
NDS®
ALL THE ENERGY
YOU NEED.
CATALOGUE 2021 / ENGLISH
REV. 1


CHOOSE THE
ENERGY SPECIALIST
NDS®
BATTERIES, CHARGING SYSTEMS,
SOLAR, CONVERTERS, MANAGEMENT AND CONTROL

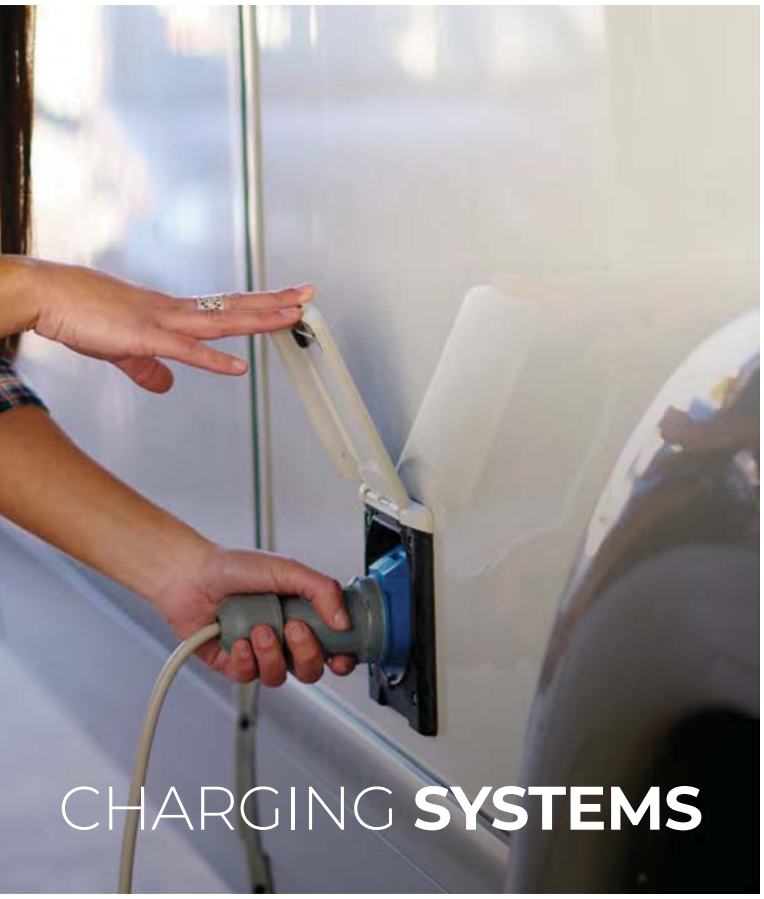
Since 1999, **NDS** is the right partner for people looking for energy while travelling.
Currently our product catalogue includes:
accumulators for every type of vehicle and
with the most widespread construction technologies,
charging systems, solar panels and charge regulators,
converters and all that concerns the management and
control of energy on recreational vehicles.

We are among the most competitive manufacturers for the camper industry in Europe and we can count on a widespread distribution network including Countries as: Spain, Germany, France, England, Benelux, Denmark, Sweden, Norway, Finland and of course Italy.

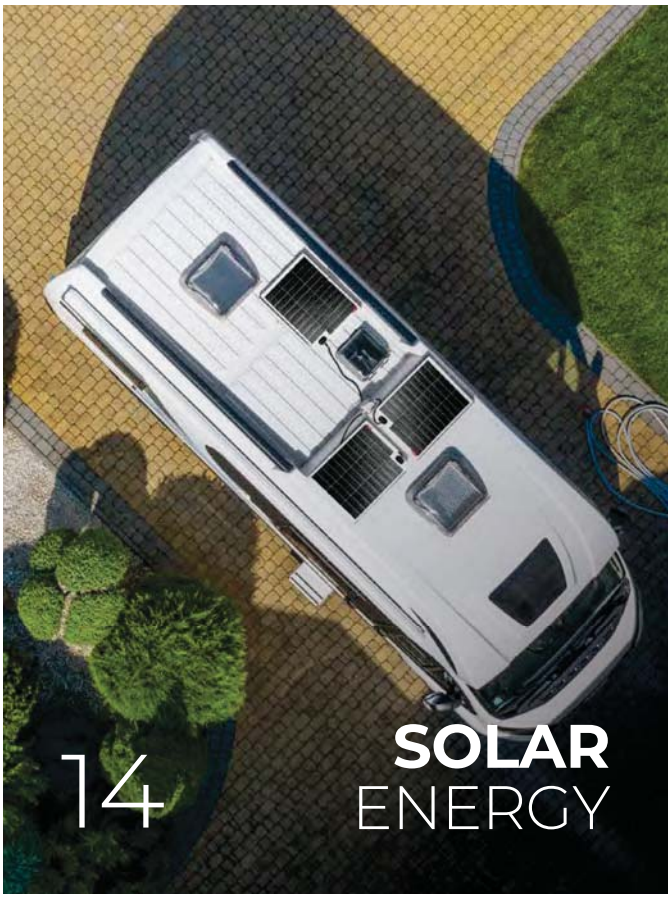
Italy is our headquarters, the core of our business:
we focus on product quality combined with excellent service, which is why we have chosen to hold “in-house” the departments: repair, research and development, managed by a team of engineers, and the customer/after-sales service department.

Our standards are aligned every year with the rigorous parameters **CSQ ISO9001:2015 9160 NDSE** and **IQNet REG. NR.: IT-100663**, to ensure maximum efficiency for those who prefer our brand.

WHERE **WE ARE**

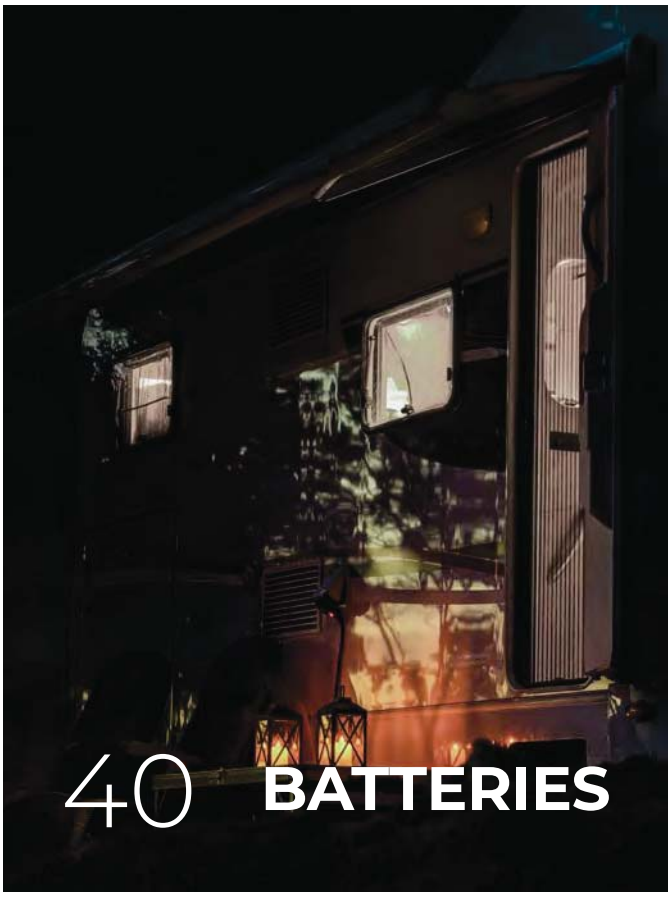


CHARGING **SYSTEMS**



14 **SOLAR** ENERGY

32 **INVERTER**



40 **BATTERIES**

CHARGING SYSTEMS

POWERSERVICE 6
DC-DC travel battery charger

POWERCHARGERPRO 9
AC-DC Professional battery charger

SMARTCHARGER 10
AC-DC Universal battery charger

NDS-techlab OPTICHARGE NDS-techlab

POWERSERVICE

DC-DC travel battery charger

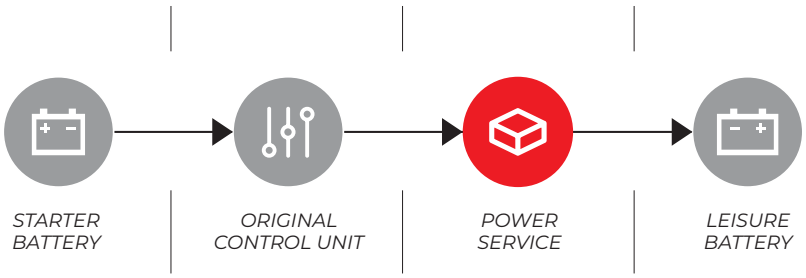
- UP TO 40A PER HOUR OF TRAVEL
- UP TO **3 CHARGING SOURCES**
- SELECTABLE CHARGING CURVE, **LiFePO$_4$*** INCLUDED

POWERSERVICE is a real DC-DC battery charger, capable of recharging leisure batteries in less time than just the alternator.
POWERSERVICE available in 3 different versions, **BASIC, PLUS e GOLD**, fully automatically recharges leisure batteries installed on campers, boats, ambulances and special vehicles. The plus and gold versions integrate a charge regulator for the management of solar panels, and (for the gold version) a 230V mains charger, combining 3 different charging devices in a single device!
The device, controlled by a microprocessor, guarantees a full recharge in half the time compared to the alternator, thus offering more autonomy during your stops. This is also possible thanks to the optimization of the 4 charging curves, selectable through a switch that permits to choose the type of battery to be re-charged between Lithium, AGM, Gel, Wet.
Each charging curve is divided into 5 stages, including the Desulphation that, besides guaranteeing a perfect charge, improves the overall performance of the battery by helping to restore the efficiency after long stops, extending its life.

Why choosing **POWERSERVICE**?

Full charge in less time, to have full autonomy during your stops.

Extend the life of your batteries with specific charging curves for all battery technologies.



* Basic model excluded

Which **POWERSERVICE** to choose?

MAIN FEATURES:

- Ideal for any type of lead acid battery
- Microprocessor charge management
- Impulse charge with desulfation
- Up to 35 Ampère recharge each travel hour

POWERED BY:

- *Alternator*

BASIC

PLUS

MAIN FEATURES:

- Two different supply sources
- Microprocessor charge management
- 5 stage charge with desulfation
- **Lithium**, AGM, Gel, Wet, battery type selection
- Up to 40 Ampère recharge each travel hour

POWERED BY:

- *Solar Panel*
- *Alternator*

EURO 6 COMPATIBILE

EURO 6 COMPATIBILE

MAIN FEATURES:

- Three different supply sources
- Microprocessor charge management
- 5 stage charge with desulfation
- **Lithium**, AGM, Gel, Wet, battery type selection
- Up to 40 Ampère recharge each travel hour

POWERED BY:

- *Alternator*
- *Solar Panel*
- *Main power supply*

GOLD

CHECK THE TABLE WITH MODELS ON THE NEXT PAGE

TIPS

The alternator is not the best device to recharge your leisure batteries

Leisure batteries are subject to cyclical use: they are continuously discharged and recharged, while starting batteries are always loaded. Differences in design and use separate these two types of batteries, so different charging methods are required.
While for a starting battery (rarely discharged) it may be sufficient to use only the alternator, a leisure battery needs specific charging curves depending on the construction technology, stability and adequate power, to never be short of energy.
An alternator with adequate power and the **PowerService** represent the optimal solution to always have the maximum energy for your leisure batteries!

Choose the **POWERSERVICE** for you!

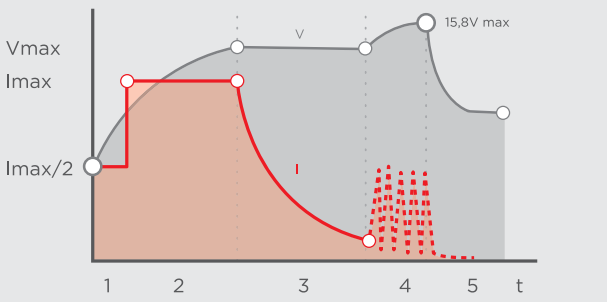
BASIC

PLUS

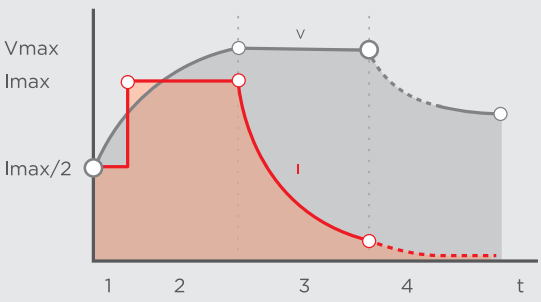
GOLD

	CODE	CHARGING VOLTAGE	POWER INPUT			MAXIMUM CHARGING CURRENT		
			ALTERNATOR (P.MIN)	SOLAR (MAX)	MAIN POWER SUPPLY	ALTERNATOR	SOLAR	MAIN POWER SUPPLY
BASIC	**PWS 4-25**	12V	70A-12V	NO	NO	25A	NO	NO
	PWS 4-30	12V	90A-12V	NO	NO	30A	NO	NO
	PWS 4-35	12V	110A-12V	NO	NO	35A	NO	NO
PLUS	**PWS 25**	12V	70A-12V	250W	NO	25A	20A	NO
	PWS 30	12V	90A-12V	250W	NO	30A	20A	NO
	PWS 40	12V	110A-12V	250W	NO	40A	20A	NO
GOLD	**PWS 25-M**	12V	70A-12V	250W	100/240Vac	25A	20A	20A
	PWS 30-M	12V	90A-12V	250W	100/240Vac	30A	20A	20A
	PWS 40-M	12V	110A-12V	250W	100/240Vac	40A	20A	20A

CHARGING CURVES



AGM/GEL



GENERIC/LITHIUM

POWERCHARGERPRO

AC-DC Professional Battery Charger

- SUITABLE ALSO FOR LiFePO$_4$ BATTERIES
- SOLID AND DURABLE BUILD
- UP TO 5 CHARGING STEPS

The **NDS** chargers at high frequency line **POWERCHARGERPRO**, are designed both for traditional and on-board use. The efficiency rate of 91% and the high reliability result from a careful development of the PCBs with components of the highest quality, for a professional use. The microprocessor automatically manages up to 5 steps of charge, optimizing them to have always correct charges and preserving the battery life. The technical staff ensures a complete and quick assistance to solve any issues, besides the possibility to customize the charger according to the type of application.

MAIN FEATURES:

- High frequency system
- Circuit with PFC
- Compact design
- 5 Charging steps
- High efficiency up to 91%
- Charge curves selector **Lithium**, AGM, Gel, Wet
- Protection over temperature, short circuit and anomalies
- State of charge indicator

	CODE	OUTPUT	SIZE (mm.)			BATTERY TYPE SELECTOR
			LENGTH	WIDTH	HEIGHT	
12V	**PFC0150-12CH10S**	12V 10A	106	128	56,5	YES
	PFC0300-12CH15S	12V 15A	145	128	56,5	YES
	PFC0600-12CH20S	12V 20A	223,2	128	56,5	YES
	PFC0600-12CH25S	12V 25A	223,2	128	56,5	YES
24V	**PFC0300-24CH10S**	24V 10A	145	128	56,5	YES
	PFC0600-24CH15S	24V 15A	223,2	128	56,5	YES
	PFC0600-24CH20S	24V 20A	223,2	128	56,5	YES
	PFC1200-24CH30S	24V 30A	280	134	77,2	YES
36V	**PFC1200-36CH25S**	36V 25A	280	134	77,2	YES

SMARTCHARGER

SMARTCHARGER is a line of advanced charger, equipped with advanced microcontroller to meet the daily needs, for applications such as boating, motorcycles, cars, etc.
According to the model, it performs up to 9 charging steps; steps include the diagnosis, to check whether the battery is able to accept and maintain the charge, the desulfation which helps maintain the plates clean from sulfate and extend the life of batteries, the maintenance *(last generation)* that keeps the battery to the 95-100% of the capacity, supplying the current when the battery starts to discharge, in order to not "stress" it during long periods of charge.
(Ex. Maintenance of a motorcycle battery during the winter).

SCS2	
Nominal Voltage	12V
Charging current	2A
Charging curves	AGM, Gel, Wet
Charging method	3 steps
Activation Voltage	2V
Battery Charge Capacity	3-40Ah
Battery Maintenance Capacity	Up to 80Ah
Protection	IP65

SCS4	
Nominal Voltage	12V
Charging current	1 - 4A
Charging curves	AGM, Gel, Wet, Lithium
Charging method	9 steps
Activation Voltage	2V
Battery Charge Capacity	5-80Ah
Battery Maintenance Capacity	Up to 100Ah
Protection	IP65

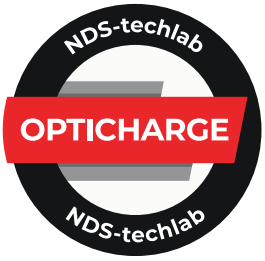
SCS8	
Nominal Voltage	12V
Charging current	2 - 8A
Charging curves	AGM, Gel, Wet, Lithium
Charging method	9 steps
Activation Voltage	2V
Battery Charge Capacity	10-160Ah
Battery Maintenance Capacity	Up to 250Ah
Protection	IP65

AC-DC Universal battery charger

MAIN FEATURES:

- Suitable also for $LiFePO_4$ batteries
- New **OPTICHARGE** firmware
- Selectable Charging curves
- Up to **9 charging** steps
- IP65 protection

OPTICHARGE, the new firmware from **NDS**, software team, for always ready and healthy batteries. Charge is optimized using technical specifications selected by **NDS** specialists, and voltage and current levels are always monitored.



SCS15	
Nominal Voltage	12V
Charging current	2 - 15A
Charging curves	AGM, Gel, Wet, Lithium
Charging method	9 steps
Activation Voltage	2V
Battery Charge Capacity	10-250Ah
Battery Maintenance Capacity	Up to 400Ah
Protection	IP20

SCM25	
Nominal Voltage	12V - 24V
Charging current	25A - 12,5A
Charging curves	AGM, Gel, Wet, Lithium
Charging method	9 steps
Activation Voltage	2V
Battery Charge Capacity	50-350Ah
Battery Maintenance Capacity	Up to 500Ah
Protection	IP20

SOLAR ENERGY

SOLENERGY 14
Silver solar panels

BLACKSOLAR 16
Black solar panels

LIGHTSOLAR 18
Lightweight solar panels

SOLARFLEXEVO 20
Flexible solar panels

SUNCONTROL2 22
MPPT Regulators

SUNCONTROL 23
Charge **Regulators**

NDS

SMART ENERGY MANAGEMENT

SOLENERGY

Silver solar panels

- MONOSCRYSTALLINE CELLS
- EASY INSTALLATION
- STAFFE INTEGRATE

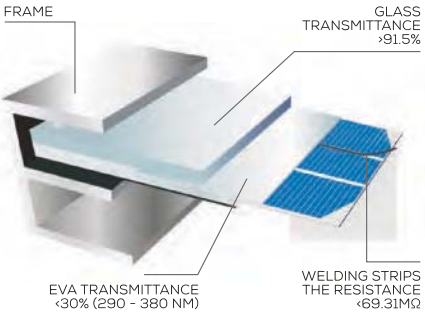
The solar panels **SOLENERGY** combine modern construction technologies in the photovoltaic sector with a complete setup and easy installation. The paneled bracket integrated into the panel guarantees superior steadiness and sturdiness, allowing the panel to be kept at the correct distance from the vehicle body by facilitating ventilation and avoiding any leakage.

Each module is made with high pure monocrystalline silicon cells, protected by a Tedlar sheet and textured tempered glass characterized by: high transparency, low iron content and anti-reflective coating that increases the efficiency up to 18.5%, all enclosed in two sheets of **EVA** (Ethylene Vinyl Acetate). Special by-pass diodes protect the cells from overvoltages and minimize the loss of power due to possible shading phenomena.

Solar modules **SOLENERGY** are conformed to the most stringent **IEC61215, IEC61730.** and **ISO9001 / ISO14000** certification. They resist the most difficult environmental and pollution conditions. They are equipped with by-pass diodes to protect over-voltage cells and minimize the loss of power due to shadowed areas.

INTEGRATED BRACKET

The special Alluminum brackets integrated into the panel, with aerodynamic frame and plastic side covers make the panel sturdy, safe, easy and quick to install.



STRUCTURE

Alluminum Frame
High transmittance glass: **91,5%**
Low Resistance Connection
Strips: **<69,31MΩ**
Eva transmittance: **<30%** *(290-380MN).*

UP TO 6m CABLE LENGTH

Each panel is equipped with a up to **6 meters**, long bipolar connection cable, with an external protection sheath resistant to any climatic condition.

PSM 85WP

Cell Number	36
Nominal Voltage	12V
Maximum Power	85WP±3%
Size mm	1165x530x60
Weight	9,0 kg

Open Circuit Voltage	22,79V
Short Circuit Current	4,81A
Maximum Power Voltage	18,83V
Maximum Power Current	4,52A
Cable Length 6m	2X2,5mm²

PSM 100WP

Cell Number	36
Nominal Voltage	12V
Maximum Power	100WP±3%
Size mm	1320x530x60
Weight	9,5 kg

Open Circuit Voltage	23,7V
Short Circuit Current	5,5A
Maximum Power Voltage	19,57V
Maximum Power Current	5,11A
Cable Length 6m	2X2,5mm²

PSM 100WP-S

Cell Number	36
Nominal Voltage	12V
Maximum Power	100WP±3%
Size mm	1727x416x60
Weight	10 kg

Open Circuit Voltage	22,74V
Short Circuit Current	5,66A
Maximum Power Voltage	18,94V
Maximum Power Current	5,28A
Cable Length 6m	2X2,5mm²

PSM 120WP

Cell Number	36
Nominal Voltage	12V
Maximum Power	120WP±3%
Size mm	1520x530x60
Weight	10,5 kg

Open Circuit Voltage	23,75V
Short Circuit Current	6,54A
Maximum Power Voltage	19,62V
Maximum Power Current	6,12A
Cable Length 6m	2X2,5mm²

PSM 150WP

Cell Number	32
Nominal Voltage	12V
Maximum Power	150WP±3%
Size mm	1475x676x60
Weight	12,5 kg

Open Circuit Voltage	20,85V
Short Circuit Current	9,30A
Maximum Power Voltage	17,23V
Maximum Power Current	8,71A
Cable Length 6m	2X2,5mm²

PSM 175WP

Cell Number	36
Nominal Voltage	12V
Maximum Power	175WP±3%
Size mm	1625x676x60
Weight	14,5 kg

Open Circuit Voltage	23,67V
Short Circuit Current	9,58A
Maximum Power Voltage	19,56V
Maximum Power Current	8,95A
Cable Length 4m	2X4mm²

BLACKSOLAR

Black solar panel

- **PERC CELLS**
  MORE POWER, LESS SPACE
- TOTAL BLACK
- BUILT-IN BRACKETS

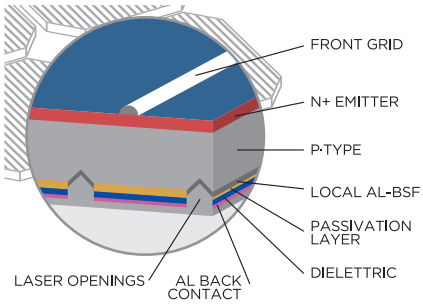
Frame, structure, cells, strings all completely black: the **BLACKSOLAR** panels capture a greater amount of solar energy and, in conditions of grazing light, such as sunrise and sunset, allowing a production of electricity higher than the standard modules.

High efficiency monocrystalline cells and excellent raw materials make **BLACKSOLAR** a cutting-edge panel in the photovoltaic sector, reaching an efficiency of 19,0%.

MORE POWER, less space

INTEGRATED BRACKET

The special Alluminum brackets integrated into the panel, with aerodynamic frame and plastic side covers make the panel sturdy, safe, easy and quick to install.



CELLE PERC

Passivated Emitter and **Rear Cell**: a new technology to increase the conversion efficiency by adding a dielectric passivation layer on the rear of the cell.

UP TO 6m CABLE LENGTH

Each panel is equipped with a up to **6 meters**, long bipolar connection cable, with an external protection sheath resistant to any climatic condition.

NDS

TUTTA L'ENERGIA CHE TI SERVE

ALL THE ENERGY YOU NEED

BS 115WP

Cell Number	36	Open Circuit Voltage	24,83V
Nominal Voltage	12V	Short Circuit Current	5,95A
Maximum Power	115WP±3%	Maximum Power Voltage	20,54V
Size mm	1320x530x60	Maximum Power Current	5,60A
Weight	9,5 kg	Cable Length 6m	2X2,5mm²

BS 155WP

Cell Number	32	Open Circuit Voltage	21V
Nominal Voltage	12V	Short Circuit Current	9,45A
Maximum Power	155WP±3%	Maximum Power Voltage	16,9V
Size mm	1475x676x60	Maximum Power Current	9,17A
Weight	12,5 kg	Cable Length 6m	2X2,5mm²

BS 180WP

Cell Number	36	Open Circuit Voltage	24V
Nominal Voltage	12V	Short Circuit Current	9,70A
Maximum Power	180WP±3%	Maximum Power Voltage	19,4V
Size mm	1625x676x60	Maximum Power Current	9,28A
Weight	14,5 kg	Cable Length 4m	2X4mm²

PLUS **DISCOVER ALL OPTIONS FOR SOLAR AT PAGE 21**

LIGHTSOLAR

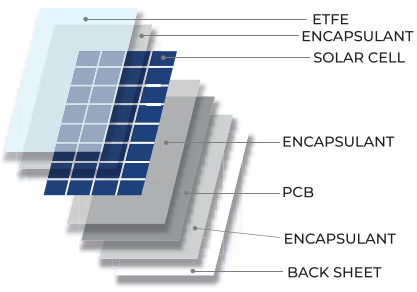
Lightweight solar panels

LSE SERIES

- HIDDEN CONNECTION AVAILABLE, IDEAL FOR TOP HOP ROOF
- THIN, LIGHT AND ROBUST
- 5% FLEXIBILITY

LIGHTSOLAR is the **"Glass & Frameless"** range of solar panels designed for applications where weight, thickness and resistance are fundamental characteristics.
The cells of these monocrystalline panels, with an efficiency of 18.75%, are embedded in an exclusive multi-layer structure: the upper layer is a plastic polymer called **ETFE** highly resistant to corrosion and weathering, such that it can be defined as self-repairing. The surface of the panel, always exposed to scratches from tree branches, hail, sharp surfaces or other accidental shocks, is able to self-model, returning to the initial shape ideal for capturing sunlight.

The lower layer of the structure is composed by an **PCB** sheet to contain and dissipate as much as possible the heat generated by the cells and to give the panel such strength that it is also perfect for nautical applications, where *(with suitable and soft footwear)* it is possible to step on the panel.



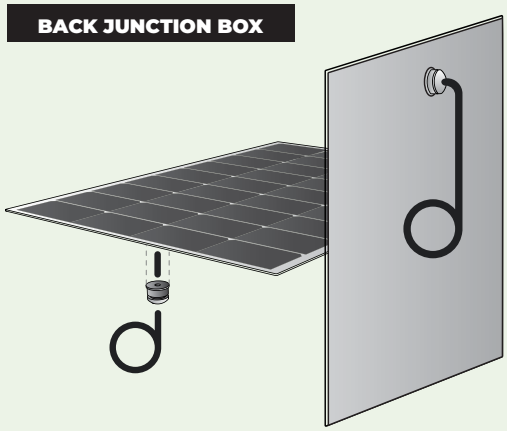
STRUCTURE

Built with **7 layers**, including the **ETFE** surface, the best surface in terms of efficiency and durability, and an **PCB** sheet that tightens it making it more robust and improving the dissipation of heat.

JUNCTION BOX

The **NDS** aerodynamic box contains the supplied **3 meters** connection cable and the bypass diodes required to reduce shading.

BACK JUNCTION BOX



FRONT CONNECTION

LSE 105 BF

Cell Number	36
Nominal Voltage	12V
Maximum Power	105WP±3%
Size mm	1068x503x4
Weight	3,97 kg

Open Circuit Voltage	23,3V
Short Circuit Current	5,45A
Maximum Power Voltage	19,8V
Maximum Power Current	5,3A
Frontal Cable Length 3m	2X2,5mm²

LSE 160 BF

Cell Number	36
Nominal Voltage	12V
Maximum Power	160WP±3%
Size mm	1253x673x4
Weight	5,82 kg

Open Circuit Voltage	23,3V
Short Circuit Current	8,72A
Maximum Power Voltage	19,8V
Maximum Power Current	8,08A
Frontal Cable Length 3m	2X2,5mm²

LSE 195BF

Cell Number	35
Nominal Voltage	12V
Maximum Power	195WP±3%
Size mm	1488x673x4
Weight	6,75 kg

Open Circuit Voltage	22,3V
Short Circuit Current	11,08A
Maximum Power Voltage	19V
Maximum Power Current	10,3A
Back Cable Length 3m	2X2,5mm²

BACK CONNECTION

LSE 105 BR

Cell Number	36
Nominal Voltage	12V
Maximum Power	105WP±3%
Size mm	1018x503x4
Weight	3,93 kg

Open Circuit Voltage	23,3V
Short Circuit Current	5,45A
Maximum Power Voltage	19,8V
Maximum Power Current	5,3A
Frontal Cable Length 3m	2X2,5mm²

LSE 200BR

Cell Number	36
Nominal Voltage	12V
Maximum Power	200WP±3%
Size mm	1488x673x4
Weight	6,79 kg

Open Circuit Voltage	23,3V
Short Circuit Current	10,9A
Maximum Power Voltage	19,8V
Maximum Power Current	10,1A
Back Cable Length 3m	2X2,5mm²

This special version of LightSolar has a completely flat surface, thanks to the use of a new connection method called **Back Junction Box** and laminated diodes included in the frame of the panel itself.

The position of the connection cable, on the back, eliminates the **Junction Box** from the exposed surface of the panel. The round box, only 30mm in diameter, tightens the cable, making the connection solid and secure.

This version is **ideal for pop top roofs**, minimizing space requirements, eliminating cable clutter, as well as unsightly and complex cable boxes.

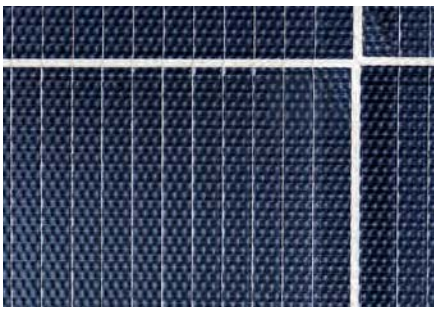
SOLARFLEXEVO

Flexible solar panels

- ULTRA LIGHTWEIGHT
- MULTIWIRE TECHNOLOGY WITH MONOCRYSTALLINE CELLS
- 30% FLEXIBILITY

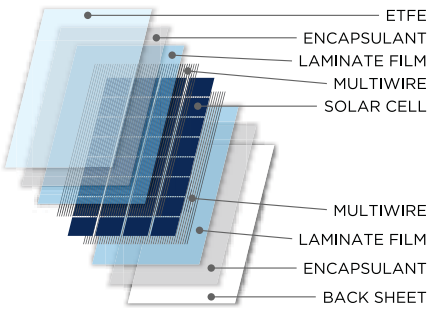
Adapts to nonlinear surfaces thanks to a high degree of flexibility, provides maximum performance with the minimum possible footprint: all this is **SOLARFLEX**EVO.
solarflexevo is the ideal choice in the Nautical and Camper sectors where the yield is optimal.
To ensure the best results in the smallest possible space, the **SOLARFLEX**EVO range is built with quality and 20% high-efficiency cells.

Energy has never been so **FLEXIBLE**



MULTIWIRE CELLS

The higher number of connections and the smaller cell distance (7 times less than 3bb cells), significantly increases the current flow. Improved resistance to micro-breaks of cells.
The dual multiwire **"front and back side"** connection dissipates **50%** more heat than a standard cell and ensures optimum efficiency even in the hottest seasons.



STRUCTURE

Built with 9 **layers**, including the **ETFE** surface, the best surface in terms of efficiency and durability.

JUNCTION BOX

Each panel is equipped with a special **Junction Box**: location of the bipolar connection cable **3 meters** long, with external protective sheath resistant to all weather conditions.

MAIN FEATURES:

- Multiwire cells
- Encapsulated with 9 layers
- Immune from micro-cracks
- Efficiency20%
- Excellent efficiency at high temperatures
- Low power loss in case of shading

SFE 60WP

Cell Number	32
Nominal Voltage	12V
Maximum Power	60WP±3%
Size mm	670x510x3
Weight	1,72 kg

Open Circuit Voltage	20,7V
Short Circuit Current	3,68A
Maximum Power Voltage	17,6V
Maximum Power Current	3,40A
Cable Length 3m	2X2,5mm²

SFE 120WP

Cell Number	32
Nominal Voltage	12V
Maximum Power	120WP±3%
Size mm	1290x520x3
Weight	2,95 kg

Open Circuit Voltage	21,2V
Short Circuit Current	7,20A
Maximum Power Voltage	18V
Maximum Power Current	6,67A
Cable Length 3m	2X2,5mm²

SFE 150WP

Cell Number	41
Nominal Voltage	12V
Maximum Power	150WP±3%
Size mm	1570x510x3
Weight	3,53 kg

Open Circuit Voltage	26,6V
Short Circuit Current	7,16A
Maximum Power Voltage	22,6V
Maximum Power Current	6,64A
Cable Length 3m	2X2,5mm²

SFE 165WP

Cell Number	44
Nominal Voltage	12V
Maximum Power	165WP±3%
Size mm	1290x680x3
Weight	4,74 kg

Open Circuit Voltage	28,2V
Short Circuit Current	7,43A
Maximum Power Voltage	24V
Maximum Power Current	6,88A
Cable Length 3m	2X2,5mm²

PLUS

OPTION

Solar Panels

Cod. PST / PG 9 / PG 13.5

Cablebox for
cable routing with
2PG configuration

SUNCONTROL2

MPPT Regulators

- **MPPT +30%** MORE FROM YOUR SOLAR PANELS
- SUITABLE ALSO FOR LiFePO4 BATTERIES
- STARTER BATTERY CHANGE

NDS-techlab OPTICHARGE NDS-techlab

SUNCONTROL2 is the latest and most innovative charge regulator from NDS. The **MPPT** technology allows to optimize the energy from any solar panel, performing the most modern charging curves, for batteries always charged and efficient over time. Solid and functional thanks to the professional terminal block and equipped with updated communication protocols N-BUS, **SUNCONTROL2** is ideal for an installation destined to last over time. Available in two different versions: **SC 320M** with input for two panels up to 320W (without cooling fan) and **SC 350M** which supports up to 350W.

MAIN FEATURES SUNCONTROL2:

- Temperature sensors (optional)
- Recharge starting battery
- 5 stages charging curves
- Desulphation system
- AGM, Gel, Wet and Lithium
- Separate input for 2 solar panels

CODE	SC 320M	SC 350M
Nominal Voltage	12V	12V
Module Max Power	320W	350W
Maximum Charging Current	20A	24A
MPPT Tecnology	YES	YES
Protection Fuse	25A	30A
Starter Battery Charge	YES	YES
Fan	NO	YES
Size (mm)	151x90x48	151x90x48
Maximum input voltage	29,5V	29,5V

TIPS

WHAT DOES MPPT MEANS?

This is the algorithm that allows to always exploit the "Maximum power point track" supplied by the panel. A charge regulator with MPPT technology can achieve a significantly higher efficiency than PWM technology *(up to 25% more)*. The MPPT regulator is ideal where space is limited because in less space you get more energy!

PLUS

DISPLAY

DT 002

This **LCD Touchscreen display** allows to quickly and easily view the charging status of the panels and provides a general indication about the status of the leisures batteries.
Equipped with 6m of communication cable, the **DT002** can be directly connected to the **SUNCONTROL2**.

SUNCONTROL Charge **Regulators**

SUNCONTROL, depending on the model is capable of handling up to 300W in input, with a maximum charge of 18A. The microprocessor is capable of up to four charge phases, including the important phase of desulfation, which guarantees longer life to your batteries. There are two versions of **SUNCONTROL**: the **SC15-240** model with **PWM** technology and the **SC300M** model with **MPPT** technology, which maximizes the potential of the solar panel, improving its yield by up to 25%.

CODE	SC 15-240	SC 300M
Nominal Voltage	12V	12V
Module Max Power	240W	300W
Maximum Charging Current	15A	18A
Tecnology	PWM	MPPT
Protection Fuse	25A	25A
Starter Battery Charge	YES	YES
Size (mm)	103x86x50	103x86x50
Display	NO	Optional

MAIN FEATURES
SC 15-240:

- PWM Technology
- Dedicated output for starting battery
- Wet, Gel and AGM battery selector
- Input power up to 240 W

MAIN FEATURES
SC 300M:

- MPPT Technology
- 4 step charging curves
- Wet, Gel, AGM and Lithium battery selector
- Input power up 300W

PLUS

DISPLAY

DT 001

This **LCD Touchscreen display** allows to quickly and easily view the charging status of the panels and provides a general indication about the status of the leisures batteries.
Equipped with 6m of communication cable, the **DT001** can be directly connected to the **SUNCONTROL**.

COMPATIBLE ONLY WITH:

SC 300M

MANAGEMENT AND **CONTROL**

IMANAGER 26
Multi-battery management

POWERSWITCH 28
Automatic battery **Switch**

BATTERYSAVER 28
Automatic battery **Switch-off**

ENERGYMETER 29
Battery **information display**

SMARTSEPARATOR 29
Automatic **paralleling**

IMANAGER

Multi-battery management

- TWO LEISURE BATTERIES AUTOMATIC MANAGEMENT
- DEDICATED FULL COLOUR TOUCH SCREEN DISPLAY
- BATTERY STATE OF CHARGE ACCURATE CALCULATION

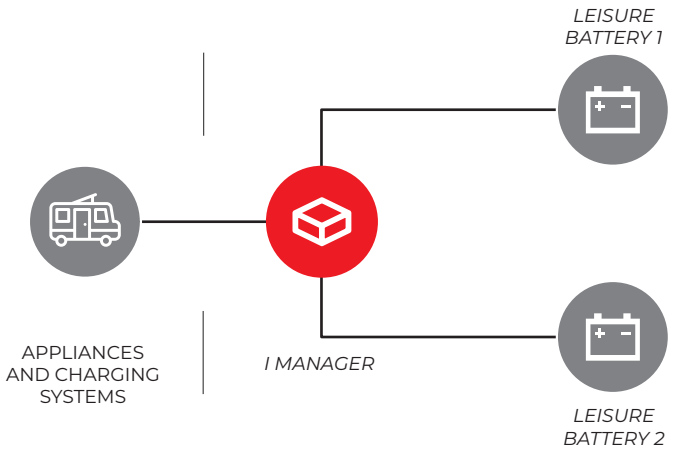
IMANAGER is the innovative system that manages all the on-board batteries and energy needs. It mainly allows avoiding the connection in “permanently parallel” of leisure batteries. It manages, simultaneously or separately, up to three batteries with different technologies and amperage. It improves their efficiency and preserves their duration, thanks to the automatic battery cut-off.

The **IMANAGER** Touchscreen displays any available information on both the accumulators charge level and the possible uses, and it allows you to manually activate or deactivate batteries by one touch, for a more customised management **IMANAGER** constantly monitors the voltage of its two batteries keeping into account the charge and discharge currents, decides and automatically selects the battery to be used, and aims at keeping the same level of charge to improve their performances.

Why do you need **IMANAGER**?

To install two service batteries in total safety, avoiding the obsolete and not recommended parallel, requires an electronic device that manages the system.
iManager permits the installation of batteries different from each other in: technology *(AGM, Gel, Wet)*, power and date of production.

Choose your batteries in total freedom, iManager takes care of the rest!



MAIN FEATURES:

- Automatic or manual management of one or two leisure batteries, even of different technology and amperage
- Specific starting battery output, when leisure batteries are 100% charged (e.g.: storage)
- It shows the batteries charging state
- Shows charge and discharge Ampere and tension
- Date and time visualization
- Battery switch-off automatic (below 11V) or manual, through the Touchscreen.
- It shows information and recommendations on the batteries management and maintenance
- Temperature monitoring during charge/discharge, for an improved security
- BlackBox/Display connection available through cable (cod. iM 12-150) and wireless (cod. iM 12-150W).

Sample screenshot Automatic and/or Manual

BLACKBOX		
Code	IM 12-150	IM 12-150W
Consum. with connected batt.	8mA	22mA
Consum. with disconnected batt.	4mA	4,2mA
Functional Mode	Automatic and Manual	
Relays Maximum Current	100A + 100A	
Rated Voltage	12V (9V - 18V)	
Working Temperature	-15°C / +65°C	
Batteries Disconnection Range	Voltage: 10,5V Temperature: 70°C	

DISPLAY TOUCH		
Code	IM 12-150	IM 12-150W
Maximum Bright Consumption	86mA	90mA
Display Off Consumption	38mA	40mA
Consum. with disconnected batt.	8mA	8mA
Connection Type	7mm Cable with Low Profile Connector	Wireless
Working Mode	Normal and Low Consumption	
Display Type	TFT2,83" / 262 k colors / touchscreen	
Working Temperature	-10°C / +70°C	

Among its multiple features, one of the most noteworthy is the automatic battery switch-off, which is activated under three different circumstances:

- When the voltage of one or both batteries is below the critical limit of 10,5V.
- When the voltage of one or both batteries stays below 11V for more than 15 minutes.
- When the temperature measured on one or both batteries is above the limit of 70°.

In this way, decreased efficiency and fatal damages are avoided.

TIPS

Why avoiding the parallel?

The parallel between several batteries, as well as not representing the maximum efficiency, constraints the purchase of batteries as similar as possible as brand, model, power. The two batteries will work together as one and the deficits of one will affect the other, reducing both their performances and durability.
When the parallel system experiences a fault, or a loss of efficiency, both batteries will need to be replaced.

POWERSWITCH
Automatic battery **Switch**

Cod. PS 12-100

POWERSWITCH is an automatic switch which allows managing two leisure batteries separately. Since electric consumption in Camper increases, you need greater quantities of energy available.

A second leisure battery can meet this need, as it ensures a broader range although it cannot be connected in parallel in case they are not "twins" *(which means identical in terms of technology, amperage, brand and production lot).*

MAIN FEATURES:

- Automatic management of two batteries, also of a different technology and capacity
- Automatic *(below 11V)* or manual battery switch-off
- Up to 2000W management both input and output
- Remote control provided

TECHNICAL FEATURES	
Rated Voltage	12V
Relays Maximum Current	100A
Appliances Disconnection Voltage	10,5V
Self-Consumption	15mA
Display Cable Length	3mt
Size	121x108x50mm

BATTERYSAVER
Automatic **battery switch-off**

Cod. BS 12-100

BATTERYSAVER is an automatic battery switch-off which constantly monitors the battery voltage, disconnecting it from any utility in case it goes below the critical 11V threshold.

It thus protects the battery against any efficiency loss or fatal damage due to deep discharges.
It also has a "Manual" mode button which allows disconnecting all the utilities at any moment.

Therefore, a manual restart is possible or automatic reset through a charging source *(e.g.: alternator, 230V charger or solar panel).*

MAIN FEATURES:

- Automatic *(below 11V)* or manual battery switch-off
- Up to 1200W management both input and output
- Led Operation indicator
- Automatic battery switch back on *(when a charging source is available)*

TECHNICAL FEATURES	
Rated Voltage	12V
Maximum Current	100A
Appliances Disconnection Voltage	10,5V
Self-Consumption	4,5mA
Size	121x108x50mm

ENERGYMETER

Battery **information display**

Cod. EM 12-100

Thanks to the wireless display, the battery status will always be under control. **ENERGYMETER** is a current and voltage meter, consisting of two units that can be installed on any vehicle.

The main unit, installed close to the battery, is combined with the display communicating continuously via wireless, in order to detect constantly voltage and current values *(range 0-100A)*. The processed data are transmitted for reading to the remote display *(or several displays at the same time)* which will allow the user to monitor the battery energy balance in real time.

MAIN FEATURES:

- Input and output current data
- Operating time charge/discharge data
- Total amount charged/discharged current

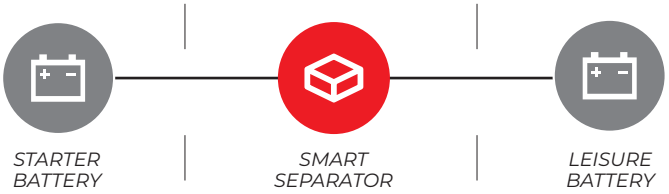
TECHNICAL FEATURES	
Data Transmission Frequency	ASK 433,92 MHZ
Maximum Signal Range	6mt
BLACK BOX	
Rated Voltage	12V
Maximum Current	100A
Appliances Disconnection Voltage	10,5V
Self-Consumption	12mA
Size	121x108x50mm
Weight	241 g
DISPLAY	
Rated Voltage	12V
Self-Consumption	3mA
Size	105x86x25mm

SMARTSEPARATOR

Automatic **paralleling**

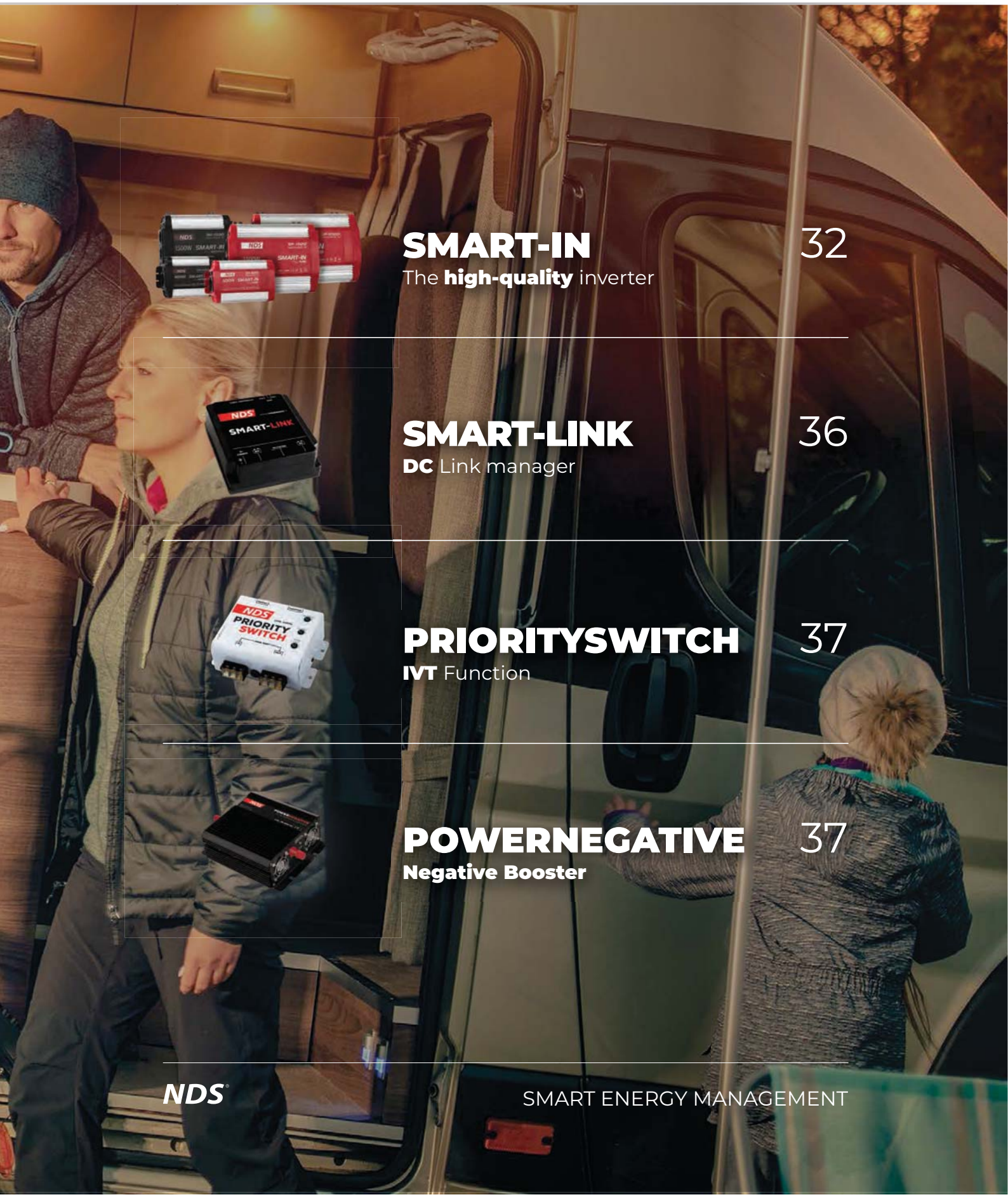
Cod. SS 12-100

SMARTSEPARATOR is an automatic device that allows the on-board management of a starting battery and a leisure battery.
Thanks to the integrated microprocessor, it will be able to monitor automatically the voltages of the connected batteries and will manage the main function of putting the starting and the leisure battery in parallel only in the event that the first one is in a state of charge.
This function allows vehicles to recharge the leisure battery with a simple and quick installation without having to use a parallel relay controlled by an ignition switch or D+.
Another important function is the manual or automatic battery switch-off that prevents deep discharges: if the leisure battery voltage drops below the critical threshold of 10.5V.



TECHNICAL FEATURES	
Rated Voltage	12V
Maximum Current	100A
Self-Consumption	5mA
ON / OFF Split-Charge Relay Voltage	13,3V / 12,7V
ON / OFF Battery Switch-Off	10,6V / 12V
Size	121x108x50mm

INVERTER



SMART-IN 32
The **high-quality** inverter

SMART-LINK 36
DC Link manager

PRIORITYSWITCH 37
IVT Function

POWERNEGATIVE 37
Negative Booster

SMART-IN

The **high-quality** inverter

- HIGH EFFICIENCY
- PROFESSIONAL COMPONENTS
- INTEGRATED PRIORITY CIRCUIT (IVT) OPTION

SMART-IN are the inverters, remarkable for design and quality. Designed to provide high performances, maximum safety, reliability and, above all, silent operation, important for those who install the inverter inside the recreational vehicle. Thanks to the **NDS** advanced engineering solutions, **SMART-IN** inverters are also suitable for professional use.
The **SMART-IN** family consists of two lines: Modified and Pure distinguished by the output waveform. The two product lines cover a wide range of powers from 400W to 3000W, with the possibility *(for some models)* to have 24V input voltage.

PROFESSIONAL CONNECTORS

Connections welded directly to the PCB with high conductivity bars prevent voltage drops, power losses and lower battery consumption.

IN/OUT IVT INVERTER

The standard versions have one or two output sockets, while for the models with IVT *(integrated priority function)*, there is one output socket and one input socket (IEC), protected by a fuse, where the external main is connected.

EASY INSTALLATION

The integrated mounting feet allow a safe installation in any position. Supplied with ultra-flexible input connection cables, specific and already sized for the device.

+ PLUS DISCOVER ALL ACCESSORIES FOR INVERTERS AT PAG. 36

MAIN FEATURES:	PROTECTIONS:
• High efficiency up to 93% • Low self-consumption • Input with professional connectors • Predisposition for remote control ON/OFF • Input and output completely isolated	• Soft Start • Protection against overload and Short circuit • Low battery alarm • Protection against polarity inversion • Over-temperature protection

Distinctive features

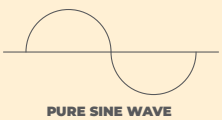
SMART-IN inverters can boast the lowest self-consumption on the market and consider that very often an inverter remains in standby mode, thus continuing to consume current, minimizing this absorption is essential and of great benefit to the user who will not discharge the battery unnecessarily.

• The input and output are completely isolated, to avoid that any anomalies from the equipment connected to the output may damage that connected to the input and vice-versa, thus ensuring a high level of safety.
• Professional connectors which, as opposed to the standard cheaper inverters on the market, are directly integrated into the PCB, thus allowing a substantial reduction of voltage drop on the connection between the device and the battery. This improves its performance and, at the same power absorbed by 230V equipment *(e.g. TVs)*, the battery consumption is lower than with the traditional inverters.

TIPS

Pure or **Modified** Wave?

Smart-In Pure, with sophisticated electronics, generates a 230V output with *"pure sine wave"*, the same type of domestic electrical network. An essential solution for sensitive and valuable devices, such as laptop PCs, air conditioners, coffee machines.


PURE SINE WAVE

Smart-In Modified, with a relatively simpler and cheaper electronic circuit than the Pure version, generates a *"modified sine wave"*, **similar to a square wave**.


MODIFIED SINE WAVE

This series is recommended for simpler loads, such as lighting, resistive loads... etc.
Remember: The modified wave may shorten the life of your devices.

SMART-IN MODIFIED

Modified sine wave

TECHNICAL FEATURES							
CODE	INPUT VOLTAGE	CONTINOUS POWER	PEAK OUTPUT POWER	OUTPUT VOLTAGE	USB OUTPUTS	SIZEI (mm)	CABLE INCLUDED
SM 400	12V	400W	800W	230Vac	5V 2,1A	184x140x71h	6mm² length 80cm
SM 600	12V	600W	1200W	230Vac	5V 2,1A	214x140x71h	10mm² length 80cm
SM 1000	12V	1000W	2000W	230Vac	5V 2,1A	262x270x121h	16mm² length 80cm
SM 1500	12V	1500W	3000W	230Vac	5V 2,1A	262x270x107,5h	25mm² length 80cm
			24V				
SM 600-24	24V	600W	1200W	230Vac	5V 2,1A	214x140x71h	10mm² length 80cm

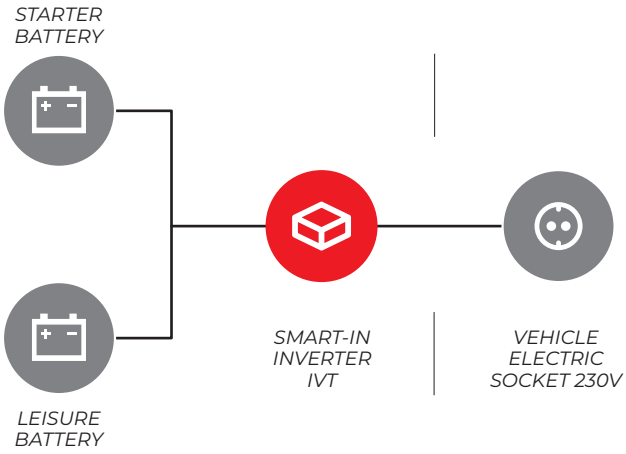
SMART-IN PURE

Pure sine wave

TECHNICAL FEATURES							
CODE	INPUT VOLTAGE	CONTINOUS POWER	PEAK OUTPUT POWER	OUTPUT VOLTAGE	USB OUTPUTS	SIZE (mm)	CABLE INCLUDED
SP 400	12V	400W	1000W	230Vac	5V 2,1A	214,5x140x71h	6mm² length 80cm
SP 600	12V	600W	1500W	230Vac	5V 2,1A	244,5x140x71h	10mm² length 80cm
SP 1000	12V	1000W	3000W	230Vac	5V 2,1A	262,4x270x107,5h	16mm² length 80cm
SP 1500	12V	1500W	4000W	230Vac	5V 2,1A	322,4x270x107,5h	25mm² length 80cm
SP 3000	12V	3000W	8000W	230Vac	5V 2,1A	412x270x107,5h	35mm² length 80cm
			24V				
SP 600-24	24V	600W	1500W	230Vac	5V 2,1A	244,5x140x71h	10mm² length 80cm
SP 1500-24	24V	1500W	4000W	230Vac	5V 2,1A	322,4x270x107,5h	25mm² length 80cm
SP 3000-24	24V	3000W	8000W	230Vac	5V 2,1A	412x270x107,5h	35mm² length 80cm

SMART-INPUREIVT

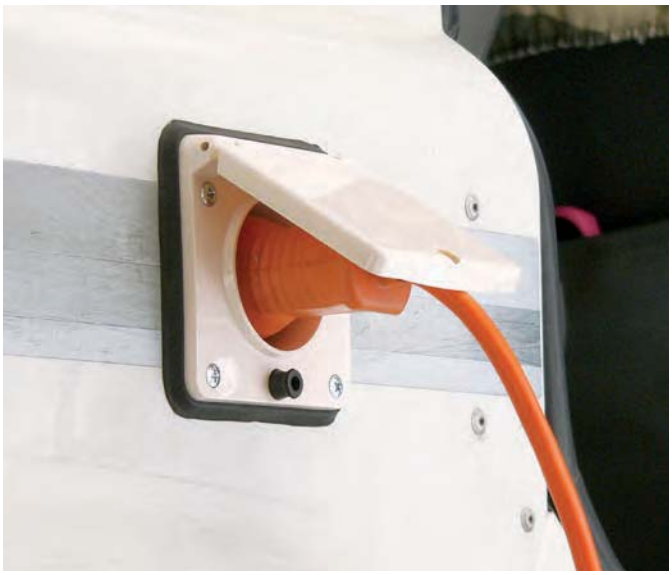
Pure sine wave



SMART-INPURE with **IVT** function is a line of inverters with an **integrated system of priority** (Priority Switch type). This special **IVT** function, through the two input and output 230V sockets, allows the management of the voltage that comes out from the inverter connected to the battery and to the external mains.
When the electronic network is available is connected to the external grid, it will have the priority in order to preserve the battery; otherwise, when the main is disconnected, the inverter use the battery to supply the 230V.

DISTINCTIVE FEATURES:

- By-pass integrated function
- Relay time change from inverter 230 VAC to external main= 20 ms
- Relay time change from 230 VAC external main to inverter = 100 ms



TECHNICAL FEATURES							
CODE	INPUT VOLTAGE	CONTINOUS POWER	PEAK OUTPUT POWER	OUTPUT VOLTAGE	USB OUTPUTS	SIZE (mm)	CABLE INCLUDED
SP 1000-I	12V	1000W	3000W	230Vac	5V 2,1A	262,4x270x121h	16mm² length 80cm
SP 1500-I	12V	1500W	4000W	230Vac	5V 2,1A	322,4x270x121h	25mm² length 80cm
SP2000-I	12V	2000W	6000W	230Vac	5V 2,1A	385x270x107,5h	35mm² length 80cm

TIPS

What is the **IVT** funtion?

More frequently, the inverter is the only solution for powering loads in the vehicle, but its dimensions and power *(above 1000W)* make it impractical to move as required. The **IVT** function is a priority system that allows the inverter to automatically power itself from the 230V mains, when available, and return to using the battery when necessary.

This function makes it possible to safely connect the inverter output to the vehicle's electrical circuit, so as to always have all the sockets powered, leaving the inverter conveniently installed near the leisure battery.

BEST WITH

SMART-LINK

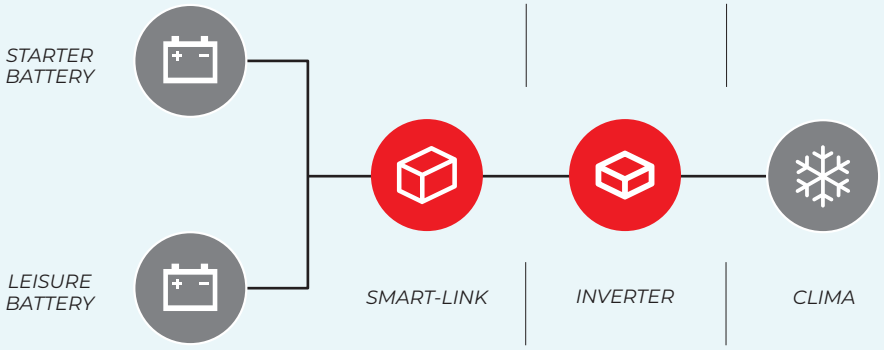
DC Link Manager

Cod. SL 12-100

It is an intelligent 12V DC power distributor that can be installed on any system, and combined with an inverter, allows the use of heavy loads, even when the vehicle is running, always keeping the electrical system and the batteries safe.

By connecting to **SMART-LINK**: inverter, starting battery and leisure battery you can use air conditioners, without risk *(with batteries of adequate capacity).*

The device is equipped with a three-way connector to which are connected the contacts of a dedicated relay *(A, B and C)* that can be used, e.g. to manage air conditioners with an economy function, temporarily turning off the compressor and leaving the rest of the circuit active.



PLUS

ACCESSORIES

Inverter

REMOTE CONTROL

Remote control for inverter. Allows to turn the inverter on and off from distance.

Cod. **RC02 · RC03**

FUNCTIONAL CONNECTOR

ON/OFF Remote control adaptor for inverters, to connect to every remote control.

Cod. **FC02**

4mm²/6mm² CABLES

4 mm_2 cables with clips, 60cm length.
6 mm_2 cables with clips, 60cm length.

Cod. **BVR4 · BVR6**

CAR LIGHT ADAPTER

2,5 mm_2 cables 50 cm length, with connector.

Cod. **CLB01**

PRIORITYSWITCH

Cod. SP 230

IVT Function

PRIORITYSWITCH is an intelligent system that allows the use of the inverter and batteries only when it is really necessary. It is a management system of the 230V, useful when the system has two power sources: electrical network and an inverter connected to the battery.
By connecting the two power sources to the input of the **PRIORITYSWITCH**, the external main will always have the priority. There are two outputs, the first one to connect all loads to be used only when the main network is present, such as air conditioners, refrigerators and other big loads; the second output, instead, is dedicated to all the accessories that can be powered either by the inverter than from the main, for example, the 230V sockets of the vehicle.

TECHNICAL FEATURES	
Voltage Input/Output	230Vac / 230Vac
Maximum Output Current	13A
Fuse	15A
Inverter Maximum Power	3000W
Self-consumption	30mA only grid
Size	145x133x55mm

POWERNEGATIVE

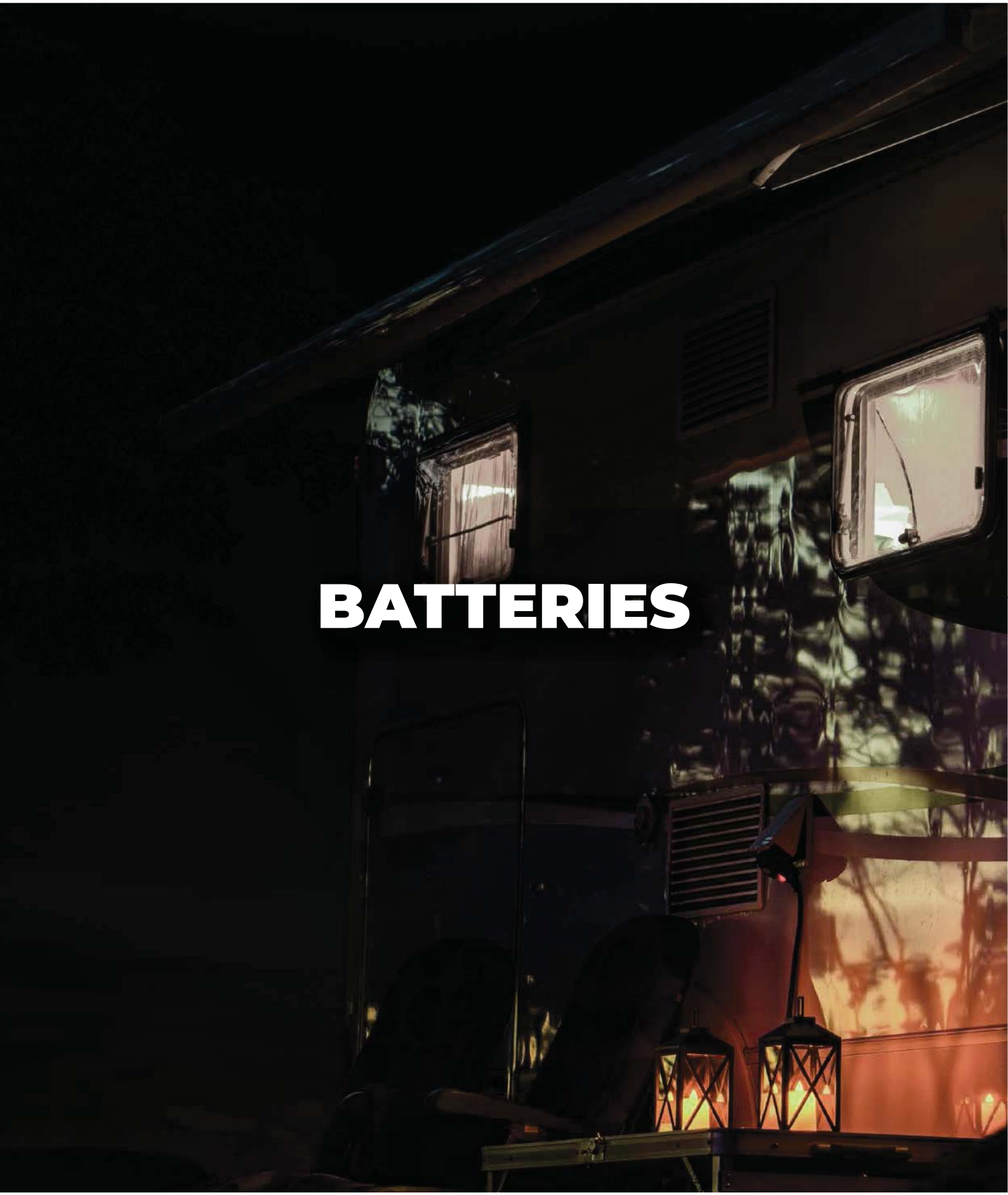
Negative booster

The DC-DC voltage converters **NDS** line are electronic devices that can reduce a voltage of 17 ~ 32VDC in a constant of 14V ± 10%. Three different versions are available, with an output power of 10A, 30A, 60A depending on the model. The devices appear to be very useful in all those situations where it is necessary to supply utilities with 12V rated voltage but the vehicle or the power source has a voltage of 24V.

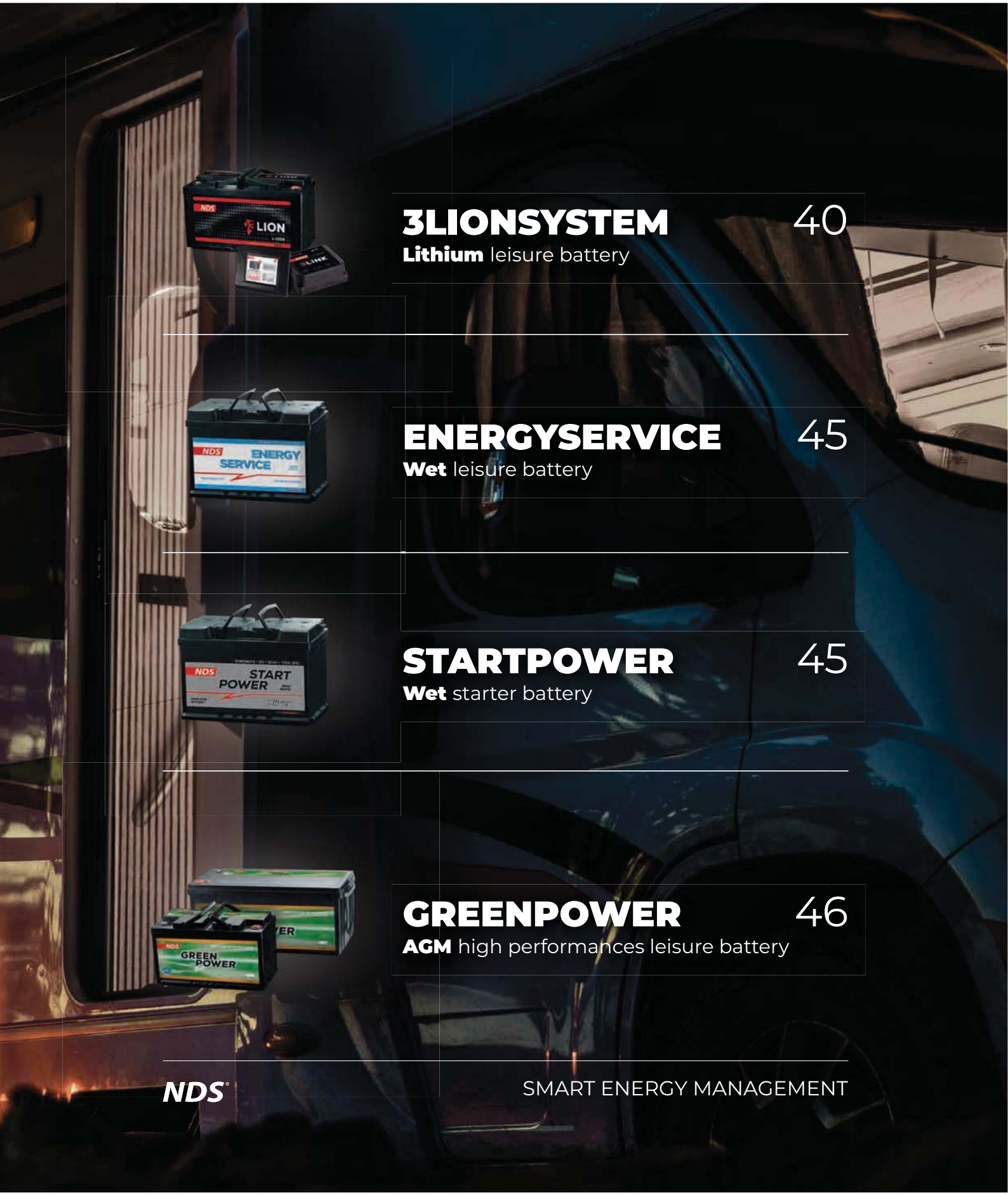
MAIN FEATURES:

- DC-DC reducer
- Automatic charge limitation
- Soft start
- Ideal for 24V vehicles with 12V loads

CODE	PN 2412-10	PN 2412-30	PN 2412-60
Input Voltage	13V - 40V	13V - 40V	13V - 40V
Output Voltage	14V ± 10%	14V ± 10%	14V ± 10%
Maximum Output Power	10A	30A	60A
Maximum Power	140W	400W	800W
Self-Consumption	35mA	98mA	220mA
Size	121x91x48mm	152x91x48mm	238x178x68mm



BATTERIES



3LIONSYSTEM 40
Lithium leisure battery

ENERGYSERVICE 45
Wet leisure battery

STARTPOWER 45
Wet starter battery

GREENPOWER 46
AGM high performances leisure battery

3LION

Lithium leisure battery

- MAXIMUM PERFORMANCE AND SAFETY ON ANY VEHICLE
- BATTERY INTEGRATED BMS
- LITHIUM $LiFePO_4$ TECHNOLOGY

The **3LIONSYSTEM** is based on $LiFePO_4$ lithium batteries with an internal **BMS**. When installed correctly, these batteries will give outstanding performance in any motorhome or caravan. $LiFePO_4$ batteries are extremely stable and safe with no dangerous fumes. Unlike some lithium batteries, $LiFePO_4$ batteries do not overheat and there is no risk .. The advanced BMS, integrateci in the battery, allows you to safely use an inverter to power 230V appliances such as air conditioners, coffee machines and hairdryers. The **BMS** constantly balances the cells in the battery and keeps under control values such as voltage, current, temperature and internal resistance, ensuring that the battery is always operating at maximum efficiency.

BENEFITS

FAST CHARGE
When the engine is running, the high charging current from the alternator can be managed by a **3LINK** unit or DC-DC battery charger, creating prioritized and safe charging without stressing the original system of the motorhome. Even if the **3LION** battery is completely discharged, running the vehicle's engine for just 30 minutes is usually enough to give one day more of battery use.

60% LESS WEIGHT
The chemical composition ($LiFePO_4$) of the **3LION** battery gives it a very high energy density and the weight saving is incredible: **approx. 60% lighter** than a lead/acid battery with the same Ah capacity!

HEAVY DUTY
The low internal resistance and special electrochemical design of the battery allow it to withstand even high discharge currents. That's why **3LION** batteries are ideai for use with inverters and can run air conditioners, coffee machines, hair dryers and just about any 230V appliances. If you have to use medicai equipment, lithium batteries are ideai. **Up to 4 hours** with an Airconditioning and **up to 2x** the capacity of a classic Lead acid battery.

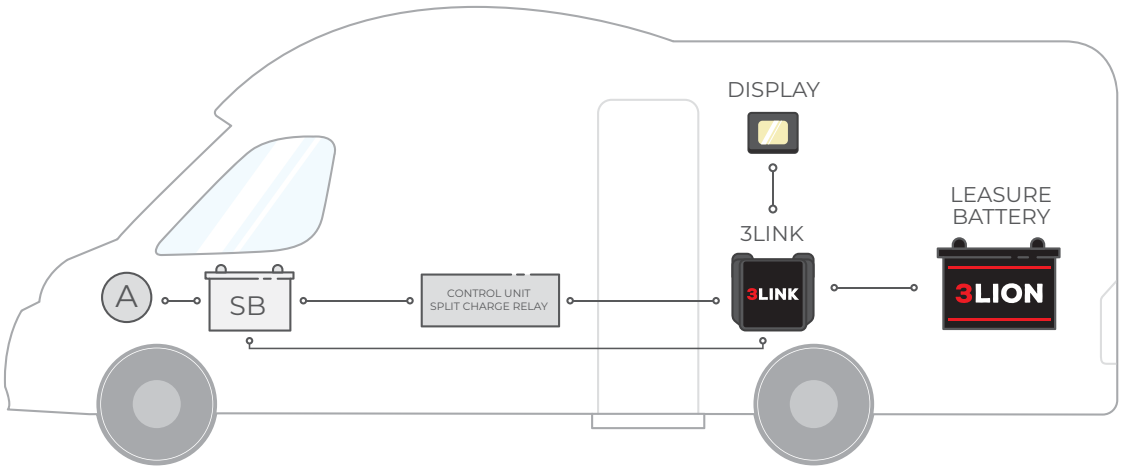
ZERO MAINTENANCE
There's no electrolyte to check and keep topped up and no need to worry about sulphation or damage caused by deep discharging as can happen with lead-acid batteries. What's more, **3LION** batteries don't suffer from the same self-discharge issues that lead-acid batteries do.

HIGH CYCLE LIFE
The charge/discharge cycles you can get from a good lithium battery are much higher than what lead-acid batteries can achieve: at least 5 times those oftraditional batteries, actual cycle life depends on how the battery is used but, as a guide, you can reach **2500 cycles with a depth of discharge of 80% and, with an ordinary usage your battery can achieve up to 5,000 cycles!**

SAFE AND RELIABLE
The $LiFePO_4$ chemistry gives the battery an intrinsic thermodynamic stability and the powerful, built-in **BMS** (Battery Management System) protects it from short circuit, polarity reversal, over-voltage, deep discharges and over/under temperatures. Using the installation configuration A or B avoids problems to the originai electrical system of the vehicle and ensures maximum performance.

THE RIGHT SOLUTION FOR **YOUR** MOTORHOME

A **ALL VEHICLES** EXCEPT EURO 6 WITH SMART ALTERNATOR



INSTALLATION

The originai electrical system - contrai unit and wiring - on many motorhomes is not suitable for the safe & efficient management of a lithium battery. For this reason, the simple replacement of a lead-acid battery with a Lithium Battery is not recommended.

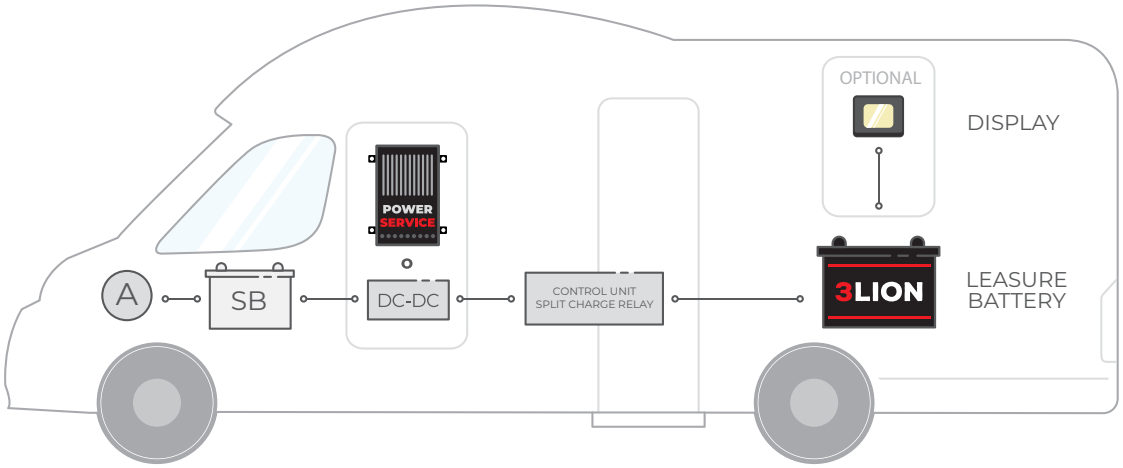
The **3LINK** system allows you to **bypass** the original electrical system avoiding any problems and ensuring efficient charging .

FEATURES

The **3LINK** controller make it possible to achieve very fast recharging of the **3LION** Lithium Battery while preserving the original electrical system.

The Touch Screen Display, included in the kit, allows you to monitor and manage the **3LION** leisure battery and the starter battery as well.

B **EURO 6 VEHICLES WITH SMART ALTERNATOR**



INSTALLATION

Newer vehicles equipped with “smart” alternators need a DC-DC charger (which takes its charge from the alternator) or a **POWERSERVICE** to charge the leisure batteries efficiently. If one was fitted as originai equipment, the vehicle’s system will be compatible with the charging parameters demanded by a **3LION** Lithium Battery and so the simple replacement of the original battery with an NDS **3LION** is a sensible option.

FEATURES

In this case the charging speed depends on the characteristics of the DC-DC charger that was originally installed. This ensures that the system is always safe and charging efficiently. With this configuration, we recommend the NDS **ENERGYMETER** which has a **Touch Screen Display** showing the performance of both the battery itself and the charging system.

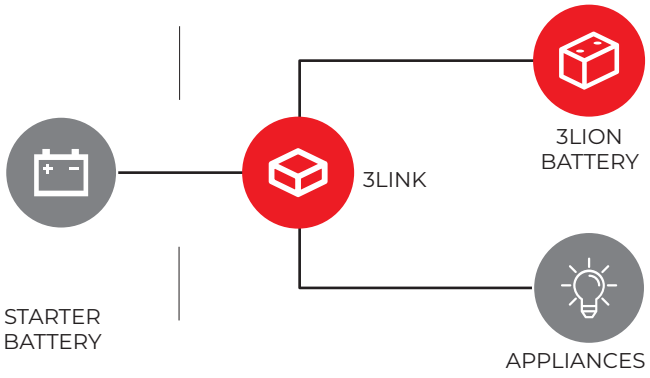
COFFEE MACHINE | MICROWAVE OVEN | AIR CONDITIONER | HAIRDRYER | E-BIKE

Relaxing at the perfect temperature thanks to the air-conditioning, enjoying a hot coffee at the touch of a button, showering and being able to dry your hair afterwards, are luxuries that you can usually only enjoy when your motorhome is connected to mains hook-up. Not anymore, thanks go your 3Lion System!

3LIONSYSTEM includes:

3LION Battery

3LION with $LiFePO_4$ technology is extremely safe, its low internal resistance and high thermal stability excludes the risks of classic lithium. Long life: about 2500 cycles with 80% DOD, it is equipped with an internal **Battery Management System** *(BMS)*, fundamental for managing and preserving the cells.
The **BMS** controls voltage, current, resistance, temperature and thanks to this information keeps the cells balanced, avoiding imbalances inside the battery and protecting it from: overvoltage, under voltage, short circuit, overtemperature, overcharge. Thanks to its high power density and a more stable operating voltage, **3LION** are able *(with the same declared capacity)* to guarantee a much longer autonomy compared to the standard batteries!



3LINK Black Box e Display

3LINK is an advanced control unit, necessary for the optimization of the lithium system on recreational vehicles.
Leaving the original system unchanged, and connecting to **3LINK: 3LION** batteries, engine battery and all the loads (control unit, battery charger, inverter, etc.), it will be possible to optimally recharge the lithium battery with high currents while driving, without damaging the original electrical system.

Moreover, the display is able to provide information about the system operation, such as the charging status of **3LION**, the battery voltages and the charging or discharging current.
3LINK directly manages the recharge from the engine battery, connected with cables a proper section, through the blackbox can perform a super fast recharge, up to 75A per hour of travel (depending on the alternator installed).

This control unit represents an additional protection system for the precious lithium battery, indeed it constantly monitors charge, discharge and SOC currents and whenever possible *(if the lithium battery is fully charged and the charging source connected)* it also charges the engine battery.

Choose the right **3LION** for you!

3L-100B

3L-100

3L-100P

3L-150

AVAILABLE MODELS AND TECHNICAL FEATURES							
Code	**L-20**	**L-30**	**L-60**	**L-100B**	**L-100**	**L-100P**	**L-150**
Voltage	12,8V	12,8V	12,8V	12,8V	12,8V	12,8V	12,8V
Capacity	20Ah	30Ah	60Ah	100Ah	100Ah	100Ah	150Ah
Max continous discharging current	20A	30A	60A	100A	100A	150A	150A
Max discharging current 30 min.	25A	35A	70A	140A	140A	170A	175A
Max charging current	1C	1C	1C	1C	1C	1C	1C
Weight	2,7Kg	4,2Kg	7,9Kg	13,3Kg	13,8Kg	13,8Kg	20,7Kg
Size (mm)	181x76x166	194x130x162	257x132x200	337x175x190	327x172x227	337x175x192	485x172x241

With **3LION** it is possible to connect up to four batteries in parallel using just one **3LINK**

You just have to buy one **3LIONSYSTEM** and add all **3LION** batteries you need *(it is advisable to use batteries with equal capacity)*, the internal electronics will protect them from each other!

3LION UTILITIES

3LION Lithium batteries are ideal in all applications with higher efficiency, where previously Lead acid battery was used!

3LION batteries don't suffer deep discharges and can support heavy-duty equipment such as caravan movers, small electric motors such as winches or lifts, and other similar loads.

MAIN FEATURES:

- Maximum power, minimum space required
- Fast Charge Ready
- Long life, over 2500 cycles
- Low weight: 60% less than traditional batteries
- Sulphation and maintenance free
- Maximum safety and reliability

MOVER ON up to 40 minutes

L20	
Capacity	20Ah
Energy	256Wh
Tecnology	$LiFePO_4$
Rated Voltage	12,8V
Self-discharge	3% month
Max discharging current	20A
Max charging current	20A
Max charging voltage	14,4V
Weight	2,7 Kg
Size mm	181x76x166

BEST WITH

Best with:
SMARTCHARGER SCS4

MOVER ON up to 60 minutes

L30	
Capacity	30Ah
Energy	384Wh
Tecnology	$LiFePO_4$
Rated Voltage	12,8V
Self-discharge	3% mese
Max discharging current	30A
Max charging current	30A
Max charging voltage	14,4V
Weight	4,2 Kg
Size mm	194x130x162

BEST WITH

Best with:
SMARTCHARGER SCS8

MOVER ON up to 120 minutes

L60	
Capacity	60Ah
Energy	768Wh
Tecnology	$LiFePO_4$
Rated Voltage	12,8V
Self-discharge	3% mese
Max discharging current	60A
Max charging current	60A
Max charging voltage	14,4V
Weight	7,9 Kg
Size mm	257x132x200

BEST WITH

Best with:
SMARTCHARGER SCS15

ENERGYSERVICE **Wet** leisure battery

ENERGYSERVICE are semi-traction batteries specific for services, built with thicker plates with radial geometry and microporous glass mat separator, which ensure a high performance.

MAIN FEATURES:

- Designed for Deep Cycles
- Vibration resistant
- Corrosion resistant thanks to a perfect contact with the active material
- Longer battery “life”

CODE	VOLTAGE	CAPACITY (Ah)			SIZE (mm)		
	VOLT	20h	10h	5h	LENGTH	WIDTH	HEIGHT
ES 80	12	80	74	66	270	175	190
ES 100B	12	100	96	85	353	175	190
ES 100	12	100	96	85	323	175	223

STARTPOWER **Wet** starter battery

STARTPOWER are high-performance batteries, built with high-efficiency lead/calcium alloy plates. The high cranking power Premium line has lids Magic Eye charge battery indicator.

MAIN FEATURES:

- Designed for starter
- Vibration resistant
- Low water consumption

CODE	BOX	Ah	A (EN)	SIZE (mm)		
				LENGTH	WIDTH	HEIGHT
STANDARD						
578.038.072	L3	78	720	278	175	190
596.035.085	L4	95	850	315	175	190
600.038.085	L5	100	850	353	175	190
600.115.072	D31	100	720	308	175	223
610.042.095	L6	110	950	393	175	190
610.110.072	CB	110	720	345	175	230
PREMIUM						
580.121.072	L3/B	80	720	278	175	175
590.122.080	L4/B	90	800	315	175	175
600.044.085	L5	100	850	353	175	190

GREENPOWER

AGM high performances leisure battery

- AUTONOMY, 40% MORE THAN A CONVENTIONAL BATTERY
- BATTERY LIFE, 4-7 YEARS UP TO 1200 CYCLES
- USE, PLEACEABLE IN ANY POSITION AND MAINTENANCE-FREE

Non-stop research led **NDS** technicians to create in 2000 the **GREENPOWER**, an **AGM** (Absorbent Glass Mat) battery with gas (VRLA) recombination for specific use in services or leisure vehicles.

GREENPOWER The “LONG LIFE” oxygen-recombination leisure battery with slow discharge.

The **BEST** for leisure vehicles!

GREENPOWER is built with special high- density lead-calcium alloy plates, which raise charge retention for a low self-discharge (Fig.1) and a high number of cycles (Fig.2).
The electrolyte liquid is absorbed by its special glass mat separators, which prevent any leaks and allow to place batteries in any position and/or inclination, keeping constant efficiency.
The reinforced grids of the separators ensure a higher resistance against vibrations.

CHARGE RETENTION

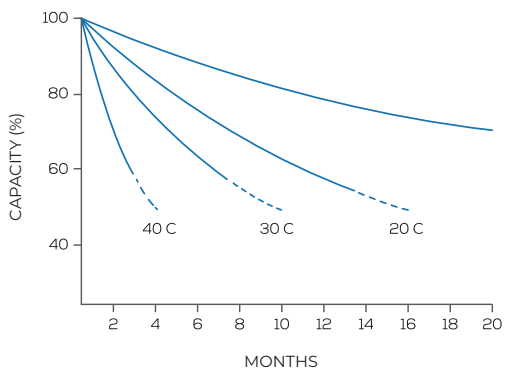


Fig. 1

LIFE CYCLES

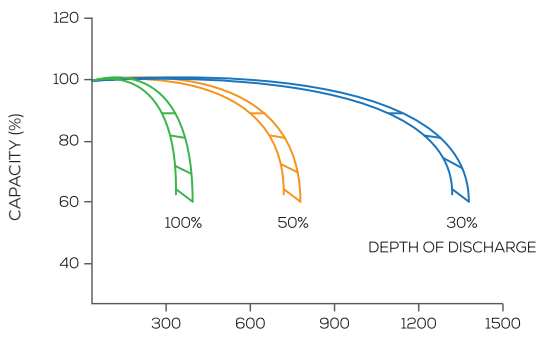


Fig. 2

GREENPOWER VRLA *(Valve Regulated Lead-acid)* system can recombine the gasses generated during charge and discharge, making **GREENPOWER** a totally hermetic and safe battery, free of any kind of maintenance. The case is ABS flame retardant *(UL 94-VO)*, the rust-proof terminals resist corrosion and the cover includes the VRLA safety pressure valves.

The battery life can be affected by several factors.
- The Depth of discharge: avoid discharging the battery beyond the maximum 11V;
- The duration of discharge: do not leave the battery discharged after use;

The charging method: provide the best and most appropriate level of charge.

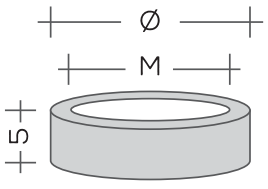
GREENPOWER batteries can be charged by an alternator, electronic charger and solar panels, complying with the recommended parameters *(Fig. 3)*.

CHARGING PARAMETERS								
CONTROL USE	CHARGING METHOD	CHARGING VOLTAGE AT 20°C (V/EL.)		TEMPERATURE COEFFICIENT FOR CHARGING VOLTAGE (mV/°C/EL.)	MAX CHARGING CURRENT (CA 100%)	CHARGING TIME AT 0,1 CA TEMP. 20°C (in hours)		CHARGING TEMPERATURE (°C)
		12V	6V			FLAT	50% FLAT	
STAND-BY	CONSTANT VOLTAGE CONSTANT CURRENT (with control ON charging current)	13,5 - 13,8	6,75 - 6,90	-3,0mV °C/EL	0,3 C	24	20	FROM -10°C TO 60°C
CYCLIC		14,4 - 14,9	7,20 - 7,45	-5mV °C/EL	0,3 C	16	10	

Fig. 3

CODE	VOLTAGE	CAPACITY (Ah)			SIZE (mm)			TERMINALS
	VOLT	20h	10h	5h	LENGTH	WIDTH	HEIGHT	
GP 60	12	60	58	54	260	168	214	F11
GP 80	12	80	74	66	350	167	179	F11
GP 80S	12	80	74	66	260	168	214	F11
GP 90	12	90	85	75	306	169	214	F11
GP 100	12	100	96	85	330	171	220	F12
GP 100B	12	100	93	82	350	166	185	F12
GP 120	12	120	115	92	330	171	220	F12
GP 130	12	130	120	105	409	176	225	F12
GP 140	12	140	130	119	342	172	285	F12
GP 150	12	150	142	135	485	172	242	F12
GP 200	12	200	192	170	530	209	221	F12
GP 210	12	210	198	183	522	238	221	F12
GP 250	12	250	236	210	521	269	223	F12
GP 6-235	6	235	220	198	243	187	276	F12

TERMINALS		
TYPE	M	Ø
F11	6	14
F12	8	16
F13	5	12
F14	6	18
F15	8	18



TECHNICAL SPECIFICATIONS			
HERMETIC	TEMPERATURE	CONSTRUCTION TECHNOLOGY	STANDARD
Without exhalations and acid leakage Free of maintenance **DO NOT OPEN** Inclinations MAX 90°	Stated capacity at 25°C 3°C Operating range from -25°C / 55°C	Lead/Calcium alloy Glass matt separators ABS Case (UL 94-HB)	Compliance with the regulations IEC, JIS, EN Classified as NON HAZARDOUS

TOOLS

POWERCHARGER BATTERY

The Powercharger battery has a built-in system that can manually allowing an up to 72 hour intensive desulfation process.
This lets the battery recover its efficiency lost due to sulfate crystals on plates. Lab tests prove that more than 80% of low yield batteries are 100% recovered *(if sulfation is not irreversible).*

Cod. **PCB 12-20**

POWERTEST BATTERY

Powertest battery lets you measure how many Ampére/hour a battery can have, therefore establishing its actual capacity.

This is useful to know the efficiency status of leisure batteries.

Cod. **PTB 12-20**

ELECTRONICSWITCH

Electronicswitch is an electronic device that can be used instead of the alternator's D+ .
According to the starting battery voltage variation, it enables or disables with an hysteresis of about 500mV.

The Electronicswitch lets the PowerService switch on and can also be used to commute any 12V relay.

Cod. **INT 12T**

DIGITAL AMPEROMETRIC CLAMP

Digital amperometric clamp with a digital multimeter.
LCD 31/2 Digit *(3200 counts)* display with 33- item bar graph.

Auto/manual indication of functions and symbols. Jaw-spread fit for 50 mm cable section.
Case and leads supplied.

Cod. **MTA 101**

BATTERY POLES

Pair of automotive poles for modification ø 6 and ø 8 mm hole.

Cod. **CPL 06** / **CPL08**

DENSIMETER

A densimeter is an ideal tool to determine the state of charge of a conventional lead acid battery.

It measures the specific weight of the electrolyte with a high precision scale in degrees Baume and specific weight with colored sections for rapid reading.

Cod. **DEN 100**

ALL THE ENERGY YOU NEED

TUTTA L'ENERGIA CHE TI SERVE

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