CZECH BATTERY ENERGY STORAGE

ENERGY UNDER CONTROL



- Protection against micro-outages
- Demand peak shaving
- Power balancing (ancillary) services
- Storage of energy from your PV system
- Energy savings through smart control
- Backup power supply

WHO WE ARE

We are a Czech manufacturer of battery energy storage systems based in Otrokovice.
We develop and produce modern energy-storage solutions with a focus on performance, safety and long-term reliability.

With us, you get:

A top-tier team of specialists
We advise on both design and installation, always tailored to your specific project.

A Czech manufacturer with European service
Support across all of Central Europe and a fast response to customer needs.

Maximum safety
24/7 monitoring, with data stored on our own servers in the Czech Republic.

AI-based smart control
Optimisation of energy flows and maximum use of available energy.

Continuous innovation
New product lines and technological improvements every year.

Free partner training
Assurance of correct installation and long-term cooperation.

Our battery storage systems are designed for family and apartment buildings, businesses, municipalities and energy companies alike. Installation is possible both indoors and outdoors.



WHAT WE STAND FOR

ULTIMATE SAFETY

- Temperature monitoring — if a battery moves outside the 5–30 °C temperature range, we automatically notify the customer of this condition.
- At 60 °C, a resettable thermal fuse — fitted to every cell — limits the battery's output (current).
- If the temperature reaches 90 °C, the fire-suppression system releases an agent into the battery enclosure that displaces the oxygen and cools the entire battery.
- In cooperation with Honeywell, we can, on request, equip the battery with a lithium-gas detection system, or supply it in a special internal fire-resistant cabinet that simplifies fire-safety compliance.
- Batteries installed outdoors are monitored by a camera system and can be connected to a central alarm-receiving station.



A CZECH COMPANY = THE ASSURANCE OF QUALITY SERVICE

- Service support throughout Central Europe.
- Remote monitoring 24/7.
- All customer data is kept on our own servers within the EU.
- Warranty and post-warranty service.
- As part of the service package, we perform a detailed remote online check of your battery's parameters every year to verify that it is functioning correctly.
- The option to replace individual components, including cells.
- All spare parts in stock.

HOME BATTERIES FOR PHOTOVOLTAIC POWER PLANTS

The **Resacs Premium 17** and **Resacs Light 17** batteries are designed as LV (low-voltage) solutions operating at 51.2 V. They are ideal for use in family and apartment buildings.



BATTERY PARAMETERS	LIGHT 17	PREMIUM 17
Flexible connections	✓	✓
Service monitoring	✓	✓
Expandability	✓	✓
Active balancer	✓	✓
Smart battery control	—	✓
24/7 monitoring	—	✓
Control of household appliances	—	✓
Resettable thermal fuses	—	✓
Autonomous fire-suppression system	✓	✓

Control system

- A proprietary system for smart battery control and remote monitoring (EMS) in every battery
- Intuitive operation via a dedicated web portal
- Remote OTA (over-the-air) updates

Other components

- Flexible bolted connections
- Modular design for easy future expansion
- Top-quality LiFePO4 cells (Grade A+), each of which can be replaced



GENERAL INFORMATION	
Measured capacity of a new battery[1)]	**16,9 kWh**
Depth of discharge[2)] (DOD)	**90 %**
Continuous charge/discharge current (at 15 °C to 25 °C)	**160 A**
Max. peak charge/discharge current (3 s)	**200 A**
Guaranteed number of cycles[3)]	**8000**
Warranty	**10 years**
Min./max. operating temperature for charging/discharging	**5 °C to 45 °C**
Recommended ambient temperature[4)]	**10 °C to 25 °C**

[1)] The resulting battery capacity was determined by testing new batteries under laboratory conditions at 25 °C, across a voltage range of 58.4–40.0 V, at a constant discharge current of 0.15C. [2)] The usable battery capacity (DoD 90 %) was determined by testing new batteries under laboratory conditions at 25 °C, across a voltage range of 56.0–49.6 V, at a constant discharge current of 0.15C. [3)] Assuming a maximum of 1 cycle per day, cell operating temperatures of 20–30 °C (avg. 25 °C), a charge/discharge current of 0.01–0.5C (avg. 0.15C) and an SOC of 30–70 %. [4)] The optimal ambient temperature to ensure reliable operation and maximum battery life. Operating outside this temperature range may significantly shorten battery life and accelerate capacity degradation over time. [5)] For a surcharge of CZK 5,000 excl. VAT, the battery can be supplied not only in blue (primarily for Victron inverters) but in any colour the customer wishes.

PROPRIETARY EMS

Every **Resacs battery** typically includes a proprietary **HW/SW EMS solution** in the form of an integrated system with intelligent functions for **monitoring** and **smart battery control**.

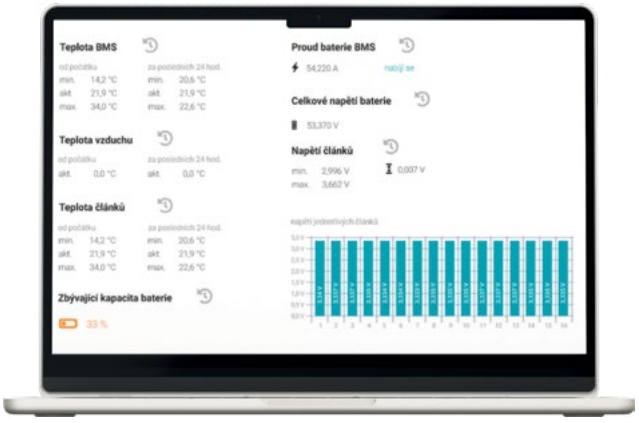
Remote monitoring and battery diagnostics **24/7**.

Smart battery control that significantly **improves the return on investment**.

The ability to connect and switch **an unlimited number of appliances**.

Data storage on our **own secured server** in the Czech Republic.

Support for trading on **the spot market**.



INDOOR BATTERY ENERGY STORAGE SYSTEMS

We offer **high-voltage batteries** from 60 kWh upwards in a modular rack design, scalable in 12 kWh increments. The EMS system also brings a **whole range of functions** for demanding business applications.



GENERAL INFORMATION	
Nominal voltage	**38,4 V**
Measured capacity of a new module[1)]	**12 kWh**
Depth of discharge[2)] (DOD)	**85 %**
Continuous charge/discharge current (at 15 °C to 25 °C)	**160 A**
Max. peak charge/discharge current (3 s)	**200 A**
Guaranteed number of cycles[3)]	**8000**
Warranty	**10 years**
Min./max. operating temperature for charging/ discharging	**5 °C to 45 °C**
Recommended ambient temperature[4)]	**10 °C to 25 °C**

[1)] The resulting capacity of the battery module was determined by testing new battery modules under laboratory conditions at 25 °C, across a voltage range of 43.8–30.0 V, at a constant discharge current of 0.15C. [2)] The usable capacity of the battery module (DoD 85 %) was determined by testing new battery modules under laboratory conditions at 25 °C, across a voltage range of 42.0–37.2 V, at a constant discharge current of 0.15C. [3)] Assuming a maximum of 1 cycle per day, cell operating temperatures of 20–30 °C (avg. 25 °C), a charge/discharge current of 0.01–0.5C (avg. 0.15C) and an SOC of 30–70 %. [4)] The optimal ambient temperature to ensure reliable operation and maximum battery life. Operating outside this temperature range may significantly shorten battery life and accelerate capacity degradation over time

AVAILABLE CAPACITIES

CONFIGURATION	CAPACITY	SCALABLE IN INCREMENTS OF	NUMBER OF RACKS (1 rack = 2×5 slots for 12 kWh modules)
1 inverter	60 – 228 kWh	12 kWh	1–2 racks
2 inverters	120 – 456 kWh	24 kWh	2–4 racks
3 inverters	180 – 684 kWh	36 kWh	2–6 racks
4 inverters	240 – 912 kWh	48 kWh	3–8 racks
5 inverters	300 – 1140 kWh	60 kWh	3–10 racks

- The rack can be fitted to order with a lockable perforated door and side, top and rear panel covers.
- Battery modules can also be supplied in a fire-resistant cabinet for indoor use, with a 30-minute fire rating, which simplifies fire-safety compliance.

OUTDOOR CONTAINERISED BATTERY ENERGY STORAGE SYSTEMS

Our high-capacity battery storage systems
Are designed for industrial sites, charging stations, local distribution grids and renewable energy sources.

Most common applications
Reducing energy costs, using stored energy for self-consumption, eliminating micro-outages, peak shaving, and supporting and stabilising the transmission grid.

The system typically includes
Inverters, battery modules on rack shelving, an LV switchboard (with an optional grid transfer switch), air conditioning, a fire-protection and suppression system, IP cameras,



UNIQUE FEATURES

- Outdoor placement of the inverters and 100 mm thermal insulation reduce internal energy consumption for cooling and heating.
- A 30-minute fire rating = a simpler permitting process under fire-safety regulations.
- Standard air conditioning = readily available, trouble-free servicing.
- Modular expandability = easy scaling of power output and capacity.
- The switchboard is part of the storage unit = lower installation costs.
- 24/7 monitoring — voltage, internal resistance and temperature monitoring down to the individual cell level, a camera system, and the option to connect to a security service.
- An autonomous fire-suppression system requiring no inspections.
- A Honeywell lithium-vapour detection system (on request).

APPLICATIONS OF THE CONTAINERISED STORAGE

- **Self-consumption, charging from surplus, and time-shifting PV generation**
  The ability to defer consumption of energy produced by your PV system to a later time when that energy is needed.
- **Backup**
  (BACKUP) provides the ability to back up part or all of your consumption, so that in the event of a power outage the backed-up portion can continue to be powered from the batteries.
- **Elimination of outages and micro-outages**
  Thanks to an inverter response time of roughly 4 ms.
- **AC Coupling**
  Supports connection to existing grid-tied PV inverters and Deye hybrid inverters. It allows a battery and inverter to be connected to any grid-tied PV inverters.
- **Peak shaving**
  (PEAK SHAVING) levels out sudden peak loads, reduces the maximum power drawn and delivers cost savings — particularly in energy-intensive operations such as large manufacturing plants.
- **Spot-market trading using AI-based smart control**
  Includes selling surplus energy to an electricity trader or buying at low spot prices, which change throughout the day depending on supply and demand.

Thanks to top-quality cells with a guaranteed 8,000 cycles, Resacs batteries achieve a service life of 15 to 20 years.

MOST COMMON POWER & CAPACITY CONFIGURATIONS

- 50 kW + 120 kWh
- 80 kW + 168 kWh
- 80 kW + 204 kWh
- 100 kW + 240 kWh
- 160 kW + 360 kWh
- 200 kW + 480 kWh
- 240 kW + 540 kWh
- 320 kW + 768 kWh



HOW IS A BATTERY STORAGE SYSTEM DELIVERED?

1

ANALYSIS

First, we map your operation, energy consumption and business goals in detail. This lets us pinpoint exactly which solution will bring you the greatest savings and efficiency — i.e. the shortest return on investment.

2

SOLUTION DESIGN

Based on the data gathered, we prepare a technical proposal tailored to your business and accompany it with a transparent price quotation, so you have certainty about the costs involved.

3

PROJECT DOCUMENTATION

We provide all the documentation needed for the legislative and permitting processes, so you don't have to deal with complex administration.

4

IMPLEMENTATION (DELIVERY)

After your approval, we move on to manufacturing and delivering the battery storage system — exactly to the agreed specifications.

5

COMMISSIONING AND TESTING

We take care of the complete installation, connection and thorough testing, so that the system is fully ready for operation with no risk of outages.

6

GRID CONNECTION

We arrange all the formalities and technical steps required to successfully connect to the distribution grid.

7

REMOTE SUPERVISION

Once the system is up and running, we monitor it continuously, optimise its performance and promptly address any deviations.

8

SERVICE THROUGHOUT THE PRODUCT LIFETIME

We provide full warranty and post-warranty support — so your investment is protected for the entire service life of the storage system.

SAFETY FEATURES OF RESACS BATTERIES

1 Automatic, maintenance-free fire-suppression system

- Activates at temperatures above 90 °C.
- The cooling agent used prevents the spread of fire.

2 Safety resettable fuse on every cell connection

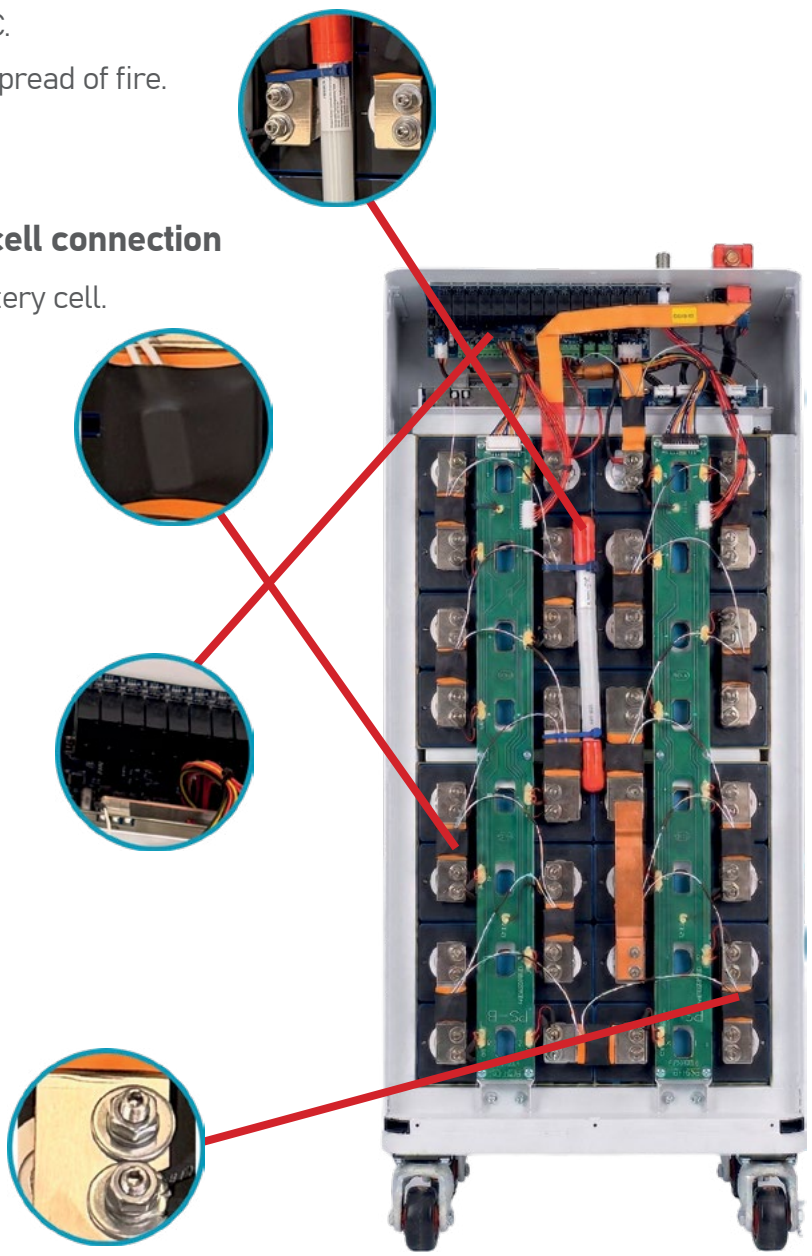
- Monitors the temperature of each battery cell.
- At temperatures above 60 °C, it automatically limits the battery's output (current).

3 Control electronics (BMS)

- Ensures reliable operation and a long service life for the storage system.
- Actively balances the cells for higher performance, safety and capacity.
- Monitors key parameters and evaluates operating data.

4 Flexible cell connections

- Unlike welded joints, they withstand vibration.
- They allow individual cells to be replaced easily.
- They accommodate changes in cell volume during charging and discharging.



COMPATIBLE INVERTERS

Deye · solis · victron energy · DELIOS · sunways · KACO new energy. · KOSTAL · SOLINTEG · SUNGROW · PYLONTECH · GOODWE · GROWATT · SRNE · SOFAR · Sol-Ark · LUXPOWER TEK · SMA · TBB POWER · MUST · MEGAREVO · invt · EATON · Ingeteam · SolarMax

SMART BATTERY CONTROL SYSTEM BY DIRECT ENERGY

Direct Energy specialises in supplying electricity to owners of photovoltaic power plants with battery storage. Using its own AI software, it helps to manage generation, consumption and energy storage efficiently.

The system learns to predict consumption and PV generation, and automatically adjusts battery charging and discharging according to spot-market prices. This enables it to deliver **additional savings**.

SELF-LEARNING ALGORITHMS
predict both PV generation and customer consumption

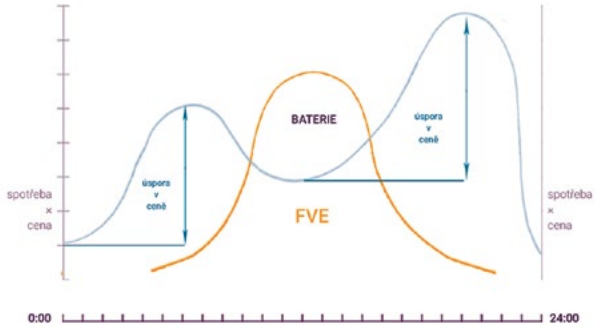
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SPOT-MARKET TRADING
delivers electricity-cost reductions of up to 15 %

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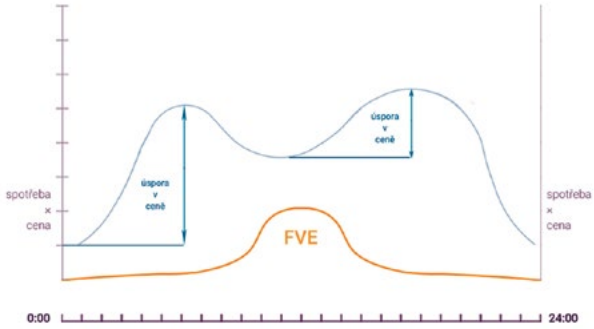
YOU'LL SEE THE SAVINGS
after just 14 days of operation

Summer



Thanks to smart control, Resacs batteries save on electricity costs twice. First, when they store electricity generated by your PV system for later use. Second, when they take advantage of price differences throughout the day.

Winter



In winter, a PV system doesn't generate much energy, but the battery can still earn its keep. Smart control helps you cut costs all year round and achieve additional savings of up to 15 %.

Direct Energy offers an attractive tariff: **SPOT + CZK 190/MWh (sale) and SPOT - CZK 250/MWh (feed-in/buy-back)**.

SAVINGS ANALYSIS AND OPTIMAL SOLUTION DESIGN

We offer customers a service that **calculates the optimal PV/battery size**. Based on specific input data (consumption, electricity costs and, where applicable, the output of an existing PV system, etc.), we calculate the **potential savings** from a PV system combined with smart battery control by Direct Energy.

WHAT BATTERIES CAN BE USED FOR

The primary role of a battery storage system is to store surplus electricity from your own generation (especially PV) for later use.

SPOT TRADING

Taking advantage of electricity-price differences throughout the day.

COVERING MICRO-OUTAGES AND BACKUP POWER

Thanks to their design, Resacs battery storage systems can be used to cover micro-outages and to act as a temporary backup power source. The hybrid inverters used respond in under 10 ms. As a result, computer systems and sensitive industrial machinery experience no interruption.

PEAK SHAVING

Covering demand peaks with energy stored in the battery. This usually makes it possible to reduce the reserved (contracted) power. With certain demand-curve shapes, this can amount to significant savings.

E-MOBILITY

Battery storage systems improve the convenience of charging electric cars in places with a limited electricity supply, at times when the PV system isn't generating.

GRID STABILISATION

One way of providing power-balancing (ancillary) services is to use battery storage systems. Their undeniable advantage is, above all, their response time — both for upward and downward balancing services.

AC COUPLING

Existing grid-tied PV inverters that don't allow a battery to be connected can be paired with a second set of inverters that do. This makes it possible to store PV surpluses in the battery and, if desired, to smartly control the entire system.

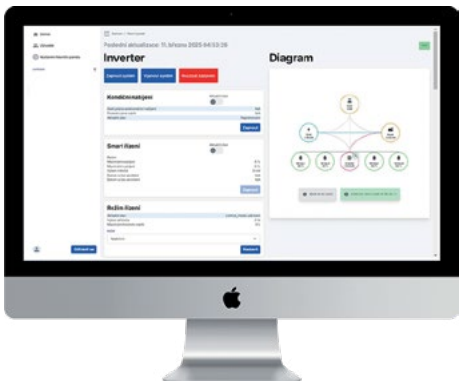


ENERGY MANAGEMENT SYSTEM (EMS)

A proprietary control unit with unique software. It actively controls the battery storage system as well as selected inverter types, and provides remote monitoring 24/7.

WHAT THE EMS DELIVERS

- **Remote monitoring 24/7** — an online overview of the system's status, down to the level of individual cells.
- **Smart energy control** — optimisation of charging and discharging based on consumption, PV generation and spot prices.
- **Scheduler** — automatic setting of time intervals for each operating mode.
- **Peak-Shaving** — cutting demand peaks and reducing the reserved (contracted) power.



Thanks to AI-based smart control, you can save 8–15 % on electricity costs per year.

TECHNICAL ADVANTAGES

- Communication via **Modbus RTU/TCP and an API interface**.
- **Integration** with third-party **dispatch/control systems**.
- **A trusted, secure connection** that protects your business and data, which is stored within the EU.
- **Alarm management** within the battery storage system.
- **An event history** for fast, easy troubleshooting.
- **Conditioning charge** — automatic battery protection during the winter period.
- **Remote updates** — over-the-air updates of firmware and features.



RESACS BATTERY INSTALLATIONS

Alcadrain s.r.o. is the largest manufacturer of sanitary fittings in Central and Eastern Europe.

Installation of a containerised battery storage system at an industrial site, controlled by the iRebox EMS, which optimises energy flow in real time according to consumption and electricity-price trends.

Power: **500 kW**
Capacity: **1080 kWh**
Inverter: **Sinexcel**

System benefits

- Lower electricity costs thanks to smart control and the use of SPOT prices
- Reduced demand peaks and, with them, lower distribution charges
- Efficient use of PV surpluses
- Greater stability and control over energy in the operation



Volvo Truck Center (Slovensko) is engaged in the development, manufacture and sale of trucks and the provision of transport solutions.

Installation of a battery storage system at the Volvo Truck Center facility in Slovakia, which stores surplus PV energy, ensures uninterrupted operation and optimises self-consumption.

Power: **288 kW (4x72 kW)**
Capacity: **600 kWh**

System benefits

- Efficient use of PV surpluses and maximisation of self-consumption
- Reduced energy costs
- Guaranteed continuous operation during grid outages
- Power-supply stabilisation and higher operational reliability



Pekařství a cukrářství Jiří Bláha (Jiří Bláha Bakery & Confectionery) — the largest bakery in Liberec, with a tradition dating back to 1990. A battery storage system ensuring stable operation of an energy-intensive production process. The system stores PV surpluses in real time and optimises charging and discharging according to electricity-price trends.

Power: **200 kW**
Capacity: **700 kWh**

System benefits

- Maximised use of self-generated energy
- Reduced costs thanks to control based on SPOT prices
- Elimination of micro-outages and assured production continuity (UPS)
- Stable operation and oversight thanks to remote diagnostics



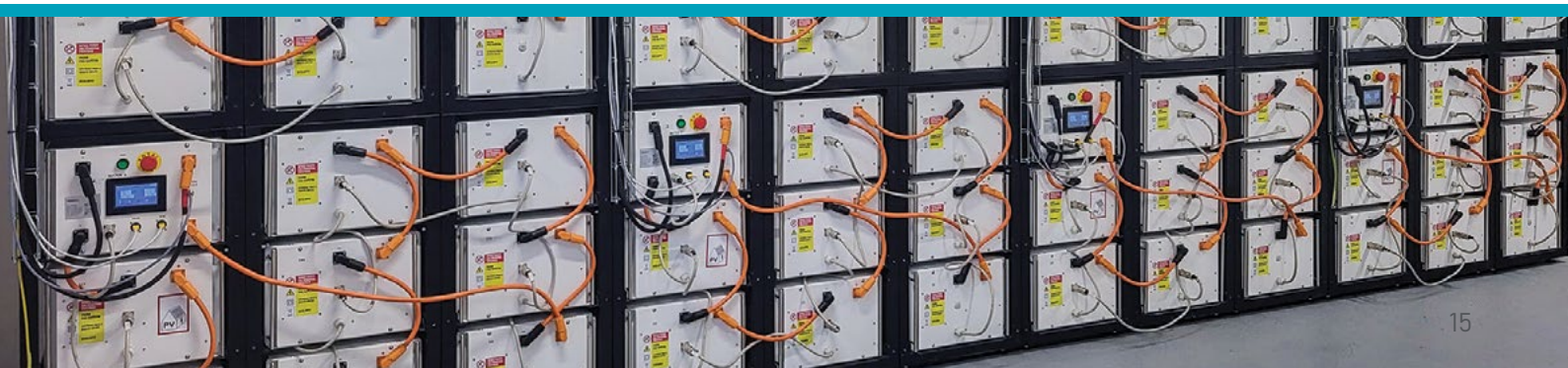
Bernhardt Fashion CZ, s.r.o. - a manufacturer of women's and men's fashion, which it supplies to European and global markets.

Installation of an indoor battery storage system integrated with photovoltaics at the production facility in Prostějov. The system, with its intelligent EMS, manages energy use in real time and schedules charging and discharging according to electricity-price trends.

Power: **400 kW**
Capacity: **768 kWh**

System benefits

- Maximised self-consumption of PV energy
- Reduced costs thanks to control based on SPOT prices
- Operational backup during power outages
- Stable, efficiently managed energy operations



REGULAR TRAINING SESSIONS

You can register here

Want to know more about Resacs batteries?
Attend one of our regular free training sessions.

You'll learn:

- How to correctly design a photovoltaic power plant and battery storage system with smart control in mind.
- Practical experience with low-voltage hybrid inverters, particularly Deye, Victron, Solis and others.
- About the safety of photovoltaic power plant systems, with a focus on battery storage.
- How remote monitoring helps with servicing battery storage systems.
- Why it pays to have a Czech battery with Czech service and European data storage.

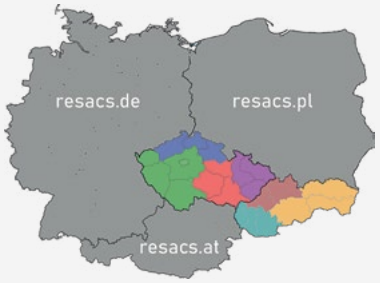
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The technical and visual parameters stated are for reference and may vary depending on the configuration of the specific battery storage system (e.g. inverter/BMS type, firmware, add-on modules, wiring, cooling), as well as the installation and operating conditions. The relevant values can always be found in the quotation or in the project documentation for the specific installation. Resacs s.r.o. reserves the right to change catalogue parameters without prior notice.