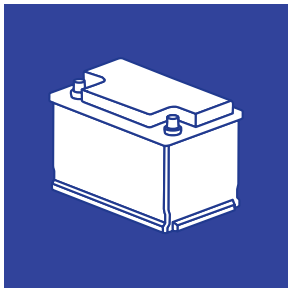
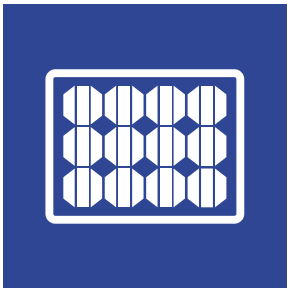
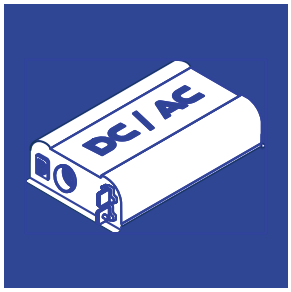
CATALOGUE 25

tH ENERGY
by Oyster®







CONTENT

ENERGY MANAGEMENT IN MOTORHOMES

Self-sufficiency in a motorhome means, among other things, a reliable and independent (self-sufficient) power supply. The use of modern technologies can significantly optimise energy management in motorhomes, resulting in longer self-sufficiency and a more comfortable travel experience.

The correct use of electricity as a resource and knowledge of your own energy requirements are two very important conditions for being optimally equipped.

tH Energy® by ten Haaft is a well-thought-out overall concept for self-determined, self-sufficient travel that cleverly combines solar modules, inverters and LiFePO4 batteries.

tHE Bat series and tHe BatPro series

-> LiFePo4 energy storage

The energy required for independent use is stored in the living space battery. Ten Haaft offers a LiFePO4 battery as the optimal storage solution. This has advantages for use in motorhomes, as it combines low weight and high safety with the maximum possible capacity for energy storage..

Solar / Energy generation

In order to be independent and not reliant on energy from the public grid for long periods of time, independent energy generation is required. A solar panel/photovoltaic system offers the ideal solution here. This system is specially designed for use on motorhomes and offers the best possible yield of solar energy. The energy storage device, the living space battery, is therefore recharged directly by the sun.

Monitoring / Displaying Energy Data

In order to optimally allocate the stored energy for daily use, a display of the available energy is required. This is particularly advantageous if you want to make the most of the independent operating time. This is where the tHE Control Station comes in. It displays all relevant data at a glance. How much energy do I still have available, how much power or energy is currently being consumed, and which consumer is currently connected to the inverter with what power? Everything can be read centrally. In addition, the inverter can also be switched on or off at the same location.

Inverter / Energy Transfer for 230V socket consumers

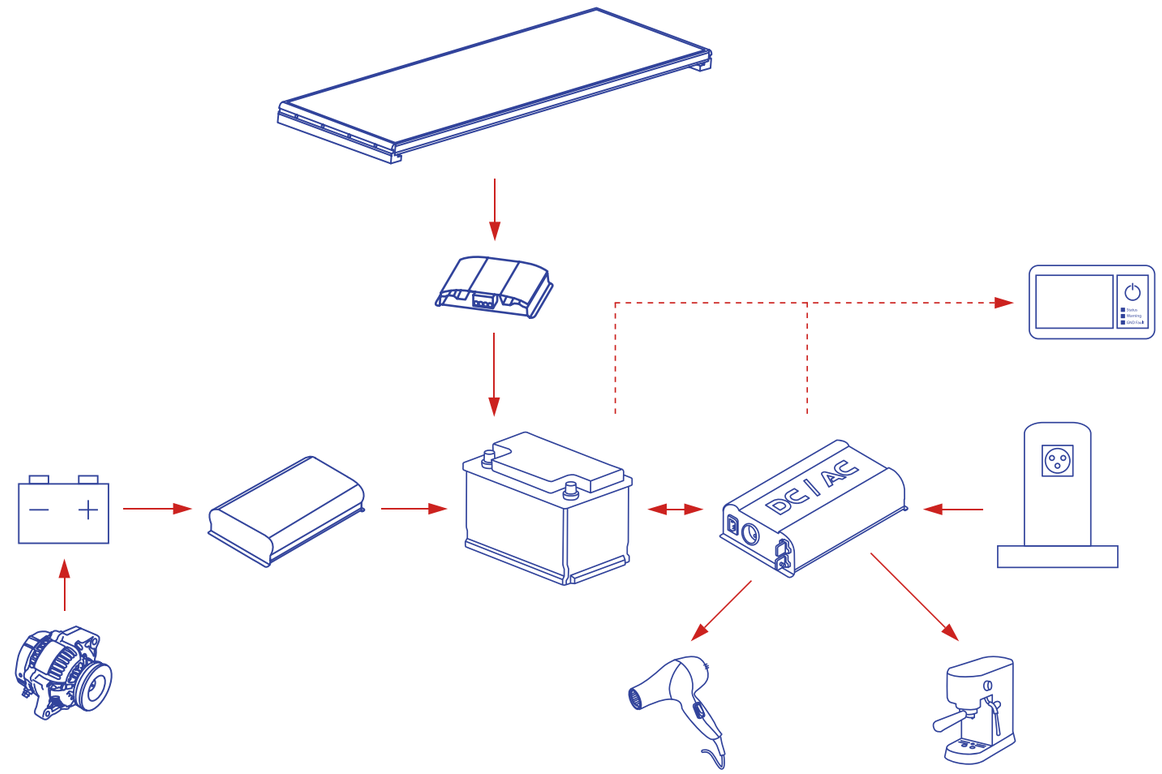
The inverter is required to enable the stored energy from the living area battery to be used for 230V mains voltage consumers in the motorhome. It converts the energy from the battery's 12V DC voltage into 230V AC voltage with the same sinusoidal quality as that supplied by a domestic power socket.

The inverters of the tHE INC series and INV series ensure that devices with mains voltage (230V/AC) can also be used in the motorhome. Thanks to the different power classes, there is enough energy for every device, from laptop power supplies to fully automatic coffee machines.

All sockets in the motorhome can be connected to the inverter thanks to the integrated mains switchover, as the switchover between externally supplied mains voltage or 230V generated by the inverter is fully automatic. The inverter/charger combinations in the INC series take automated operation to the next level. These devices in the INC series start the regulated charging of the living area battery when sufficient external mains power is available. If there is a restriction due to weak fuses at the campsite, this can be stored as a default setting in the INC. If power is then drawn from the 230V sockets in the vehicle, the charging power is reduced as necessary so as not to exceed the fuse rating. When there is no consumption in the motorhome, the optimum charging power is restored in order to charge the battery as quickly and efficiently as possible.

Enjoy your independence and take time for the important things in life.

THE CONTROL CONCEPT FROM TH ENERGY



LIFEPO4 BATTERIES FROM THE BAT SERIES

The lithium iron phosphate battery (LiFePO4) is the safest member of the lithium-ion battery family. It is highly current-resistant, universally applicable and weighs less than lead, gel or AGM batteries. In addition, the latest lithium iron phosphate battery technology offers a high degree of intrinsic safety, ensuring that it can be used even in the most extreme conditions.

More and more motorhome owners are opting to convert to lithium batteries. The tHE Bat series and the tHE BatPro series LiFePO4 lithium batteries were developed with the aim of replacing lead-acid batteries and fully meeting the high demands placed on storage batteries today. The advantages of LiFePO4 technology are ideal for use in motorhomes and guarantee independent travel.

The tHE Bat series batteries feature lithium iron phosphate (LiFePO4) cells, which are considered to be very safe and cycle-resistant. Thanks to the use of the latest generation of LiFePO4 battery cells, charging is possible even at temperatures as low as -10°C without preset charging current reduction!

In addition, the battery is protected against overcurrent, overcharging, deep discharge, reverse polarity and overtemperature by an integrated analogue BMS.

The lithium iron phosphate (LiFePO4) residential battery is one of the safest on the market. High safety means, above all, that they have high thermal and chemical stability and are non-flammable and non-explosive (among other things). Other advantages of lithium technology include low weight, high charging and discharging currents, low self-discharge, a high number of discharge cycles and a comparatively high capacity for the same space requirement compared to conventional storage batteries. And last but not least: LiFePO4 batteries do not contain any heavy metals that are harmful to the environment or health.

tHE Bat 105

Capacity: 105 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 278 × 175 × 190 mm
Weight: 10 kg
Connection terminal: Round pole

tHE Bat 150

Capacity: 150 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 330 × 173 × 212 mm
Weight: 13,5 kg
Connection terminal: M8

tHE Bat 315

Capacity: 315 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 485 × 170 × 240 mm
Weight: 26,5 kg
Connection terminal: M8

3+2 YEARS WARRANTY!

LIFEPO4 BATTERIES FROM THE BAT PRO

The tHE Bat Pro series LiFePO4 battery offers unlimited convenience. With the tHE BatPro series, you can be as self-sufficient as possible while still saving electricity. The digital battery management system (BMS) built into each battery ensures that the battery is protected against incorrect use. For example, it switches the battery off in the event of under-voltage or over-voltage and automatically switches it back on as soon as the problem is resolved.

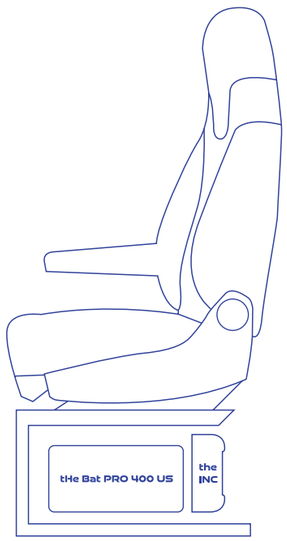
Bluetooth and APP connectivity as well as an integrated switching function enable maximum ease of use. In addition, the BatPro variant has an integrated CAN/RS485 interface. Thanks to the use of the latest generation of LiFePO4 battery cells, charging is possible even at temperatures as low as -10°C without preset charging current reduction!

Digital and analogue battery management system!

Our battery management systems can be regarded as a logical further development of the classic protection circuit. In addition to the standard functions of the protection circuit, a BMS provides further relevant data such as the current remaining charge, the status of the individual battery segments, the current temperature, the number of charging cycles and numerous other pieces of information for further processing. This data can be read out via serial RS485 or CAN bus communication.

Key-Features tHE BatPro US (Under seat)

The under-seat battery consists of a custom-made, robust metal housing that has been designed to fit perfectly under the driver's or passenger's seat frame. This allows for the best use of installation space while maximising battery capacity.



View of the under-seat battery in a motorhome.

tHE Bat PRO 120

Capacity: 120 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 278 × 175 × 190 mm
Weight: 13 kg
Connection terminal: Round pole

tHE Bat PRO 160

Capacity: 160 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 335 × 175 × 190 mm
Weight: 14,9 kg
Connection terminal: Round pole

tHE Bat PRO 325

Capacity: 325 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 485 × 170 × 240 mm
Weight: 26,5 kg
Connection terminal: M8

tHE Bat PRO 410

Capacity: 410 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 522 × 280 × 250 mm
Weight: 38,7 kg
Connection terminal: M8

tHE Bat PRO 400US

Capacity: 400 Ah
Cycles (DoD 55 %): ≥ 8000
Dimensions: 355 × 350 × 190 mm
Weight: 45 kg
Connection terminal: M8

3+2 YEARS WARRANTY!

THE BAT PRO SERIES APP

With the battery app for your caravan, you can keep track of the charge status, remaining runtime and important system data of your on-board battery at all times – conveniently via smartphone or tablet. The app provides all relevant information in real time and warns you early on if the charge level is low or there are technical problems. This allows you to avoid breakdowns and continue enjoying your trip in a relaxed manner.

The tH ENERGY battery app has a genuine pairing function with security code query. This technology protects your on-board power supply from unauthorised access or faulty settings on your system.

Thanks to its simple operation and clear display, it is ideal for use on the go – whether at the campsite or in the middle of nature.

THE INV SERIES INVERTERS

The inverters in the INV series from ten Haaft Energy provide a reliable power supply for all 230V appliances in your motorhome – with maximum efficiency, high safety and hum-free operation.

Thanks to their pure sine wave voltage, they guarantee safe and stable operation of sensitive devices up to a power of 3600 W.

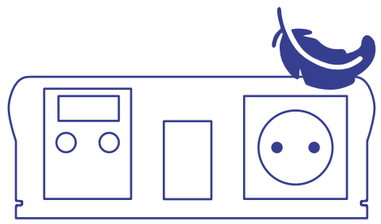
The specially developed, compact design allows for space-saving installation even in limited installation space while reducing weight – ideal for mobile applications.

Mains priority circuit

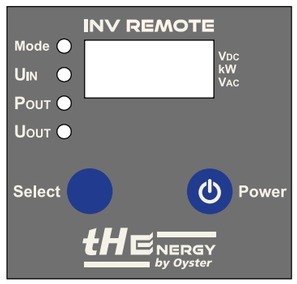
All inverters have a grid priority circuit that automatically switches to the external power supply as soon as it becomes available and only supplies power from the battery when no external mains power supply is available.

Advantages of the INV series at a glance:

- Pure sine wave with stable frequency and voltage for sensitive consumers such as laptops, coffee machines, TVs, etc.
- High performance: operation of devices up to 3600 W (depending on type)
- Wide temperature range: can be used from -20°C to +45°C
- Compact, lightweight design – saves space and weight
- Hum-free operation – ideal for indoor use
- Modern HF technology – reduces the size of the transformers required
- Electrical isolation of input and output – protects the vehicle electrical system from defects
- Mains priority circuit – automatic switchover to shore power when available
- Wide range of protective functions: overload, undervoltage, short-circuit and overvoltage protection
- Interface – for communication with ten Haaft Energy systems
- Remote ON/OFF function for connection to automated or higher-level control systems (e-bike charging while driving)
- Standby function automatically detects whether a consumer is connected to the inverter



The inverters in the INV series have a unique housing height of 90 mm and come with a remote control or remote display with a 5 m connection cable. There are 5 models available, optionally with residual current device (RCD) protection in the device.



tHE INV 1000

Continuous power: 1000 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Dimensions: 338 × 175 × 90 mm
Weight: 2,8 kg

tHE INV 2000

Continuous power: 2000 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Dimensions: 347 × 225 × 90 mm
Weight: 3,7 kg

tHE INV 3600

Continuous power: 3600 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Dimensions: 457 × 225 × 90 mm
Weight: 5,3 kg

RCD (residual current device in the appliance)

As a special further development, the versions with RCD already offer the necessary integrated protective device for professional installation, ready to plug in. The plug connections used are reverse polarity-proof and vibration-proof with a locking mechanism.

tHE INV 2000 RCD

Continuous power: 2000 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Dimensions: 351 × 225 × 90 mm
Weight: 4,0 kg

tHE INV 3600 RCD

Continuous power: 3600 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Dimensions: 461 × 225 × 90 mm
Weight: 5,6 kg

3+2 YEARS WARRANTY!

THE INC SERIES INVERTERS/CHARGERS

The INC series combines all the functions of the INV series with an integrated intelligent charger and additional convenience features for self-sufficient travel – ideal for the discerning camper or off-grid user

In addition to reliable voltage conversion, the INC series offers a fully automatic charger with adjustable input current limitation. This means that even with a weak external power supply (e.g. at overloaded campsite sockets), the mains fuse is not triggered – the charging current is intelligently reduced without disrupting the ongoing operation of the consumers.

Advantages of the INC series at a glance:

· All the advantages of the INV series included

· Integrated charger with intelligent charge management

· Adjustable input current limitation – prevents external fuses from tripping when the power supply is weak.

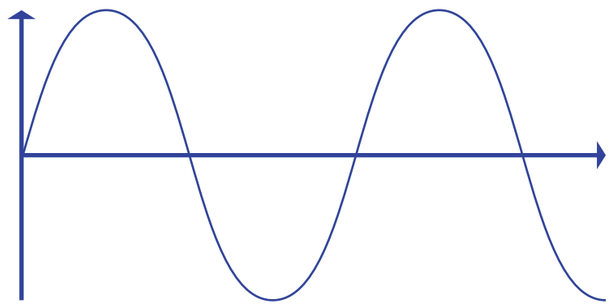
· Automatic power distribution: power for consumers has priority – the rest is used for battery charging

· Maximum energy efficiency even with weak mains supply

· Seamless operation thanks to automatic switching between battery and shore power

· Ideal for self-sufficient systems or frequent switching between mains and battery operation

· CS control panel for optimum overview of device functions included in delivery.



RCD (residual current device in the appliance)

As a special further development, the versions with RCD already offer the necessary integrated protective device for professional installation, ready to plug in. The plug connections used are reverse polarity-proof and vibration-proof with a locking mechanism.

tHE INC 2000/80

Continuous power: 2000 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Max. charging current: 80 A
Battery type/
charging characteristic curve: adjustable
Dimensions: 403 × 260 × 110 mm
Weight: 5,5 kg

tHE INC 3600/120

Continuous power: 3600 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Max. charging current: 120 A
Battery type/
charging characteristic curve: adjustable
Dimensions: 448 × 260 × 110 mm
Weight: 6,5 kg

tHE INC 2000/80 RCD

Continuous power: 2000 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Max. charging current: 80 A
Battery type/
charging characteristic curve: adjustable
Dimensions: 403 × 260 × 110 mm
Weight: 5,8 kg

tHE INC 3600/120 RCD

Continuous power: 3600 W
Input: 12 V DC
Output: 230 V AC / 50 Hz
Max. charging current: 120 A
Battery type/
charging characteristic curve: adjustable
Dimensions: 448 × 260 × 110 mm
Weight: 6,7 kg

3+2 YEARS WARRANTY!

THE CONTROL STATION

The tHE CS control unit can be connected to an inverter charger combination and to a battery from the tHE BatPro series.

You can then use just one control unit to monitor your tHE BatPro series battery as well as the powerful inverters (INC/INV) or the battery charger (INC).

If you have several batteries from the tHE BatPro series connected in parallel in your vehicle, the TOTAL power or capacity of the connected batteries will be displayed.

Power Saving

The power saving function can be configured via the tHE CS control panel so that the maximum permissible input current from the mains supply can be adjusted. If this value is exceeded, the tHE INC Inverter Charger first reduces the battery charge. If this is still not sufficient, a warning sounds and the tHE INC Inverter Charger switches off. The customer can then start the load, i.e. the current consumption, via the tHE INC Inverter Charger.

Capacity measurement (from the BMS)

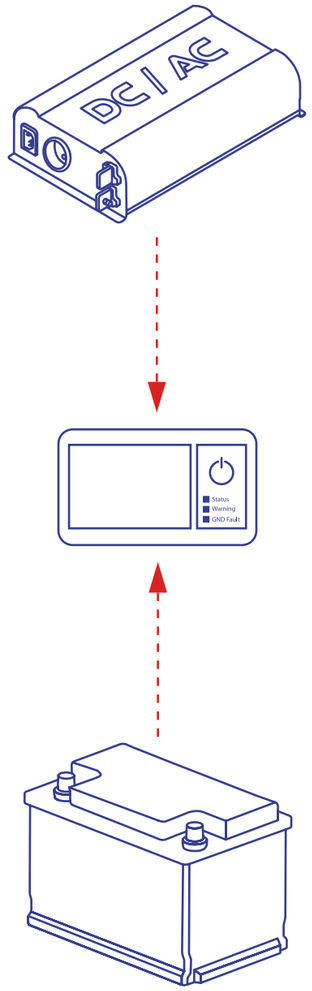
When connecting a tHE INC inverter charger to a tHE Bat Pro battery, operation can also be terminated depending on the battery's state of charge, as the battery can transmit the state of charge to the tHE CS control unit.

This means that discharging (i.e. inverter operation) can be switched off at any desired SOC (state of charge) and automatically restarted at any other, higher SOC. Or, even better, manual start-up is permitted again.

Hibernation mode

Together with a battery from the tHE BatPro series, the tHE CS control unit can switch off the battery and put it into 'hibernation mode'. This means that all devices are then disconnected from the power supply and the battery is prevented from discharging.

Hibernation mode is very easy to activate and can therefore replace the conventional 'bone' for completely switching off the living area.



Additional features

- 2.8" colour RGB TFT display with capacitive touchscreen
- One large central backlit control button
- 2 RGB LED indicators for important operating statuses
- 1 warning indicator
- 1 modulatable audible signal generator

Display of important operating parameters

- Battery charge/discharge currents
- AC output power
- Display of power consumption from the mains supply and for all settings on the INC

Available settings

- Load capacity of the mains supply (campsite fuse)
- Settings for battery charging/discharging
- Different profiles for LiFePO4 batteries (performance vs endurance)

Battery monitor for the BatPro series

- Battery charge status display (SOC=StateOfCharge)
- REAL charging or discharging current from the battery out/in display
- Operating status display

undervoltage protection

Battery voltage shutdown from 11.8V to 10.5V (default)

THE SUN COLLECTION – MORE POWER – LESS SPACE

Solar modules convert natural sunlight into usable electrical energy extremely effectively. This allows electrical devices to be operated and solar power to be stored in the on-board batteries.

With its tHE Sun collection, ten Haaft offers three different solutions, with something for every purpose and every type of vehicle!

Our solar modules use advanced monocrystalline solar cells that ensure high solar energy yield. This means that the modules deliver the best possible output even on the smallest of surfaces.

The connection boxes of our modules are dust-proof in accordance with protection class IP65 and protected against water jets from any angle. All tHE Sun solar modules are equipped with pre-assembled MC4 connectors. This means that the modules can be connected immediately after installation without any problems and the power of the sun can be used directly.

In addition to classic solar modules that are permanently mounted on motorhomes, caravans, campers or boats, we also offer extremely lightweight, foldable solar panels in our range. These can be easily taken with you, offering complete mobility and independence.

SUNSOLID

Stable and torsion-resistant modules with high efficiency

SUNFLEX

For flexible construction, lightweight and flat

SUN FOLD

Absolute mobility and flexibility in the smallest of spaces

THE SUNSOLID SERIES

Solar modules convert natural sunlight into usable electrical energy extremely efficiently. This allows electrical devices to be operated and solar power to be fed into the grid. Sunsolid modules are lightweight and flat, yet robust, with a stable and torsion-resistant frame design, integrated spoiler and adhesive profile for direct bonding to the roof. The use of HPBC back-contact cells gives them a high efficiency rating.

Additional features

· Split cells to prevent power loss in partial shade
· Integrated mounting spoiler for a flat design
· Pre-assembled MC4 solar connectors, reverse polarity protected
· Screw-on spoiler for easy module replacement

SUNSOLID

Stable and torsion-resistant modules with high efficiency

tHE Sunsolid 100

Nominal power: 100 Wp
Leerlaufspannung (Voc): 27.7 V
Short circuit current (Isc): 4.59 A
Dimensions : 1280 x 400 x 54 mm
Weight: 5,6 kg

tHE Sunsolid 120

Nominal power: 120 Wp
Leerlaufspannung (Voc): 33.3 V
Short circuit current (Isc): 4.59 A
Dimensions : 1116 x 590 x 54 mm
Weight: 6,8 kg

tHE Sunsolid 145

Nominal power: 145 Wp
Leerlaufspannung (Voc): 27.0 V
Short circuit current (Isc): 6.85 A
Dimensions : 1331 x 590 x 54 mm
Weight: 8,0 kg

tHE Sunsolid 190

Nominal power: 190 Wp
Open circuit voltage (Voc): 36.2 V
Short circuit current (Isc): 6.69 A
Dimensions : 1345 x 775 x 54 mm
Weight: 10,8 kg

tHE Sunsolid 235

Nominal power: 235 Wp
Open circuit voltage (Voc): 44.0 V
Short circuit current (Isc): 6.81 A
Dimensions : 1606 x 775 x 42 mm
Weight: 12,6 kg

3+2 YEARS WARRANTY!

THE SUNFLEX SERIES

The Sunflex series offers high-quality flat modules for direct installation on vehicle roofs. They are extremely thin and lightweight and, thanks to the use of HPBC back-contact cells, have a high efficiency rating even at high temperatures.

Additional features

- Split cells to prevent power loss in partial shade
- Coating
- Walkable, flat structure with low weight
- Roof feed-through
- Pre-assembled MC4 solar connectors, reverse polarity protected
- Cell connection and number of cells optimised for low light conditions

SUNFLEX

For flexible construction, lightweight and flat

tHE Sunflex 105

Nominal power: 105 Wp
Open circuit voltage (Voc): 31.9 V
Short circuit current (Isc): 4.19 A
Dimensions: 1036 x 585 x 4 mm
Weight: 2,4 kg

tHE Sunflex 130

Nominal power: 130 Wp
Open circuit voltage (Voc): 26.3 V
Short circuit current (Isc): 6.29 A
Dimensions: 1251 x 585 x 4 mm
Weight: 2,9 kg

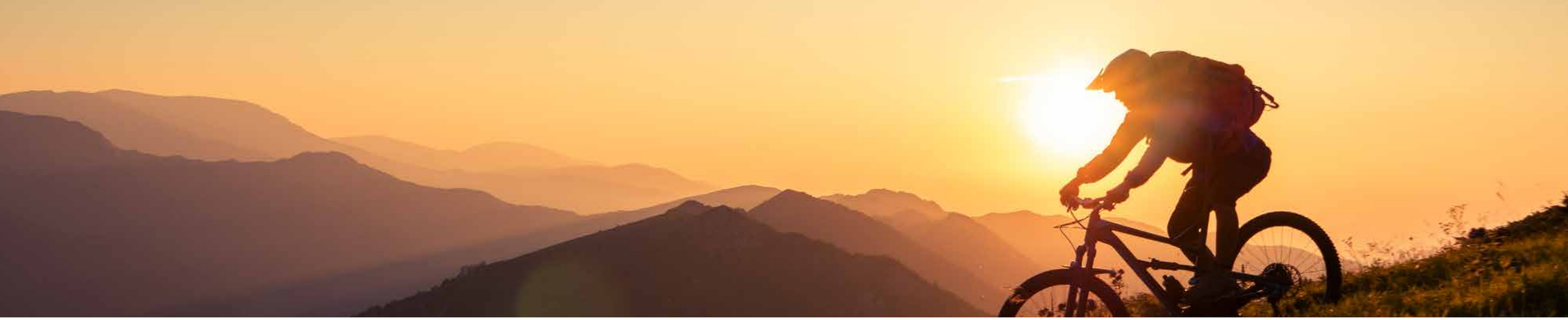
tHE Sunflex 170

Nominal power: 170 Wp
Open circuit voltage (Voc): 29.2 V
Short circuit current (Isc): 6.11 A
Dimensions: 1265 x 770 x 4 mm
Weight: 3,9 kg

tHE Sunflex 210

Nominal power: 210 Wp
Open circuit voltage (Voc): 43.5 V
Short circuit current (Isc) 6.15 A
Dimensions : 1526 x 770 x 4 mm
Weight: 4,7 kg

3+2 YEARS WARRANTY!



THE SUNFOLD SERIES

Technology for maximum solar power output, robust, flexible and portable! The use of HPBC back-contact cells ensures high efficiency. Comes with a 3 m charging cable and USB-A/USB-C charging ports directly in the practical storage compartment. The module can be easily folded up and has practical carrying handles and stands for optimal placement.

SUNFOLD

Absolute mobility and flexibility in the smallest of spaces

tHE Sunfold 110

Nominal power: 110 Wp
Open circuit voltage (Voc): 23.76 V
Short circuit current (Isc): 5.98 A
Dimensions : 1020 x 510 mm
(590 x 510) mm
Weight: 4 kg

tHE Sunfold 165

Nominal power: 165 Wp
Open circuit voltage (Voc): 23.76 V
Short circuit current (Isc): 8.87 A
Dimensions : 1540 x 510 mm
(590 x 510) mm
Weight: 6,2 kg

tHE Sunfold 220

Nominal power: 220 Wp
Open circuit voltage (Voc): 23.76 V
Short circuit current (Isc): 11.96 A
Dimensions : 2060 x 590 mm
(590 x 510) mm
Weight: 7,1 kg

3+2 YEARS WARRANTY!

TECHNICAL INFORMATION

LiFePO4 batteries	tHE Bat 105	tHE Bat 150	tHE Bat 315
rated capacity	105 Ah	150 Ah	315 Ah
energy content	1344 Wh	1920 Wh	4032 Wh
cell technology	LiFePO4	LiFePO4	LiFePO4
field of activity	10,5 to 14,6 V	10,5 to 14,6 V	10,5 to 14,6 V
Life cycles (80% DoD)	≥ 4000	≥ 4000	≥ 4000
Life cycles (55% DoD)	≥ 8000	≥ 8000	≥ 8000
self-discharge	< 3% Monat	< 3% Monat	< 3% Monat
charging characteristics	CC/ CV	CC/ CV	CC/ CV
final charging voltage	14,4 V@2A	14,4 V@3A	14,4 V@6A
Recommended charging current	20-50 A	30-75 A	60-150 A
Max. charging current	100 A	150 A	200 A
final discharge voltage	10 V	10 V	10 V
Max. discharge current (30 minutes)	100 A	150 A	300 A

Mechanical parameters

dimensions	278 x 175 x 190 mm	330 x 173 x 212 mm	485 x 170 x 240 mm
Weight	10,0 kg	13,5 kg	26,5 kg
connection terminal	SAE - Roundpol	M8	M8

Device parameters

Temperature range Discharge process	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
Temperature range Charging process 1C	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C
Temperature range Charging process 0.1C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C
Temperature range Storage	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
protection class	IP55	IP55	IP55
type approval mark	E57 10R – 06 1665	E57 10R – 06 1664	E57 10R – 06 1663

TECHNICAL INFORMATION

LiFePO4 batteries	tHE Bat Pro 120	tHE Bat Pro 160	tHE Bat Pro 325	tHE Bat Pro 410	tHE Bat Pro 400US
rated capacity	120 Ah	160 Ah	325 Ah	410 Ah	400 Ah
energy content	1536 Wh	2048 Wh	4160 Wh	5166 Wh	5120 Wh
cell technology	LiFePO4	LiFePO4	LiFePO4	LiFePO4	LiFePO4
field of activity	10,5 to 14,6 V	10,5 to 14,6 V	10,5 to 14,6 V	10,5 to 14,6 V	10,5 to 14,6 V
Life cycles (80% DoD)	≥ 4000	≥ 4000	≥ 4000	≥ 4000	≥ 4000
Life cycles (55% DoD)	≥ 8000	≥ 8000	≥ 8000	≥ 8000	≥ 8000
self-discharge	< 3% Monat	< 3% Monat	< 3% Monat	< 3% Monat	< 3% Monat
charging characteristics	CC/ CV	CC/ CV	CC/ CV	CC/ CV	CC/ CV
final charging voltage	14,4@2A	14,4@3A	14,4@6A	14,4@8A	14,4@8A
Recommended charging current	25-50 A	32-80 A	64-160 A	75-100 A	75-100 A
Max. charging current	100 A	160 A	200 A	200 A	200 A
final discharge voltage	10,5 V	10,5 V	10,5 V	10,5 V	10,5 V
Max. discharge current (30 minutes)	100 A	200 A	300 A	400 A	400 A

Mechanical parameters

dimensions	278 x 175 x 190 mm	335 x 175 x 190 mm	485 x 170 x 240 mm	522 x 280 x 250 mm	355 x 350 x 190 mm
Weight	13,0 kg	14,9 kg	26,5 kg	38,7 kg	45.0 kg
connection terminal	SAE - Roundpol	M8	M8	M8	M8

Device parameters

Temperature range Discharge process	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
Temperature range Charging process 1C	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C	-10°C to 50°C
Temperature range Charging process 0.1C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C
Temperature range Storage	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
protection class	IP2X	IP2X	IP2X	IP2X	IP2X
ports	RS485 / CAN Wireless: Bluetooth 5.0	RS485 / CAN Wireless: Bluetooth 5.0	RS485 / CAN Wireless: Bluetooth 5.0	RS485 / CAN Wireless: Bluetooth 5.0	RS485 / CAN Wireless: Bluetooth 5.0
APP	Android and iOS	Android and iOS	Android and iOS	Android and iOS	Android and iOS
type approval mark	E57 10R – 06 1662	E57 10R – 06 1661	E57 10R – 06 1660	E57 10R – 06 1659	E57 10R – 06 1658

TECHNICAL INFORMATION

Inverter with grid priority circuit	tHE INV 1000	tHE INV 2000	tHE INV 3600	tHE INV 2000 RCD	tHE INV 3600 RCD
Nominal voltage	12 V DC	12 V DC	12 V DC	12 V DC	12 V DC
Input voltage range	10,0 - 15.7 V DC	10,0 - 15,7 V DC	10,0 - 15,7 V DC	10,0 - 15,7 V DC	10,0 - 15,7 DC
Output voltage	230 V AC (adjustable 220 V - 240 V)	230 V AC (adjustable 220 V - 240 V)	230 V AC (adjustable 220 V - 240 V)	230 V AC (adjustable 220 V - 240 V)	230 V AC (adjustable 220 V - 240 V)
Output frequency	50 Hz (adjustable 60 Hz)	50 Hz (adjustable 60 Hz)	50 Hz (adjustable 60 Hz)	50 Hz (adjustable 60 Hz)	50 Hz (adjustable 60 Hz)
Output power (continuous)	1000 W	2000 W	3600 W	2000 W	3600 W
Peak power	2000 W	4000 W	7200 W	4000 W	7200 W
Output	pure sine wave	pure sine wave	pure sine wave	pure sine wave	pure sine wave
Max. efficiency	to zu 91%	to zu 91%	to zu 91%	to zu 91%	to zu 91%
Current without load	1.0 A	1.0 A	1.2 A	1.0 A	1.2 A
Current in standby mode	< 0,4 A	0.4 - 0.5 A	0.4 - 0.6 A	0.4 - 0.5 A	0.4 - 0.6 A
Power off	< 1mA	< 1mA	< 1mA	< 1mA	< 1mA

Mechanical parameters

Connection terminal	M8 screw bolt	M8 screw bolt	M8 screw bolt	M8 screw bolt	M8 screw bolt
Dimensions	338 x 175 x 90 mm	347 x 225 x 90 mm	457 x 225 x 90 mm	351 x 225 x 90 mm	461 x 225 x 90 mm
Weight	2,8 kg	3,7 kg	5,3 kg	4,0 kg	5,6 kg
Mounting hole diameter	4 mm	4 mm	4 mm	4 mm	4 mm

Device parameters

Temperature range (operation)	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C
Temperature range (storage)	-30°C to 70°C	-30°C to 70°C	-30°C to 70°C	-30°C to 70°C	-30°C to 70°C
Relative humidity	<95, % non-condensing	<95, % non-condensing	<95, % non-condensing	<95, % non-condensing	<95, % non-condensing
Protection class Housing	IP2X	IP2X	IP2X	IP2X	IP2X
Altitude	to 3000 m NN	to 3000 m NN	to 3000 m NN	to 3000 m NN	to 3000 m NN
type approval mark	E9 10R - 06 24921	E9 10R - 06 24921	E9 10R - 06 24921	E9 10R - 06 24921	E9 10R - 06 24921

Mains switching

Max. current	10 A	16 A	16 A	16 A	16 A
Switching time	< 30 ms	< 30 ms	< 30 ms	< 30 ms	< 30 ms
RCD TYP	-	-	-	16 A	20 A

Inverter Charger combination	tHE INC 2000/80	tHE INC 3600/120	tHE INC 2000/80 RCD	tHE INC 3600/120 RCD
Nennspannung	12 V DC	12 V DC	12 V DC	12 V DC
Eingangsspannungbereich	10,0 - 16,5 V DC	10,0 - 16,5 V DC	10,0 - 16,5 V DC	10,0 - 16,5 V DC
Ausgangsspannung	230 V AC (adjustable 220 V - 240 V)	230 V AC (adjustable 220 V - 240 V)	230 V AC (adjustable 220 V - 240 V)	230 V AC (adjustable 220 V - 240 V)
Ausgangsfrequenz	50 Hz	50 Hz	50 Hz	50 Hz
Ausgangsleistung (Dauer)	2000 W	3600 W	2000 W	3600 W
Spitzenleistung	4000 W	7200 W	4000 W	7200 W
Ausgang	pure sine wave	pure sine wave	pure sine wave	pure sine wave
Max. Wirkungsgrad	to zu 90%	to zu 90%	to zu 90%	to zu 90%
Strom ohne Last	2.5 A	3 A	2.5 A	3 A
Strom im Standby-Modus	< 0,8 A	< 0,8 A	< 0,8 A	< 0,8 A
Power off	< 1mA	< 1mA	< 1mA	< 1mA

Electrical parameters Charging function

Charging voltage	13,5 - 14,8 V DC	13,5 - 14,8 V DC	13,5 - 14,8 V DC	13,5 - 14,8 V DC
Input voltage range	180-250 V AC	180-250 V AC	180-250 V AC	180-250 V AC
Max. charging current	80 A	120 A	80 A	120 A
Adjustable charging current	10-80 A	10-120 A	10-80 A	10-120 A
Adjustable battery type	Liquid, gel, AGM, LiFeP04, customised, power supply			
Charging phases	Bulk / Absorption / Float / Recharge			
Efficiency	typ. 91%	typ. 91%	typ. 91%	typ. 91%

Mechanical parameters

Connection terminal	M8 screw bolt	M8 screw bolt	M8 screw bolt	M8 screw bolt
Dimensions	403 x 260 x 110 mm	448 x 260 x 110 mm	403 x 260 x 110 mm	448 x 260 x 110 mm
Weight	5,5 kg	6,5 kg	5,8 kg	6,7 kg
Mounting hole diameter	4 mm	4 mm	4 mm	4 mm

Device parameters

Temperature range (operation)	-20°C to 40°C	-20°C to 40°C	-20°C to 40°C	-20°C to 40°C
Temperature range (storage)	-30°C to 60°C	-30°C to 60°C	-30°C to 60°C	-30°C to 60°C
Relative humidity	<95, % non-condensing	<95, % non-condensing	<95, % non-condensing	<95, % non-condensing
Protection class Housing	IP2X	IP2X	IP2X	IP2X
Altitude	to 3000 m NN	to 3000 m NN	to 3000 m NN	to 3000 m NN
type approval mark	E9 10R - 06 24920	E9 10R - 06 24920	E9 10R - 06 24920	E9 10R - 06 24920

Mains switching

Input mains current limitation	adjustable 4, 6, 10, 13 or 16 A	adjustable 4, 6, 10, 13 or 16 A	adjustable 4, 6, 10, 13 or 16 A	adjustable 4, 6, 10, 13 or 16 A
Max. current	16 A	16 A	16 A	16 A
Switching time	< 30 ms	< 30 ms	< 30 ms	< 30 ms
RCD TYP	-	-	16 A	20 A

TECHNICAL INFORMATION

SOLAR PANELS	tHE Sunsolid 100	tHE Sunsolid 120	tHE Sunsolid 145	tHE Sunsolid 190	tHE Sunsolid 235
Nominal power	100 Wp	120 Wp	145 Wp	190 Wp	235 Wp
Open circuit voltage (Voc)	27,7 V	33,3 V	27,0 V	36,2 V	44,0 V
Short circuit current (Isc)	4,59 A	4,59 A	6,85 A	6,69 A	6,81 A
Voltage at maximum power (Vmp)	22,9 V	27,5 V	22,3 V	29,8 V	36,6 V
Current at maximum power (Imp)	4,37 A	4,37 A	6,51 A	6,38 A	6,43 A

Mechanical parameters

Dimensions	1280 x 400 x 54 mm	1116 x 590 x 54 mm	1331 x 590 x 54 mm	1345 x 775 x 54 mm	1606x775x42 mm
Weight	5,6 kg	6,8 kg	8,0 kg	10,8 kg	12,6 kg
Protection class	IP65	IP65	IP65	IP65	IP65
Number of cells	80	96	78	104	128
Number of modules (per panel)	2 parallel	2 parallel	2 parallel	2 parallel	2 parallel
Cell type	HPBC	HPBC	HPBC	HPBC	HPBC

SOLAR PANELS	tHE Sunflex 105	tHE Sunflex 130	tHE Sunflex 170	tHE Sunflex 210
Nominal power	105 Wp	130 Wp	170 Wp	210 Wp
Open circuit voltage (Voc)	31.9 V	26.3 V	35.5 V	43.5 V
Short circuit current (Isc)	4.19 A	6.29 A	6.11 A	6.15 A
Voltage at maximum power (Vmp)	26.3 V	21.7 V	29.2 V	36.0 V
Current at maximum power (Imp)	4.00 A	6.00 A	5.83 A	5.84 A

Mechanical parameters

Dimensions	1036 x 585 x 4 mm	1251 x 585 x 4 mm	1265 x 770 x 4 mm	1526 x 770 x 4 mm
Weight	2,4 kg	2,9 kg	3,9 kg	4,7 kg
Protection class	IP65	IP65	IP65	IP65
Number of cells	92	76	102	126
Number of modules (per panel)	2 parallel	2 parallel	2 parallel	2 parallel
Cell type	HPBC	HPBC	HPBC	HPBC

*In direct sunlight, the module can reach a temperature of up to 85°C. When installing, please observe the manufacturer's specifications for the vehicle roof.

TECHNICAL INFORMATION

SOLAR PANELS	tHE Sunfold 110	tHE Sunfold 165	tHE Sunfold 220
Nominal power	110 Wp	165 Wp	220 Wp
Open circuit voltage (Voc)	23,76 V	23,76 V	23,76 V
Short circuit current (Isc)	5,98 A	8,97 A	11,96 A
Voltage at maximum power (Vmp)	19,8 V	19,8 V	19,8 V
Current at maximum power (Imp)	5,54 A	8,31 A	11,08 A

Mechanical parameters

Dimensions (folded)	1020 x 510 mm (590 x 510) mm	1540 x 510 mm (590 x 510) mm	2060 x 590 mm (590 x 510) mm
Weight	4 kg	6,2 kg	7,1 kg
Protection class	IP44	IP44	IP44
Number of cells	66	99	132
Number of modules (per panel)	2	3	4
Cell type	HPBC	HPBC	HPBC

SCOPE OF DELIVERY

Scope of delivery for Bat series

· LiFePo4 battery (depending on type)
· Operating instructions

Scope of delivery for Bat PRO series

· LiFePo4 battery (depending on type)
· IRJ45 data cable for connection to tHE CS Touch Display with 5 m cable length)
· IRJ45 data cable for connection to additional Bat Pro battery when connecting several batteries in parallel with 0.6 m cable length
· PRJ45 data cable with remote ON/OFF switch with 2 m cable length
· Operating instructions

Scope of delivery for INV series inverters

· Sine wave inverter (depending on model)
· Control unit with connection cable (not included with INV 1000)
· Grounding cable
· Remote connection cable
· AC IN cable / WAGO / open end / 1 m
· AC OUT cable / WAGO / Schuko coupling / 1.5 m (not included with INV 1000)
· Temperature sensor cable, incl. temperature sensor for battery
· Protective sleeves for the battery connection cables

Scope of delivery for INC series inverters/chargers

· Sine wave inverter (depending on model)
· tHE CS Control Station with connection cable
· Grounding cable
· Remote connection cable
· AC IN cable / WAGO / open end / 1 m
· AC OUT cable / WAGO / Schuko coupling / 1.5 m (not with INV 1000)
· Temperature sensor cable, incl. temperature sensor for battery
· Protective sleeves for the battery connection cables

Scope of delivery for Sunsolid series

· Pre-assembled mounting spoiler (details below)

Scope of delivery for Sunsolid series

· Roof feed-through with sealing insert for round cables, permanently attached

Scope of delivery for Sunsolid series

· Connection adapter

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