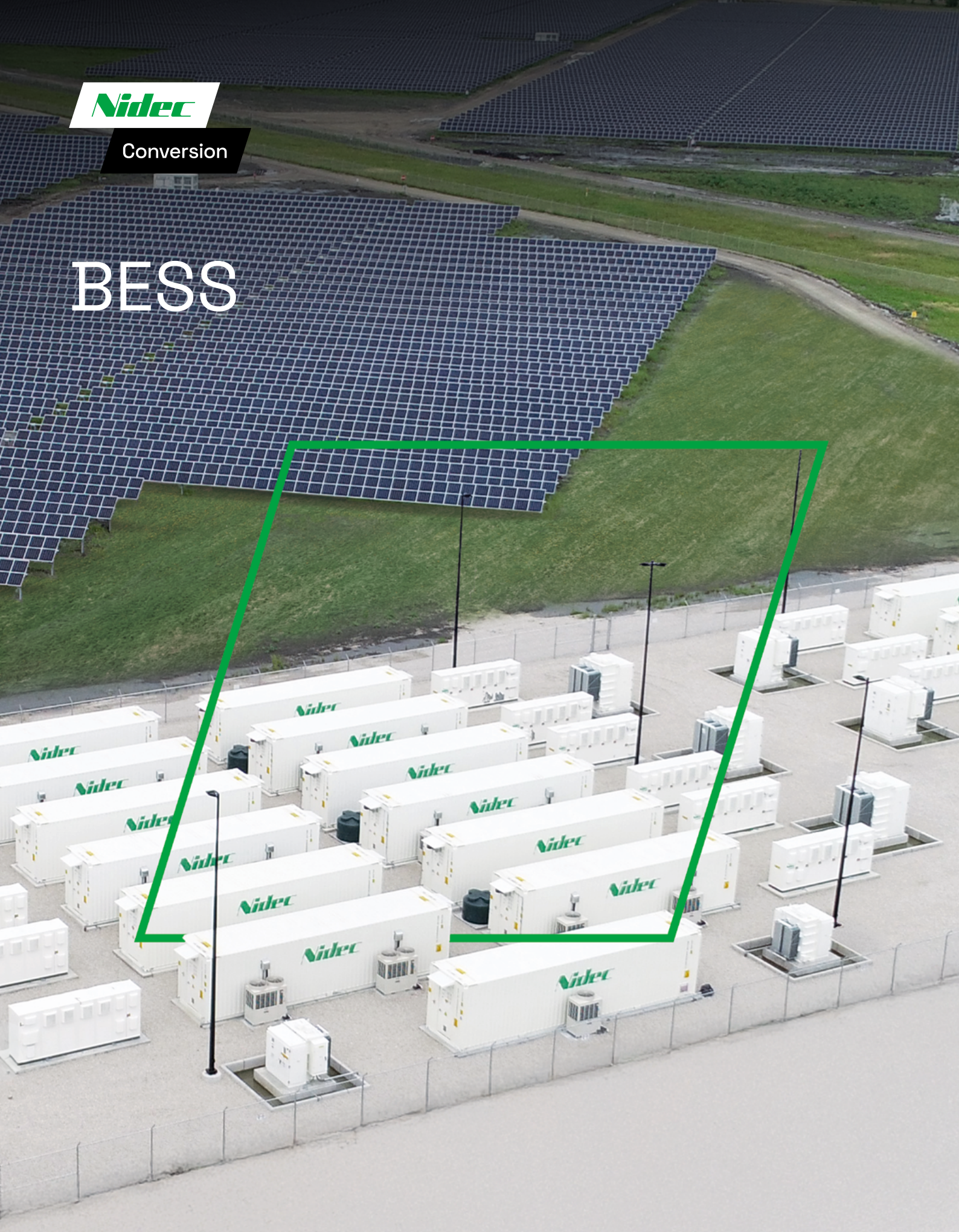
Nidec

Conversion

BESS



Battery Energy Storage Systems

Nidec - a global force

We are focused on converting Clean Energy into Power, we convert Clean Power into Motion, and we power the future, achieving a better and greener world for next generations, developing and manufacturing solutions that serve Energy, Mobility, and the Planet.

In 2013, Nidec group purchased Ansaldo Sistemi Industriali, an Italian multinational with over a century of experience in the design and manufacture of power electronics, motors and generators and automation systems for industrial applications thus entering the rapidly evolving energy sector with a focus on solutions that are transforming the industry, including Energy Storage. Nidec also owns the following industrial brands: US Motors, KatoEngineering, Leroy Somer, Control Techniques and SSB Wind Systems.

With over 11.0 GWh of energy storage across the globe in 170 projects, Nidec is one of the world's leading providers of large scale energy storage solutions. Whether you are investing in Primary Frequency Regulation, Power Balancing, Peak Shaving, Peak Shifting or Microgrid applications we have the right solution to fit your needs.

The extraordinary value of experience and proximity

18
Service centers

11.0 GWh
Energy storage

9
Manufacturing sites

170
Projects

4.3 GW
Installed capacity

28
Countries

Our expertise in power conversion, power management and power quality is your key to a successful project. Backed by nearly a century of experience in the design, manufacture and supply of electrical systems, our components and systems offer safe, reliable performance with a proven track record across the globe.

Our presence on a global scale and our proximity to the customer are the cornerstones of our commitment to a continued partnership through our solutions' entire lifetime and beyond.

Integrated solutions through a single partner

LFP CELLS — Tier 1 LFP cells manufactured by leading and bankable suppliers undergo Nidec Conversion custom testing and validation protocol before integration in our products

PACK — Battery packs designed by Nidec Conversion R&D and manufactured in Nidec Conversion facilities in Qingdao (China)

BMS — Proprietary software developed and maintained by Nidec Conversion's BESS Center of Excellence in France

PCS — Proprietary hardware and software design of the Power Conversion System, developed and maintained by a team based in France and Italy

SYSTEM — Fully customized design of the system to achieve the best density and performance thanks to the expertise of teams based in France and Italy

MV — MV equipment selected and sized by Nidec Conversion, and manufactured by leading EU-based suppliers

PMS — Grid code compliance ensured by our top-of-class plant controller, developed and maintained by Nidec Conversion's BESS Center of Excellence in France

EMS — Nidec Conversion solutions include our own Energy Managment System, offering real-time battery supervision and diagnostics, battery-PCS coordination and plant-level energy optimization

HV — Sound track record of HV substation construction and grid connection, with capabilities up to 400 kV

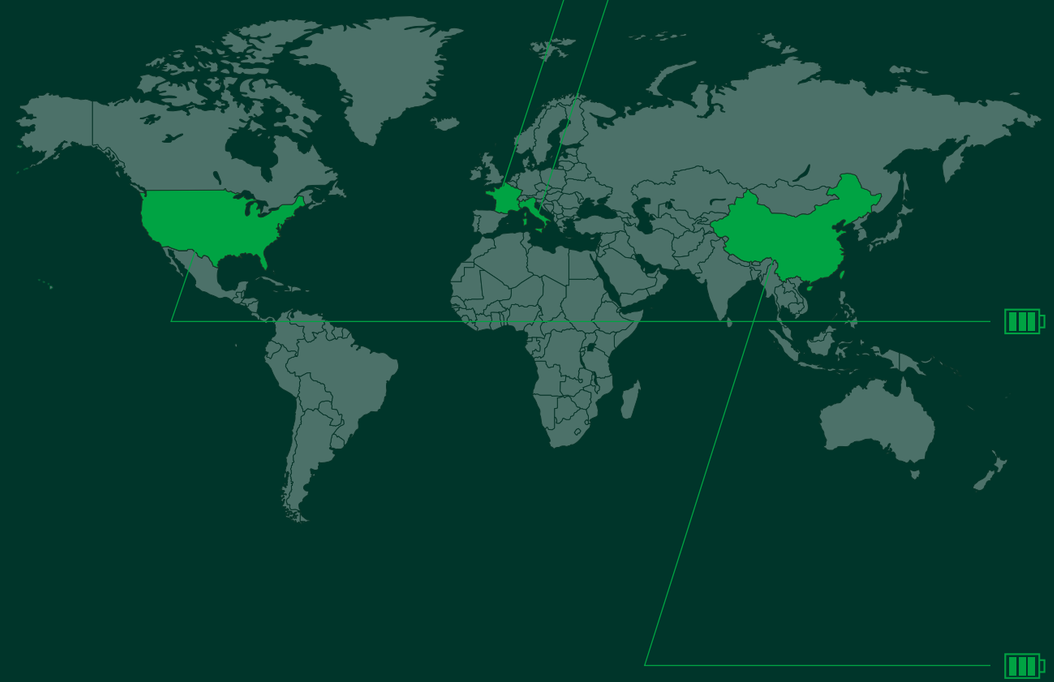
BoP — Balance of Plant and civil works provided by Nidec Conversion through a network of trusted local partners

FULL EPC

PROJECT MANAGEMENT

- Basic & Detailed Engineering
- Control System Software Configuration
- Manufacturing Purchasing Assembly
- Installation & Commisioning
- Construction & civil works
- Operation & Maintenance

Primary manufacturing locations for Battery Energy Storage:



France

Located in central France, our Roche-la-Moliere and La Fouillouse facilities are the global Center of Excellence for Battery Energy Storage Systems with responsibility for the development of our Power and Energy Management System (PEMS) and our all-in-one ACBOX solutions. La Fouillouse site current capacity of 5 GWh/year is being expanded to reach 10 GWh/year in 2027.

Italy

Located in northern Italy, our Milan and Vicenza facilities are the global Center of Excellence for Power Electronics. Our Power Conversion Systems are designed, developed and manufactured based on our more than 100 years of experience in power electronics for heavy industrial applications, derived from Ansaldo Sistemi Industriali legacy.

USA

Nidec Group expanded its US operations with the opening of a facility in Cleveland (Ohio). The state-of-the-art facility features a purpose-built area for the assembly and testing of extensive industrial controls and automation systems, Battery Energy Storage Systems (BESS), and Medium Voltage Drives, along with a cutting-edge production area for Nidec's Avtron Encoders.

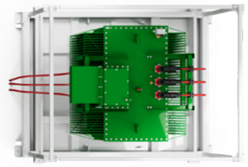
China

Nidec Conversion subsidiary SSB Wind Energy Technology Co.,Ltd. was established in Qingdao in 2005 and a dedicated team for Battery Energy Storage Systems was formed in 2021 to develop a custom battery pack design and BMS, in collaboration with our BESS Center Of Excellence in France. Upon completion of the certification of both our battery pack and DC block according to major IEC and North America standards, in-house manufacturing facilities entered service in 2025, with a yearly capacity of 1 GWh.

ACBOX | All-in-one solution

ACBOX is an all-in-one solution based on a proprietary design comprising batteries, 4-quadrant AC/DC power conversion, efficient thermal management through an embedded liquid cooling system, and state-of-the-art safety features. ACBOX units are delivered in rugged high-cube containers, ensuring maximum robustness and compatibility with the harshest environmental conditions.

ACBOX units are complemented by an external MV/LV transformer and MV switchgear also configured and supplied by Nidec. Seamless integration with Nidec Conversion's Power and Energy Management Systems ensures maximum flexibility in meeting customer application demands and grid code requirements.



1 Energy

Tier 1, 315 Ah 0.5P LFP cells to meet demands from all applications and deliver 20+ years lifetime

2 Distributed AC/DC

SiC-based independent AC/DC converters (Rack PCS) with native grid forming capabilities deliver top-of-the-class RTE and maximum energy yield and system availability

3 Embedded TMS

Embedded, custom-designed Thermal Management System (TMS) for optimal performance in all operating conditions in the most compact footprint

4 Safety Systems

- Fire detection and aerosol-based suppression
- 120-minute fire resistance of insulating material on all sides and ceiling
- NFPA 69-compliant early gas detection and extraction
- NFPA 68-compliant upward-facing deflagration venting panels

5 One-sided access

Non-walk-in design enables access to all critical equipment through doors on one side only, enabling back-to-back installation for dense site layouts

6 AC Port

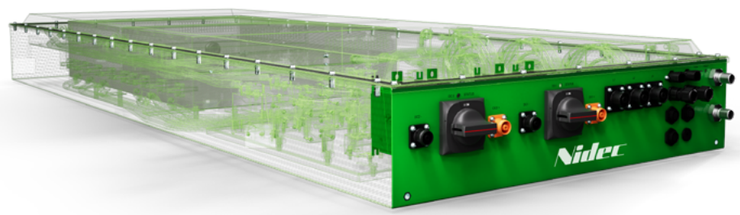
Fault-tolerant IT distribution with Insulation Monitoring Device and Type I+II SPDs

SiC-based distributed PCS

ACBOX design modularity is pushed to the extreme by a distributed power conversion architecture featuring an independent SiC-based PCS for each rack. SiC devices deliver a top-of-class peak efficiency exceeding 99% on top of overload capability, to fully leverage the native grid forming algorithm. Full independent operation of battery racks results in maximum energy yield, optimized availability and improved SOH estimation. Benefits extend to the whole plant, thanks to enhanced balancing strategies and the possibility to do away with burdensome periodic SOC calibration procedures.

Efficiency Boost

24/7 Availability Boost



Thermal Management System (TMS)

A custom-designed liquid cooling system delivers the benefits of a rugged industrial chiller while optimizing auxiliary consumption across the whole operating range, thanks to its free-cooling capability and tunable ventilation and liquid flow, continuously adapted in real time. Maintenance is minimized thanks to the lack of air filters and thanks to an embedded auto-refill system which ensures the maximum system availability.

Safety features

ACBOX solutions deliver the highest safety levels by adhering to the most stringent regulatlons in all its parts.

- Multi-layered fire detection system
- Aerosol-based fire extinguishing system
- 24 h black out resilience for fire detection
- 120-minute fire resistant insulation on all sides and ceiling
- Early gas detection and extraction
- Upward-facing deflagration venting panels
- Embedded liquid spill tank
- Dry pipe option

Compliance

Batteries

UL 1973, UL 9540A, IEC 62619, IEC 63056, UN 3536

Power Conversion

IEC 62109-1, IEC 62909-1, IEC 62477-1

System

IEC 62933-5-2

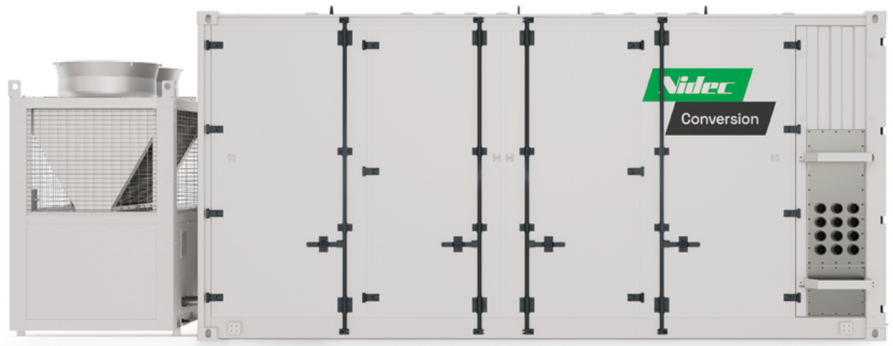
Cyber-Security

IEC 62433

Grid Code

EU EN 50549
Finland SJV2024
Germany VDE-AR-N 4110, 4120, 4130, VDE FNN Guidelines for grid forming
Italy Terna Allegato A.79, CEI 0-16
Spain NTS v2.1, Capacidades grid forming
UK G99
US UL 1741 SB, IEEE 2800

V3



Product size	U1	U2	U3
Footprint	25 ft HC	32 ft HC	38 ft HC
Cell type	LFP 315 Ah 0.5P	LFP 315 Ah 0.5P	LFP 315 Ah 0.5P
Nameplate energy	5.03 MWh	6.71 MWh	8.39 MWh
System configuration	6 racks	8 racks	10 racks
Power	Up to 2.47 MVA	Up to 2.47 MVA	Up to 2.47 MVA
Independent AC/DC	1	1	1

V4

Product size	U1	U2	U3
Footprint	22 ft HC	28 ft HC	34 ft HC
Cell type	LFP 315 Ah 0.5P	LFP 315 Ah 0.5P	LFP 315 Ah 0.5P
Nameplate energy	5.03 MWh	6.71 MWh	8.39 MWh
System configuration	12 racks	16 racks	20 racks
Power	Up to 3 MVA	Up to 3 MVA	Up to 2.5 MVA
Independent AC/DC	Up to 12	Up to 16	Up to 20

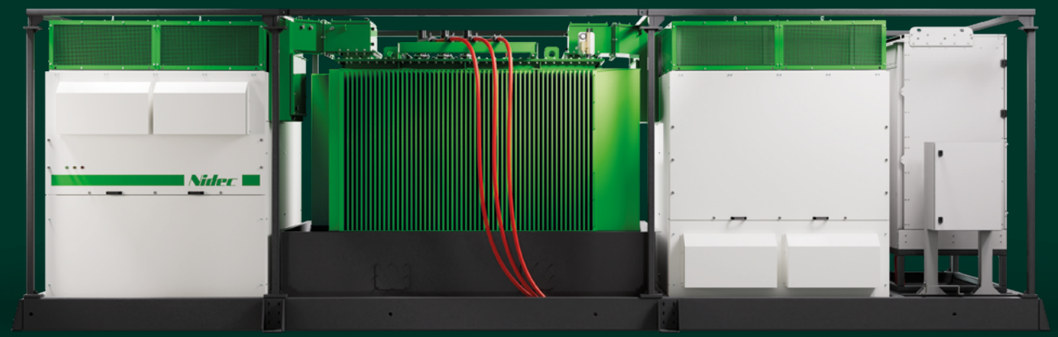
V5

Product size	C1	C1
Footprint	12 ft HC	12 ft HC
Cell type	LFP 755 Ah 0.25P	LFP 755 Ah 0.25P
Nameplate energy	4.02 MWh	3.12 MWh
System configuration	4 racks	4 racks
Power	Up to 1.43 MVA	Up to 1.91 MVA
Independent AC/DC	Up to 4	Up to 4

UniQube | Power Unit for DC blocks

Leveraging its extensive expertise in power electronics, Nidec Conversion developed UniQube, a 4- quadrant, water-cooled Power Conversion System compatible with batteries rated up to 1500 V and designed for long duration (from 2 h to 8 h) BESS applications.

UniQube can be shipped as a stand-alone product or integrated in a complete plug & play skid solution also featuring a Ring Main Unit (RMU), MV/LV KNAN transformer and a customizable auxiliary cabinet.



High Power Density

Co-design of UniQube and Power Unit resulted in one of the highest power density in the market, maintaining maximum efficiency and performance without taking up valuable on-site space.

Flexibility

Nidec Power Unit is available in 2 alternative configurations:

5 MVA in a 20’ ft skid
10 MVA in a 30’ ft skid

Power Management System

Advanced PMS (Power Management System) capabilities, with fast local control functions, ensure optimal performance even in complex distributed systems, combined with a secure architecture designed for integration in high cybersecurity environments.

Ready For Next Generation Grids

Grid-connected grid forming operation with fault ride-through and synthetic inertia capabilities make Nidec Power Unit ready to support grids in the face of ever increasing penetration of non-programmable power generation.

Compliance

Nidec Conversion UniQube and Power Unit meet requirements by all major international standards.

List of standards

- EN IEC 62920
- EN IEC 62477-1
- EN IEC 60068-2-2/30/78
- EN IEC 62443
- EN IEC 60529
- EN IEC 62262
- EN IEC 60076
- EN IEC 62271- 1/100/102/200/213

	20 ft	30 ft
DC | Maximum voltage	1500 V	1500 V
DC | Independent ports	1 or 2	2 or 4
DC | Short-circuit current	250 kA per port	250 kA per port
DC | Protections	DC disconnect switch, SPD Type I+II	DC disconnect switch, SPD Type I+II
AC | Rated power @ 40 °C	Up to 5057 kVA	Up to 10115 kVA
PCS number	1	2
AC | Rated voltage (MV)	6.6 kV to 36 kV	6.6 kV to 36 kV
AC | THDI @ P_{NOM}	< 1%	< 1%
AC | Power Factor	0 under-excited, 1, 0 over-excited	0 under-excited, 1, 0 over-excited
AC | Protections (LV)	SPD Type I+II	SPD Type I+II
AC | Protections (MV)	RMU	RMU
Transformer cooling	KNAN	KNAN
Transformer losses	Eco design 2 available	Eco design 2 available

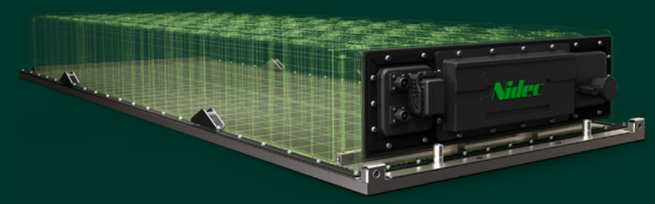
PowerGalaxy | 5 MWh DC block

Nidec Conversion PowerGalaxy is the perfect companion for the UniQube Power Unit in 2 h to 8 h applications. Featuring a battery pack based on a proprietary design and Tier 1 LFP cells, the PowerGalaxy DC block delivers 5 MWh in a compact 20 ft HC form factor.

The integrated liquid cooling unit ensures optimal performance across a wide operating range, enabling installation in all enviromental conditions and operation for more than 20 years.

Nidec Conversion expertise in battery management was leveraged to develop the BMS embedded in PowerGalaxy, which implements advanced energy optimization and SOC estimation routines and can be seamlessly integrated with both UniQube and our own plant monitoring and control solutions.

PowerGalaxy is also equipped with redundant safety features for fire detection and extinguishing and explosion prevention, ensuring compliance with IEC 62933-5-2, UL 9540, NFPA 855, NFPA 68 and NFPA 69.



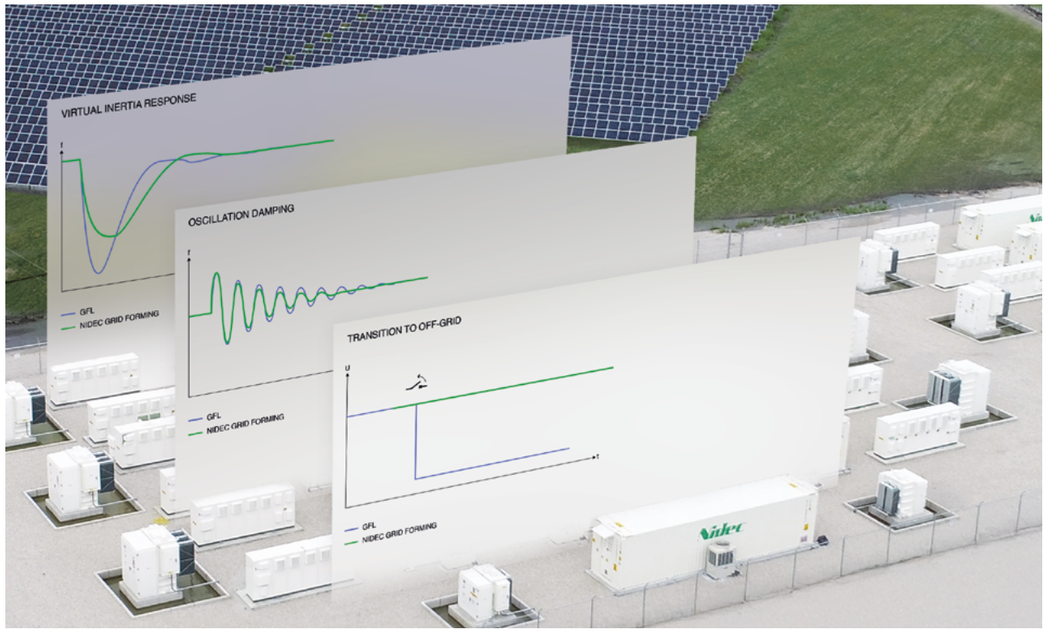
	2 h	4 h
Cell type	LFP 315 Ah 0.5P	LFP 315 Ah 0.5P
Maximum voltage	1500 V	1500 V
Rated voltage	1331 V	1331 V
Minimum voltage	1164 V	1164 V
System configuration	12 racks x 419.3 kWh	12 racks x 419.3 kWh
Independent DC ports	2	2
Nameplate energy	5.03 MWh	5.03 MWh
Power	2.51 MW	1.25 MW
Short-circuit current	2 x 64 kA=128 kA	2 x 45 kA=90 kA

Features

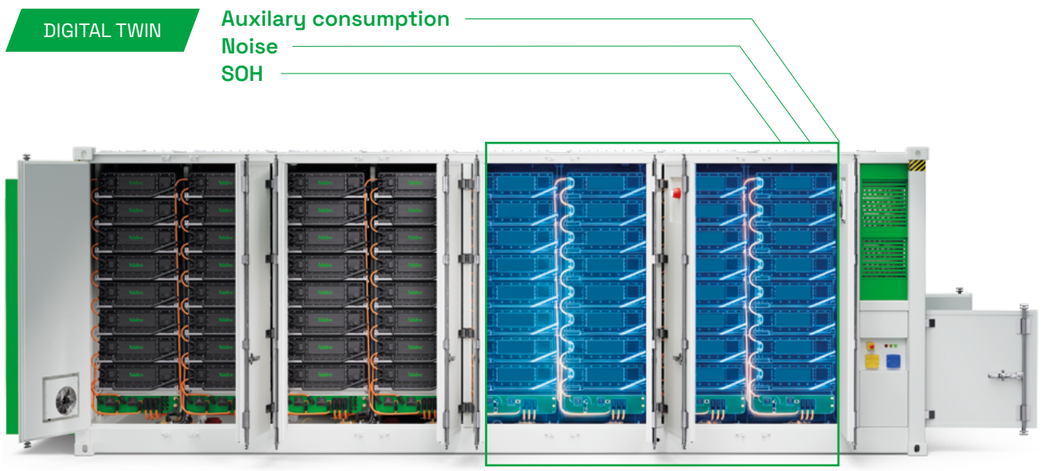
Dimensions	20 ft HC
Weight	42000 kg
Cooling	Liquid cooling by integrated chiller
Ingress Protection	IP 54 (Optional IP 55)
Corrosion Protection	C4 (Optional C5)
Over-current protection	Rack level fuses
Disconnection	Rack level disconnect load switch Container level disconnect load switch (optional)
Fire detection	Redundant optical smoke and thermal sensors
Fire extinguishing	Aerosol (optional dry pipe)
Explosion prevention	Redundant gas detection Air exchange system through motorized inlet and outlet (NPFA 69 compliant)
Explosion management	Pressure-controlled, upward-facing deflagration venting panels (NFPA 68 compliant)

Ready for next generation grids

Grid-connected grid forming operation with fault ride-through and synthetic inertia capabilities make Nidec Conversion BESS solutions ready to support grids in the face of ever increasing penetration of non-programmable power generation and decommissioning of legacy generators.



Our products come with Digital Twins and RMS and EMT models compatible with all major simulation softwares used in the industry, enabling customers to thoroughly assess our solutions' performances and validate their business plans with unmatched accuracy.



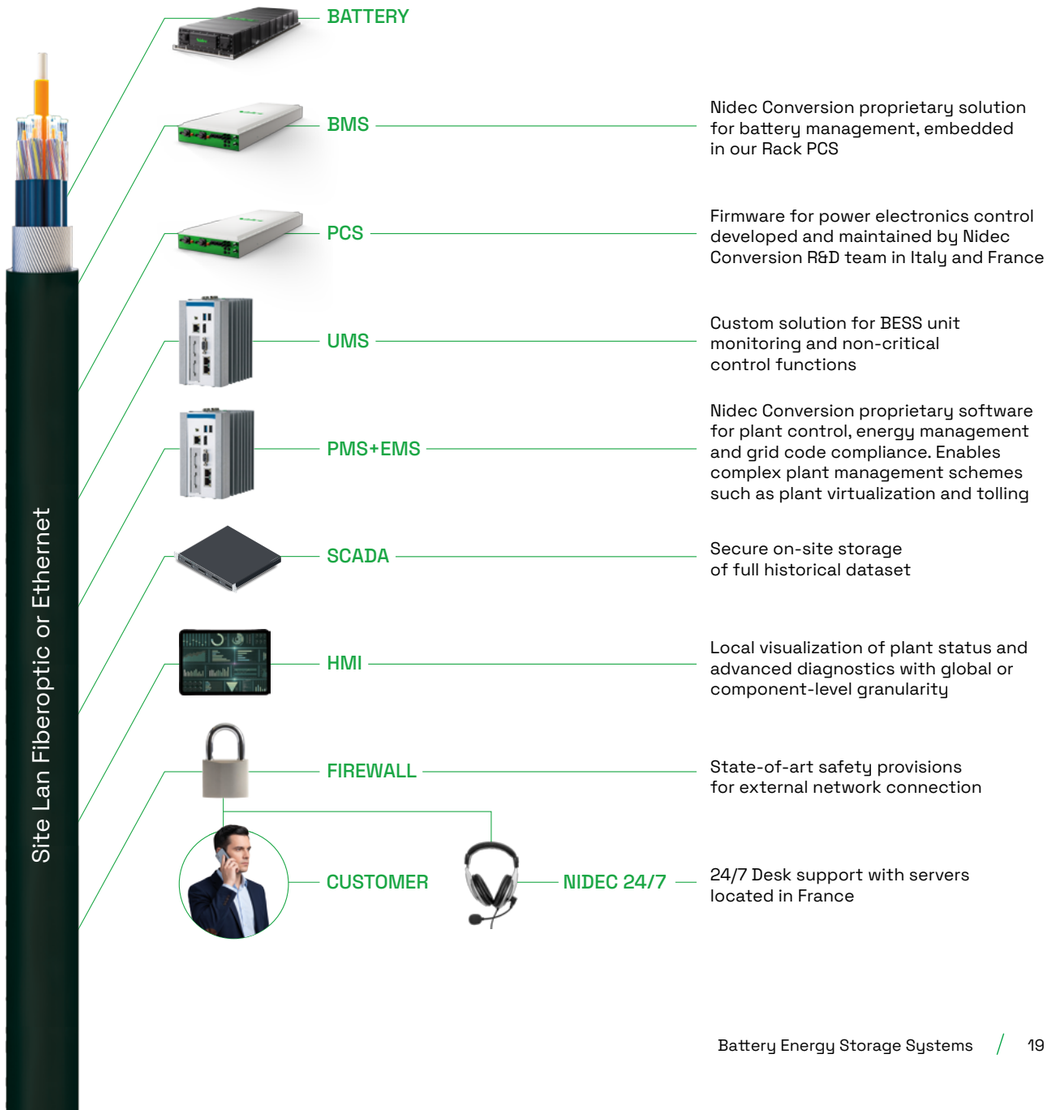
Vertical ownership of software stack

Nidec Conversion is committed to the highest cybersecurity standards, which are built in every layer of our vertically-owned software stack.

Every active layer of the software stack is internally designed and maintained, ensuring seamless integration and consistent cybersecurity management from the Point of Connection to the battery cells, among the manifold benefits deriving from single ownership of the entire solution.

Software development for the BMS, PCS, PMS and EMS is not only carried out internally, but exclusively within EU boundaries.

Compliance with KRITIS regulation and Network and Information Security (NIS) 2 Directive and readiness to meet Cyber Resilience Act (CRA) requirements, as they become mandatory are testament to our continued commitment.



Full-scope EPC

Nidec Conversion delivers comprehensive Engineering, Procurement, and Construction (EPC) solutions with full scope responsibility—from batteries to High Voltage (HV) grid connection. By managing every stage of the project lifecycle, we ensure seamless execution and optimized performance, and reduced risk for both developers and Independent Power Producers (IPPs).

Our EPC approach is built on strong project ownership and accountability. From initial concept and site assessment through to commissioning and grid integration, Nidec Conversion assumes full responsibility for planning and execution. Early-phase site visits enable a precise understanding of site conditions, ensuring tailored system design and accurate project execution strategies.

Nidec Conversion's expertise spans the entire electrical chain, from batteries and Power Conversion Systems to medium- and high-voltage infrastructure, and grid connection. Strategic collaborations with leading HV transformer suppliers, combined with a trusted network of qualified local partners for civil works, allow us to deliver efficient and reliable solutions that meet local requirements and standards.

Timely delivery and successful grid connection are at the core of Nidec's commitment to customers. Our Project Management team ensures that each milestone is achieved on schedule, enabling clients to reach operational readiness with confidence. Safety is embedded in every aspect of our operations.

Nidec's strong Health, Safety, and Environment (HSE) culture ensures that all activities are performed according to the highest standards, safeguarding people, assets, and the environment. With a holistic EPC offering and proven expertise across the full value chain, Nidec Conversion provides turnkey energy storage solutions that are efficient, reliable, and ready to meet the challenges of BESS markets.

Operation & Maintenance

Nidec provides warranties with optional long term operation and maintenance contracts for full life cycle support. Our operating and maintenance philosophy represents our company's general partnership approach - the scope of work can be adapted to the customer's needs and requirements.

Operation & Maintenance are an optional service that we can provide to customers.
This service can be tailored to our customer's specific needs.

Nidec is able to offer customers 24/7 remote plant operation control and monitoring, including reporting of site operation and performance data. As the plant operator, Nidec will manage scheduling for preventive and corrective maintenance programs as well as ensuring spare parts are always available and up to date. Plant performance reporting includes regular performance analysis with both monthly and annual status updates. Furthermore, Nidec can manage customer invoicing to third parties. Yearly qualification testing can also be included in the contract.

Our maintenance programs include the following activities:
- First Level Intervention
- Preventive Maintenance
- Corrective Maintenance
- Hot Line Support, through a dedicated
- Help-Desk
- Remote Access Support

Under Long Term contracts, Customers are expected to ensure that a minimum stock of spare parts are available on-site but these can be managed by Nidec.

Nidec can also provide technical training for the Customer's Plant personnel, including Corrective Maintenance, troubleshooting, and equipment repairs so that the customer's Staff can repair the failure within the minimum possible time.

Nidec offers various communication strategies to minimize eventual downtime periods including: Maximum Notification Period, 24h Desk Support, Remote Support (via authorized VPN tunnel), Single Call Procedure.

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Nidec Conversion

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