SUNVEC

smart solar & storage



SUNVEC STORAGE BLOCK

Battery energy storage systems (BESS)

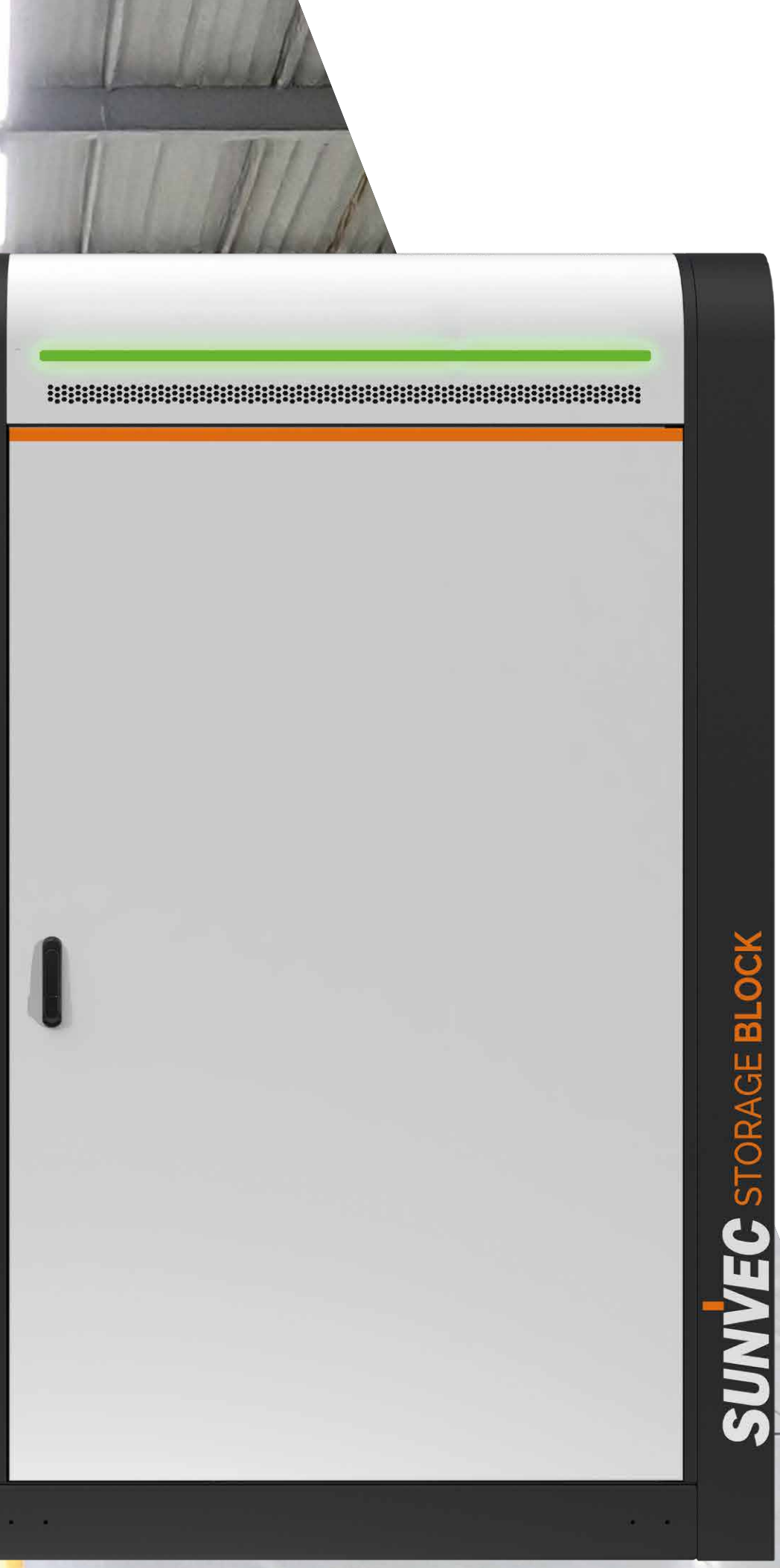
Up to 375 kVA / 780 kWh



- ✓ Fire protection
- ✓ Off-grid operation
- ✓ Connectivity
  4G, WIFI, Modbus TCP
- ✓ Modular and scalable
  from 125 to 375 kVA
  from 260 to 780 kWh
- ✓ Intelligent energy management

Applications

- ✓ Peak shaving
- ✓ Energy arbitrage
- ✓ Solar self-consumption
- ✓ Energy backup and resilience
- ✓ Power quality improvement
- ✓ Demand flexibility
- ✓ Reserve and Blackstart



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About Vector Energy/ SUNVEC



> “ Technology, proximity, customization, and operational continuity. ”

Vector Energy is a member of:

AEPIBAL

entra
AGREGACIÓN Y FLEXIBILIDAD

UNEF
Solar + Almacenamiento

esmc
EUROPEAN SOLAR MANUFACTURING COUNCIL

vector Energy

Vector Energy is a company specialized in energy storage solutions with over a decade of experience in power electronics, system integration, and energy control. Our multidisciplinary team combines **electrical engineering, software, and industrial design** to deliver **robust, modular, and scalable solutions**.

We operate mainly in the **industrial, commercial, critical infrastructure, and renewable energy sectors**, offering solutions for both medium- and low-voltage applications.

SUNVEC
smart solar & storage

Our **SUNVEC** technological capabilities range from the **development of Energy Management Systems (EMS)** and **smart batteries (BMS)** to the **design of inverters and complete Battery Energy Storage Systems (BESS)**, whether containerized or for indoor industrial installations, targeting industrial, commercial, and infrastructure applications. As a European manufacturer based in Barcelona, we integrate the design, engineering, manufacturing, and technical support of all critical components of our Sunvec Storage systems: battery packs, BMS, EMS, and inverters.

Our philosophy is based on four pillars: **technology, proximity, customization, and operational continuity** — all to ensure performance, safety, and system availability throughout the lifecycle.

About Vector Energy/ SUNVEC

Manufacturing and engineering in Europe:
All SUNVEC Storage equipment is designed and assembled at our Barcelona facilities, ensuring quality control, regulatory compliance, and full traceability.

Vertical integration (EMS, BMS, Battery pack):
We develop all key system elements in-house, allowing for greater compatibility, energy efficiency, and control over future upgrades.

Local and remote support with guaranteed spare parts:
We have our own technical support and service agreements with local teams trained directly by Vector Energy, ensuring rapid response and original parts for any intervention.

Modularity and ease of maintenance:
The smallest unit of intervention is the battery pack, which reduces replacement costs and time. The modular design facilitates progressive expansions and maintenance without operational impact.

Flexibility in configuration, upgrades, and expansions:
We adapt our solutions to each client's energy needs, with the ability to integrate into existing systems and support firmware and EMS updates.

Extended warranty programs with comprehensive coverage:
We offer scalable warranty packages (up to 10 years), including labor, travel, and critical component replacement, to protect your long-term investment.



SUNVEC Block

> “ The SUNVEC Storage energy solution for commercial and industrial environments. ”



MULTI-LAYER SECURITY

Advanced fire detection, early warning, and automatic fire extinguishing systems.

BEYOND THE GRID

It operates independently for off-grid operations and strengthens grid resilience.

CONNECTIVITY

Full integration with 4G, WiFi and Modbus TCP for real-time monitoring and remote management.

HIGH-CAPACITY SCALABILITY

Modular design allows for seamless expansion to meet future energy needs.

APPLICATION VERSATILITY

Adaptable to industrial, commercial, renewable energy and critical load backup applications.

INTELLIGENT ENERGY MANAGEMENT

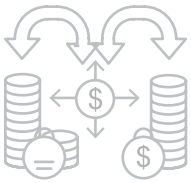
Automated optimization of energy flows to maximize savings and system performance.

Main applications



Peak Shaving

Store energy during off-peak hours to cover peak consumption and reduce costs due to higher rates.



Energy arbitrage

Buy energy when it is cheapest and sell or use it when the price rises, maximizing income or savings.



Solar self-consumption

Store surplus renewable energy to use when you're not producing, increasing your energy independence.



Energy backup and resilience

Continuous power supply in the event of power outages, protecting critical loads and ensuring operation through static transfer systems (STS).



Power quality improvement

Stabilizes voltage and frequency to protect equipment and optimize processes.



Demand Flexibility

Adjust consumption according to market signals and receive financial incentives.



Reserve and Blackstart

Provides fast backup power and the ability to revive the grid after a power outage.

Configuration and dimensions

Power module

125 kVA

250 kVA

375 kVA

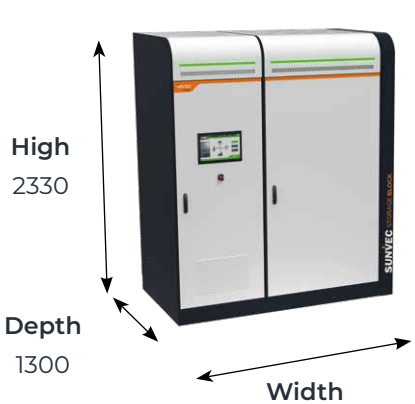
Battery module

260 kWh each, expandable up to 780 kWh



Model	Power kVA	Batteries kWh
MPSS 125 - 260	125	260
MPSS 125 - 520	125	520
MPSS 125 - 780	125	780
MPSS 250 - 520	250	520
MPSS 250 - 780	250	780
MPSS 375 - 780	375	780

Dimensions (mm)



MPSS 125 / 260



MPSS 125 / 520
MPSS 250 / 520



MPSS 125 / 780
MPSS 250 / 780
MPSS 375 / 780

Battery Pack

Our **Battery Pack** has been designed and assembled in-house to guarantee the **highest quality and performance** in energy storage solutions, controlling the materials used in its manufacture and ensuring its sustainability and traceability. This allows us to ensure that each battery is ready for the **Battery Passport** (mandatory in the EU as of February 2027), thus ensuring full transparency regarding its origin, carbon footprint, and circularity throughout its entire lifecycle.

The **BCU (Battery Control Unit)** contains the protection and control module and the battery management system (BMS), responsible for monitoring and processing battery cell parameters and other relevant parameters to ensure safety and maximize the efficiency and lifespan of the system.

Through our platform, we offer **real-time monitoring** of critical parameters such as state of charge (SOC), temperature, and thermal differential between cells, optimizing operation and extending the system's lifespan.

Thanks to their **modular architecture**, our battery packs are **scalable and adaptable**, making them ideal for energy-intensive applications, both on-grid and off-grid.



Climate control

The **BESS's climate control system** is the essential component that ensures the **longevity and optimal performance of its batteries.** It is designed to ensure precise thermal control, which is essential to prevent overheating and cell performance degradation over time.

Active Temperature Regulation: The system constantly monitors and controls the temperature inside the battery cabinet. When the internal temperature exceeds a preset threshold, the system activates its cooling mode to dissipate excess heat and ensure the temperature always remains within its optimal range. If ambient conditions are cold, the system also has the ability to provide heating to ensure the batteries operate within their ideal temperature range, thus maximizing their efficiency and lifespan.

Efficient and Controlled Air Flow: The system's design ensures that the hot air generated by the coils is efficiently extracted and replaced with cooled air. This is achieved through careful design of the air inlets and outlets, allowing for constant, unobstructed circulation within the cabinet. It is crucial to keep the space around these openings clear to ensure optimal airflow and efficient performance.

Comprehensive Protection for Reliability: The system is equipped with various alarm and protection functions to safeguard both the air conditioning equipment and the batteries themselves. In the event of any anomalies, such as extreme temperatures or failure of critical components, the system issues alarms and, if necessary, shuts down operation to prevent further damage. Furthermore, its automatic restart capability ensures that, after a power outage, air conditioning resumes according to the last operating conditions, maintaining the thermal stability of the BESS.



Fire protection system

Early detection

The greatest threat to any battery system is thermal runaway, a chain reaction that can lead to a fire in seconds. To combat this, our BESS includes an early detection system that **acts in the first phase of failure, even before smoke appears.**

Before a cell overheats and catches fire, it releases gases detectable by specialized sensors. Upon detection, the BESS triggers an alarm signal and preemptively shuts down the system to avoid any risk.

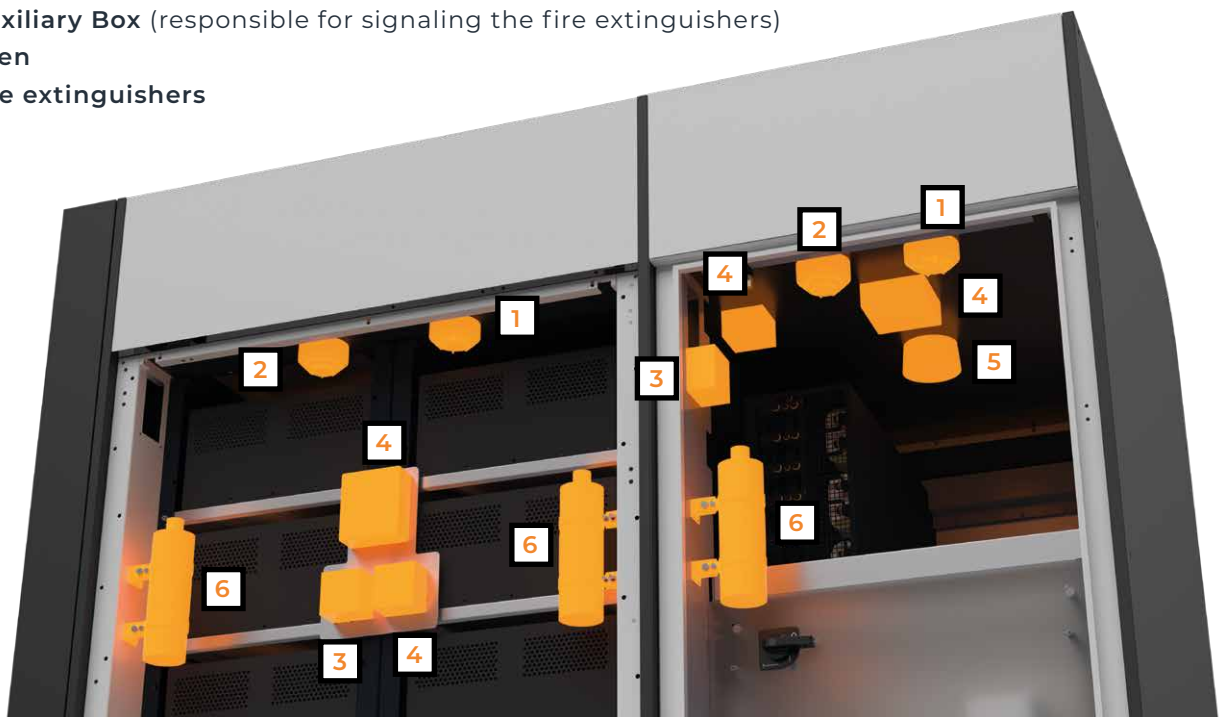
Fire detection and extinguishing system:

If the early detection stage is passed, our fire suppression system springs into action. A combination of photoelectric and thermal **smoke sensors** is used to detect and verify the threat.

When the **control system** receives a first signal from any of the sensors, it issues a warning alarm and automatically stops system operation to mitigate the risk. Only when the signal from the **second sensor** is received, confirming the presence of a real fire, does the control system (via the **auxiliary boxes**) activate the **extinguishing sprays**. This intelligent process prevents false alarms and ensures that extinguishing is activated only when **strictly necessary.**

Furthermore, for complete safety, our system incorporates a **redundant communication circuit.** If any interruption or failure is detected in this circuit, it immediately stops system operation, ensuring that safety monitoring is always active.

1. **Photoelectric smoke sensor**
2. **Thermal sensor**
3. **Selector** (allows extinguishing to be blocked for maintenance)
4. **Auxiliary Box** (responsible for signaling the fire extinguishers)
5. **Siren**
6. **Fire extinguishers**



Technical data



	Power module - PCS Cabinet		
Model	MPSS 125K / ... [1] K	MPSS 250K / ... [1] K	MPSS 375K / ... [1] K
Rated power [kVA]	125	250	375
Rated current [A]	182	364	546
Max. current (1 min) [A]	217	434	651
Rated voltage [Vac]	3P / 400 (allowable range 300-460Vac)		
Rated frequency [Hz]	50/60		
Power factor range	1.0 inductive a 1.0 capacitative		
Max. Efficiency [%]	98.9		
THDi [%]	<3 (at rated power)		
THDV [%]	<3 (linear load)		
PCS Cabinet dimensions (W x H x D) [mm]	800 x 2330x 1300		
	Battery module - Cabinet		
Battery type	LFP		
Battery capacity (BOL) [kWh]	260 x n (n=1,2,3)		
Voltage range [Vdc]	650 - 950		
Dimensions of 1 battery cabinet module (W x H x D) [mm]	1400 x 2330 x 1300		
	General		
Degree of protection	IP54		
Cooling system	Forced ventilation		
Type	Transformerless [2]		
Relative humidity	0 - 95% (non-condensing)		
Operating temperature range	-20 to 50°C (derating for >45°C)		
Safety	Early warning system (H_2/VOC) Fire detection system (smoke/heat)		
Fire protection	Passive fire protection system Aerosol fire extinguishing system		
Communications	Potential-free contacts (status indicator, fire alarms, etc.) Touchscreen HMI		
Max. altitude [m.a.s.l.]	<4000m (derating above 3000m)		
Regulations, certifications, and standards [3]	IEC 62477-1, IEC 62116, EN 61000-6-2, EN 61000-6-4, NTS v2.1, UNE 217002:2020, EN 62439-1, EN 62439-2		

[1] X=Battery capacity (kWh)
[2] It is recommended to install a transformer at the equipment output
[3] Consult Vector Energy for other regulations and standards

Technical data



QR Battery Passport included for improved transparency, traceability, and sustainability in the battery value chain.

Battery pack	
Battery Type	LFP
C-Rate	0.5P
Configuration	1P20S
Rated voltage [V]	64
Voltage range [V]	54 - 72
Rated energy (@100%) [kWh]	20
Rated charge and discharge power [kW]	10
Weight [kg]	160
Dimensions [mm]	950 x 430 x 230
Certification	IEC 62619; UN 38.3



Cells	
Cell type	LFP
Cell capacity	314
Rated voltage [V]	3.2
Voltage range [V]	2.7 ~ 3.6
Energy density [Wh/kg]	≥ 168.5

EMS



Optimize energy with our Energy Management System (EMS)

Complete energy control at the facility. Our Energy Management System (EMS) is the smart solution for maximizing the performance of your energy storage system (BESS).

How does it work?

The EMS is the brain of the system. It interprets all operating data in real time, allowing it to precisely and efficiently control the BESS's energy flow. Thanks to its intelligent algorithms, the system can operate autonomously, adapting to needs and optimizing energy consumption according to defined premises.

EMS Functions

- ✓ **Remote access to the system:** Real-time monitoring of equipment status, modification of operating modes, equipment limits, etc.
- ✓ **Data acquisition:** Periodic data collection for current and future decision-making. Algorithms for measuring, grouping, and storing historical data for subsequent analysis.
- ✓ **Control of operating modes:** Automatic energy flow control, operating according to the configured operating mode. The system's priority and objective change depending on the mode (Zero-injection, Autoconsumption, Peak Shaving, Arbitrage, etc.).
- ✓ **Maintenance management:** Using measured usage, failure, or aging data, the system can alert and recommend possible maintenance or repairs to the end user or manufacturer. For example, it can predict failures based on predicted degradation of cells, modules, or battery packs.
- ✓ **Predictions to maximize future performance:** Optimization of operating modes using information from weather forecasts and market prices.

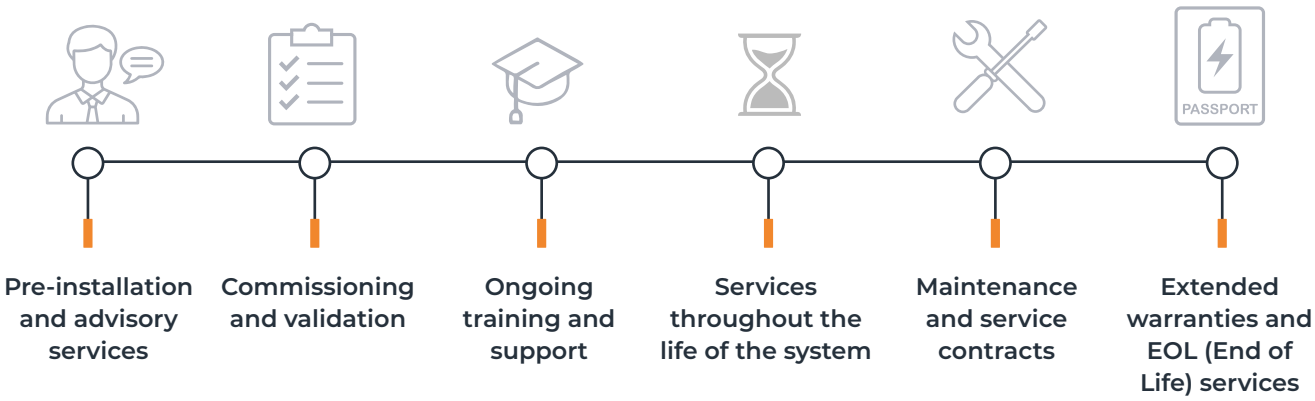
Intelligent Energy Management for Various Operating Scenarios:

- ✓ **Peak Shaving Charge Reduction:** It stores energy during low-rate periods to strategically discharge it during peak demand, minimizing power and consumption costs.
- ✓ **Energy Arbitration:** Optimize the purchase and sale of energy in the market, charging the BESS during low-price periods and discharging (or selling) it during high prices, to maximize revenue or savings.
- ✓ **Self-consumption:** Maximizes the use of on-site renewable generation (solar/wind) by storing surplus energy for consumption when production is low or non-existent, increasing energy self-sufficiency.
- ✓ **Energy and Resilience Backup:** It provides uninterrupted power supply during grid failures or outages, ensuring operational continuity and protecting critical loads.
- ✓ **Improving Power Quality:** Mitigates voltage and frequency fluctuations, providing more stable, cleaner power that protects sensitive equipment and optimizes the performance of industrial processes.
- ✓ **Participation in Demand Flexibility Programs:** It facilitates participation in demand response programs, allowing the facility to adjust its grid consumption in a controlled manner and receive financial compensation.
- ✓ **Reserve Capacity and Blackstart:** It provides rapid response operational reserves and the ability to initiate grid restoration (Blackstart) following a general blackout.

SUNVEC Storage Service Catalog

Services

Each stage of the lifecycle of our SUNVEC Storage solutions features a specific set of services designed to maximize system performance, security, and operational continuity.



1. Pre-installation and advisory services

- Technical visit to the site and study of electrical and environmental conditions.
- Assistance with technical and economic sizing and configuration selection.
- Complete technical documentation for the installer and end customer (plans, data sheets, schematics).
- Advice on compatibility with photovoltaics, generators, electric vehicle chargers, and weak grids.
- Regulatory support and recommendations for project certification.

2. Commissioning and validation

- Complete field commissioning by specialized Vector Energy technicians.
- Configuration of BMS and EMS parameters according to the client's requirements.
- Factory Acceptance Test (FAT) testing on request at the factory.
- Site Acceptance Test (SAT) testing with on-site verification protocols.
- Delivery of a commissioning report and formal warranty activation.
- Basic training for the client's technical staff on operation and maintenance.

3. Ongoing training and support

- Regular technical webinars on new releases and firmware updates.
- In-person or remote training courses for installers and maintenance technicians.
- Internal certification for Vector Energy-approved installers.
- After-sales technical support via phone, email, and video calls.

4. Services throughout the life of the system

- Remote monitoring via EMS VectorLink Cloud.
- On-site and remote corrective technical support.
- Automatic periodic reports and access to event history.
- Battery pack replacement without impact to the rest of the system.
- Alerts and predictive diagnostics for maintenance planning.

5. Maintenance and service contracts

- Scalable maintenance contracts: standard, premium 24/7, predictive, and adaptive.
- Guaranteed SLA based on system criticality.
- Scheduled replacement of consumables: fans, sensors, electronic components.
- Remote diagnostics and adjustments without travel when possible.
- Unlimited corrective interventions under a premium contract.

6. Extended warranties and EOL (End of Life) services

- All SUNVEC Storage equipment comes with a standard warranty with full coverage of critical components.
- Warranty extension options up to 10 years with additional packages (annual or multi-year).
- Technical inspection at the end of the standard period for extension activation.
- Analysis of remaining capacity and system status.
- Proposals for partial repowering or scheduled replacement.
- Recycling and reverse logistics for components with certified traceability.
- Battery Passport.

SUNVEC Storage Service Catalog

Maintenance contracts

Vector Energy offers a range of maintenance contracts tailored to each client's specific needs, both in terms of operational criticality and budget. The main options are detailed below:

1. Standard Contract (Working Hours).

- 1 annual preventive maintenance visit.
- Corrective interventions during business hours.
- Access to technical support by phone and email.
- Discounts on spare parts and consumables.
- Advanced Contract (8x5 with 24-hour SLA).
- 1 or 2 preventive visits per year.
- Corrective interventions with guaranteed response time in less than 24 business hours.
- Technical reports after each intervention.
- Replacement of consumables (fans, sensors, filters).

2. Premium Contract (24/7 with priority SLA).

- Full coverage 365 days a year.
- Urgent interventions with immediate response (<8 hours).
- Includes labor, travel, and major replacement parts.
- Periodic reporting and personalized follow-up by support engineering.

3. Predictive Contract (for systems connected to VectorLink).

- Continuous monitoring.
- Early warnings and condition-based maintenance proposals.
- Remote adjustments and diagnostics without on-site visits.
- Each option can be combined with warranty extension plans and can be customized according to the sector, criticality, or environmental conditions of the facility. Our goal is to ensure operational continuity, anticipate failures, and optimize equipment lifespan.

4. Maintenance contracts tailored to operational criticality (annual, 24/7, hourly).

- Scheduled technical reviews and replacement of consumables.
- Advanced diagnostics by product engineering.
- Corrective interventions with an agreed SLA.
- Technical reports and continuous improvement proposals.

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