TRACTION
POWER
SYSTEMS

Sécheron

SUPPLY PROGRAM

FOR RAIL TRANSPORTATION

Supply program

Sécheron offers an **extensive range of products** for
electrification of public transport

This document is intended to give a brief idea of our **services**, **cubicles** and **systems** in the field of traction substations.

Detailed brochures are available for all products.

APPLICATIONS

DC electrification

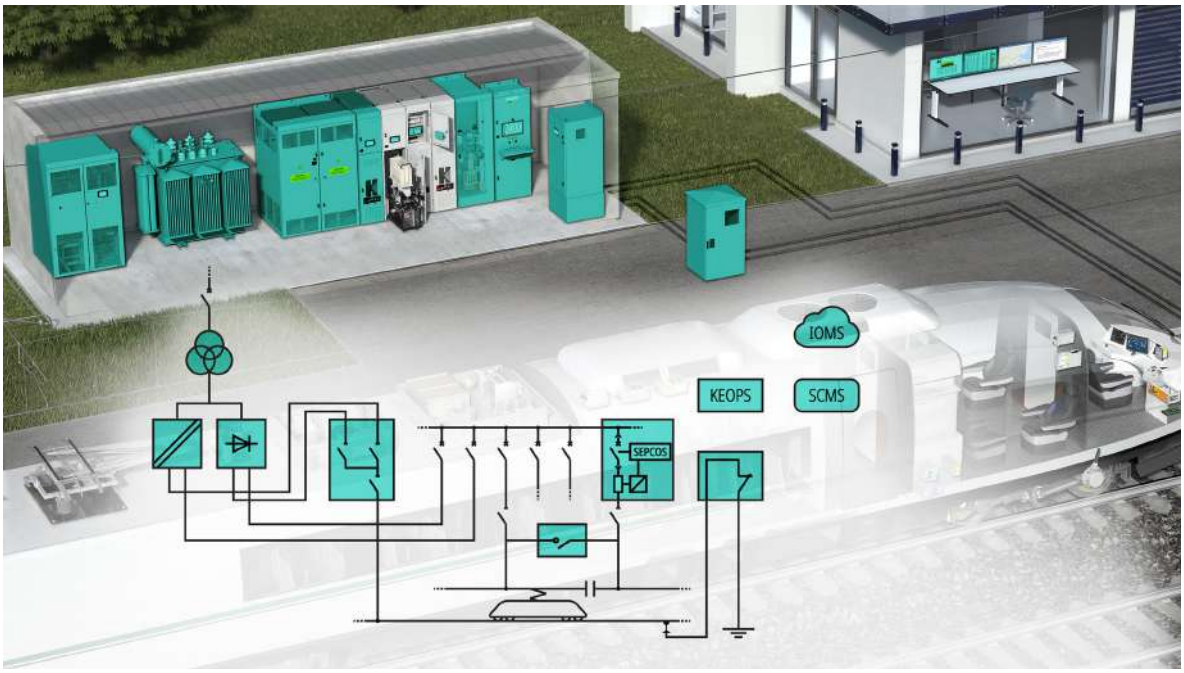
Wherever DC substations are found, Sécheron DC electrification equipment helps deliver power and provide protection for people and property in the railway industry. Whether you need an individual component or complete DC substation, you can count on Sécheron for reliability and performance backed by extensive factory testing.

Sécheron develops and manufactures components and solutions for the DC traction substations that power and protect mass transit and railway systems. We have more than 80 years of experience serving the railway industry. Our DC electrification equipment is in service on mass transit and light railway networks in most major cities and on DC railway lines in many countries worldwide.

AC electrification

With a complete range of equipment and a long-lasting expertise in traction power, Sécheron is a world leader in the design and production of AC vacuum circuit breakers. Whether you need an outdoor railway vacuum circuit breaker (ORS) or an outdoor railway skid mounted switchgear (SKID), you can count on Sécheron for reliability and performance supported by extensive factory testing.

In case the request is for an indoor solution, Sécheron is proud to offer one environmental-friendly solution (SF6-free) with the air insulated metal clad switchgear (MCS) for AC traction power distribution.



ENGINEERING SERVICES

NETWORK EXPERTISE

It is essential to understand all the subsystems of a traction network such as the AC network interface, DC power supply substations, DC network and vehicles, and our engineering team does this successfully and effectively.

Available for clients looking to establish or to improve existing equipment or services, Sécheron is able to apply its extensive professional experience to a variety of situations.

Our offer includes a wide range of services from dynamic network simulation to measurement on-site and in the laboratory, through various calculations and tests on transformer-rectifier sets and short-circuits.

Transformer-rectifier unit in-line test

Our experience in this domain has allowed us to develop specific software for the design of the transformer and rectifier more accurately and efficiently. We are able to answer questions regarding transformer-rectifier units and their operation within the traction system.

Sécheron has a strong experience in leading combined tests of transformer-rectifier units according to IEC 62590, EN 50327 and IEEE 1653.2 standards in major test laboratories (CESI, IPH, KEMA and Powertech).

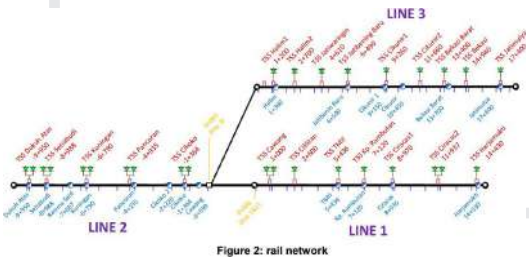


Figure 2: rail network

Consulting expertise

Network expertise is essential to accommodate future growth and expansion of the railway system.

Our consulting expertise helps identify areas where infrastructure investments are necessary and ensure seamless integration with existing infrastructure.

We help the customer in the dimensioning of the equipment, in order to have the best solution according to the project needs and standards.

Brochure Network expertise · SG815456BEN

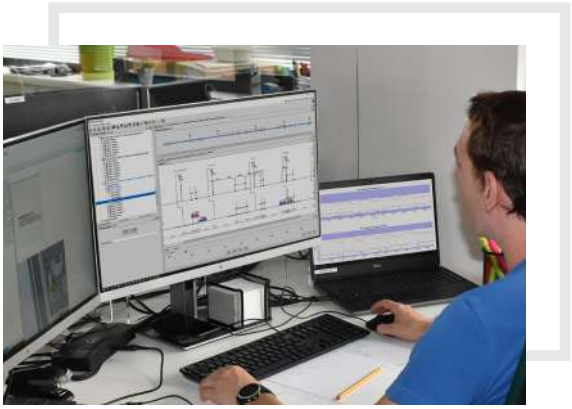
SIMULATIONS

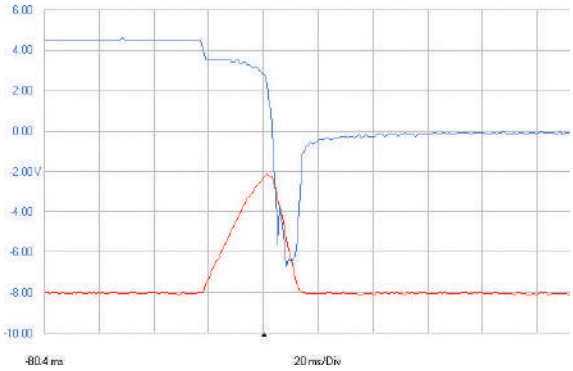
For DC railway applications, a good knowledge and understanding of the entire system's behaviour is highly important.

It is fundamental to know if the electric system is capable of sustaining the foreseen traffic.

Sécheron has conducted various studies for different systems of railway all over the world: Asia, Europe, Middle East, South America and Pacific.

As a manufacturer, Sécheron can complement these studies with advice on the selection of well adapted hardware and make propositions of actions to be done to fix problems and avoid critical situations.





Dynamic DC network simulation

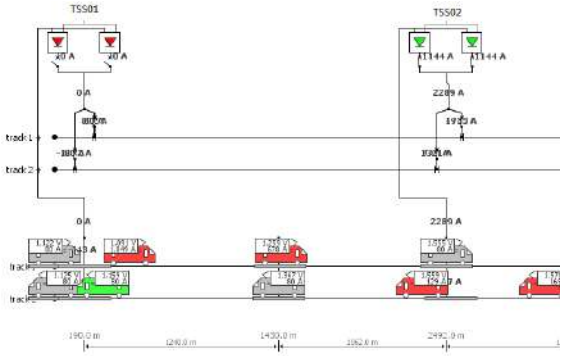
Sécheron is able to analyse all kinds of networks, from the simplest ones (one segment only) to complex ones (with many branches, single/double track), and even with interconnections between them both (track interconnections or electrical links).

The simulation takes into account the foreseen service between different lines even with diverse headway and rolling stock.

Simulation for different cases

Simulation for normal case (all substations in service) and abnormal cases. Without information from the customer, one substation out of service has been considered for abnormal cases. If the customer needs other failure types (for example two consecutive substations out of service), this can be done but must be specified as input data.

With the simulation results, Sécheron will provide a general conclusion with detailed recommendations concerning all presented results.



Brochure Simulations · SG868482BEN

EFFICIENT

POWER CONVERSION

Using experience accumulated over more than 100 years working in the field of traction power substations, Sécheron has designed the EFFICIENT product category from the ground up to cover all the customer needs for DC supplies.

All EFFICIENT products are built specifically to comply with the most stringent requirements of usability, maintainability and durability in traction power application environments, maximizing the return on investment for our customers. These reliable and field-proven building blocks are also the basis for custom applications upon specific requests.

Transformers

Based on strong experience, Sécheron provides engineering and consulting support services for transformers according to standards IEC 62695 (EN 50329), IEC 60076 and IEEE 1653.1:

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

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

AC/DC bus ducts

BDUCT

Our BDUCT AC and DC bus ducts are designed for interconnecting groups of metal-enclosed or metal-clad switchgear, power converters and transformers. By manufacturing the bus duct as well as the switchgear, we contribute to efficient site integration between components.

Brochure BDUCT · SG859912BEN

	Unit	AC bus duct	DC bus duct
Rated voltage	[V]	Up to 1058	Up to 1200
Rated current	[A]	Up to 3000	Up to 15000
Rated frequency	[Hz]	50-60	N/A
Rated short-time withstand current	[kA]/[s]	30/1	69/0.25
Rated short-circuit withstand current	[kA]	70	121

Diode rectifiers

REC-D

Brochure REC-D · SG825863BEN

Sécheron is able to propose a reliable and suitable range of REC-D diode rectifiers for DC traction power supply. Our natural air cooled rectifiers are equipped with diode blocks with high overload capability and high blocking voltage.

	Unit	REC-D		
Rated DC voltage	[V]	750	1500	3000
Rated current	[A]	Up to 6000	Up to 4000	Up to 3000
Overload capacity	-	Class VI per EN 50328 / IEC 60146 Extra Heavy Traction Service per IEEE 1653.2 (others on demand)		
Maximum altitude	[m]	1000 (without derating)		
IP degree	-	Up to IP32		

Thyristor controlled rectifiers

REC-T

Brochure REC-T · SG841750BEN

Sécheron's REC-T thyristor rectifiers incorporate decades of experience in traction rectifiers, making these controlled rectifiers for DC traction power supply and industrial applications a reliable long-term investment.

	Unit	REC-T		
Rated DC voltage	[V]	750	1500	3000
Rated power	[MW]	0.5 - 3	1 - 6	6
Maximum power	[MW]	Up to 9	Up to 9	Up to 12
Maximum altitude	[m]	1000 (without derating)		
IP degree	-	Up to IP32		

Rectifiers with insulating switch

REC-AIS

Brochure REC-D · SG825863BEN

Sécheron also offers a cubicle which integrates both functions of rectifier (up to 1200 kW) and isolating switch for special applications for light rail systems (compact solution for tramway and trolley-bus).

IGBT inverters

INV-I

Brochure INV-I · SG839109BEN

Answering to increasing energy efficiency requirements of rail transportation, the INV-I high power IGBT inverters have been designed to recover the excess braking energy present in the system.

	Unit	INV-I
Power	[MW]	0.5 - 9
AC frequency	[Hz]	50/60
Efficiency	[%]	> 97
IP degree	-	Up to IP32
Cooling system	-	Forced air

IGBT phase leg

The design of the INV-I inverters is based on the latest IGBT module technology, combining both high efficiency and reliability.

The INV-I inverters are designed in accordance with customer specifications and International, European or American standards.

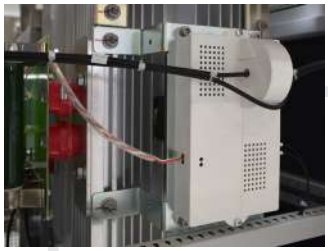
Thyristor inverters

INV-T

Brochure INV-T · SG839110BEN

The design of the INV-T inverters 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
Power	[MW]	1 - 9
AC frequency	[Hz]	50/60
Efficiency	[%]	> 98.5
IP degree	-	Up to IP32
Cooling system	-	Naturel / forced air



Fully recovering the energy of decelerating vehicles instead of wasting it as heat in braking resistors offers the following advantages:

- Reduction of total energy consumption
- Reduction of heat in tunnels
- Reduction or complete removal of braking resistors in the rolling stock

Reversible controlled converters

REV

Brochure REV · SG847024BEN

Using modular configurations, the REV reversible controlled converters can handle the asymmetrical power flow of traction acceleration and braking while maintaining constant DC voltage in narrow regulation range.

	Unit	REV
Power	[MW]	0.5 - 9
AC frequency	[Hz]	50/60
Efficiency	[%]	Up to > 98.5
IP degree	-	Up to IP32
Cooling system	-	Forced air

Reversible group boost converters

BOOST

Brochure BOOST · SG868481BEN

Sécheron's BOOST reversible group boost converter is an innovative technology for implementing fully reversible traction power substations.

The BOOST is composed of an IGBT inverter connected to the secondaries of a traction transformer.

	Unit	BOOST
Power	[MW]	0.5 - 9
AC frequency	[Hz]	50/60
Efficiency	[%]	Up to > 98.5
IP degree	-	Up to IP32
Cooling system	-	Forced air

Automatic assured receptivity units

AARU

Brochure AARU · SG866829BEN

The AARU automatic assured receptivity units is a wayside energy dissipation system designed to assure braking energy receptivity for train systems not equipped with on-board resistors.

	Unit	AARU
Type	-	IGBT stacks AARU
Power	[MW]	0.5 - 4.5
Voltage range	[V]	520 - 1950
IP degree	-	Up to IP32
Cooling system	-	Forced air (IGBTs)

ESTRA-DC

DC SWITCHGEAR & DISTRIBUTION BOARD

With a leading expertise in DC traction power substations, Sécheron is your major partner for the electrification of DC traction networks, covering all activities from network design, calculation and engineering, to the production of the DC systems.

The ESTRA product category covers all key equipment applied in DC distribution, integrating DC high-speed circuit breakers, disconnect switches, load break switches, control & protection relays, measuring amplifiers, etc. We can offer tailor made solutions based on modular concepts and standard products. Our equipment is developed on world leading technology and proven worldwide design and acceptance. Our customers and partners benefit through this offer of all our system skills and experience.

Disconnect switch panels

PADS

Brochure PADS · SG859909BEN

Sécheron PADS disconnect switch panels cover all disconnector cubicle supply needs and are available for indoor and outdoor installations.

Our wide range of configurations address the vast majority of needs can be extended on request.

	Unit	PADS		
Rated current	[A]		8000	
Rated voltage	[V]	900	1800	3600
Control voltage	[V_{DC}/V_{AC}]	24 to 220		230
Poles	-		Up to 2	
Reference standards	-		EN 50123-3, IEC 61992-3, IEEE ANSI C37.20.1	

Load break switch panels

PALB

Brochure PALB · SG859910BEN

Sécheron PALB load break switch panels are available for indoor and outdoor installations.

Our wide range of configurations address the vast majority of needs can be extended on request.

	Unit	PALB		
Rated current	[A]		6000	
Rated voltage	[V]	900	1800	3600
Control voltage	[V_{DC}]		24 to 220	
Poles	-		Up to 2	
Reference standards	-		EN 50123-3, IEC 61992-3	

High-speed circuit breaker panels

MBS

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

The MBS high-speed circuit breaker panel is based on Sécheron traction DC protection experience, and proven technology components are applied for all major functions in this cubicle.

The DC switchgear serves as the control and protection equipment for the DC power distribution.

	Unit	MBS-HD	MBS-SECUB
Rated service current	[A]	Up to 8000	2500
Main busbar	[kA]	Up to 11	Up to 6
Protection degree	-	IP20 or IP42	
Busbar rating - Connection	[A]	Up to 8000	2500
Ambient temperature range	[°C]	-5 to +40	

Our MBS-HD high-speed circuit breaker panels meet the needs of rail vehicles such as trolleybuses, tramways, metros, heavy mass transit vehicle, monorails, commuter trains and main line railway vehicles. Our modular concept and standard products make it easy for us to customize a solution to address your unique needs.

The DC breaker panel type MBS-HD high-speed circuit breaker panels is a modular concept cubicle which integrates different functions and equipment in three compartments:

- Rear high-voltage busbar compartment
- Protection and control system
- High-speed circuit breaker trolley

The high-speed circuit breaker (Sécheron UR series) is mounted on a removable four-wheeled trolley which can be easily withdrawn from the cubicle. The trolley also contains the line test device equipment.

The HSCB is connected to the auxiliary circuits thanks to an unpluggable multiple connector and the breaker is connected to the high-voltage busbars by power finger connectors.

Key components of the switchgear are designed and manufactured by Sécheron and are fully compatible.

With automatized production facilities for assembly, wiring and testing of MBS range of cubicles, Sécheron can ensure a constant and top level quality for these products.

Voltage limiting devices

VGUARD

Brochure VGUARD · SG825867BEN

Sécheron's VGUARD voltage limiting device is built on proven technologies and meets the electrical safety and internal arc testing requirements in the EN 50122-1 and EN 50526-2 standards.

	Unit	VGUARD-B	VGUARD-H
Rated voltage	[VDC]	900 to 3600	
Nominal triggering voltage	[V]	50 to 750	
Non-triggering voltage	[%]	UT_n - 10	
Residual voltage at rated current	[V]	< 50	
Rated insulation voltage	[kV]	3.6	

VGUARD-B

- Basic VGUARD with contactor
- Class 3 according to EN 50526-2 standard
- Parameterization through the display
- Simple installation through compact design
- No commissioning required as the system is supplied ready for operation

VGUARD-H

- Hybrid VGUARD with contactor and thyristors
- Class 4 according to EN 50526-2 standard
- Maximum protection for personnel and equipment thanks to short reaction time
- Especially adapted to application > 1 kV
- High short-time current withstand
- Ensure VLD-F protection
- Compliant with Clause 9 (Limits for touch voltage and protection against the danger of rail potential) of EN 50122-1 standard

Isolated amplifiers for current measurement

MIU

Brochure MIU10 · SG813841BEN

The MIU10 amplifier is suitable for measuring high DC currents in power distribution systems for public transport networks.

The MIU10 measuring equipment, with its high voltage isolation, ensures safety for the equipment and for the personnel.

	Unit	MIU10
Supply voltage	[$V_{AC/DC}$]	24...230 $V_{AC/DC}$ -20% / +10%
Input sensitivity	[mV]	± 60, 90, 150, 300, 500, 5000
Output voltage	[V]	Us nom ± 5 V
Residual ripple	[mV_{eff}]	< 10
Voltage consumption	[VA]	< 5

Isolated amplifiers for voltage measurement

VM

Brochure VM10 · SG817910BEN
Brochure VM12 · SG830925BEN

Our VM amplifier measures high DC voltages in power distribution systems for public transportation networks.

With its high-voltage isolation the VM ensures the electrical safety of people and property.

	Unit	VM10	VM12
Supply voltage	[$V_{AC/DC}$] / [V_{DC}]	24...230 $V_{AC/DC}$ -20% / +10%	24 V_{DC} -20% / +10%
Cut off frequency (-3 dB)	[kHz]	> 5	
Residual ripple	[mV_{eff}]	< 10	
Voltage consumption	[VA]	< 5	
Sealing	-	IP40 (housing)	

Isolated relays for voltage presence detection

VP

Brochure VP20 · SG849116BEN

The VP20 relay is suitable for detection of DC voltages in power distribution systems for public transport networks such as tramways, railways and metro systems, with rated voltage levels from 750 VDC to 3000 VDC.

	Unit	VP20-350-2400	VP20-50-600
Input resistance	[MΩ]	10	> 2
Hysteresis	[%]	3.5	
Supply voltage range	[$V_{AC/DC}$]	24...230	
Switching voltage	[V_{DC}]	24	
Switching delay	[ms]	2	

ESTRA-AC

AC SWITCHGEAR

With a leading expertise in AC traction power substations, Sécheron SA is your major partner for the electrification of AC traction networks, covering the activities from engineering to the production of AC systems.

The ESTRA-AC product category covers all key equipment applied in AC distribution, integrating vacuum circuit breakers technology, earthing switches, measuring transformers, etc. We can offer tailor-made solutions based on modular concepts and standard products. Our equipment is developed on world-leading technology and proven worldwide design and acceptance. Our customers and partners benefit through this offer of all our system skills and experience.

Outdoor railway vacuum circuit breakers

ORS

Brochure - ORS25 · SG852186BEN

With a complete range of equipment and a longlasting expertise in traction power, Sécheron is a world leader for the design and the production of AC vacuum circuit breakers for rolling stock applications (15 kV and 25 kV), with more than 18 000 units in operation worldwide.

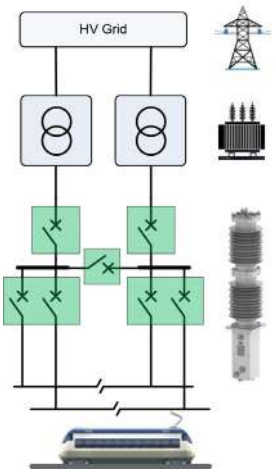
	Unit	ORS25
Rated voltage	[kV]	27.5
Rated frequency	[Hz]	50 / 60
Rated normal current	[A]	1 250 to 2 500
Rated duration of short-circuit	[s]	3
Mechanical endurance class	-	Class 3, 10 000
Reference standards	-	EN 50152-1, IEC 62505-1, IEC 62271-1, IEC 62271-100

The ORS outdoor railway vacuum circuit breakers are designed to feed the overhead line and are usually placed trackside, in an outdoor substation, in a container or skid-mounted.

Our equipment is developed on world-leading design and technology and proven acceptance.

Available in single-phase or two-phase systems, the ORS circuit breakers switch and protect the main railway traction circuits including the overhead line at a voltage level of 25 kVAC.

The ORS is designed for conventional commuter trains, main line railway, high-speed rail (> 250 km/h) and very high-speed trains (> 350 km/h).



Air insulated metal clad switchgears

MCS

Brochure - MCS15 · SG869532BEN

Available in single-phase systems for 15 kV / 16.7 Hz and in single-phase or two-phase systems for 27.5 kV / 50 Hz, the MCS air insulated metal clad switchgear switches and protects the main railway traction circuits including the overhead line.

	Unit	MCS15	MCS25
Rated voltage	[kV]	15	27.5
Rated frequency	[Hz]	16.7	50/60
Rated power frequency withstand voltage	[kV]	50	95
Rated normal current	[A]	Up to 2500	Up to 2000
Rated short-circuit breaking current	[kA]	40	25
Reference standards	-	IEC 62505-1, IEC 62505-2, IEC 62271-1, IEC 62271-100, IEC 62271-200	

Outdoor railway skid mounted switchgears

SKID

Thanks to the design of our outdoor railway switches (ORS), we can offer one integrated solution, including the different main high voltage equipment used in one railway feeder station, such as - outdoor voltage transformers, outdoor current transformers, motorised disconnectors, motorised earthing switches and surge arrestors - all mounted on one dedicated structure, pretested and delivered on site.

The main benefit for our customer is to have one fully integrated solution, which is pre-assembled and pretested, drastically reducing installation and commissioning time on site.

With our skid mounted solutions, the customer will have one single point of contact, reducing the engineering, project management and logistic costs.

Each skid mounted solution is specifically designed according to the best configuration of the related substation.

STELLA

PROTECTION & SUPERVISION

Sécheron has been developing and manufacturing safety devices for DC traction systems for the railway industry for decades. We have drawn upon our extensive experience with DC traction systems and the related industry standards to develop our STELLA product range.

All STELLA products, including control and protection devices (SEPCOS range), control and supervision (KEOPS), stray current monitoring system (SCMS) and for the help of operation and predictive maintenance (IOMS), are designed based on our strong experience in the field and customer feedback to answer the railway requirement and simplify our customer's follow up of their traction power substations.

STELLA products are designed with the latest technology, with the modular design allowing the customer needs to be met even on the most complex of projects.

Control command & local SCADA

KEOPS

Brochure - KEOPS · SG817955BEN

The solution provided by Sécheron for local control and monitoring of traction substations is a significant step in supporting operations and maintenance of the power supply network.

In order to meet high demands in reaction time and cost efficiency, the powerful control and supervision system is based on modern communication protocols and combined with a user-friendly interface.

The KEOPS control command/local SCADA is generally composed of:

- An industrial **PLC** (SEPCOS or other) to control and command all equipment
- The local SCADA runs in a rugged industrial-grade **PC** suitable to operate in the harsh environment of the substation (panel PC with a multitouch screen)
- The local SCADA communicates using industrial **buses** to all the field-level controllers and optionally to the remote customer supervision SCADA
- **Digital and analog inputs/outputs** modules to control the equipment directly by wire when required
- **Ethernet switch(es)**
- **Media converters** (copper cable or optical fiber) or protocol gateways if necessary

Control & protection relays

SEPCOS

Brochure - SEPCOS · SG825866BEN

SEPCOS control & protection relay is made of high-tech equipment which satisfies the most demanding safety requirements applicable to DC traction distribution networks.

It is a powerful electronic system based on advanced technology and embeds all dedicated communication protocols used in railway such as IEC 61850 and PRP/HSR.

	Unit	SEPCOS
Supply voltage	[V]	24 to 48 (-20% / +10%) 60 to 220 (-20% / +10%)
Insulation	[kV]	2 kV_{AC}, 50 Hz , 1min
Analog voltage input levels	[V]	±5, ±10, 0-5, 0-10
Analog current input levels	[mA]	±20, 0-20, ±40, 0-40, 4-20, 4-20 extended
Degree of protection	-	SEPCOS: IP20 / IP42 Display: IP40 / IK05

SEPCOS control & protection relay is made of several modules that can be adapted in order to meet the needs of each customer:

- Power supply (PWR)
- Control / Command (CPU)
- Protection (PRO & ePRO)
- Digital Inputs / Outputs (DIO & DI)

By combining these modules, Sécheron is able to provide a modular range of SEPCOS with dedicated functions.

SEPCOS-PRISM

Brochure SEPCOS-PRISM · SG847023BEN

SEPCOS–PRISM control & protection relay has the advantage to embed complete functionalities of protection relay, programmable logic controller (PLC) and color touch screen display in a compact housing.

Thanks to this, the mechanical integration through mounting directly on the door is easy and increases free space in the low voltage compartment.

	Unit	SEPCOS-PRISM
Supply voltage	[V]	24 to 48 (-20% / +10%)
Insulation	[kV]	2 kV_{AC}, 50 Hz , 1min
Analog voltage input levels	[V]	±5, ±10, 0-5, 0-10
Analog current input levels	[mA]	±20, 0-20, ±40, 0-40, 4-20, 4-20 extended
Degree of protection	-	Outside: IP52 / IK05 Display housing: IP20

SEPCOS-PRISM is a monoboard product integrating all different functionalities (power supply, control/command, protection and display) in an electronic board.

Intelligent operation and maintenance systems

IOMS

Brochure - IOMS · SG859911BEN

IOMS is a software as a service for data transfer and analysis, to optimize substation operations and support maintenance activities.

A large number of data is collected from each traction power substation and pushed to a central server.

IOMS is composed of two main modules: Intelligent Operation and Maintenance.

Intelligent Operation

The information produced by the Intelligent Operation module is used to optimize its network usage and reduce maintenance activities.

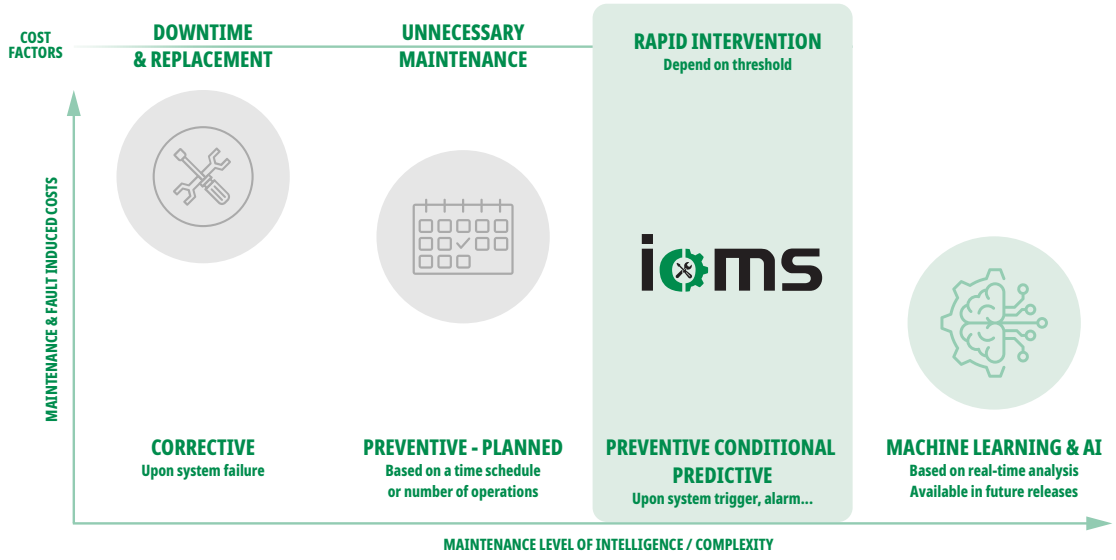
The Intelligent Operation module contains several functions, including communication network monitoring, ambient temperature, humidity and protections trips.

Maintenance

The main functionality of the predictive maintenance module of IOMS is the optimization of maintenance activities scheduling.

Its main goal is to reduce equipment failures, increase reliability and improve asset performance.

The Maintenance module contains several functions, including the overview of the system, scheduling of actions and automatic maintenance reports.



Dashboard

Wear details of parts in equipment

Stray current monitoring systems

SCMS

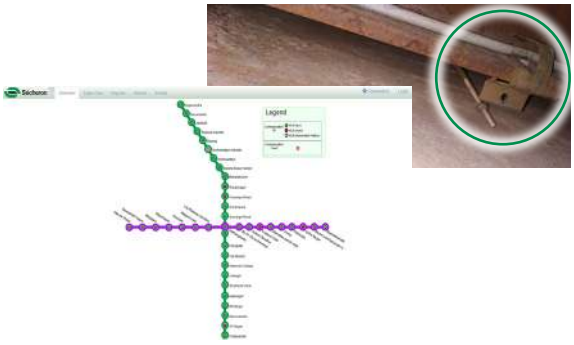
Brochure - SCMS · SG825868BEN

Sécheron Stray Current Monitoring System (SCMS) is a straightforward and efficient method to monitor the stray current protection system. It avoids manual repetitive measurement and doesn't interfere with the stray current collecting system. The SCMS gives a quick information for a better reactive maintenance.

Hardware

Already compatible with the SCMS, the VGUARD collects measurement along the line and transmits data via possible communication protocols:

- Voltage between the return circuit and the earth structure through a high accuracy sensor
- Potential current flowing in the VGUARD through a high accuracy sensor
- VGUARD status

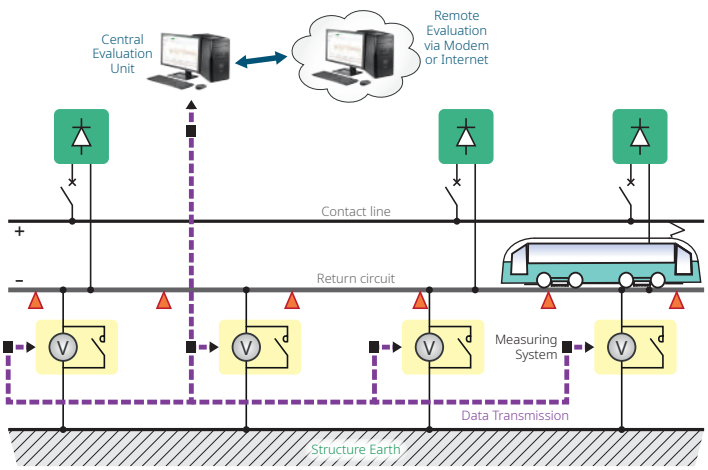


Software

Functions of the SCMS are performed at the Control Evaluation Unit (CEU). The CEU includes an interface program to plot the real-time data being captured by the SCMS, as well as the data stored in the database. It realizes permanent automatic analysis of recorded values and an alarm is displayed in case stray current increases.

At the end of each day, the software automatically generates an analysis file of the data recorded during the day and saves it as a CSV file.

Architecture



CUSTOMER SERVICES

ON-SITE SUPPORT

As a producer of DC high-speed circuit breakers and a long-standing supplier of substations for DC traction power distribution, Sécheron SA has a strong experience in commissioning and support activities.

Our commissioning and training experts know our equipment inside and out. All commissioning projects are overseen by our qualified commissioning expert to ensure that your installation aligns with the current state of the art technology. We can measure insulation, troubleshoot in the event of a problem, and train your operations staff.

Our on-site support services are designed to ensure that your Sécheron equipment gets up and running quickly for maximum value to your business.

On-site support by experienced engineers guaranteeing the highest level of security for:

- Installation phase
- Commissioning activities
- Load testing and energization
- SCADA integration
- Short-circuit testing
- Training for installation, commissioning and maintenance

The commissioning engineer will work with you to review and test all equipment and make sure that our products work seamlessly with the other substation equipment.

Installation support

Each specific traction system requires specific rules to be followed during the installation phase, our team is able to guide you to perform the installation in order to avoid potential problems.

Commissioning

The commissioning activities include visual inspection, mechanical and electrical tests, interlocking with other equipment, installation of software in the protection relay, setting the protection parameters and verification of all measurements.

Energization

After installation, commissioning and testing is complete, we will oversee the energization of the equipment: transformer, rectifier, feeder and the track.

SCADA integration

In order to have an optimized SCADA integration, the signals in the supervision system can be tested.

Short-circuit and performance test

Our team perform short-circuit tests and other tests with rolling stock on the track in order to validate the protection settings using the data recorded by the SEPCOS during the tests.

Training

Training can be performed on-site directly on all equipment for operation, maintenance and troubleshooting.

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AFTER-SALES SERVICES

Sécheron offers support services for all of its products, ensuring that you get the most out of your equipment throughout the duration of its lifespan. Using a worldwide network of sales and service locations, we are able to provide you with prompt and effective support, troubleshooting and repair services wherever you are around the globe.

Our solutions are essential for protecting people and equipment: regular preventative maintenance needs to be conducted by engineers and technicians with specialized training.

You can submit your Sécheron product to us for troubleshooting and repair if it has been damaged or does not function as intended for any reason. We will carry out the required troubleshooting based on your description of the issue once the product is received.

E-LEARNING

Whether you are in charge of integration, operation or maintenance, Sécheron has created a wide range of training programs, from e-learning to in-person training, to help you get the most out of your products.

Our training courses are updated frequently with new content to assist you in lowering Total Cost of Ownership (TCO), extending the service life of your solution, enhancing customer service, and improving operational safety.

After a course is successfully completed, training certifications are provided (i.e. demonstrated knowledge of best practices recognized by Sécheron).

E-HOUSE

Depending on the customer specification, Sécheron can propose different versions of container construction.

Sécheron uses the internal space of the container efficiently, while at the same time providing the highest security conditions for the operating personnel.

Container traction substations can be equipped with different additional systems (fire alarm, intruder alarm, air conditioning...).

All necessary studies and calculations, including detailed design, are made by Sécheron in order to provide the customer with a fully integrated solution.

Concrete container

A concrete prefabricated container can be an efficient integration solution in cities and along railway lines.

Concrete containers can withstand severe weather conditions and can be provided in different architectural configurations.

Features are available in order to fit the substation in the surrounding landscape. The installation of the concrete container is possible with minimum ground treatment.

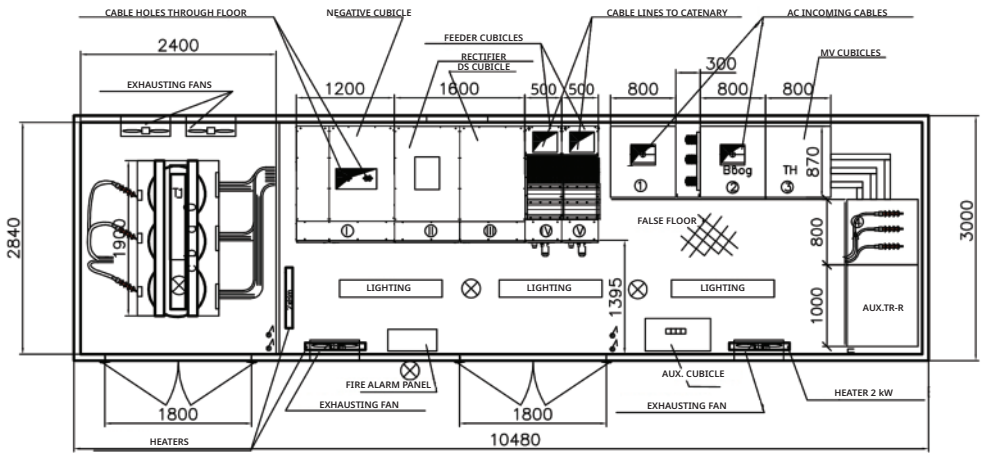
Metal container

Sécheron metal containers have a self-supporting rigid base frame with welded metallic walls fitted with insulation.

A raised floor is used as standard to provide space for power cables.

The thickness of the pre-treatment surface and painting is optimised and adjusted to resist corrosion in the long-term depending on the environment.

Example of an equipped container substation



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OTHER APPLICATIONS

TRANSPORTATION

E-Mobility

- Traction to EV charging
- Charging stations
- Electric Road Transport

Marine

- Vessels with on-board DC grid
- Charging stations

RENEWABLE ENERGY

Hydrogen production by electrolysis

Solar farms

Windmills

Fuel cells

Energy storage

Nuclear fusion

INDUSTRIES

Mining

- Trucks electrification
- Charging stations

Rolling mills

Plasma torch

MVDC grids

Green steel

DC arc furnace

Data centers

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RETROFIT

Retrofit refers to the process of upgrading an existing system to improve its performance, efficiency and safety without replacing the entire system.

By retrofitting existing equipment, railways can extend their lifespan, improve operational efficiency, and meet evolving industry standards without the need for expensive replacements.

Sécheron is able to retrofit any brand of protection relays, as well as measuring transducers, complete rectifiers, HSCB, and withdrawable trolleys.

Our expert teams also have the capacity to take care of the refurbishment of DC panels.

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