Nidec Conversion

POWER ELECTRONICS

Nidec Conversion: destined to be number one in industrial drive solutions

A TRADITION IN EXCELLENCE

With over 150 years of experience in the energy, metal, environmental, marine and industrial markets, Nidec Conversion has the experience to deliver process oriented power quality and control solutions, from components to complete engineered systems.

Nidec Conversion is a global supplier of power electronic equipment and automation systems as well as electric motors and generators.

This combination of technologies and background is the base of our expertise in engineering flexible, customized solutions for global industrial markets at competitive prices.

RELIABLE COST-EFFECTIVE SOLUTIONS FOR ALL INDUSTRIAL APPLICATIONS

At Nidec Conversion, reliability is the foundation of our product design. Using proven IGBT/IGCT or traditional LCI technology our variable frequency drives are custom engineered to provide outstanding static and dynamic performance with a high level of efficiency across the driven equipment's entire operating range.

Our Variable Frequency Drives' built-in WINDOWS® based diagnostic tools and streamlined modular design result in easy maintenance and repair.

In addition, the flexibility of our modular design allows us to configure compact solutions granting you greater flexibility in terms of plant layout. Our remote diagnostics features can play an important role in your maintenance and operating strategies, contributing to a significant reduction in Life Cycle Costs for your equipment by making it possible for plant managers and technicians to monitor equipment performance from any position across the globe.

Compliant with all applicable norms and standards including IEEE519 and EN-IEC 61800

EXCITATION SYSTEMS & SOFTSTARTERS

APPLICATIONS:

- Voltage regulations of synchronous generators
- Power control of synchronous motors

The Silcostat is an AC/DC thyristor power converter that supplies excitation current to the motorwindings.

The digital soft starters Silcostart are designed to start induction motors in any fixed speed application, mitigating mechanical shock and reducing inrush current to protect both motor and load.

Silcostat

Power range:

Natural air up to 200 A
Forced air up to 3500 A
Forced water up to 6000 A

Cooling methods include:

- Natural air
- Forced air
- Forced water with water/water-air exchanger

Silcostart

Power range:

400 - 9000 kW

Voltage:

3300 - 11000 V

Main characteristics:

- Input voltage tolerance ± 10%
- Frequency 50/60 Hz ± 5%
- Control signals fiber-optically isolated from HV signals
- Remote control with dedicated digital inputs (24Vdc and 230Vac)
- Remote monitoring with dedicated digital outputs (dry contacts)
- Current limit: adjust. 100 - 3/400 % In (ask the factory)
- Ramp-up time: adjust. 1- 30 sec.
- Numbers of starts : 2/3 per hour at maximum conditions according to the motor data.

LOW VOTAGE DRIVES

APPLICATIONS:

AC Drives

- General purpose drives for water treatment, energy, marine, petrochemical

DC Drives

- General purpose drives for metals, paper, cement, textile, material handling

Nidec has a complete range of AC and DC LV drives from 0.75kW up to 4MW (in parallel configuration) that are widely used by System Integrators and End Users across the globe in heavy industry applications where uptime and reliability are paramount. With the recent acquisition of Control Techniques we further enlarge our product range, especially for general purpose applications. We also have a wide range of Active Front End (AFE) inverter solutions

DC Drives

Current ratings:

25-4000A dc

Input Voltage:

240 - 950 V ac

Power range:

3.7 kW to 12 MW

Voltage:

230 - 1500 V dc

Unidrive M

Voltage classes:

380÷480 V ac
575 V ac
690 V ac

Power ratings: up to 1600 kW

Power configurations:

AC/AC (6-12-18 pulses)
DC/AC
AFE (regenerative versions)

AD 5000 & AD 3000

Voltage classes:

380÷480 V ac (F)
500 V ac (G)
525÷690 V ac (K)

Power ratings: up to 4000 kW

Power configurations:

AC/AC (6-12-18 pulses)
DC/AC
AFE (regenerative versions)

POWER CONVERSION SYSTEMS

APPLICATIONS:

- Photovoltaic Power Plants
- Smart Micro Grids

Nidec Conversion has more than forty years of experience in power conversion solutions with significant experience in power quality. The PCS (Power Conversion System) consists of power converter, control system, transformer & switch gear (where needed). For Battery Energy Storage Systems the PCS offers bi-directional power conversion and can be configured for both on-grid and off-grid use. Thanks to the sophisticated algorithms and open control platform, the PCS seamlessly integrates with any battery management system (bms) regardless of type or brand. The PCS is available in two standard configurations:

- a modular cabinet based solution for internal and external installations
- a fully containerized plug and play solution, 1.5 kV up to 10 MVA single machine

PCS GS1500

This solution is ideal for system integrators and end users who require high-performance solar inverters for large photovoltaic plants and are interested in reducing installation time and the overall complexity of the plant to enhance power production and performance. The PCS is based on the state-of-the-art inverter GS1500i, with an innovative cooling system which significantly reduces system losses offering one of the highest efficiencies on the market today.

GS1500i

- High PV input voltage up to 1500 V dc
- Maximum inverter power 5 MW ac; 10 MW ac for turn-key stations
- Max Efficiency: 99%; EU Efficiency: 98.8%
- Outdoor installation (IP54 or NEMA 3R); indoor version also available
- Air Cooled (water cooling available upon request)

POWER CONVERSION SYSTEMS

APPLICATIONS:

- Battery Energy Storage Systems
- Smart Micro Grids

PCS ES1000

This line of 1000 V PCS is based on Nidec's significant experience in battery energy storage systems. Thanks to the sophisticated algorithms and open control platform, the PCS seamlessly integrates with any Battery Management System regardless of type or brand. It is compliant with IEC standards and has been UL certified. It is also ready for the next generation of batteries at 1500 V.

ES1000i

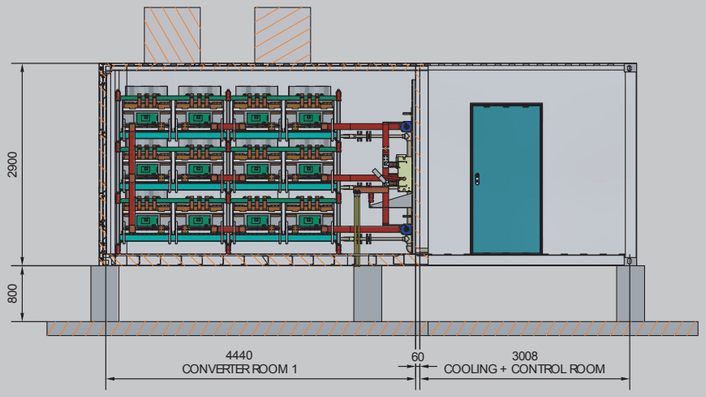
- Inverter voltage: 1000 V dc
- Maximum inverter power: 2 MW ac
- Max Efficiency: 98.84%; EU Efficiency: 98.62%
- Indoor installation (IP31 / NEMA 1)
- Water cooled

PCS ES690

This PCS solution is based on our own consolidated LV inverter technlogy for industrial applications. Compliant with IEC Standards, it has been successfully installed in multiple projects worldwide. The basic building block of our Power Conversion Systems is our ES690i smart inverter with Active Front End. Used widely in industrial automation, these drives are well known for their reliability and rapid response time.

ES690i

- Inverter voltage: 525 – 690 V
- Power range: 480 – 6000 kW
- Max efficiency 98.5% with very low harmonics
- Available with either forced air or water cooling



SILCOVERT TH

Silcovert TH is a series of medium-voltage PWM Voltage Source Inverters for the most demanding applications where reliability and performance are fundamental requirements. Built around the most up-to-date IGBT technology, its multi-level structure makes it suitable for driving any motor at variable speed in the power range from 400 kVA to 100 MVA (4 containers/VFD in parallel), up to 13.8 kV.

We offer a modular and flexible solution, suitable for cabinet and container installation for a wide variety of applications.

Series 7000

Power range:
Air cooling: up to 8900 kVA
Water cooling: up to 21200 kVA
Voltage: 2400 to 7200 V
Output Frequency:
up to 250 Hz -Up to 330 Hz with derating

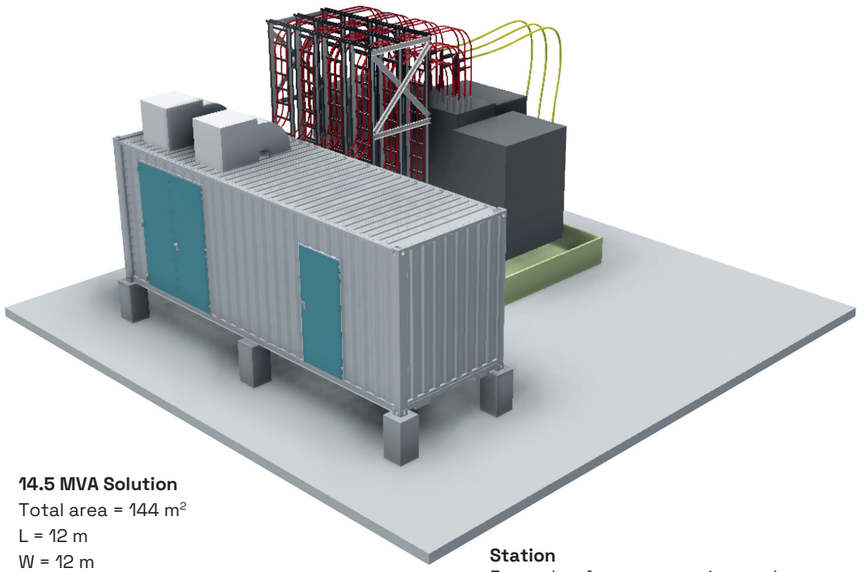
Series 14000

Power range:
Air cooling: up to 7000 kVA
(up to 14 MVA in parallel configuration)
Water cooling: up to 30000 kVA
(up to 100 MVA in parallel configuration)
Voltage: 6600 to 13800 V
Output Frequency:
up to 250 Hz -Up to 330 Hz with derating

SILCOVERT TH

Containerized solutions are the ideal choice when space is limited and costly. Our containers, in pre-engineered configurations for outdoor installation, are designed to minimize footprint and simplify system integration.
If you are extending an existing electrical room or installing new equipment in a congested area, you can benefit from these modular configurations that require minimum civil works. Control wiring and power cables have been studied for simple plug & play solutions.

Extensive factory testing prior to shipment shortens installation and commissioning time so that your plant is on-line in the shortest possible time.



14.5 MVA Solution
Total area = 144 m^2
L = 12 m
W = 12 m

Station
Example of our pre-engineered configuration

Data about other configurations are available upon request.
Higher power ratings available upon request.

SILCOVERT N

APPLICATIONS:

- Finishing block for rod mill
- Ship propulsion
- High reversing cold mill
- Roll mill
- Mill stand & coilers
- Tube mill
- Conveyor starter

The Silcovert N Series is a high performance neutral point clamped voltage source drive for induction and synchronous motors. Both field oriented and V/Hz controls are available for different applications.

Silcovert TN

Power range:

Air cooling 1300/10400 kVA
Water cooling up to 21600 kVA

Voltage:

Up to 3300 V

Drive Topology:

Neutral Point Clamped (NPC)
Active Front End (AFE)

Output Frequency:

Normal 5 - 70 Hz
Extended 5 - 140 Hz

Silcovert GN

Power range:

Water cooling 9000 - 24000 kVA
(higher power on request)

Output Frequency:

Normal 10 - 65 Hz
Extended 10 - 100 H

SILCOVERT S

APPLICATIONS:

- Starting of synchronouscompensators, large gas turbine alternators or motor/generators
- Ship propulsion Pumps and fans
- Extruders and mixers
- High power ratings
- High speed applications

The Silcovert S is a load-commutated current source inverter (LCI) for synchronous motors and provides speed regulation, motoring and braking torque regulation, and programmable V/Hz profiles. The Silcovert S has a rugged, compact design and is highly efficient and reliable.

Silcovert S

Power range:

Air cooling up to 20000 kVA
Water cooling up to 75000 kVA

Voltage:

Air cooling: up to 6600 V
Water cooling: up to 10000 V

Output Frequency:

5 - 95 Hz

Container Solutions available

Features:

- High accuracy
- Four-quadrant operation
- High immunity to any line transient and “flying restart” after a supply voltage loss or dip
- High starting torque and wide constant torque operation range
- Air and water cooled
- 98% efficiency

POWER QUALITY

APPLICATIONS:
Industrial, renewables and transmission & distribution

Power Quality is one of our key areas of expertise. We work closely with end users, grid operators and utilities to identify the best solution to ensure grid stability on transmission and distribution networks. We offer a full range of reactive power compensation solutions including SVCs, Statcoms and LV Statcoms.

Silcovar D

Technical Data Summary:
- Suitable for demanding applications
- Reactive Power rating: From ± 0.5 MVAr to ±10 MVAr and up to [0; 20] MVAr
- Max rated voltage: any Medium Voltage level with standard transformer
- Rated frequency: 50/60Hz
- Cabinet and container solutions
- Cooling: forced ventilation/Water
- Modular and flexible solution: scalable to different power and voltage levels
- Suitable for redundant operation

Common Applications:
- Steel, Mining, Oil&Gas
- Renewables
- Utilities
- Traction

Key features:
- Very low total harmonic distortion
- Fast and stable response time of current control
- Fast active and reactive load current extraction
- Fast power factor correction
- Fast compensation of negative sequence of load current
- Mitigation of switching transient of capacitor filter
- Active damping and mitigation of grid voltage oscillation
- Voltage support and mitigation of voltage dips

Silcovar H is a medium voltage statcom that can implement the function of “grid forming + energy storage” in delta connection configuration

Silcovar H

Technical Data Summary:
- Suitable for demanding applications
- Reactive Power rating: From ± 2,6 MVAr to ± 300 MVAr. Greater power ratings than 300 MVAr can be reached with customized solutions, please contact Nidec
- Maximum rated voltage 40 kV. Greater voltage ratings than 40 kV can be reached with customized solutions
- Rated frequency: 50/60Hz
- Container, Cabinet and Building solutions
- Cooling: Air forced or Water
- Modular and flexible solution: scalable to different power and voltage levels
- Suitable for redundant operation

Common applications:
- Heavy industries such as Melt Shop with Electrical Arc Furnace
- Renewables
- Utilities
- Traction

Key features:
- Flicker mitigation and Selective Harmonic mitigation
- POD function
- Very low total harmonic distortion
- Fast and stable response time of current control
- Fast active and reactive load current extraction
- Fast power factor correction
- Fast compensation of negative sequence of load current
- Mitigation of switching transient of capacitor filter
- Active damping and mitigation of grid voltage oscillation
- Voltage support and mitigation of voltage dips

Silcovar C

Technical Data Summary:
- Well-proven technology
- Reactive Power rating: up to 330 MVAr. Greater power ratings than 330 MVAr can be reached with customized solutions, please contact Nidec
- Maximum rated voltage 35 kV. Greater voltage ratings than 35kV can be reached with customized solutions, please contact Nidec
- Cooling: Water
- Rated frequency: 50/60Hz
- Electrically and Light Triggered Thyristors (BCT, PCT, LTT)

Common applications:
- Electric arc furnaces and rolling mills
- Transmission lines

Key features:
- Flicker mitigation
- Low total harmonic distortion
- Fast active and reactive load current extraction
- Power factor correction
- Compensation of negative sequence of load current
- Voltage support

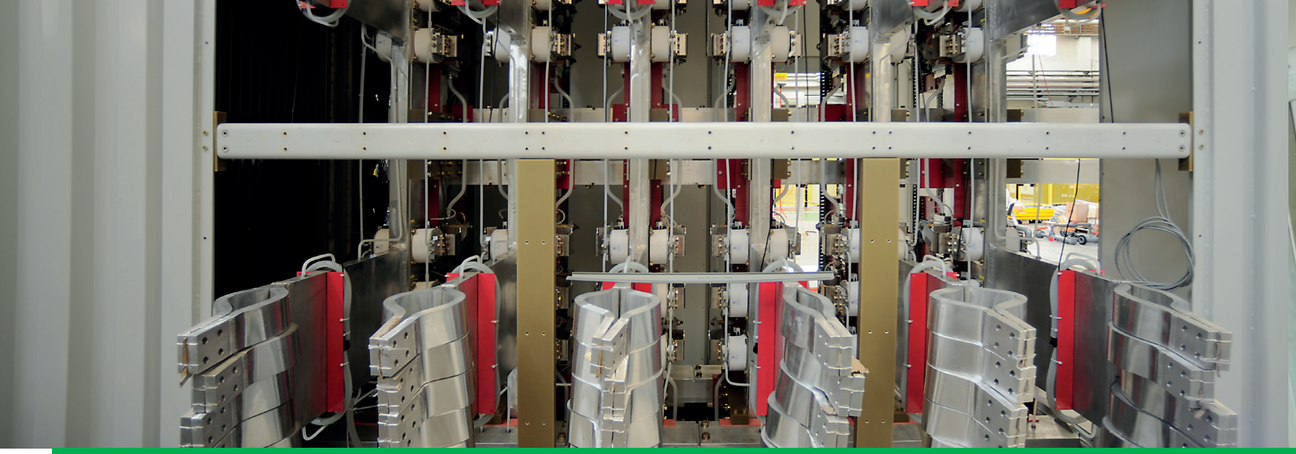
Silcovar T

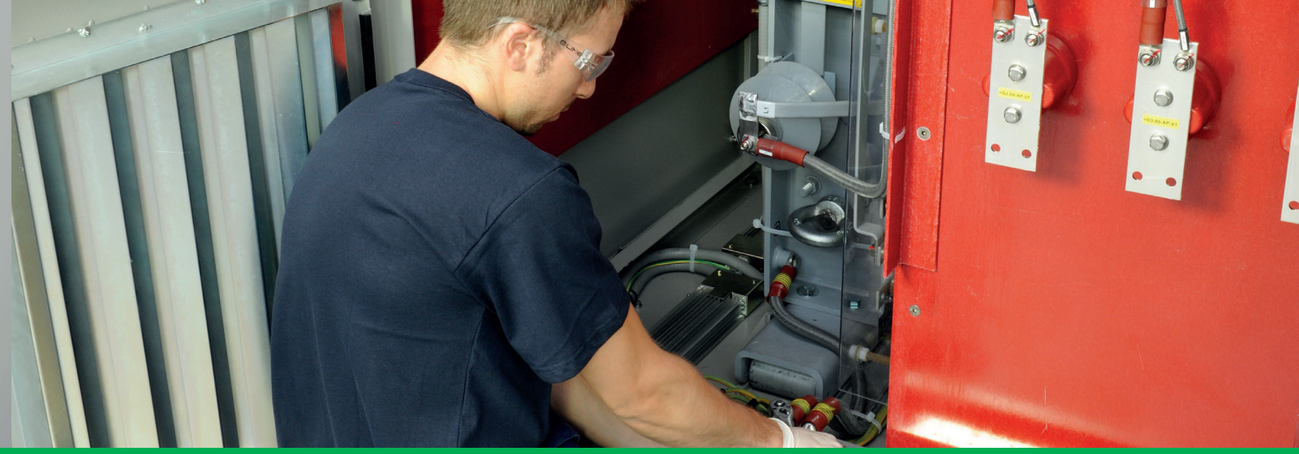
Technical Data Summary:
- Outdoor panel solution:IP 54
- Reactive Power rating: up to 5,4 MVAr (greater value can be offered after dedicated analysis)
- Cooling: Air Forced
- Rated frequency: 50/60Hz
- IGBT Technology

Common applications:
- Renewable
- Transmission and distribution
- Rolling mills,steel,Mining,Oil&Gas, etc..
- Utilities

Key features:
- N-1 Power redundancy
- Modular power design
- Pollution degree 3
- Power factor correction
- Voltage support

SPECIAL SIZES AND GREATER POWER RATING CAN BE PROVIDED UPON REQUEST





POWER SUPPLY

APPLICATIONS:
Smelting, electrowinning and chloralkali production

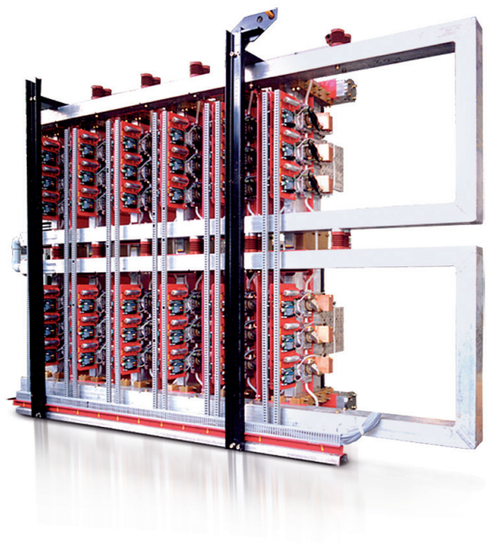
Nidec Conversion has over 30 years of consolidated experience in the field of medium and large power AC/DC converters. Our SILCOMAX DC power systems are designed to provide your process with an ultra reliable DC current source. With our own in-house rectifier technology, Nidec designs systems fully tailored to your needs.

Silcomax Large

- Up to 60kA for each 6 pulse double phase connection
- Up to 100kA for each 6 pulse single phase connection
- 6 / 12 pulses reaction (higher pulse reaction upon request)
- Up to 1600 Volts
- Horizontal thyristor/diode bar layout
- Optical firing and monitoring
- Advanced water cooling
- Open or containerized solutions

Silcomax Light

- Up to 25kA for each 6 pulse double way connection
- Up to 50kA for each 6 pulse single way connection
- 6 / 12 pulse reaction (higher pulse reaction upon request)
- Up to 1000 Volts
- Vertical thyristor bars layout
- Press-pack fuses and thyristors
- Optical firing and monitoring
- Water cooled designs
- Cabinet (up to IP54) and container solutions



SERVICE

Customer Proximity remains one of our strongest commitments.

Our capabilities extend to personalized assistance to meet our customers' needs. Our staff of highly qualified supervisors, as well as our Service Engineering team, are available to oversee complex interventions should the need arise. Nidec guarantees original manufacturers' spare parts for the life of your equipment and offers a wide range of personalized contracts for preventive and predictive maintenance which are tailored around your needs and production schedule. Nidec has over 180 subsidiaries and affiliates across the globe, providing manufacturing, sales and service support to Nidec's extensive customer base.

- Personalized assistance
- Long term maintenance agreement
- Global support

Nidec

All for dreams

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www.nidec-conversion.com