

SUPPLY PROGRAM

FOR E-MINING



OUR VALUE PROPOSITION FOR
MINING SOLUTIONS

We provide complete power supply solutions for mining electrification, including a wide range of power options, along with efficient electrical safety solutions.

We ensure reliable power for mining trucks through plug-and-play solutions, guaranteeing high uptime and flexibility during operation.

Containerized substations are also available for remote areas.

Our offering is composed of:

- Power supply systems
- Charging stations and conversion systems
- On-board equipment

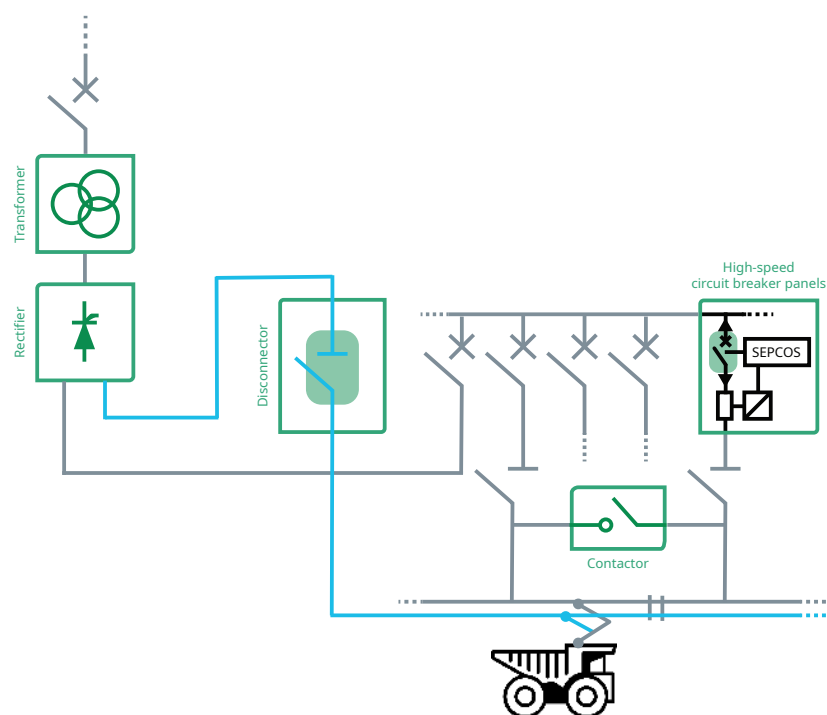
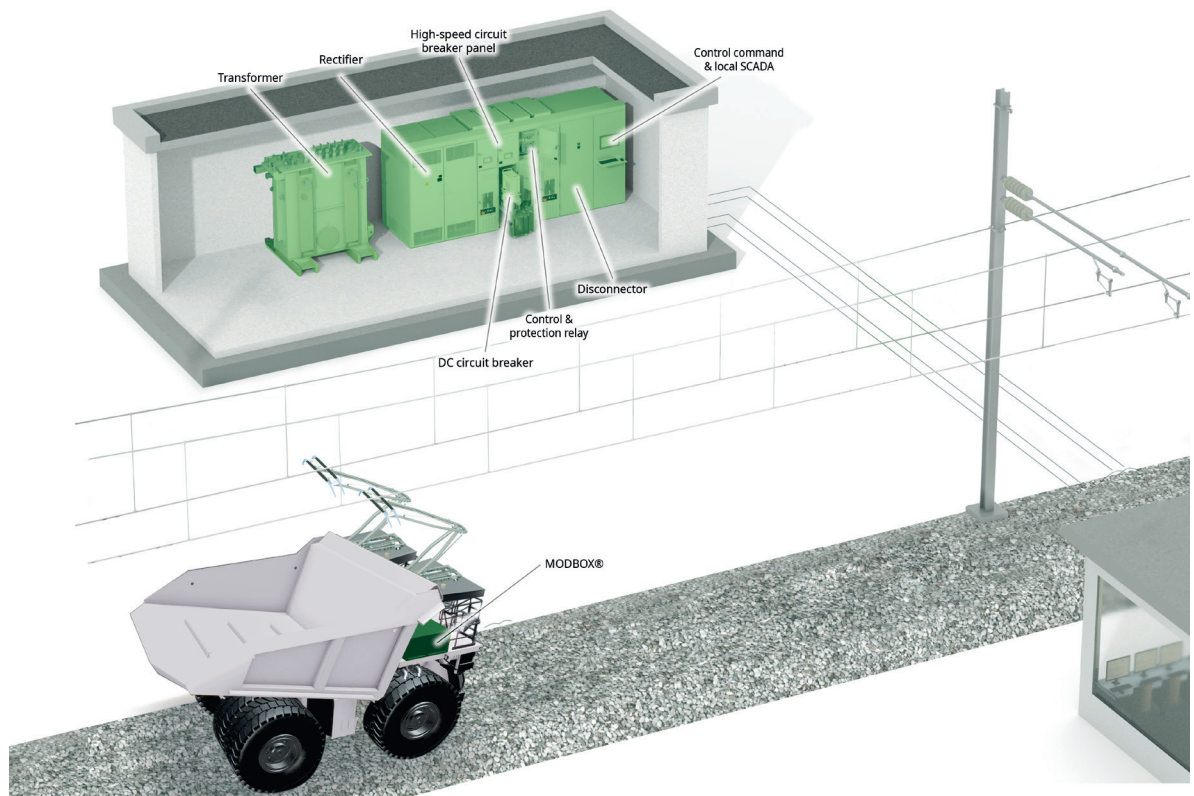
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Our product offering for mining applications		
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MINING ELECTRIFICATION

Mining trucks using electric motors allow 24/7 efficient, reliable and quieter operations, contributing to improving worker safety, all within harsh environments.

The electrification of mining trucks revolutionizes the industry by reducing emissions and thus leading to cleaner air. It makes mining operations more environmentally friendly, and aligns with sustainability goals.

Mining electrification also offers lower maintenance and it therefore supports the reduction of operational costs.



MINING ELECTRIFICATION

COMPLETE POWER SUPPLY SYSTEMS

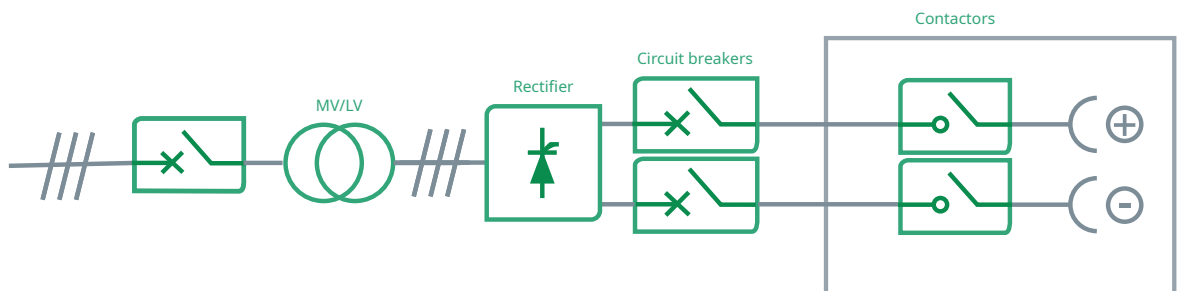
With over 80 years of experience, we specialize in providing DC electrification equipment for mass transit and light railway networks globally, serving major cities and railway lines in numerous countries. Leveraging our extensive expertise in electrification, we now offer innovative solutions for mining trucks.

We offer a range of options tailored to your requirements. REC-T and REC-D, our Thyristor and Diode rectifier respectively, can deliver up to 10MW of power, driving your mining business to peak efficiency and a more sustainable future.

MINING TRUCKS CHARGING STATIONS

Charging stations for mining trucks are essential for advancing electrification in mining operations. These stations support continuous operation by providing dedicated infrastructure for charging electric trucks, reducing emissions and improving sustainability.

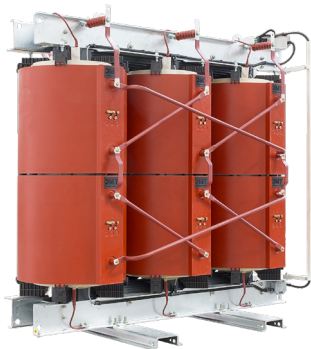
Efficient charging solutions are key to optimizing performance and ensuring reliable power delivery for electrified mining fleets. High-power DC fast charging optimizes fleet utilization and reduces downtime.



Contactors for EV charging stations supporting efficient ultrafast charging

EQUIPMENT

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.

Diode rectifiers

REC-D

and withdrawable function

 **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.



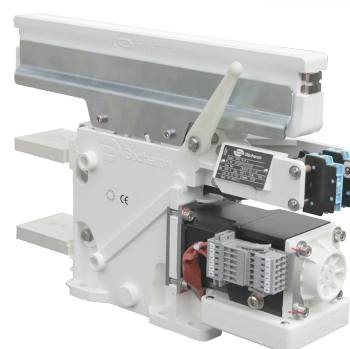
	Unit	REC-T		
Rated DC voltage	[V]	750	1500	3000
Rated power	[MW]	0.5 - 3	1 - 6	6
Maximum power	[MW]	Up to 9	Up to 9	Up to 12
Maximum altitude	[m]	1000 (without derating)		
IP degree	-	Up to IP32		

Contactors

BMS

 **Brochure BMS..08** · SA003724BEN
Brochure BMS15 BMS18 · SG202454BEN
Brochure BMS36.10 · SA015795BEN
Brochure BMS08 BMS10 · SG202168BEN
Brochure BMS18 BMS36 · SA020552BEN

Sécheron's BMS contactors can be configured to meet a wide variety of needs, including line contactors, converter switches, permanent-magnet synchronous motor (PMSM) switches, traction circuit reconfiguration contactors, charging contactors, HVAC switches, auxiliary circuit isolating switches, and more.



MINING ELECTRIFICATION

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	

Circuit breakers

UR



Brochure UR26-80S · SG101001BEN

For DC applications, Sécheron proposes a complete range of high-speed current limiting circuit breakers rated up to 8 000 A and up to 3 600 Vdc. These DC circuit breakers are used in various applications to protect equipment against short-circuit currents and overloads.



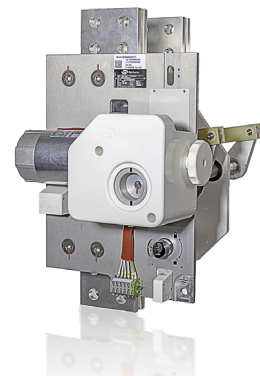
Disconnectors

SW



Brochure SW · SP1880098BEN

Sécheron's SW disconnectors for fixed installations can be integrated into your disconnector panels to be used as the rectifier incoming or negative disconnector, feeder cable disconnector, by-pass disconnector, or as disconnector with earthing.



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.



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

Electrical houses

E-HOUSE

 Brochure - E-HOUSE · SG830928BEN

Sécheron's E-House container substations offer a turnkey solution that is customized, compact, and relocatable.

Our substations are built for all weather, sheltering the equipment inside from environmental influences.

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



MINING TRUCKS ON-BOARD EQUIPMENT

High-voltage integrated enclosure

MODBOX®

 Brochure MODBOX® • SG580044BEN

Car builders seeking high performance, reduced engineering work and easier vehicle manufacturing combined with lower maintenance have placed their trust in our MODBOX® enclosure running on AC or DC.

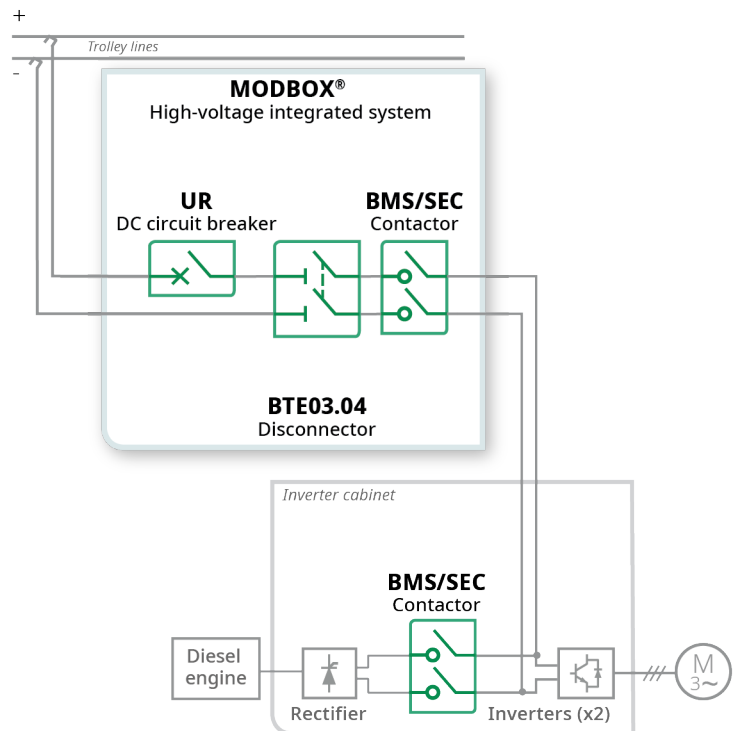
Sécheron's MODBOX® offers robust and reliable solutions for on-board high-voltage components integration for mining trucks and locomotives.

Designed to withstand harsh mining environments, MODBOX® facilitates efficient operation, enhancing overall vehicle safety and longevity. This **plug-and-play solution** allows a reduced engineering effort and a faster deployment.

Sécheron's contactors and DC circuit breakers also provide precise control and rapid response times, crucial for the demanding conditions of mining operations. With a focus on safety and durability, Sécheron on-board mining solutions are essential for modernizing and optimizing mining trucks and locomotives fleets.



Typical application




Off-load switches

XMS BTE

The XMS and BTE can be delivered as a stand-alone product or integrated into Sécheron's smart, compact MODBOX® high-voltage enclosure with other high- and low-voltage functions to ensure the electrical safety, measurement, and control of the traction chain.



 **Brochure XMS** • SG200998BEN
Brochure BTE • SG480329BEN

RELATED SERVICES

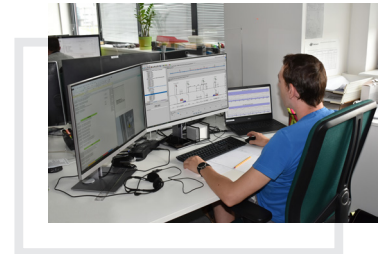
SIMULATIONS

ENGINEERING SERVICES

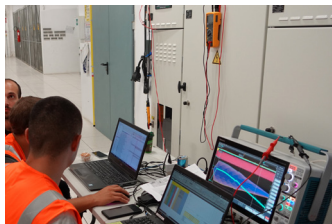
Sécheron offers top-tier DC transport simulation services, ensuring reliability and security for millions of users.

Leveraging extensive DC traction experience, we provide dynamic network simulation, on-site and lab measurements, and various tests.

Our expert team optimizes all traction subsystems, delivering tailored solutions and consulting for your DC network design and protection needs.




 **Brochure Simulations** • SG815456BEN



AFTER-SALES SERVICES

Through a full range of after-sales solutions, Sécheron ensures project continuity and high performance of the equipment while maximizing the life cycle of traction substations and power supply stations while minimizing the operational costs and risks of the end users.

Thousands of customers and users in railway and other industries place their trust in the excellence of Sécheron products every day. It is a privilege to have earned their trust with the awarding of the initial project.

 **Brochure After-sales services for Traction Power Systems** • SG872750BEN
Brochure After-sales services for Electrical Safety Solutions • SA007814BEN

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