart-Boost	Charge current	Transfer current
XTS 900-12	12V	230Vac*	900VA** / 500VA	900VA**	0 - 35A	16A
XTS 1200-24	24V	230Vac*	1200VA** / 650VA	1200VA**	0 - 25A	16A
XTS 1400-48	48V	230Vac*	1400VA** / 750VA	1400VA**	0 - 12A	16A
XTM 1500-12	12V	230Vac*	1500VA / 1500VA	1500VA	0 - 70A	50A
XTM 2000-12	12V	230Vac*	2000VA / 2000VA	2000VA	0 - 100A	50A
XTM 2400-24	24V	230Vac*	2400VA / 2000VA	2400VA	0 - 55A	50A
XTM 2600-48	48V	230Vac*	2600VA / 2000VA	2600VA	0 - 30A	50A
XTM 3500-24	24V	230Vac*	3500VA / 3000VA	3500VA	0 - 90A	50A
XTM 4000-48	48V	230Vac*	4000VA / 3500VA	4000VA	0 - 50A	50A
XTH 3000-12	12V	230Vac*	3000VA / 2500VA	3000VA	0 - 160A	50A
XTH 5000-24	24V	230Vac*	5000VA / 4500VA	5000VA	0 - 140A	50A
XTH 6000-48	48V	230Vac*	6000VA / 5000VA	6000VA	0 - 100A	50A
XTH 8000-48	48V	230Vac	8000VA / 7000VA	8000VA	0 - 120A	50A

* For the 120Vac/60Hz version, -01 is added to the model designation.
** These features are valid only when using the cooling module ECF-01.
Complete technical specifications on page 32.

Function Smart-Boost and active filtering

With this function it is possible to interact directly with the AC source (Genset or grid) and to implement some basic functions such as:



- Efficient and immediate limitation of the current of the source, including fore non linear or inductive/ capacitive loads, protecting efficiently the breakers during connection to shore power or to a camping power counter with limited current (function of power shaving and of power assistance) **(more information on our website and in the Application Note AN001/www.studer-innotec.com).**
- Power shaving of load steps on the generator allowing therefore an optimal sizing of the generator and asssuring the best possible efficiency of the fossile fuels (function of filtering and of power assistance).

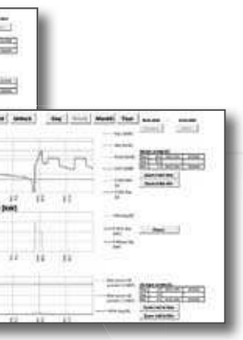
The function of assistance to the source enables also to implement advanced functions such as the priority use of renewable energy, even when the grid is available **(more information on our website and in the Application Note AN002/www.studer-innotec.com).**

The new alpine cabin of Monte-Rosa with a system Xtender

RCC-02  **RCC-03** 

mming centre RCC-02 or RCC-03

fference, adapted for wall or panel mounting, both units have exact-ow the user to survey his system and fully customize it to his needs. s to the many adjustable parameters of the Xtender. It enables the setting ttery, the programming of the auxiliary contacts and gives access to a lot of ts graphic display RCC provides clear and comprehensive indications on the ble language. The unit memorizes and displays the events that occurred on anticipate the problems that might appear. A slot for a SD card is available cord and download as well as the full software update.



Data logging and analysis

Analyze easily your data with the RCC-02/03 Data logger function that will record on the SD card the main electrical values of your Xtender system during its operation.

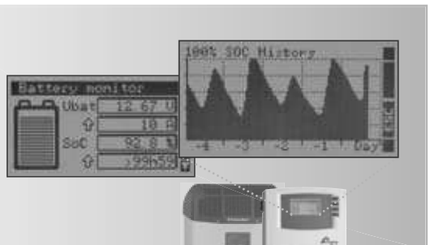
These standards enable the follow up on the system's energy consumption evolution, to check the power cuts, the state of the auxiliary contacts, the input currents and voltages, etc.

r free two graphical and analysis tools, Xtender Data Analysis Tool and sis **(more information on our website and in the Application Note com).**

or XTENDER systems

ation for a safe and effective opera-eries is their state of charge. ns, a highly precise measuring and at calculates the state of charge in

vides the display, the data logging, f charge history and the settings. he programming of the Xtender sys-an be displayed like for instance:



Accessories

		XTS	XTM	XTH
	***RCC-02/-03*** *The remote control module (with 2m cable) enables the setting of the parameters as well as the display of the values measured. By means of a SD card it is possible to log the system data, to save and restore the parameters of the system. This module is available either for wall mounting (model RCC-02), or for panel mounting (model RCC-03).*	●	●	●
	***BTS-01*** *Battery temperature sensor (with 5 m cable) offering the automatic compensation of the adjustable thresholds of the battery voltage.*	●	●	●
	***RCM-10*** *Module for rail DIN mounting (with 5 m cable) giving access to the main ON/OFF and to the command entry with the models XTS and XTM.*	●	●	
	***BSP 500/1200*** *Module meant for the measuring and calculating of the battery state of charge (with 5 m cable). This module is connected to the communication bus of the Xtender. It allows the display and the datalogging of the values measured and calculated (see opposite screens) and also the control of the 2 auxiliary contacts of the Xtender.*	●	●	●
	***Xcom-232i*** *Communication module with RS-232 port and 2 m RJ45 cable, allowing access to the parameters and measured values of the Xtender system. It makes the link between an Xtender system and a SCADA supervision or control system (not supplied).*	●	●	●
	***Xcom-MS*** *Bridge for a communication between an Xtender system and one or several MPPT chargers Tristar (with 2 m cable). With this module it is possible to set the parameters and to have access to the values measured in the solar charger, as well as to synchronize the charging profile of the battery. The main values can be stored in the SD card of the module RCC or are accessible by means of the communication module Xcom-232i.*	●	●	●
	***ARM-02*** *This module only meant for the XTS models and for rail DIN mounting, is equipped with 2 auxiliary contacts controlled by the XTS. This function is already integrated in the models XTM and XTH.*	●		
	***ECF-01*** *External cooling module (IP54) for models XTS. The use of this accessory will increase the power of the XTS. The ECF-01 is directly installed on top of the XTS casing and its mounting can be done at any time after installation.*	●		
	X-Connect			

The main configurations offered by the Xtender series

Wide modularity

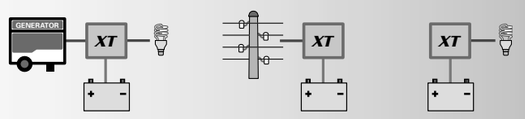
By the implementation of several units, it is possible to create a 3-phase source or to set them in parallel to increase the power available without extra cost. Up to 9 inverters of the Xtender serie shall therefore be combined together up to 72kVA !

ti-units

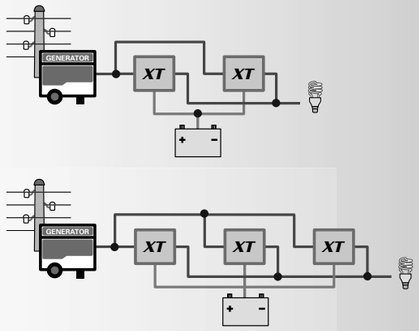
Compatible with standard cable channel (230 x 60 mm)

eart of the Spitzbergen...

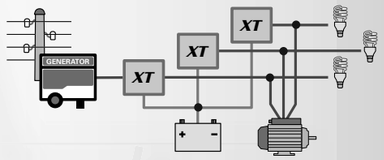
Inverter, charger and transfer relay
The Xtender basically works as an inverter and as a charger, combined with a transfer relay.



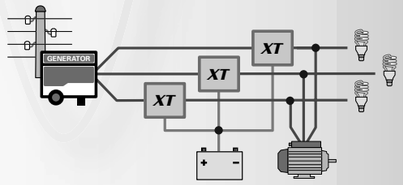
2 or 3 units in parallel on 1 phase
Increase of the power on one phase by setting 2 or 3 Xtender in parallel.



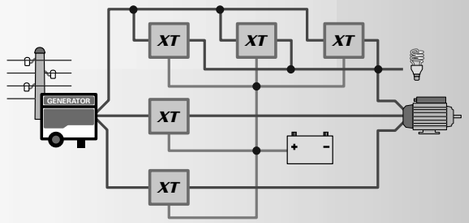
1 phase in and 3 phase out
Three-phase power supply from a single phase source.



3 phase in and 3 phase out
Three-phase source for a three-phase power supply.



3 phase + with one reinforced phase
Three-phase power supply with increase of the power on one phase by setting 2 or 3 Xtender in parallel on this phase.



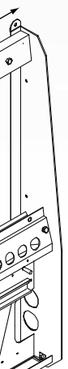
Mounting frame for Xtender multi-system

Offers a flexible and cost effective solution for high power systems based on the XTH inverter.

Up to 72kVA multi-unit system

Frame is supplied with:

1. Pre-installed DC circuit breakers
2. Pre-installed DC fuses



Solsafe: the anti-blackout system for grid connected solar installations

Despite a solar system on your house, in case of power outage, the grid inverters will shut off and the solar generator, whatever its size, will be useless. Studer Innotec Ldt has developped, already in 2004, a concept in which its inverter-chargers allow to keep energy available from the solar generator, even in case of a power cut.

Solsafe S-Box

Compared to other similar solutions, it offers:

- Great system flexibility by choosing both the grid inverter power (matching the solar generator) and the stand-alone power (matching the needs for autonomous energy) independently, as long as the stand-alone inverter is as big as, or bigger than the grid inverter.
- The choice of the grid inverter allows working with standard well known products.
- To choose the grid inverter with any voltage input range, independently from the battery voltage.
- A possible and easy upgrade of existing grid-connected solar installations.

S-Box: a genuine cabling solution to implement the Solsafe

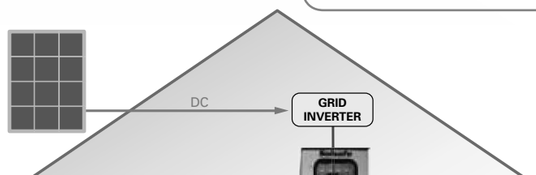
- Hassle free cabling
- Quick installation
- Easy commissioning

The S-Box can be supplied in 4 versions:

For single phase application:

- Solsafe box 25A for Compact..... S-Box-25C
- Solsafe box 25A for Xtender..... S-Box-25X
- Solsafe box 25A for Compact with ENS-26..... S-Box-25C-E
- Solsafe box 25A for Xtender with ENS-26..... S-Box-25X-E

For Solsafe implementation in 3ph systems, a schematic is at disposal on simple request.



Compact series

The Compact series models consist of 3 fully automatic functions: a sine wave inverter, a battery charger and a transfer system. Equipped with high-end technology, they optimally perform, thanks to Studer Innotec's extensive experience in the field of electrical supply.

Features and performances

- True sine wave voltage.
- Suitable for any kind of electrical appliance.
- Reliable and silent working with all kind of loads.
- Outstanding overload capabilities.
- Stand-by level adjustable over a large range and from a very low threshold.
- 4 STEP battery charger with PFC.
- Ultra-fast transfer relay.
- High efficiency.
- Full internal protection.
- Ultra-fast regulation.
- Microprocessor controlled.

E24 Norm E certification

The XPC 1400-12, XPC 2200-24, C 1600-12 and C 2600-24 are certified to the ECE-R 10 norm.

power nom	Battery voltage	AC voltage	Charge current	Transfer current	Solar option (-S)

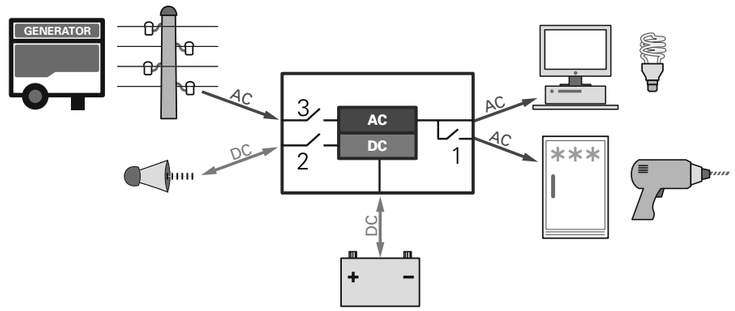
Multifunctional contact

The 16 A. potential free contact can be programmed according to the user wishes. It reacts according to battery levels, as well as to the system status (alarm conditions, public grid presence, sunlight's presence…), and provides:

1/ Automatic disconnection of second priority users (conditional supply).

2/ Alarm signalization, acoustic signal, MODEM, radio alarm etc.

3/ Conditional battery charge.



Accessories

		XP COMPACT	COMPACT
	***RCC-01 Remote control*** *State of the system displayed by LED and remote programming* (supplied with a 20 m cable).* **compulsory for the programming of the XP Compacts*	●	●
	***CT-35 Temperature sensor*** *This sensor adapts charge levels to the battery's temperature variations (supplied with 3 m cable).*	●	●
	***ARM-01 Auxiliary relay module*** *Equipped with 3 programmed relays and a fourth one which is like the inverter-charger's auxiliary contact, this module allows the Solsafe system to be implemented (see page 11).*	●	●
	***CFC-01 Cover*** *This cover provides additional connection protection by means of glands.*	●	●
	***C-IP22 Cover*** *Cover for a protection against intrusions or projections, installed after the mounting of the device. It extends the protection index of the XP Compacts and Compacts from IP 20 to IP 22.*	●	●

AJ series

The AJ range consists of sine wave inverters that convert a battery's DC voltage into AC voltage, which can be used by all electrical appliances.

Features and performances

- High and steady efficiency.
- Outstanding overload capabilities.
- Digital regulation and control by microprocessor.
- Electrical supply to any type of appliance.
- Full internal protection.
- Battery lifetime optimization (B.L.O.) function.
- Supplied with battery and AC cables.

Norm E certification

The AJs in 12 and 24Vdc are certified to the ECE-R 10 norm.

power nom	Battery voltage	AC voltage	Solar option (-S)
200 VA	12 Vdc	230 Vac*	10 A
300 VA	24 Vdc	230 Vac*	10 A
300 VA	48 Vdc	230 Vac*	10 A
400 VA	12 Vdc	230 Vac*	15 A

Battery Lifetime Optimization: B.L.O.

With this function the AJ inverters offer an advanced protection of the battery, by a smart management of the low voltage disconnection (LVD).

Accessoire

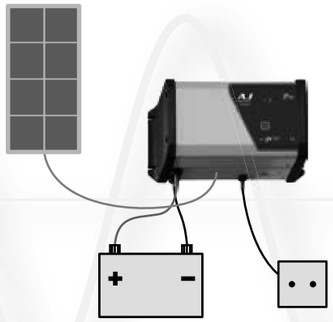
	***JT8 Remote control*** *Enables the control (ON/OFF) and the remote display (ON / Standby / Temporary off).* *(supplied with a 5 m cable)*	*AJ 1000-12, AJ 1300-24* *AJ 2100-12, AJ 2400-24*

Option plug for remote control RCM

Connection (plugs male and female) to start/stop an inverter AJ under certain circumstances:

- *RCM 01: ON when a contact is closed.*
- *RCM 02 : ON when a voltage is present on the plug.*
- *RCM 03: ON when a contact is open.*

For the AJ inverters 275 to 700VA.
Supplied with a «connector Jack» 3.5 mm.



Option built-in solar charge controller

For a complete solar system !

The models AJ can be supplied equipped with an optional integrated PWM solar charge controller, making the inverter an «all in one» device for a solar installation.

Rural electrification (Solar Home System)

The rural electrification and the inverters of the AJ series: excellence to the benefit of the development of remore areas and populations. Choosing AC voltage for the rural electrification systems is going for simplicity, reliability and cost saving. Indeed, compared with a DC voltage one, a system with an inverter is often more efficient from 100W of solar power.

The AJ series, due to its overload capability and to its very reliable stand-by system adjustable from 2W, is the most suitable range of inverters to meet the rural electri-

VarioTrack series

The VarioTrack solar charge controller maximizes the energy generated from solar panels in any solar installation. It contains a MPPT (Maximum Power Point Tracking) algorithm that continuously tracks the maximum power point and automatically charges the batteries in an optimal way with all the available solar power.

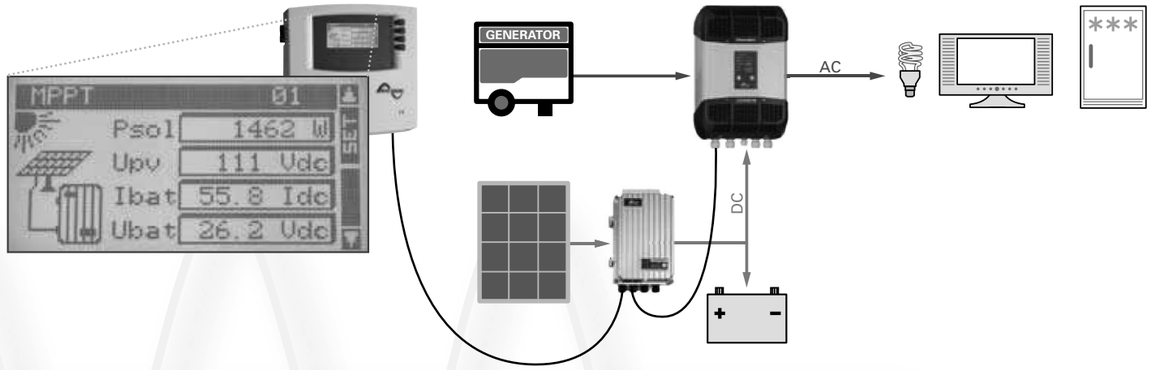
Features and performances

- Easy and safe commissioning with full protection against incorrect wiring
- Rugged and durable, this device is designed to perform in harsh environmental conditions (IP54)
- High conversion efficiency, 98%
- Up to 15 VarioTrack in parallel on the same communication bus
- 4 step charger for longer battery life
- Low self-consumption : <1W in night time mode
- Display with 7 LEDs showing status and current
- Comprehensive display, programming and datalogging with RCC-02/-03
- Suitable for any solar system
- Optimal usage in an Xtender system with a synchronized battery management

battery	Maximum power of the solar generator	Maximum voltage of the solar generator	Maximum charging current to the battery

The VarioTrack in an Xtender system

Designed to function in any solar installation, the VarioTrack is working optimally in an Xtender system. The communication between the two devices allows in particular for a synchronized battery management.



Display and programming possibilities

The VarioTrack is fitted with several indicator lights and a control button for its basic operation. It is also possible to do basic programming using the DIP switches situated inside the device.

By adding a remote control and programming center RCC-02/-03, the VarioTrack can use all functions available in the remote control such as display, programming, data logging etc.

Accessories

		VT-65	VT-80
	***RCC-02/-03 Remote control and programming centre*** *The remote control module (with 2m cable) enables the setting of the parameters as well as the display of the values measured. By means of a SD card it is possible to log the system data, to save and restore the parameters of the system.* *This module is available either for wall mounting (model RCC-02), or for panel mounting (model RCC-03).*	●	●

ers

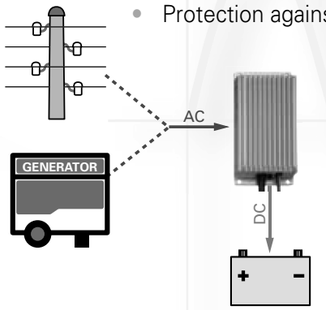
DC/DC converters

MBC series

The MBC chargers enable battery charging from an AC voltage supply source (genset, public grid, shorepower, etc.). These chargers are also watertight and therefore especially designed for outdoor applications (IP 65).

Features and performances

- Universal input voltage.
- Charge of lead acid batteries with liquid or gelled (GEL) electrolyte.
- Protection against battery overcharge.



voltage	Input voltage	Output current	Output
dc	230 Vac ±15%	6 A	1
dc	230 Vac ±15%	15 A	1
dc	230 Vac ±15%	3 A	1
dc	230 Vac ±15%	8 A	1
dc	230 Vac ±15%	32 A	1

Complete technical specifications on page 37.

MDCI and MDC series

The DC/DC converters type MDCI and MDC are used, depending on the model, either to step up or to step down a DC voltage.

The MDCI range converters are electrically isolated.

Features and performances

- High efficiency.
- Low consumption.
- Protection against short-circuit, overheat, overvoltage and reverse polarity.
- Great stability of the output voltage for a more reliable system.

MDCI range	Power	Output Current	Input variant	Output variant	Isolated
MDCI 100	100 W	8/4 A	A/B/C/D	12.5 or 24 Vdc	Yes
MDCI 200	200 W	16.5/8 A	A/B/C/D	12.5 or 24 Vdc	Yes
MDCI 360	360 W	30/15 A	A/B/C/D	12.5 or 24 Vdc	Yes
MDCI 360 A24 Charger	330 W	30/15 A	A	24 Vdc	Yes

A = 9-18 Vdc B = 20-35 Vdc C = 30-60 Vdc D = 60-120 Vdc (ex. MDCI 200 D24)

MDC range	Power	Output Current	Input voltage	Output voltage	Isolated
MDC 1224-7	170 W	7 A	9-18 Vdc	24 Vdc	No
MDC 2412-5	65 W	5 A	18-35 Vdc	13.2 Vdc	No

ery splitters

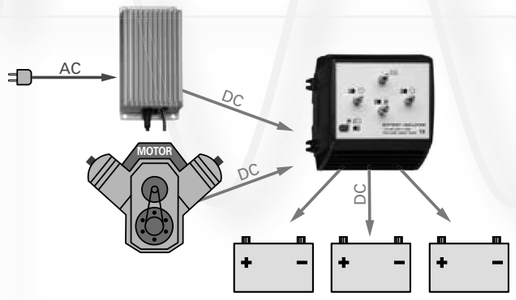
MBI series

The MBI MOSFET battery splitters generate an insignificant voltage drop. They supply the charger's or alternator's current to several batteries. All batteries are thus charged at the same time, and therefore will not charge or discharge each other.

MBI range	Input	Charge current	Charge input	Outputs
MBI 100/2	12/24 Vdc	100 A	1	2
MBI 150/2	12/24 Vdc	150 A	1	2
MBI 100/3	12/24 Vdc	100 A	1	3
MBI 150/3	12/24 Vdc	150 A	1	3
MBI 200/3	12/24 Vdc	200 A	1	3
MBI 2-100/3	12/24 Vdc	100 A	2	3

Complete technical specifications on page 38.

e batteries voltage.
ry from an alternator
Amp.
ators.



arators

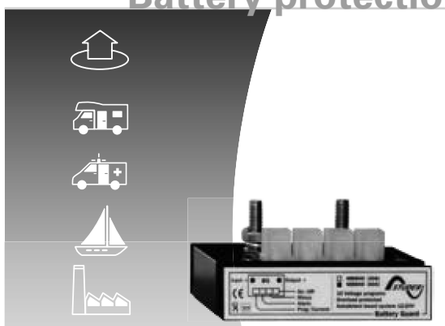
MBR series

The MBR batteries separators allow to supply the auxiliary battery or the appliances, as soon as the mainbattery voltage is high enough.

MBR range	Battery voltage	Charge current	Batteries
MBR 12/24-100	12/24 Vdc	100 A	2
MBR 12/24-160	12/24 Vdc	160 A	2
MBR 12/24-500	12/24 Vdc	500 A	2

Complete technical specifications on page 38.

Battery protection



MBW series

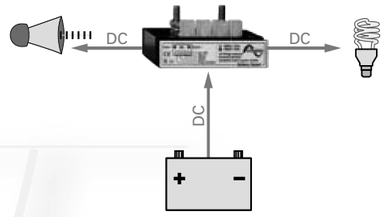
The Battery Watch protects the battery from an excessive discharge and also the consumers in case of overvoltage.

Features and performances

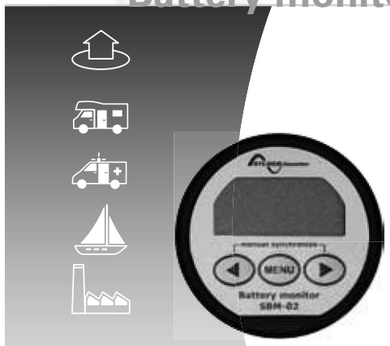
- Programming the connection and disconnection voltages by jumpers.
- MOSFET switches, therefore no sparks.
- Alarm output to indicate excessive voltage drops.

MBW range	Maximum current	Operating voltage range (Vdc)
MBW 40	40	6-35
MBW 60	60	6-35
MBW 200	200	8-32

Complete technical specifications on page 39.

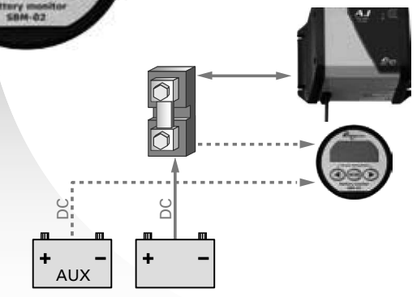


Battery monitoring



SBM-02

The SBM-02 is a highly accurate battery monitor with a history data memory. It is supplied together with a 500A/50mV shunt. This device is designed for 12 and 24V batteries. The optional SBM-PS-02 voltage pre-scaler extends the use of the SBM-01 to 27-175V batteries.



Features and performances

- Digital display of the 6 most important parameters of a DC power system:
  1. Battery voltage (V)
  2. Current (A)
  3. Consumed Ampere-hours (Ah)
  4. Sate-of-charge (%)
  5. Time-to-go (h:m)
  6. Temperature (°C or °F)

Optional accessories

-12	XTS 1200-24	XTS 1400-48	XTM 1500-12	XTM 2000-12	XTM 2400-24	XTM 2600-48	XTM 3500-24	XTM 4000-48	XTH 3000-12		XTH 5000-24	XTH 6000-48	XTH 8000-48
c	24Vdc	48Vdc	12Vdc		24Vdc	48Vdc	24Vdc	48Vdc	12Vdc		24Vdc	48Vdc	
Vdc	19 - 34Vdc	38 - 68Vdc	9.5 - 17Vdc		19 - 34Vdc	38 - 68Vdc	19 - 34Vdc	38 - 68Vdc	9.5 - 17Vdc		19 - 34Vdc	38 - 68Vdc	
0VA	800**/650VA	900**/750VA	1500VA	2000VA			3000VA	3500VA	2500VA		4500VA	5000VA	7000VA
0VA	1200**/1000VA	1400**/1200VA	1500VA	2000VA	2400VA	2600VA	3500VA	4000VA	3000VA		5000VA	6000VA	8000VA
A	2.5kVA	2.8kVA	3.4kVA	4.8kVA	6kVA	6.5kVA	9kVA	10.5kVA	7.5kVA		12kVA	15kVA	21kVA
Up to short-circuit													
Up to Pcont.													
2 to 25 W													
0.1-1													
	93%	93%	93%		94%	96%	94%	96%	93%		94%	96%	
/7W	1.2W/1.5W/8W	1.3W/1.6W/8W	1.2W/1.4W/8W	1.2W/1.4W/10W	1.4W/1.6W/9W	1.8W/2W/10W	1.4W/1.6W/12W	1.8W/2.1W/14W	1.2W/1.4W/14W		1.4W/1.8W/18W	1.8W/2.2W/22W	1.8W/2.4W/30W
Pure sine wave 230Vac (± 2%) / 120Vac [1]													
Adjustable 45 - 60Hz [1] ± 0.05% (crystal controlled)													
<2%													
Automatic disconnection with 3 time restart attempt													
Warning before shut-off - with automatic restart													
6 steps: Bulk-Absorption-Floating-Equalization-reduced floating-periodic absorption Number of steps, thresholds, end current and times completely adjustable with the RCC-02/-03													
	25A	12A	70A	100A	55A	30A	90A	50A	160A		140A	100A	120A
With BTS-01 or BSP 500/1200													
EN 61000-3-2													
-12	**XTS 1200-24**	**XTS 1400-48**	**XTM 1500-12**	**XTM 2000-12**	**XTM 2400-24**	**XTM 2600-48**	**XTM 3500-24**	**XTM 4000-48**	**XTH 3000-12**		**XTH 5000-24**	**XTH 6000-48**	**XTH 8000-48**
150 to 265Vac / 50 to 140Vac [1]													
45 to 65Hz													
16Aac/20Aac			50Aac/56Aac										50Aac/80Aac
<15 ms													
ARM-02 with 2 contacts, in option			2 independent contacts (potential free 3 points, 16Aac/5Adc)										
g	9 kg	9.3 kg	15 kg	18.5 kg	16.2 kg		21.2 kg	22.9 kg	34 kg		40 kg	42 kg	46 kg
x310	110x210x310	110x210x310	133x322x466				133x322x466		230x300x500		230x300x500	230x300x500	
IP54			IP20										
Directive EMC 2004/108/EC: EN 61000-6-1, EN 61000-6-3, EN 55014, EN 55022, EN 61000-3-2, 62040-2 Low voltage directive 2006/95/EC: EN 62040-1-1, EN 50091-2, EN 60950-1													
-20 à 55°C													
100%			95% without condensation										
ptional cooling module ECF-01			Forced from 55°C										
<40dB / <45dB (without/with ventilation)													
5 years													
	•	•	•	•	•	•	•	•	•		•	•	•
	•	•	•	•	•	•	•	•	•		•	•	•
	•	•	•	•	•	•	•	•	•		•	•	•
	•	•	•	•	•	•	•	•					
	•	•											

COMPACT series

Model	XPC 1400-12	XPC 2200-24	XPC 2200-48	C 1600-12	C 2600-24	C 4000-48
Inverter						
Nominal battery voltage	12Vdc	24Vdc	48Vdc	12Vdc	24Vdc	48Vdc
Input voltage range	9.5 – 16Vdc	19 - 32Vdc	38 - 64Vdc	9.5 - 16Vdc	19 - 32Vdc	38 - 64Vdc
Continuous power @ 25°C	1100VA	1600VA	1600VA	1300VA	2300VA	3500VA
Power 30 min. @ 25°C	1400VA	2200VA	2200VA	1600VA	2600VA	4000VA
Power 5 sec. @ 25°C	3 x Pnom					
Maximum power	Up to short-circuit					
Maximum asymmetric load	Up to Pcont.					
Stand-by adjustment	1 to 25W					
Cos φ	0.1 - 1					
Maximum efficiency	94%	95%		94%	95%	
Consumption OFF/Stand-by/ON	0.5/0.6/4W	0.8/0.9/7W	1.2/1.3/7W	0.5/0.6/6W	0.8/0.9/9W	1.2/1.4/12W
Output voltage	Sine wave 230Vac (±5%) (XPC also available in 120Vac)					
Output frequency	50Hz ± 0.05% (crystal controlled)					
Total harmonic distortion	< 4%	< 2%				
Overload and short-circuit protection	Automatic disconnection with 3 time restart attempt					
Overheat protection	Acoustic warning before shut-off - with automatic restart					
Battery charger (4 STEP) I-U-Uo-Equalize (every 25 cycles)						
Charging current adjustable	0 - 45Adc	0 - 37Adc	0 - 20Adc	0 - 55Adc		0 - 50Adc
Input current balance adjustment	Not available			1 - 16A		
Maximum input voltage	265Vac					
Input AC voltage range	Adjustable threshold from 150 to 230Vac (XPC also available in 120Vac)					
Input frequency	45 - 65Hz					
Power Factor Correction (PFC)	EN 61000-3-2					
Battery control (thresholds and times adjustable by the user)						
Absorption time	0-4 h					
End charge cycle voltage*	14.4Vdc	28.8Vdc	57.6Vdc	14.4Vdc	28.8Vdc	57.6Vdc
Floating voltage	13.6Vdc	27.2Vdc	54.4Vdc	13.6Vdc	27.2Vdc	54.4Vdc
Equalization time	0-4 h					
Equalization voltage	15.6Vdc	31.2Vdc	62.4Vdc	15.6Vdc	31.2Vdc	62.4Vdc
Deep-discharge protection	10.8Vdc	21.6Vdc	43.2Vdc	10.8Vdc	21.6Vdc	43.2Vdc
Temparature compensation (optional CT-35)	-3mV / ° C / Cell					
General data						
Multifunction contact programmable	16A - 250Vac (potential free 3 points)					
Max. current on transfer relay	16Aac					
Transfer time	< 40 ms					
Weight	11.7 kg	12.6 kg		16 kg	17.1 kg	29.4 kg
Dimension hxwxl [mm]	124x215x410			124x215x480		124x215x670
Protection index	IP20 (IP22 with top cover C-IP22)					
Certification ECE-R 10 (E24)	•	•	Not available	•	•	Not available
EC conformity	EN 61000-6-1, EN 61000-6-3, EN 55014, EN 55022, EN 61000-3-2, Low voltage directive 2006/95/EC: EN 62040-1-1, EN 50091-2, EN 60950-1					
Operating temperature range	-20°C up to +55°C					
Relative humidity in operation	95% without condensation					
Ventilation	From 45°C					

J 275-12	AJ 350-24	AJ 400-48	AJ 500-12	AJ 600-24	AJ 700-48
12Vdc	24Vdc	48Vdc	12Vdc	24Vdc	48Vdc
5 – 16Vdc Vdc max.)	21 – 32Vdc (44Vdc max.)	42 – 64Vdc (64Vdc max.)	10.5 – 16Vdc (24Vdc max.)	21 –32Vdc (44Vdc max.)	42 –64Vdc (64Vdc max.)
200VA	300VA	300VA	400VA	500VA	500VA
275VA	350VA	400VA	500VA	600VA	700VA
350VA	500VA	600VA	575VA	675VA	900VA
450VA	650VA	1000VA	1000VA	1200VA	1400VA
150VA	150VA	200VA	250VA	300VA	300VA
93%	94%	94%	93%	94%	94%
up to 200 VA	0.1 – 1 up to 300 VA	0.1 – 1 up to 300 VA	0.1 – 1 up to 400VA	0.1 – 1 up to 500VA	0.1 – 1 up to 500VA
2W (only with the solar option -S)			Adjustable: 1 → 20W		
A (4.6A*)	3.2A (6.4A*)	4.6A (9.2A*)	5.2A (10.4A*)	5.7A (11.4A*)	7A (14A*)
Sine wave 230Vac (120Vac*) ±5%					
50Hz (60Hz*) ± 0.05% (crystal controlled)					
< 5% (@ Pnom.)					
0.3W**	0.5W**	1.1W**	0.4W	0.6W	1.5W
2.4W	3.5W	5.2W	4.6W	7.2W	12W
Shut down @ 75°C - Auto-restart @ 70°C					
Automatic disconnection with 2 time restart attempt					
60A	40A	25A	120A	90A	60A
Shut off @ 0.87 x Unom - Automatic restart @ Unom					
Shut off @ >1.33 x Unom - Automatic restart @ < Umax					
Before low battery or overheating disconnection					
2.4 kg	2.6 kg		4.5 kg		
142x163x84			142x240x84		
IP 30 conforms to DIN 40050					
•	•	Not available	•	•	Not available
EN 61000-6-1, EN 61000-6-3, EN 55014, EN 55022, EN 60950-1					
-20°C up to +50°C					
95% without condensation					
From 45°C ± 5°C					
< 45 dB (with ventilation)					
5 years					
-1.5%/°C since +25°C					
> 5 x Pnom/Unom (recommended value in Ah)					
1.2m / 1m			1.5m / 1m		
275-12-S	**AJ 350-24-S**	**AJ 400-48-S**	**AJ 500-12-S**	**AJ 600-24-S**	**AJ 700-48-S**
25Vdc	45Vdc	90Vdc	25Vdc	45Vdc	90Vdc
10Adc			15Adc		
Floating 3 stages (I/U/UO)					
14.4Vdc	28.8Vdc	57.6Vdc	14.4Vdc	28.8Vdc	57.6Vdc

AJ series

Model	AJ 1000-12	AJ 1300-24	AJ 2100-12	AJ 2400-24
Inverter				
Nominal battery voltage	12Vdc	24Vdc	12Vdc	24Vdc
Input voltage range	10.5 – 16Vdc (24Vdc max.)	21–32Vdc (44Vdc max.)	10.5 – 16Vdc (20Vdc max.)	21–32Vdc (40Vdc max.)
Continuous power @ 25°C	800VA	1000VA	2000VA	2000VA
Power 30 min. @ 25°C	1000VA	1300VA	2100VA	2400VA
Power 5 min. @ 25°C	1200VA	2000VA	2450VA	2800VA
Power 5 sec. @ 25°C	2200VA	2800VA	5000VA	5200VA
Maximum asymmetric load	500VA	600VA	1000VA	1200VA
Max. efficiency (%)	93%	94%	92% @ 300VA	94% @ 300VA
Cos φ max.	0.1 – 1 up to 800VA	0.1 – 1 up to1000VA	0.1 – 1 up to 2000VA	0.1 – 1 up to 2000VA
Detection of the load	Adjustable: 1 → 20W			
Current of short-circuit 2 sec. (exit)	10Aac (20Aac*)	13Aac (26Aac*)	26Aac (52Aac*)	30Aac (60Aac*)
Output voltage	Sine wave 230Vac (120Vac*) ±5%			
Frequency	50 Hz (60Hz*) ± 0.05% (crystal controlled)			
Distortion THD (resistive load)	< 5% (@ Pnom. & Uin nom.)			< 3% (@ Pnom & Uin nom.)
Consumption Stand-by	0.7W	1.2W	0.7W	1.2W
Consumption «ON» no load	10W	13W	16W	16W
Overheat protection (±5°C)	Shut down @ 75°C - Auto-restart @ 70°C			
Short circuit protection	Automatic disconnection with 2 time restart attempt			
Reverse polarity protection	Protected by internal fuse 125A	Protected by internal fuse 100A	Not protected	Protected by internal fuse 150A
Deep discharge battery protection	Shut off @ 0.87 x Unom - Automatic restart @ Unom			
Max. battery voltage	Shut off @ >1.33 x Unom - Automatic restart @ < Umax			
Acoustic alarm	Before low battery or overheating disconnection			
General data				
Weight	8.5 kg		19 kg	18 kg
Dimensions hxwxl [mm]	142x428x84		273x399x117	
Protection index IP	IP 30 conforms to DIN 40050		IP 20 conforms to DIN 40050	
Certification ECE-R 10 (E24)	•	•	•	•
EC conformity	EN 61000-6-1, EN 61000-6-3, EN 55014, EN 55022, EN 60950-1			
Operating temperature	-20°C up to +50°C			
Relative humidity in operation	95% without condensation			
Ventilation forced	From 45°C ± 5°C			
Acoustic level	< 45 dB (with ventilation)			
Warranty	5 years			
Approximate correction of Pnom	-1.5%/°C since +25°C			
Recommended battery capacity	> 5 x Pnom/Unom (recommended value in Ah)			
Length cables (Battery/left AC)	1.5m / 1m		1.7m / 1m	
Options	**AJ 1000-12-S**	**AJ 1300-24-S**	**AJ 2100-12-S**	**AJ 2400-24-S**
Solar regulator – Voltage max.	25Vdc	45Vdc	25Vdc	45Vdc
Solar regulator – Current max.	25A		30A	
Solar regulator – Principle	Floating 3 stages (I/U/UO)			
Solar regulator – Absorption voltage	14.4Vdc	28.8Vdc	14.4Vdc	28.8Vdc
Solar regulator – Floating voltage	13.6Vdc	27.2Vdc	13.6Vdc	27.2Vdc
Remote control	IT8 supplied with			

	VT-65			VT-80		
	12 V	24 V	48 V	12 V	24 V	48 V
	1000 W	2000 W	4000 W	1250 W	2500 W	5000 W
	80 Vdc	150 Vdc		80 Vdc	150 Vdc	
	75 Vdc	145 Vdc		75 Vdc	145 Vdc	
	65 A			80 A		
	Automatic / manual set to 12, 24 or 48 Vdc					
	Above battery voltage, minimum 7 V					
tem)	98 %					
	25 mA > 1.2 W					
	30 mA > 0.8 W					
	35 mA > 0.5 W					
	4 stages : Bulk, Absorption, Float, Equalization					
n accessory BTS-01)	–3 mV /°C /cell (25°C ref) default value adjustable -8 to 0 mV /°C					
	Up to –150 Vdc					
	Up to –150 Vdc					
	Up to 150 Vdc					
	Protected					
	Prevented by relays					
	–20 to 55°C					
	100 %					
	IP54, IEC/EN 60529:2001					
	indoor					
	5 years					
	5.2 kg		5.5 kg			
	120 / 220 / 310		120 / 220 / 350			
	Up to 15 devices					
	35 mm²					
	M 20 x 1,5					
	STUDER communication BUS					
	RCC-02/-03 / Xcom-232i					
	English / French / German / Spanish					
	With RCC-02/03 on SD card · One point every minute					
	EMC 2004/108/CE · LV 2006/95/CE · RoHS 2002/95/CE					
	IEC/EN 62109–1:2010					
	IEC/EN 61000–6–3:2011 · IEC/EN 61000–6–1:2005					

MBC series

Model	MBC 12-06/1	MBC 12-15/1	MBC 24-03/1	MBC 24-08/1	MBC 24-32/1
Battery voltage (Vdc)	12	12	24	24	24
Input voltage (Vac)	230 ±15% (40 - 60 Hz)				
Charge voltage (boost) (Vdc)	14.4	14.4	28.8	28.8	28.8
Charge voltage (float) (Vdc)	13.8	13.8	27.6	27.6	27.2
Output (A)	6	15	3	8	32
Cooling	Heat sink				
Outputs	1				
Efficiency	> 85 %				
Ambient temp. range	-25 to 50°C				
Dimensions lxwxh (mm)	155x80x36	195x100x47	155x80x36	195x100x46	158x245x47.5
Weight (kg)	0.9	1.8	0.9	1.8	3.8
Switch to Floating mode (A)	0.2	0.8	0.2	0.4	3.5
Secondary fuse (A)	7.5	20	7.5	15	40
Input wired	•	•	•	•	•
Ouput wired	•	•	•	•	•
Warranty	2 years				

MDCI and MDC series

MDCI – DC/DC converter, switch-mode, isolated

Model	MDCI 100	MDCI 200	MDCI 360	MDCI 360 Charger
Power (W)	100	200	360	330
Input variants (Vdc)*	A-B-C-D	A-B-C-D	A-B-C-D	A
Output variants (Vdc/A) ± 2%	12.5/8-24/4	12.5/16-24/8	12.5/30-24/15	27.6/12
Output current (A)	8/4	16.5/8	30/15	13
Galvanic isolation	•	•	•	•
Isolation voltage (V)	400			
Efficiency @ full load (%)	> 85			
Off-load current (mA)	< 25			
Operating temperature	-20 / +45°C			
Ambiant temp. (20°) increase after 30 min. @ full load	25°C	30°C		
Cooling	Convection	Fan		
Dimensions HxWxD (mm)	49x88x152	49x88x182	64x163x160	
Weight (gr)	500	600	1400	

* A = 9-18 Vdc B = 20-35 Vdc C = 30-60 Vdc D = 60-120 Vdc

MDC –DC/DC converter, switch-mode, not-isolated

Model	MDC 1224-7	MDC 2412-5	MDC 2412-8	MDC 2412-12	MDC 2412-20	MDC 2412-30
Power (W)	170	65	105	160	275	415
Output current (A)	7	5.5	8	12	20	30

Common features MDCI & MDC	
Paralleling	Max. 2 converters
Humidity	Max. 95% non condensing

free

BI 100/2 IG	MBI 150/2 IG	MBI 100/3 IG	MBI 150/3 IG	MBI 200/3 IG	MBI 2-100/3
12/24					
8-30					
100	150	100	150	200	100
1					2
2		3			
0.05 / 0.1					
0					
•	•	•	•	•	
-40 / +85					
146x85x92		146x85x152			
780	810	780	810	815	780
Automatic detection					
> 500V @ 60Hz					
2 years					
EN 50081-1 (emission) EN 50082-1 (immunity) EN 60950-1 (safety)					

ttery separator

	MBR 12/24-100	MBR 12/24-160	MBR 12/24-500
	12/24	12/24	12/24
	100	160	500
	13.2/26.4	13.2/26.4	13.2/26.4
	12.8/25.6	12.8/25.6	11.8/23.6
	2		
	•	•	•
		•	•
			•
	46x46x80	46x93x96	72x70x80
	110	300	417
	< 5mA		
tage	16 / 32Vdc		
	M6		M8

MBW series

MBW – Battery watch

Model	MBW 40	MBW 60	MBW 200
Nominal voltage (Vdc) depends on jumpers	12/24		
Max. continuous current 5' (Amp)	40	60	200
Peak current (Amp)	120	120	480
Operating voltage range (Vdc)	6-35		8-32
Consumption (mA)	< 7		< 3
Alarm output delay	15 seconds		
Alarm output max. current (mA)	500		
Load disconnect delay	1 minute		30 secondes
Voltage level accuracy	0.2V	2%	0.1V
Casework	Anodized aluminium, black		
Weight (gr)	200		580
Dimensions HxDxL (mm)	80x60x40	80x60x40	145x92x85
Battery protection	Against excessive discharge		
Users protection	Against overvoltages (16 / 32 Vdc)		Against overvoltages (15.5 / 31 Vdc)
MOSFET switches	No sparks		
Norms	EN 50081-1 (emission) EN 50082-1 (immunity) Automotive Directive 95/54/CE		EN 50081-1 (emission) Automotive Directive 95/54/CE

Jumper selectable voltage	
Disengage (V)	Engage (V)
10	11.5
10.5	12
11	13
11.5	13.8
21.5	24.5
22	25
22.5	25.5
23	26.5

SBM-02

SBM-02 – Battery monitor 12 and 24 Vdc (27-175 Vdc in option)

Model	SBM-02
Supply voltage range	9-35 Vdc
Consumption @ 12Vdc, without BL	9 mA
Consumption @ 24Vdc, without BL	7 mA
Input voltage range («Auxiliary» battery)	2...35 Vdc
Input voltage range («Main» battery)	0...35 Vdc
Input current range	-9999…+9999 A
Battery capacity range	20…9990 Ah
Operating temperature range	-20…50°C
Protection class	IP20 (Frontpanel IP65)
Front panel	Ø 64 mm

Standart equipment SBM-02
Potential free alarm contact
500A/50mV current shunt
Optional accessories
SBM-PS-02-Voltage pre-scaler 1:5 (adapting the SBM-02 to input voltage 27-175Vdc)
Connection kit, type SBM-CAB-20, including 20 m of twisted pair cable (3x2x0.5 mm2) and 2 fuseholders
Communication kit, type SBM-COM, including RS232 interface box, 1.8 m of 9p DSUB serial cable and a software
Communication kit, type SBM-COM-USB, including USB interface box, 1.8 m of USB cable and software.