

—
POWER
CONVERSION
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SOLUTIONS

FOR RENEWABLES & INDUSTRIES



OUR VALUE PROPOSITION FOR
DC POWER CONVERSION SOLUTIONS

- Strong & proven expertise and state of the art tools for DC power supply system design, optimization and test.
- Focused team and important engineering capabilities allowing to design customized and cost-efficient solutions.
- Leading components for DC power conversion, switching, protection and control.
- Last generation control platform.
- Industrial base for production of standardized electrical solutions in Europe and Asia.
- Worldwide network for technical support and service points.

MAIN BENEFITS

- ✓ Expert knowledge of DC power conversion and protection
- ✓ A broad range of solutions
- ✓ Standard products and custom solutions
- ✓ System competencies and engineering capabilities
- ✓ Extensive testing for high uptime
- ✓ Knowledgeable customer support technicians
- ✓ Proven designs accepted worldwide

COMPETENCIES

With decades of experience in **DC power conversion, switching, protection & control**, Sécheron is uniquely placed to provide a broad range of field-proven solutions for a variety of DC applications, such as hydrogen production (electrolyzer stabilized power supplies), energy storage (high-power battery systems) as well as other renewable energy and industrial applications.

The Sécheron Power Conversion engineering team supports customers through development and manufacturing services in the realization of both standard and specific converters from concept to series production.

Sécheron's customers gain competitive advantages through short development cycles, and innovative, field-tested and high quality solutions for DC power conversion.

Supply program

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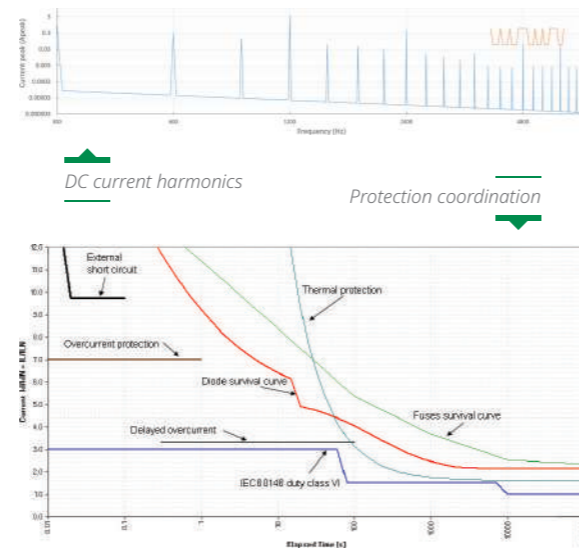
Sécheron's entire value chain, from initial requirement to production



COMPETENCIES

ENGINEERING

- Selection of the best technology or architecture to meet the needs with reuse of existing field-tested building-blocks when possible.
- Kick-off and development project management through a phase-gate process validated by a Quality Management System.
- Hardware design, sizing of components, dimensioning and specification of magnetics.
- Electrical diagrams and mechanical construction, taking into consideration EMC requirements.
- AC and DC network power quality assessment, protection coordination, study of worst-case scenarios.
- Converter control strategy, real-time control embedded software design.
- PLC & control command interface programming.
- Design FMECA: MTBF, MTTR and Life Cycle Cost.



Transformer-converter group expertise

We provide consulting service for transformers according to standard IEC 62695 (EN 50329):

- Technical specification.
- Monitoring during the manufacturing process with the supplier.
- Assistance during factory acceptance test.
- Assistance during the combined tests of the complete transformer-converter group.

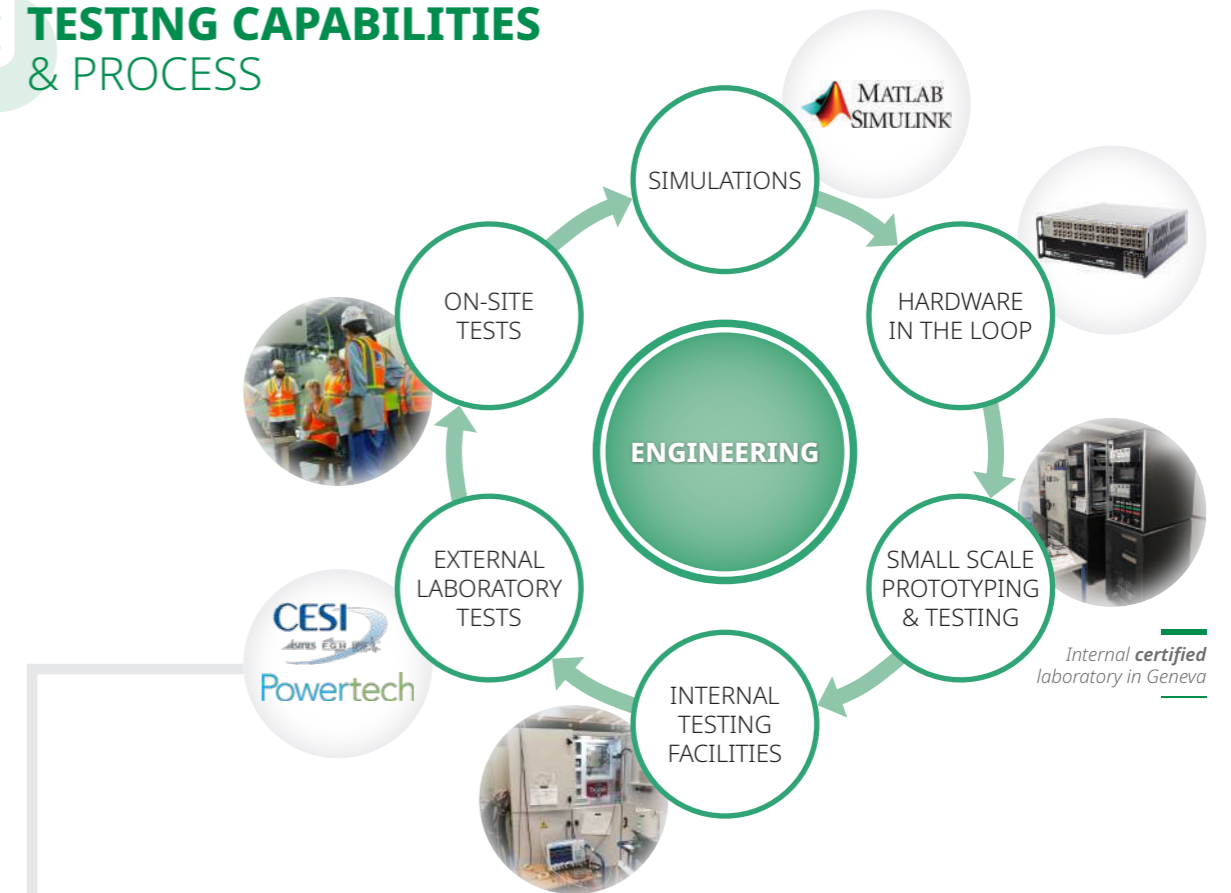
To ensure a good harmonization between our products and the transformer, Sécheron is able to provide the complete transformer-converter group.

SUPPLY CHAIN & PRODUCTION

- In-house capability for prototyping, production and test of power stacks.
- Production, test and Factory Acceptance Test of complete converters in Sécheron's manufacturing facilities in Czech Republic.



TESTING CAPABILITIES & PROCESS



COMMISSIONING SERVICES

Sécheron provides **on-site and remote support** for the commissioning of our equipment worldwide. All commissioning projects are overseen by our qualified commissioning and training experts, to ensure that your installation is erected and put into service quickly and efficiently. We can optimize control parameters and protections, troubleshoot in the event of a problem, and train your operations staff.

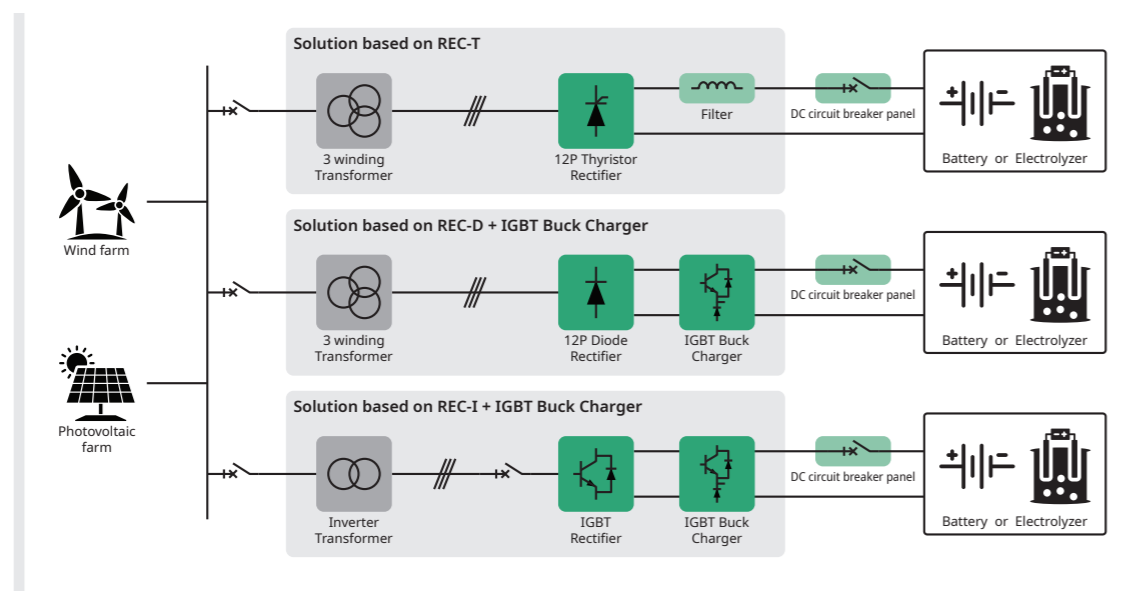
APPLICATIONS

RENEWABLE & NEW ENERGY APPLICATIONS

Sécheron designs and manufactures DC power conversion products and solutions for the safe, reliable DC supply of multi-megawatt electrolysis and battery systems. The following solutions are available depending on our customers' AC and DC power quality requirements:

- **REC-T based DC power supplies:** Simple, robust and cost-efficient at high power
- **REC-D and IGBT Buck Charger based:** Good reactive power factor on the AC side and low switching harmonics on the DC side
- **REC-I and IGBT Buck Charger based:** Unity power factor on the AC side and low switching harmonics on the DC side

Power supply for green hydrogen & energy storage



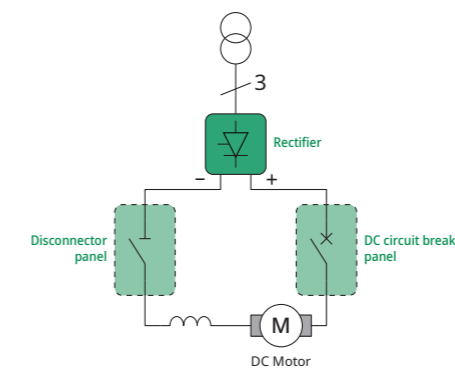
Battery charging solutions for electromobility and others

Sécheron is able to provide several different configurations of power supply systems which include our converter products, from simple diode rectifiers to smarter and modern solutions, shaping the suitable power to all types of DC charging stations for electrical vehicles (trains, trucks, buses, cars...).

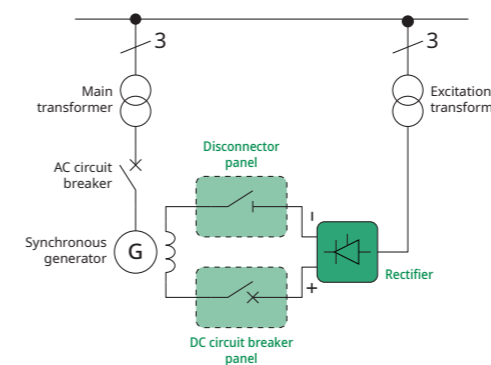


INDUSTRIAL APPLICATIONS

Rolling mill DC drive for hydrogen-based steel / aluminium factories



Static excitation for power plant generator



OTHER TYPES OF APPLICATIONS

- Solar photovoltaic
- Data centers (uninterruptible power supplies)
- Electric mining haul trucks
- Marine (azimuth thrusters, cycloconverter drives, etc.)
- Test stands for vehicles (DC dynamometers)
- Heavy AC drives with low system frequencies
- Others...



PRODUCTS

Thyristor inverters & controlled rectifiers

INV-T REC-T

The design of our INV-T inverters and REC-T controlled rectifiers is based on optimally sized and field-proven thyristors, offering particularly high performances and reliability.

Thyristor press-pack technology also provides high overload capacity, allowing for natural air-cooled and low maintenance solutions.

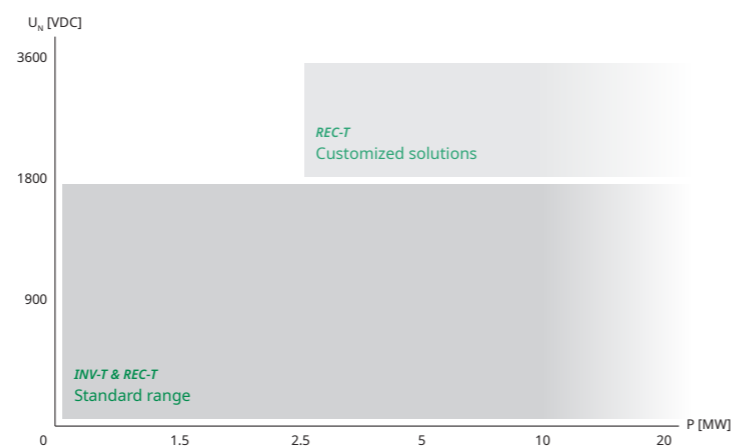
	Unit	INV-T / REC-T
Efficiency	[%]	> 98
Power factor	-	1 (with optional filter)
THDi	[%]	< 5 (with optional filter)
Cooling	-	Natural or forced air
Max. ambient temperature	[°C]	40 (without derating)
IP degree	-	Up to IP32
Noise level	[dB]	< 65
Insulation levels	-	Tested for Cat 3 Power Frequency Withstand Voltage Levels according to IEC 61992-1

Brochure INV-T · SG839110BEN

Brochure REC-T · SG841750BEN



Product range



IGBT inverters & rectifiers

INV-I REC-I

Our modular IGBT inverters and rectifiers follow the strictest requirements of sustainability, maintainability and durability.

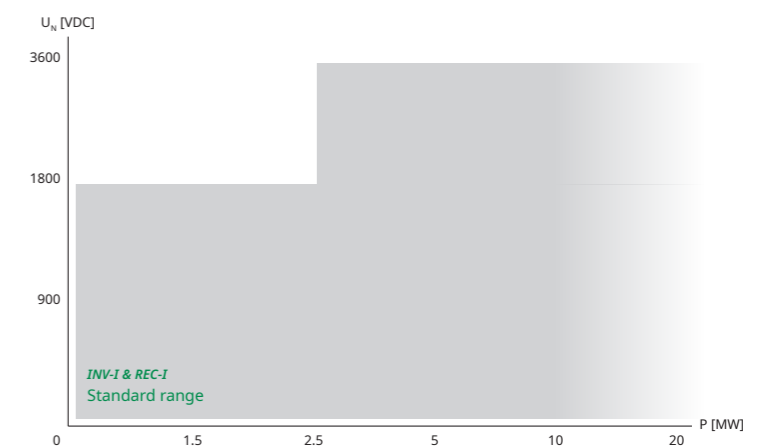
In comparison with thyristor technology, these IGBT converters offer improved harmonic performance and unity power factor. An additional advantage of this technology is the use of simple transformers or autotransformers that allow connection to an existing installation.

	Unit	INV-I / REC-I
Efficiency	[%]	> 97.5
Power factor	-	1 (fully controllable)
THDi	[%]	< 5
Cooling	-	Forced air
Max. ambient temperature	[°C]	40 (without derating)
IP degree	-	Up to IP32
Noise level	[dB]	< 75
Insulation levels	-	Tested for Cat 3 Power Frequency Withstand Voltage Levels according to IEC 61992-1

Brochure INV-I · SG839109BEN



Product range



PRODUCTS

High-speed circuit breaker panels

MBS



with integrated High-speed circuit breakers

UR



Brochure MBS-HD (EN/IEC) · SG839111BEN
 Brochure MBS-HD (IEEE/ANSI) · SG839112BEN
 Brochure MBS-SECUB · SG839113BEN
 Brochure UR · SG104249BEN

Control & protection relays

SEPCOS



Brochure SEPCOS · SG825866BEN

Our control & protection relays deliver network communication and satisfy the most demanding safety requirements applicable to DC networks.

Equipped with a programmable logic unit, SEPCOS allows to freely define the operating logic functions, in order to match the requirements of the system being supervised.

Modularity and adaptability are the key strengths of SEPCOS, offering a wide choice of communication BUS and ethernet protocols, as well as a flexible connectivity.

Disconnect switch panels

PADS



with integrated Disconnectors

SW



Brochure SW · SP1880098BEN

Converters control board

UNITY



UNITY is a modular digital platform designed to control all Sécheron power conversion equipment with the objective of covering the widest variety of applications.

Electronic design has been specified and developed within the Sécheron Hasler Group.

UNITY platform embeds in-house firmware and sophisticated control software and algorithms allowing flexibility and adaptive capability to multiple applications and requirements.

Contactor panels



with integrated Contactors

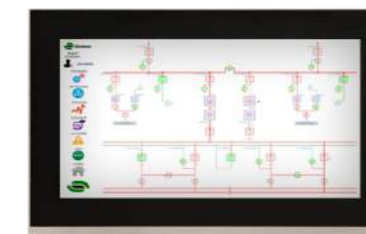
BMS



Brochures BMS..08/BMS..10 · SG202168BEN
 Brochures BMS..15/BMS..18 · SG202454BEN

Control command & local SCADA

KEOPS



Brochure KEOPS · SG817955BEN

KEOPS is a polyvalent, modular and powerful system of supervision supporting operations and preventive maintenance of the power supply network.

In order to meet high demands in reaction time and cost efficiency, KEOPS is based on modern communication protocols and combined with user-friendly interface.

In addition, all information, documents, event history, protection curves and diagnostic are available to be transmitted to the centralized SCADA system.

Available protocols:
 IEC 61850, IEC 60870-5101/104,
 DNP 3.0, Modbus-TCP, Profinet, ...

SÉCHERON'S WORLDWIDE NETWORK

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