FULLSET

Energy Storage Systems

for residential, industrial and RES farms applications

www.fullsetenergy.com

LT LaserTec

Meet **LaserTec**

At LaserTec, we develop and implement modern energy storage solutions for residential users, businesses and for renewable energy installations with capacities ranging from 10 kWh to over 10 MWh.

LaserTec was founded in 2002, since when we have been gaining experience in the design, development and implementation of laser technologies. Due to this, we design and integrate robotic production workstations as well as manufacture energy storage and lithium-ion batteries to be used by leading European companies.

The LaserTec team has more than 10 years of experience in designing, building, implementing and operating energy storage systems. Our solutions are built for the most demanding industrial and domestic applications.

We offer reliable energy storage systems and energy management products for the full spectrum of applications on the market including supplying, installing and commissioning.

We work with experienced specialists in the fields of energy, electronics, industrial automation and renewable energy sources.

Our comprehensive range of business services cover the entire customer journey from consultancy, system selection, assistance in obtaining financing, delivery and implementation of after-sales and life-cycle services, including service and technical support.

Features

FullSet Energy Storage Systems

Safety

Our systems are protected against overloads and short circuits. They are certified and designed in accordance with industry-leading European safety standards, such as UN38.3, EMC and IEC, among others.

Durability

Up to **≥8000 cycles** of charge and discharge; more than 20 years of service under unchanged conditions. Industrial design for the most demanding applications.

Warranty

Each user receives warranty for up to 10 years.

Backup

Automatic switching from grid power to system energy consumption.

Service and maintenance

Made entirely in the EU, with full EU service support.

Power supply

No additional power supply needed for all FullSet control systems.

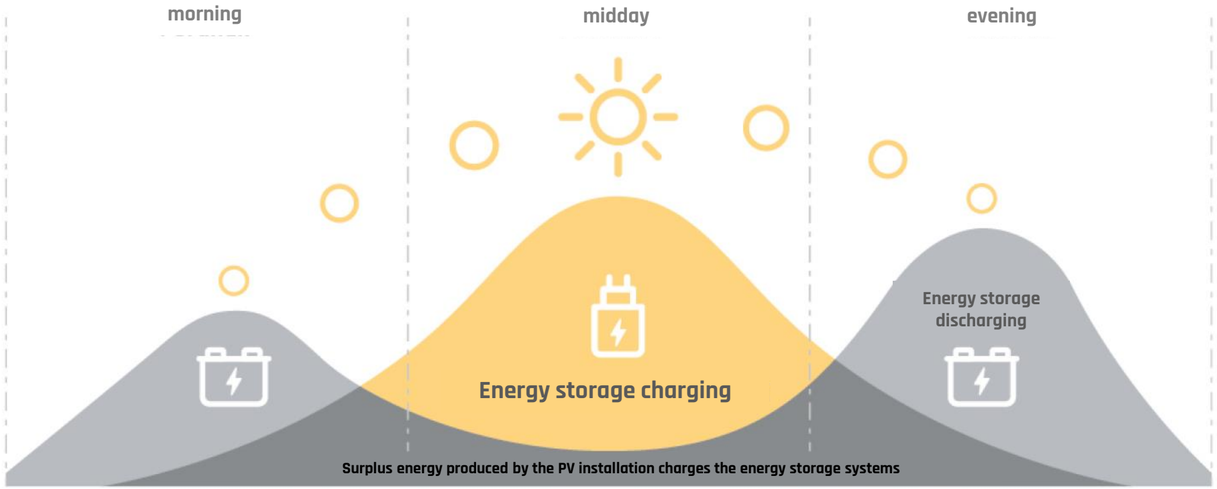
BMS / EMS

The efficiency and safety of the unit is controlled by a Battery Management System. Dedicated energy storage system (EMS) management system.

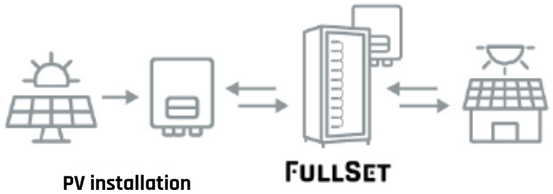
Expandability

Possibility of expanding the energy storage systems (increased capacity) or inverters (increased power).

How the FullSet Energy Storage Systems
work with RES installations



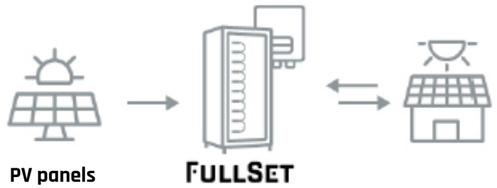
You have your photovoltaic system installed



If your photovoltaic installation does not produce energy in the event of a power failure on the grid.

Add a FullSet energy storage system to your installation! There is no need to change anything in your installation; therefore, there is no risk of voiding your warranty.

You don't have a photovoltaic installation but are planning to set one up



Connect the panels of the photovoltaic installation directly to the FullSet energy storage system.

You will gain:

- Energy storage capability.
- The option of photovoltaics to also produce energy in the event of a power outage.

FullSet Pro

Energy Storage Systems
for residential applications

Solutions for your home to harness up to 100% of the energy produced by PV installation and to protect it from the effects of grid failure.

Go to section

FullSet Extreme & Monolith

Energy storage systems
for industrial and RES farm applications

Support companies to ensure continuity of its their operations through Securing and reliable access to energy.

Go to section

FullSet Pro residential Energy Storage Systems
Low-voltage

FullSet Extreme / Monolith industrial Energy Storage Systems
High-voltage

Complete
energy storage system

FullSet is ready to connect to a photovoltaic/RES installation or the grid energy storage and management system.

FullSet
energy storage
unit

Hybrid / battery
inverter

EMS / SCADA
energy management
system

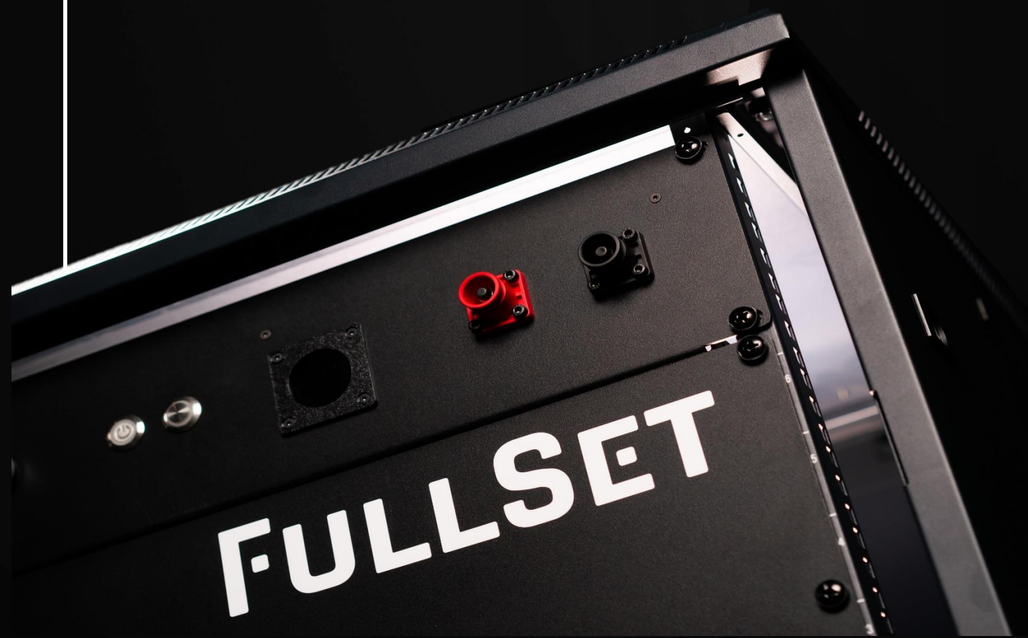
Complete FullSet
energy storage
system

Pro
series

residential energy storage and management systems

FullSet Pro enables you to:

- store surplus energy from the photovoltaic / RES installation,
- secure permanent access to energy for your home even when its supply from the network is interrupted,
- reduce energy bills,
- become energy-independent,
- guarantee continuous operation of photovoltaic system installation even in the absence or excessive voltage in the network.

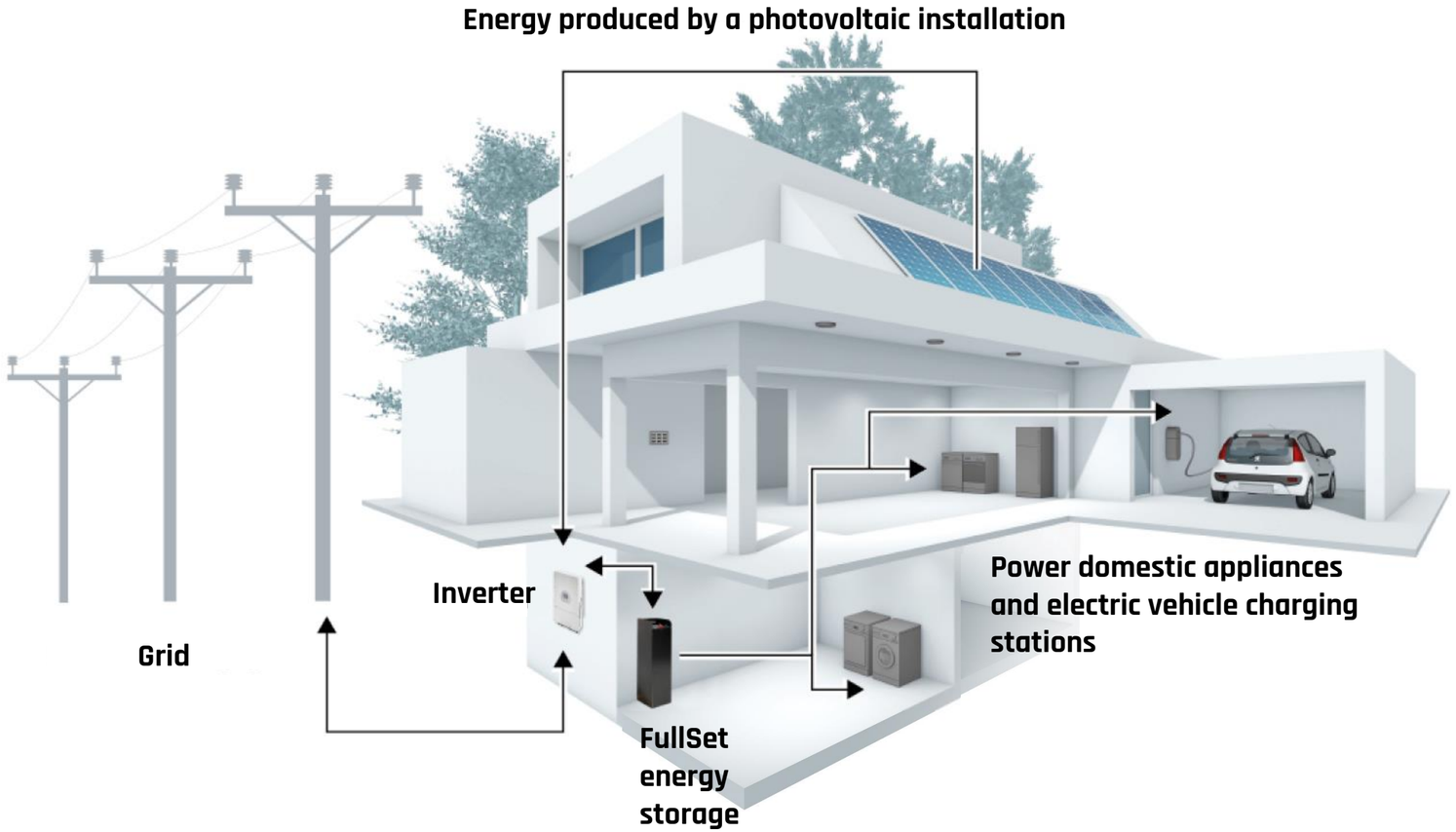


Plug & play

FullSet Pro is a complete plug-and-play energy storage system that easily integrates energy storage with new and existing photovoltaic installations both on and off-grid. .

Get energy from the grid or RES

and use it whenever you need it



- **Uninterrupted operation of the PV**
  The PV installation produces electricity even when the grid voltage is interrupted or excessive.

- **Savings**
  You do not have to feed the energy produced by the PV installation back into the grid. You can store it in FullSet and use it whenever you need it. .

- **Emergency power system**
  FullSet can act as a UPS - protecting your home from the effects of grid failure and power outages.

Pro series

Illustrative photo

FullSet Pro 10.5

10 kWh / 5 kW

Dedicated to up to 5 kW PV installation

Low-voltage

Download the full technical specifications

Illustrative photo

FullSet Pro 14.10

14 kWh / 10 kW

Dedicated to up to 10 kW PV installation

Low-voltage

Download the full technical specifications

Technical **specifications**

Nominal energy	10.3 kWh
Dimensions (height x width x depth)	600 mm x 600 mm x 600 mm
Estimated weight	~75 kg
Output voltage range	40 VDC ÷ 60 VDC
Maximum discharge current @ 25°C	100 A
Maximum charge current @ 25°C	100 A
Certifications	UN38.3; CE
Operating temperature range	0°C ... +55°C
Recommended temperature	25°C
Communication interface	CAN Bus
IP class	54IP
High-current connection between battery blocks	Wire connection
Cycle life	≥8000[1]
Level of discharge (DoD)	80%
Battery chemistry	Li-ion NMC
Inverter power	5 kW
Inverter type	Hybrid, single-phase

[1] At DoD=100%, the number of cycles is ≥6000.

Also compatible with the 8 kW hybrid inverter.

Nominal energy	14.3 kWh
Dimensions (height x width x depth)	1027 mm x 239 mm x 400 mm
Estimated weight	~120 kg
Output voltage range	40 VDC ÷ 60 VDC
Maximum discharge current @ 25°C	200 A
Maximum charge current @ 25°C	200 A
Certifications	UN38.3; CE
Operating temperature range	0°C ... +55°C
Recommended temperature	25°C
Communication interface	CAN Bus
IP class	54IP
High-current connection between battery blocks	Wire connection
Cycle life	≥3000
Battery chemistry	Li-ion NMC
Inverter power	10 kW
Inverter type	Hybrid, three-phase

Also compatible with the 8 kW hybrid inverter.

Pro series

Illustrative photo

FullSet Pro 20.10

20 kWh / 10 kW

Dedicated to up to 10 kW PV installation

Low-voltage

Download the full technical specifications

Technical specifications

Nominal energy	20,7 kWh
Dimensions (height x width x depth)	1051 mm x 277 mm x 438 mm
Estimated weight	~170 kg
Output voltage range	40 VDC ÷ 60 VDC
Maximum discharge current @ 25°C	200 A
Maximum charge current @ 25°C	200 A
Certifications	UN38.3; CE
Operating temperature range	0°C ... +55°C
Recommended temperature	25°C
Communication interface	CAN Bus
IP class	54IP
High-current connection between battery blocks	Wire connection
Cycle life	≥8000[1]
Level of discharge (DoD)	80%
Battery chemistry	Li-ion NMC
Inverter power	10 kW
Inverter type	Hybrid, three-phase

[1] At DoD=100%, the number of cycles is ≥6000.

Also compatible with the 8 kW hybrid inverter.

Extreme Monolith
series

Industrial energy storage and management system

- Guarantee the continuity of operation for companies or PV / wind farms by securing access to energy,
- increase the life of equipment by offsetting the effects of sudden surges and voltage drops in the network,
- increase self-consumption of energy from RES,
- flatten the energy load profile of the facility,
- reduce energy procurement costs,
- support grid stability and energy system operations.

Extreme series

Technical specifications

Illustrative photo

FullSet Extreme 26.20

26 kWh / 20 kW*

Dedicated to up to 20 kW PV installation

High-voltage

Download the full technical specifications

Nominal energy	26.5 kWh
Dimensions (height x width x depth)	1115 mm x 600 mm x 800 mm
Estimated weight	~250 kg
Output voltage range	205 VDC ÷ 300 VDC
Maximum discharge current @ 25°C	50 A
Maximum charge current @ 25°C	50 A
Certifications	UN38.3; CE
Operating temperature range	0°C ... +55°C
Recommended temperature	25°C
Communication interface	CAN Bus
IP class	20IP
High-current connection between battery blocks	Wire connection
Cycle life	≥8000[1]
Level of discharge (DoD)	80%
Battery chemistry	Li-ion NMC
Inverter power	10 kW, 20 kW
Inverter type	Hybrid, three-phase

*The maximum discharge power in backup is 13 kW
[1] At DoD=100%, the number of cycles is ≥6000.
Also compatible with the 10 kW and 15 kW hybrid inverters.

Illustrative photo

FullSet Extreme 40.20

40 kWh / 20 kW

Dedicated to up to 20 kW PV installation

High-voltage

Download the full technical specifications

Nominal energy	40 kWh
Dimensions (height x width x depth)	1603 mm x 600 mm x 800 mm
Estimated weight	~450 kg
Output voltage range	302 VDC ~ 450 VDC
Maximum discharge current @ 25°C	50 A
Maximum charge current @ 25°C	50 A
Certifications	UN38.3; CE
Operating temperature range	0°C ... +55°C
Recommended temperature	25°C
Communication interface	CAN Bus
IP class	20IP
High-current connection between battery blocks	Wire connection
Cycle life	≥8000[1]
Level of discharge (DoD)	80%
Battery chemistry	Li-ion NMC
Inverter power	20 kW
Inverter type	Hybrid, three-phase

[1] At DoD=100%, the number of cycles is ≥6000.
Also compatible with the 10 kW and 15 kW hybrid inverters

Technical specifications

Extreme series

Illustrative photo

FullSet Extreme 66.20

66 kWh / 20 kW

Dedicated to up to 20 kW PV installation

High-voltage

Download the full technical specifications

Nominal energy	66 kWh
Dimensions (height x width x depth)	1700 mm x 1370 mm x 885 mm
Estimated weight	~600 kg
Output voltage range	500 VDC ÷ 750 VDC
Maximum discharge current @ 25°C	100 A
Maximum charge current @ 25°C	100 A
Certifications	UN38.3; CE
Operating temperature range	0°C ... +55°C
Recommended temperature	25°C
Communication interface[1]	CAN Bus, Modbus TCP
IP class	20IP
High-current connection between battery blocks	Wire connection
Cycle life	≥8000[2]
Level of discharge (DoD)	80%
Battery chemistry	Li-ion NMC
Inverter power	20 kW
Inverter type	Hybrid, three-phase

[1] Depending on customer needs, it is possible to order CAN Bus and Modbus TCP simultaneously. CAN Bus communication is adaptable according to customer requirements.
[2] At DoD=100%, the number of cycles is ≥ 6000.
Also compatible with the 10 kW, 15 kW and 50 kW hybrid inverters.

Monolith series

Illustrative photo

FullSet Monolith 265.50h

265 kWh / 50 kW

Dedicated to up to 50 kW PV installation

High-voltage

Download the full technical specifications

Nominal energy	265 kWh
Dimensions (height x width x depth)	2000 mm x 1800 mm x 1180 mm
Estimated weight	~3000 kg
Output voltage range	500 VDC ÷ 750 VDC
Maximum discharge current @ 25°C	150 A
Maximum charge current @ 25°C	150 A
Certifications	UN38.3; CE
Operating temperature range	0°C ... +55°C
Recommended temperature	25°C
Communication interface[1]	CAN Bus, Modbus TCP
IP class	20IP
High-current connection between battery blocks	Wire connection
Cycle life	≥8000[2]
Level of discharge (DoD)	80%
Battery chemistry	Li-ion NMC
Inverter power	50 kW
Inverter type	Hybrid, three-phase

[1] Depending on customer needs, it is possible to order CAN Bus and Modbus TCP simultaneously. CAN Bus communication is adaptable according to customer requirements.
[2] At DoD=100%, the number of cycles is ≥ 6000.
Also compatible with the 10 kW, 15 kW, 20 kW and 50 kW hybrid inverters as well as with 50 kW and 100 kW battery inverters.

Container Energy Storage System

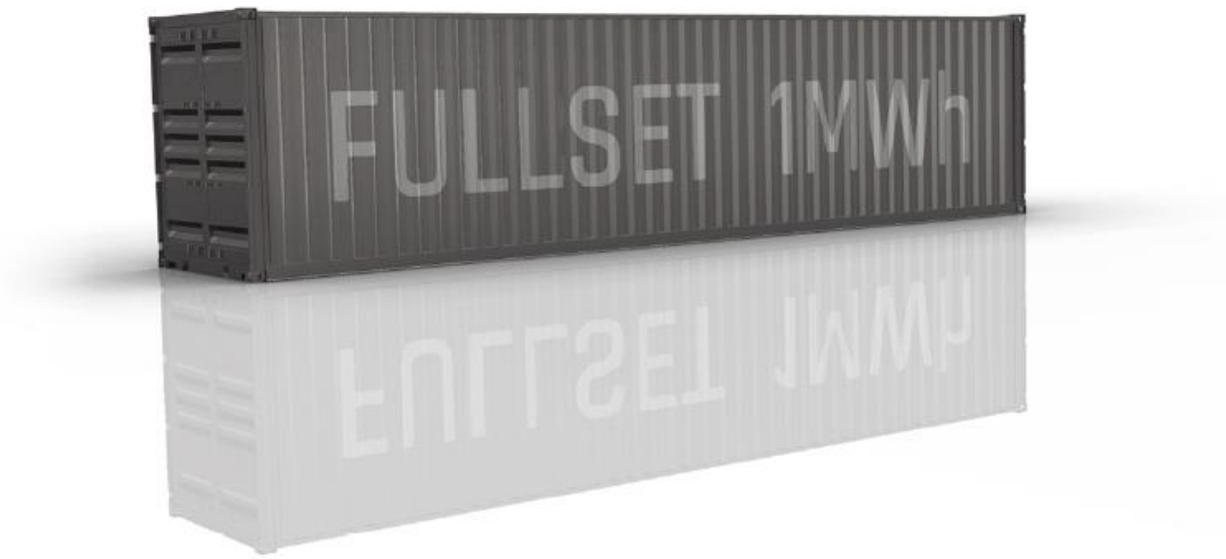
FullSet Monolith 1060.400

With a capacity of 1060 kWh and 400 kW (or more), FullSet Monolith enables a range of grid applications and services which include grid stabilisation, flexible use of peak power, frequency regulation, RES integration, improved power transmission and distribution, and much more.

The Monolith System guarantees stability in the operation of your business (uninterrupted access to energy, even in the event of grid failure), savings (the possibility of reducing the power ordered - thanks to the reduction of current peaks) and energy independence (uses up to 100% of the resources produced by the PV installation).

The comprehensive monitoring systems with which FullSet Monolith is equipped (including the EMS) provide security and the ability to continuously control and manage the quality of the system.

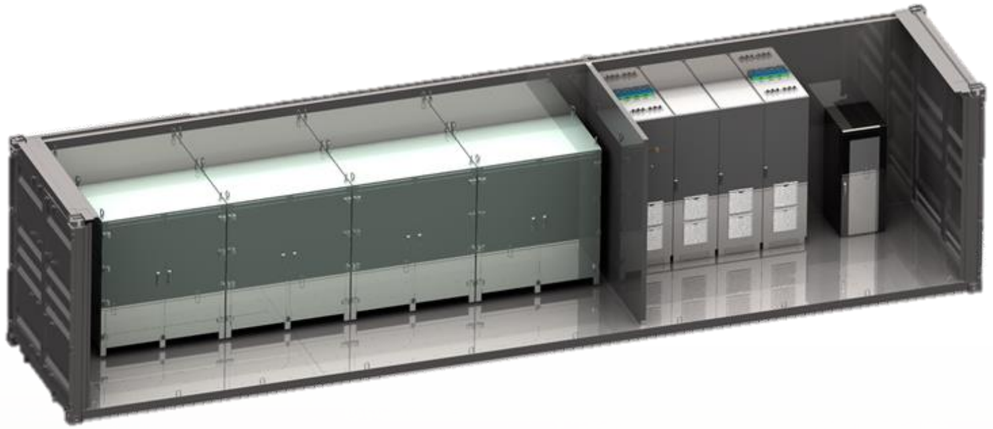
The EMS can be integrated with the customer's SCADA system. The user then gains the option to monitor, detect and be alerted to potential anomalies related to the operation of the energy storage system.



Container energy storage systems

FullSet Monolith 1060.400

FullSet Monolith 1060.400 can be combined into larger systems and create container energy storage facilities.



Nominal energy	1060 kWh
Output voltage range	500 VDC ÷ 750 VDC
Max. discharge current @ 25°C	800A
Max. charging current @ 25°C	800 A
Certification	UN38.3; CE
Operating temperature range	-30°C ... +55°C
Communication interface[1]	CAN Bus, Modbus TCP
IP class	55IP
Cooling and heating	Energy Efficient HVAC
Early detection of fire hazards	Equipped
Fire extinguishing system	Equipped
High-current connection between battery blocks	Wire connection
Cycle life	≥8000[2]
Level of discharge (DoD)	80%
Battery chemistry	Li-ion NMC
Dimensions (lenght x width x height)	12192 x 2438 x 2896 mm
Estimated weight of the system	< 20 tons
Inverter power	400 kW
Inwerter type	Battery inverter

[1] Depending on customer needs, it is possible to order CAN bus and Modbus TCP simultaneously. CAN bus communication is adaptable according to customer requirements.

[2] At DoD=100%, the number of cycles is ≥ 6000.

Can be combine with other inverters.

FullSet expansion

examples of configurations

FullSet energy storage systems are designed so that any user can increase their capacity or power by adding more units, such as:

- Additional energy storage of the same model resulting in increased system capacity,
- an additional inverter resulting in increased system power,
- an electric vehicle charger allowing the stored energy to be used to charge electric cars or other vehicles.

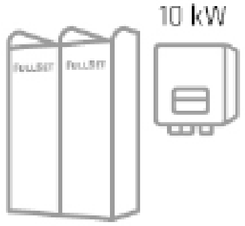
We have the ability to design, manufacture and prepare install a system according to the individual needs of the client.

FullSet Pro 14

14 kWh / 10 kW

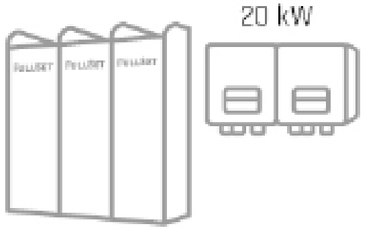
1 x 14 kWh

28 kWh / 10 kW



2 x 14 kWh

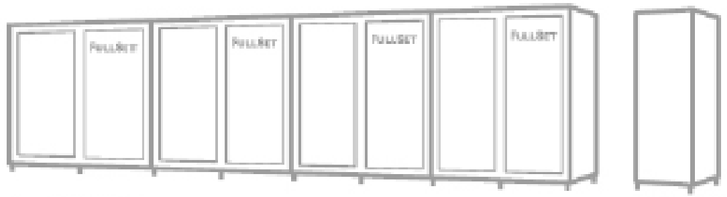
42 kWh / 20 kW



3 x 14 kWh

FullSet Monolith 265

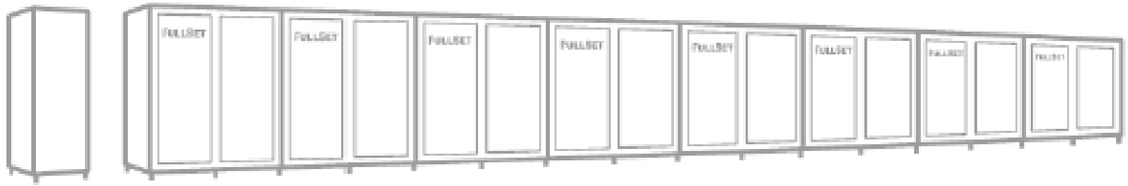
1060 kWh / 250 kW ■ 1060 kWh / 400 kW ■ 1060 kWh / 500 kW



4 x 265 kWh

250 kW
400 kW
500 kW

2120 kWh / 500 kW ■ 2120 kWh / 800 kW ■ 2120 kWh / 1000 kW



500 kW
800 kW
1000 kW

8 x 265 kWh

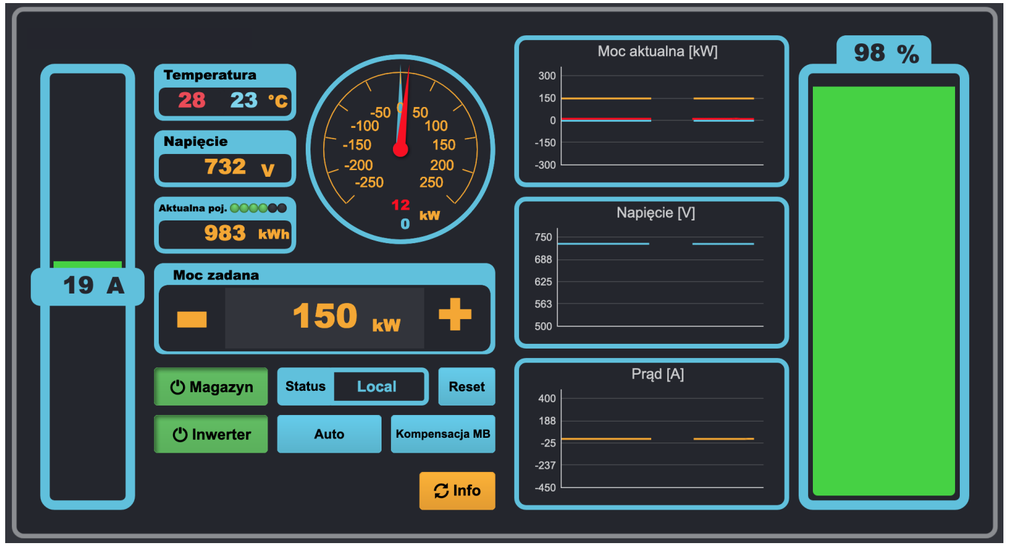
Energy Management System (EMS)
in FullSet

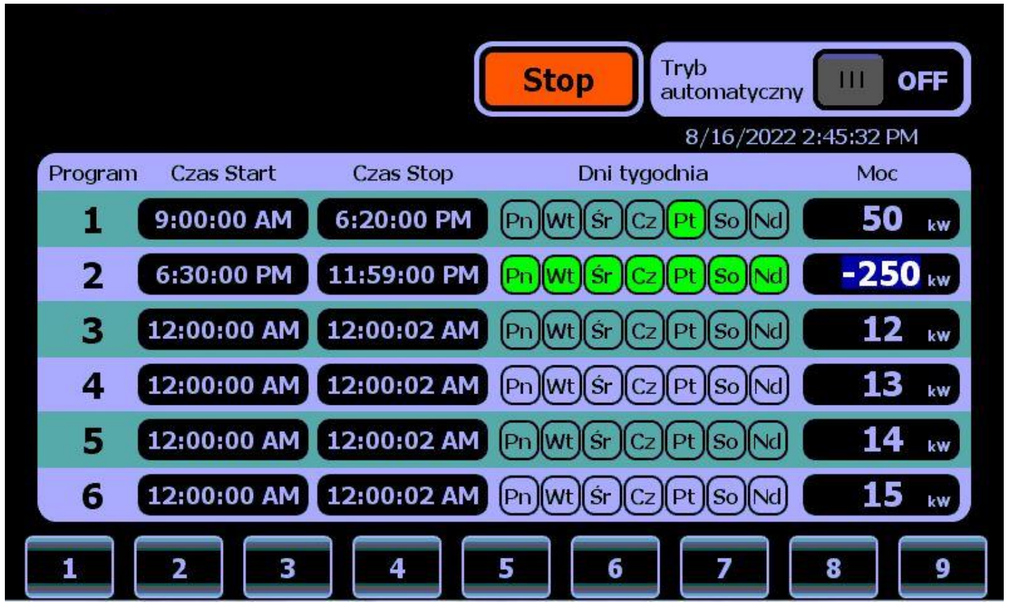
Integrated with the energy storage system, the operating platform combines comprehensive control, management of multiple systems and energy in a single system, as well as real-time monitoring of the energy storage system in individual facilities or networks.

The EMS system enables:

- centralised control of the distributed energy storage system,
- remote security control of system operation,
- remote monitoring,
- efficient regulation and monitoring of energy flows,
- collection of statistical data for the work of our warehouses - in the context of energy flow,
- remote diagnostics,
- tracking of occurring alarms and locating possible hardware faults.

The energy storage system can be configured with the customer's SCADA system - allowing full integration and management of RES energy production, consuming from the network then storing it, and using it when needed.





We developed FullSet
for the following businesses:

Production facilities and warehouses

Commercial facilities

Development industry and building owners

Hospitals and public buildings

Hotels

- Autonomy in power supply
- Reactive power reduction
- Electromobility support
- Current peaks reduction
- Improved energy quality
- Use up to 100% energy produced by PV
- Lower energy costs
- Uninterrupted operation of strategic systems

Vehicle charging stations

- Support infrastructure for the installation of fast chargers
- Charge in the absence of grid power
- Raise the virtual connection capacity

Photovoltaic and wind farms

- Increased PV generator output
- Black-start
- Output power at a stable level

FullSet energy storage systems
also support:

- **Electric vehicle charging stations**

Fast charging of multiple electric vehicles at the same time requires a significant amount of electricity - increase in connection power. Energy storage facilities with fast chargers enable fast charging of electric vehicles in areas with low connection power.

- The ability to fast charge electric vehicles anywhere, even in the event of an energy shortage in the public grid.
- The ability to rapidly charge multiple vehicles simultaneously - accelerated charging times.
- Continuous charging readiness - works with current and future electric vehicle models.

- **Electric tram and railway systems with overhead wires**

Energy storage systems are being used as an element to improve the efficiency of overhead catenary networks - both tram and railway.

Thanks to energy storage, the overhead grid:

- is protected against voltage drops - has an emergency power supply,
- is more stable - improved performance,
- may be powered by RES,
- requires a smaller buffer of procured energy - becoming less of a burden on the city's electrical infrastructure.

Benefits
of energy storage systems

Charging/discharging to the grid according to a schedule

Save energy by charging on a lower-cost tariff and discharging on higher-cost energy fee schedule.

Emergency power supply in case of main power failure

Prevents power outages and power fluctuations.

Limiting the power of the connection to the set value

The energy storage can charge when the measured power of the connection is lower than the set value and discharge when it is higher. This also prevents energy peaks/current consumption peaks.

Management of energy surpluses from EE sources

When there is excess production from the RES, the energy storage is recharged and thus, energy is not exported to the grid.

Energy storage

Connected to the inverter

Energy storage

connected to the inverter
with energy flow measurement
at the connection

Energy storage

connected to the inverter
with energy flow measurement
at the connection and RES

FULLSET

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