Nidec

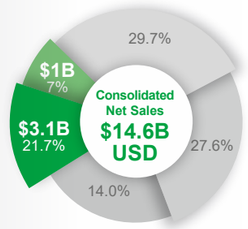
All for dreams

EV CHARGING SYSTEM

ultra-fast, modular and expandable

Nidec a global force for the future

Nidec is a global player in electric motors and related technologies. With more than 3 bn USD in sales in the automotive sector and over 1 bn USD in energy infrastructure technologies, Nidec is driving the future.



Consolidated Sales FY19 Nidec Group

- Automotive Motors & Electronic controls
- Energy Infrasctructure Technologies
- Appliance, Commercial & Industrial Products (ACIM)
- Small Precision Motors (SPM)
- Other Products

Building on a strong position in Energy and Automotive, Nidec offers state-of the art ultrafast charging solutions that are adapt for the vehicles on the road today and tomorrow. Futureproofing investments in infrastructure for electric vehicle charging means that an all-electric world was never closer than it is today.

With Nidec's ultra-fast charging systems, you can scale your investment to fit growing needs over time. Our intimate knowledge of electric vehicles, energy storage and power electronics, make our systems the most reliable on the market in terms of performance and safety.

Expertise in Power Systems + **Electric motors & sensors for Automotive** + **Industrial Power Electronics**

MOST RELIABLE CHARGING SYSTEM AVAILABLE TODAY

The extraordinary power of experience

Our in depth know how in Power Conversion, Power Management and Battery Power Storage coupled with Nidec's vast experience in electrical systems for automotive and automotive testing, particularly electric vehicle testing, make us uniquely positioned to offer the best solution for today's and tomorrow's needs.

POWER CONVERSION
Our Power Conversion Systems are designed and built in-house using the same components of our industrial product line, which means spare parts and upgrades will be available for the life of the equipment. Rugged and robust, these products have a proven track record for performance and efficiency.

POWER MANAGEMENT
The Ultra Fast Charging unit incorporates algorithms from our ARTICS Smart Energy platform. This proprietary, real-time integrated Power and Energy Management System, which operates on standard hardware platforms, offers precision readings on electricity consumption and accurately manages energy flow to the car batteries. Moreover, it is ready for use with renewable energy sources incorporating state-of-the art days ahead forecasting and can be seamlessly integrated with third party accounting or supervisory software.

POWER STORAGE
Nidec is one of the world's leading providers of battery energy storage solutions globally. With more than 800MWh of energy storage systems in operation worldwide, no one knows storage like we do. Our charging algorithms optimize charging for enhanced safety and help contribute to longer battery life. Nidec also works closely with battery manufacturers and the automotive industry to develop a more sustainable business model, including the re-use of second life batteries to reduce environmental impact.

The reliability, safety and performance of our charging systems stems from more than a century of experience in power electronics and power management systems for industrial applications.

PLUS A GLOBAL FOOTPRINT

- **Capillary Service support**
- **9 Manufacturing Sites**
- **12 Engineering and Design facilities**
- **7 primary locations for power electronics**
  Italy, France, Germany, Rumenia, China, India and USA.

Charge any model including the next

The EV market is evolving rapidly and the cars coming out after 2021 will be equipped with next generation batteries that can be charged in less than 15 minutes. Our System was designed with the future in mind. Working closely with battery and automotive manufacturers across the globe has given us an edge in developing a chagrining unit that is suitable for all brands on the market today as well as future models.

CONNECTION TO LV OR MV LINES

REDUCED OPERATING COSTS

MINIMUM INSTALLATION COST

REDUCED INSTALLATION TIME

READY FOR THE FUTURE

- **Next Gen ready**
- **Connection in highly congested areas**
  where energy demand is already high and may not be able to support additional, unpredictable loads.
- **Multi-car simultaneous**
- **Ultra-fast charging under 15 minutes**

Configure your investment

Powersafe 1.0 consists of the following components: a customizable ergonomic dispenser, an AFE AC/DC Power Supply Unit with high charging capacity that can be connected to a LV or MV grid network, a DC/DC Power Supply Unit, an incoming line unit, a Renewable Energy Connection Module, an Integrated battery pack and optional MV/LV transformer Module. This flexible modular solution allows us to quickly configure charging infrastructure from a single 160 kW unit (which is able to supply from 0 to 210 kW on two outputs) up to a full multicar charging station using renewable energy sources. It can also be expanded by adding additional power supply units and energy storage units to match power requirements. This allows customers to tailor investments to their pocketbooks and demand over time. The renewable energy module can be supplied at time of original purchase or seamlessly integrated into the system at a later date.

Proven technology

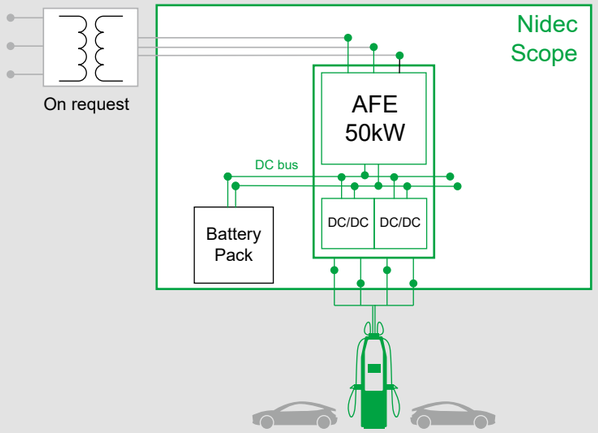
At the heart of our charging infrastructure are the power supply units which are based on our industrial power conversion systems and active front end technology. The technology in these systems has been widely used and tested in numerous industrial applications across the globe. This means our solutions are robust, reliable, efficient and safe.

Customize the dispenser

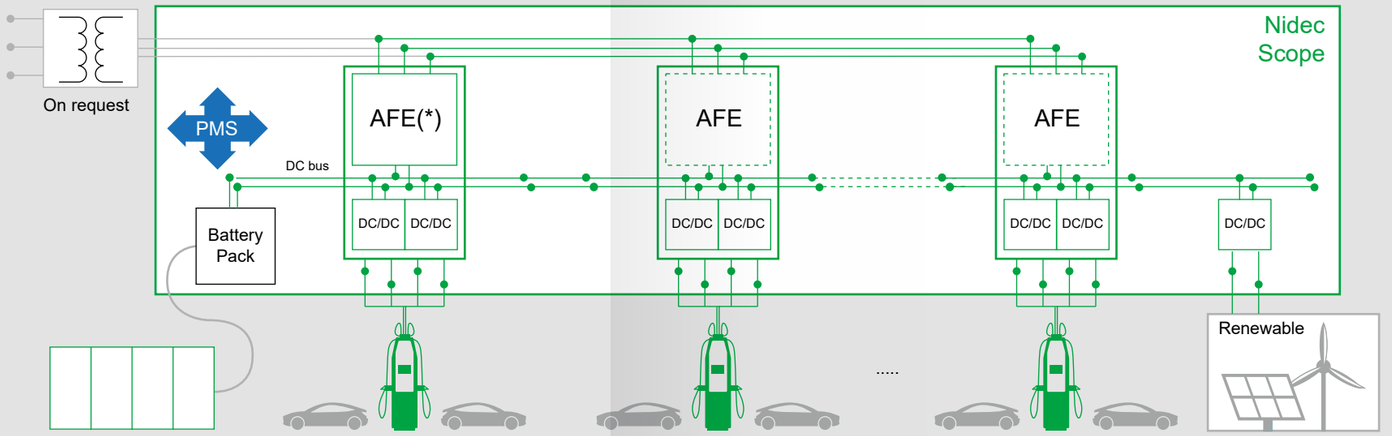
Powered by Nidec, the colors of the dispenser can be customized to fit your branding strategy and company logo. We offer a wide variety of options to choose from as an option. Our standard units are white and light grey

WE CAN ENGINEER THE SYSTEM TO YOUR NEEDS

NIDEC POWER SAFE 1.0 - SINGLE UNIT



CHARGING PARKS WITH STORAGE & RENEWABLE ON DC
(Solutions for connection on AC MV grid also available)



Plug connector

Steady, Stable Power Supply

Nidec's Powersafe 1.0 is a modular solution with high charging capacity that can be connected to a LV or MV grid network. Another key feature is that our charging units can be powered by an integrated energy storage system.

The benefits of an integrated Energy Storage System

The ability to power the chargers from the grid and from renewable energy sources such as PV or Wind allow the operator to maximize profit as energy can be bought, sold or stored based on time of day tariffs and availability of renewable sources. Our highly advanced Energy Management System can help set the optimal charging time and includes options for day ahead and three day ahead predictivity on energy production from renewable sources. In addition, the batteries can act as a buffer, shaving the peaks of recharging requests for better power management and enhanced grid stability. Nidec is one of the world's leading suppliers of energy storage solutions both on land and at sea. The energy storage systems provided with our EV charging units offer the highest power density and safety standards on the market today. Our battery systems come in four standard configurations:

- Cabinet mounted for smaller applications up to 960kW
- 1 MW solutions (In 20' container)
- 3 MW solutions (In 40' container)
- The box – a 1 MW/1MWh solution for EV+grid services

50 kW FROM THE GRID UP TO 320kW CHARGING

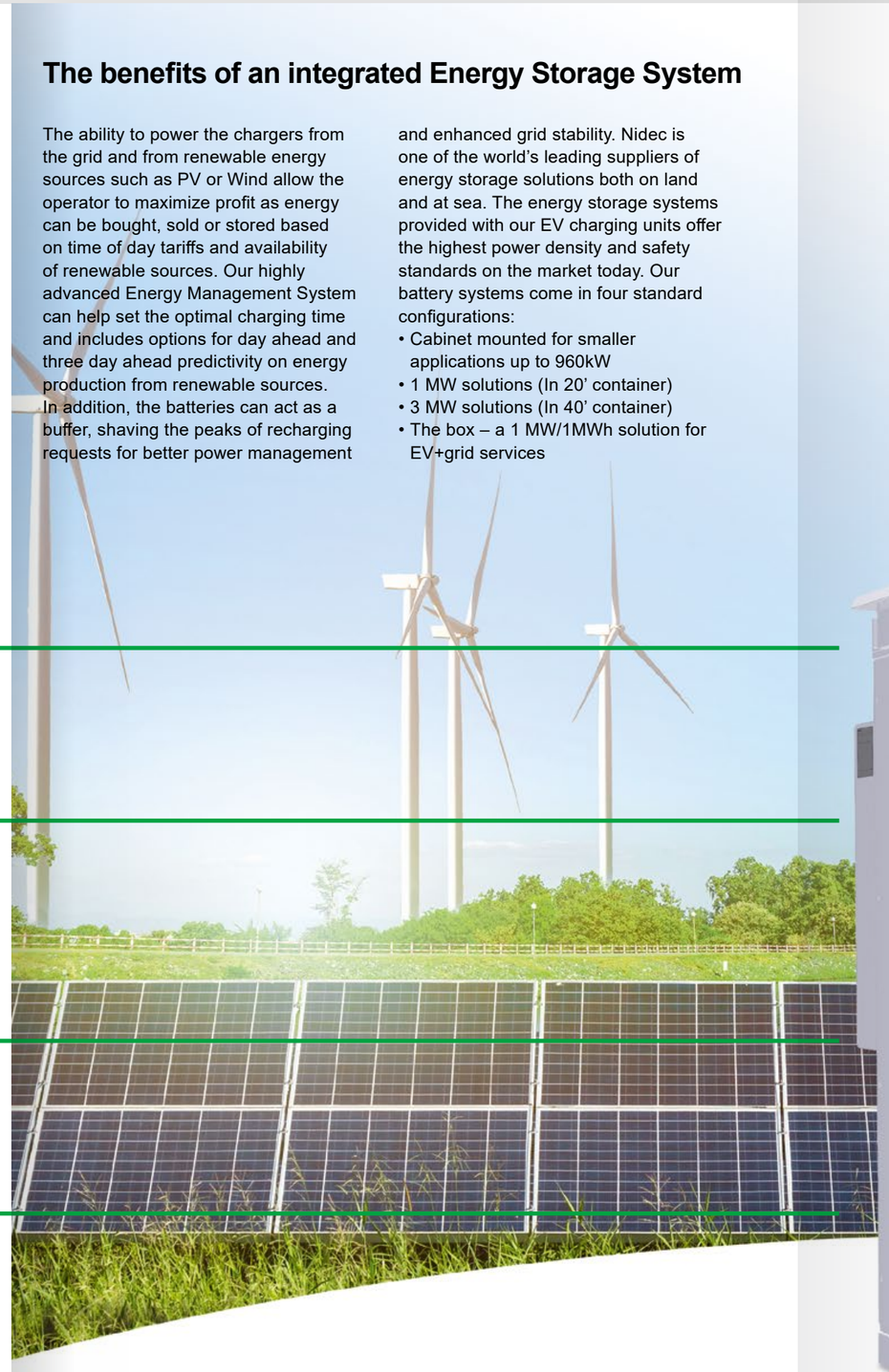
MAXIMIZE REVENUE

since batteries can be recharged when the cost of the energy is more convenient

NO MV INFRASTRUCTURE INVESTMENTS

ENERGY STORAGE

according to the needs, eventually containerized



More than 150 units installed to date

THE BOX

Plug and play solution for EV charging and grid services.
Jump start your green investments with this prefabricated cement housing which contains all electrical components for connection to MV line and batteries for 1MW/1MWh of charging plus grid services like frequency regulation. The unit is fully wired and ready for service and can be delivered anywhere by freight.

Easy Maintenance & Remote Diagnostics

The Powersafe 1.0 draws on our experience in heavy industry. With over half a century of experience in designing power electronics for remote and hazardous areas, our cabinets are built to the maximum safety standards and were developed to keep the Mean Time to Repair to a minimum. All components are easily accessible for inspection and repair in the unlikely event that the need arise. Moreover, the system is equipped with a stateof-the-art remote diagnostics system that allows maintenance managers to troubleshoot from anywhere on the globe. The average MTBF on our power electronics is 100,000 hours with proper usage and maintenance.

Precise, Real-Time Control

In addition to offering functions for remote diagnostic, our real-time control system offers highly accurate, precise information on energy consumption and usage. The charge adapts automatically to the type of vehicle connected and the state-of-charge of the battery to ensure an optimal charge. The smart charging algorithms balance the total capacity of the grid to the number of vehicles charging. The charger adapts charging automatically, depending on the vehicles connected, priorities and the available energy. Our system includes remote control monitoring which gives visibility to how long and how fast a vehicle charges.

No Risk Charging

Overcharging a car battery or charging at the wrong voltage can lead to premature degradation of the car battery. Thanks to our significant experience in energy storage, our charging algorithms optimize the depth of charge, protecting the car battery.

Technical data

TECHNICAL SPECIFICATION	
BASE CONFIGURATION	Common Rectifier 50kW, 2x160kW (1x320kW) DC/DC modules, 1x79kWh battery rack
COMPLIANCE & CERTIFICATION	CE: IEC 61851-1, ISO 11518, IEC 62196, IEC 61851-21-2, CEI 0-21, UL
INSTALLATION	Outdoor/Indoor
OPERATING TEMPERATURE	-25˚C to 50˚C. Others available upon request. De-rating characteristics apply.
HUMIDITY	5% to 95%
MAXIMUM OPERATING ALTITUDE	2000 mt (6562 ft) - Higher on request
MAX. DISTANCE BETWEEN UFC & DISPENSER	100 mt
NOISE	< 60 dB(A)
PERSONALISATION	Yes. According to Customer Logo & Colors
DISPENSER UNIT	
UNIT CONNECTORS	CCS Type 1, CCS Type 2, and CHAdeMO | Single or dual cable option
OUTPUT POWER	Up to 320 kW
OUTPUT VOLTAGE	200-950 Vdc
OUTPUT CURRENT	
CCS:	Up to 500A
	continuous with liquid-cooled cables; air-cooled cables also available
CHAdeMO:	Up to 200A
IP RATING	IP65
IK RATING	IK10
DISPLAY	10 Inches High Brightness Touch Screen (Custom display messages available)
DIMENSIONS	2,060mm (H) x 490mm (W) x 510mm (D) - Shaped
WEIGHT	150kg
MATERIAL	Stainless Steel AISI 304
RFID READER	NFCIP-1, NFCIP-2, ISO/IEC 14443, ISO/IEC 15693, MIFARE Classic, FeliCa card
CREDIT CARD INTERFACE	Available upon request
CABLE LENGTH	3,5 mt standard. Longer cables available as an option
POWER UNIT	
INPUT POWER	CE Models: max.53 kW, 400V, 3ph 50Hz, 78A@400V (any output)
	UL Models: max.53 kW, 480V, 3ph 60Hz, 65A@480V (any output)
OUTPUT	"DC: 2x160kW (200-450Vdc) - 1x320kW (400-950Vdc) AC: 22kW AC plug on request"
EFFICIENCY	>94% at full load
THD	<3%
POWER FACTOR	0.98
BATTERIES	Li-ion. 79kWh each rack. Modular & Expandable configuration.
IP RATING	IP54
IK RATING	IK10
DIMENSIONS	2,275mm (H) x 1650mm (*) (W) x 800mm (**) (D)
	(*) + 600mm for each battery rack - (**) +270mm for battery cooling, if necessary
WEIGHT	1200 kG + 650kG each battery rack
MATERIAL	Stainless Steel AISI 304L
CONTROL UNIT	
WIRELESS CONNECTIVITY	3G/4G cellular communications with failover redundancy
	IEEE 802.11 b/g/n
	Bluetooth Low Energy
WIRED CONNECTIVITY	10/100 Base-T Ethernet - RS485 interfaces
COMMUNICATION PROTOCOL	OCPP 1.6 Json (support for management and billing)
IT SECURITY	SSH protocols, password protected for remote diagnostics
POWER SHARING	Configurable site-level energy demand management according to the battery state of charge
POWER CONTROL	Power sharing algorithms included to manage the available energy from batteries
CONTROL PLATFORM	Provides owner/operators real-time information on the performance of the charging station
POWER SUPPLY	Battery-backed UPS functionality on request for reliable telemetry at all times

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INDUSTRIAL SOLUTIONS