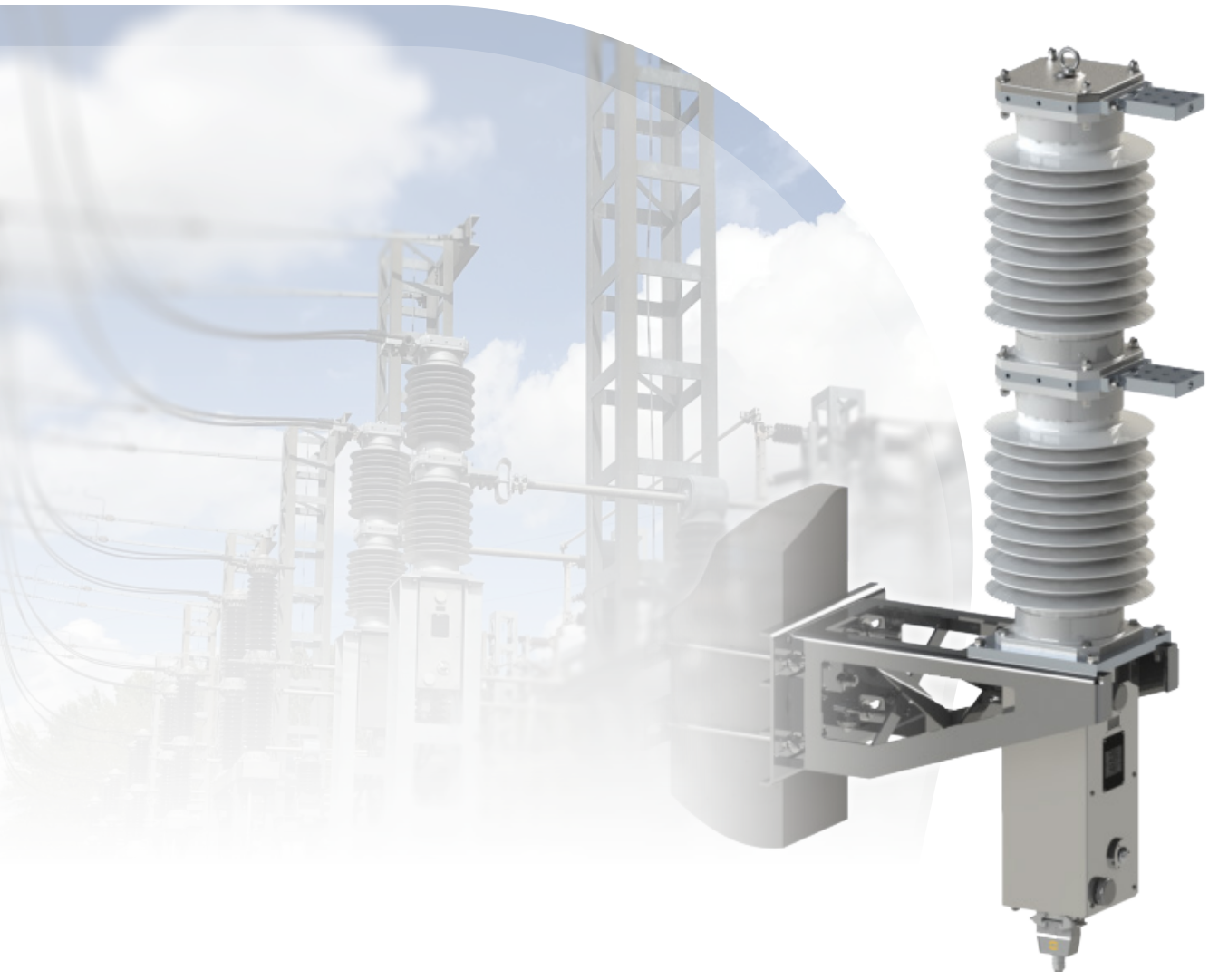
TRACTION
POWER
SYSTEMS

Sécheron

OUTDOOR RAILWAY VACUUM CIRCUIT BREAKER

ESTRA-AC-**ORS**



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 breaker 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 from this offer of all our system skills and experience.

GENERAL INFORMATION

With a complete range of equipment and a long-lasting expertise in traction power, Sécheron is a world leader in 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.

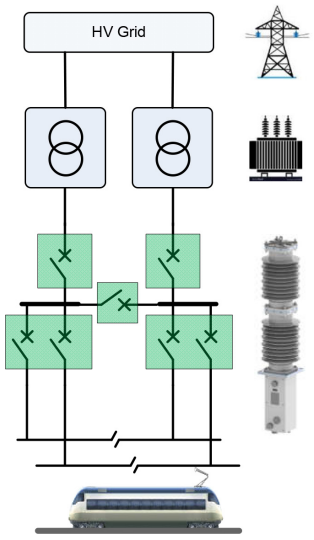
Outdoor railway vacuum circuit breakers are designed to feed the overhead line and can be placed trackside, in an outdoor substation, in a container or skid-mounted.

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

APPLICATIONS

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).



Typical AC traction substation

MAIN BENEFITS

- Robust and compact, for outdoor installation
- Pole 100% maintenance free (neutral nitrogen gas under controlled pressure)
- Easy to install (specific configurations and options to suit all operating conditions and requirements)
- Main control unit including extended diagnostic functions
- Operating mechanism driven by a variable speed magnetic actuator
- Improved vacuum interrupter electrical life, thanks to the optimised closing and opening principle
- Compliant with IEC and EN standards

MAIN CHARACTERISTICS

	Symbol	Unit	Value		
High-voltage circuit - Pole			**ORS25**	**ORS25-HE**	**ORS15**
Rated voltage	U_{Ne}	[kV]	27.5	27.5	17.25
Rated lightning impulse withstand voltage	U_{Ni}	[kV]	250	250	170
Rated power-frequency withstand voltage	U_d	[kV]	105	105	70
Rated frequency	f_r	[Hz]	50 / 60	50	16.7
Rated normal current	I_r	[A]	1 250 to 2 500	1 250	2 500
Rated duration of short-circuit	t_k	[s]	3	3	1
Rated short-circuit breaking current	I_{SC}	[kA]	25	12.5	40
Rated short-circuit making current	I_{MC}	[kA]	63	31.25	100
Mechanical endurance class	-	-	Class 3, 10 000	100 000	Class 3, 10 000
Weight	-	[kg]	140	140	135
Dimensions (W x D x H)	-	[mm]	368 x 368 x 1947	368 x 368 x 1947	368 x 368 x 1687
Relevant standard	-	-	IEC 62505-1	IEC 62505-1	IEC 62505-1

	Symbol	Unit	Value		
Low-voltage auxiliary circuit - Control box			**ORS25**	**ORS25-HE**	**ORS15**
Rated supply voltage of auxiliary	U_a	[VDC]	48 to 220	48 to 220	48 to 220
Option: Rated supply voltage of auxiliary	U_a	[VAC]	230	230	230
Maximum power load [1]	P_{max}	[W]	≤ 150	≤ 150	≤ 150
Nominal power load	P_0	[W]	≤ 7	≤ 7	≤ 7
Mechanical opening time	T_o	[ms]	≤ 40	≤ 45	≤ 17
Mechanical closing time	T_c	[ms]	≤ 70	≤ 75	≤ 70
Weight	-	[kg]	25	25	25
Dimensions (W x D x H)	-	[mm]	500 x 370 x 530	500 x 370 x 530	500 x 370 x 530

[1] Loading time by commissioning < 30 seconds / loading time after closing/opening < 4 seconds.

STANDARDS

Sécheron outdoor railway vacuum circuit breakers are compliant with railway standards:

- **IEC 62505-1 (EN 50152-1)** | Railway applications – Fixed installations – Particular requirements for AC switchgear – Part 1: Circuit breakers with nominal voltage above 1 kV
- **IEC 62271-1** | High-voltage switchgear and controlgear – Part 1: Common specifications for alternating current switchgear and controlgear
- **IEC 62271-100** | High-voltage switchgear and controlgear – Part 100: Alternating-current circuit-breakers

HIGH-VOLTAGE CIRCUIT - POLE

DESCRIPTION

Suitable for single-phase or two-phase applications, the ORS25 is fitted with a railway specific vacuum interrupter, designed to break high short-circuit current. The pole is made of 2 stacked polymeric insulators, completely sealed and filled with neutral nitrogen gas under controlled pressure.

The vacuum interrupter is operated by a magnetic operating mechanism and a push rod, each of them mounted in one axis.

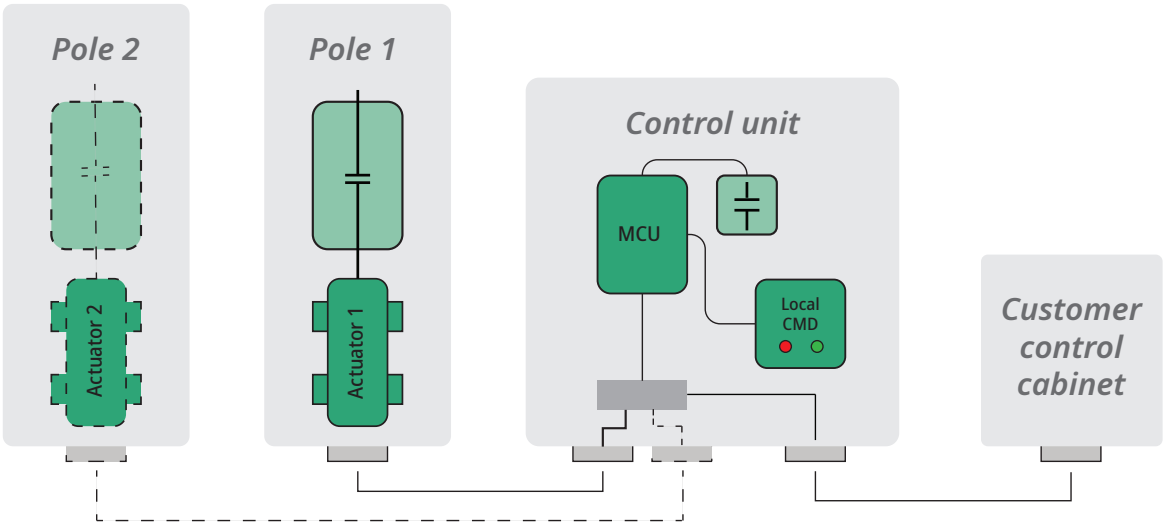
The pole is delivered with installation brackets, which makes the installation work on site very easy and efficient.

The connection between the pole and the control box is made with a flexible halogen-free shielded control cable.

Emergency opening is always possible by means of one special hand trip lever.

SINGLE-PHASE AND TWO-PHASE

The circuit breaker is operated via the main control unit (MCU). The energy required for switching operations is supplied by a capacitor bank. The circuit breaker can be controlled by local push buttons or remote control signals. For a two-phase circuit breaker, the principle is the same.



Functional description (single-phase and two-phase circuit breaker)

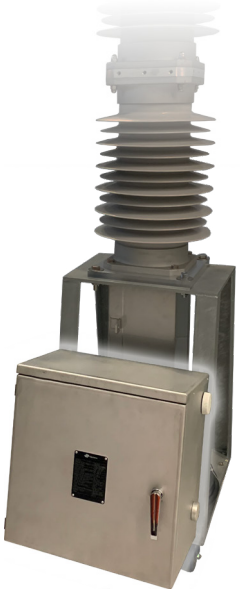
LOW-VOLTAGE AUXILIARY CIRCUIT - CONTROL BOX

DESCRIPTION

The control box houses the main control unit (MCU) and the different low-voltage components according to the specific requested features.

The MCU has extended diagnostic functions (power drive supervision, coil supervision, capacitor bank supervision, inputs supervision and outputs supervision).

Developed by Sécheron with decades of rolling stock expertise, the MCU features temperature-stable film capacitors and a single RJ45 connection for easy log file access.

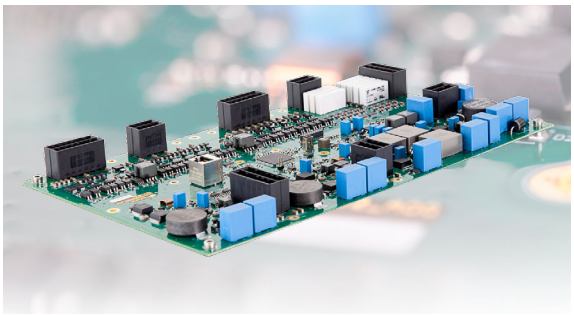


ELECTRONIC BOARD

Sécheron presents its innovative product, designed to deliver unparalleled performance and reliability.

Our advanced equipment features:

- **Superior Design:** Developed with Sécheron's extensive experience, ensuring robust and reliable operation.
- **Enhanced Components:** Equipped with film capacitors that are less sensitive to temperature variations, ensuring consistent performance.
- **Seamless Connectivity:** Includes an RJ45 connection for easy log file reading and future-proofing with potential integration of the IEC 61850 communication protocol.



- **Optimized Speed Control:** Voltage variation technology optimizes closing speed to reduce bouncing and protect mechanical contacts, while the opening speed minimizes over-travel of the vacuum interrupter (VI) and safeguards the bellow.
- **Extended Electrical Life:** The VI's electrical life is significantly enhanced, ensuring long-lasting performance.
- **Comprehensive Diagnostics:** Advanced diagnostic functions include coil supervision, capacitor bank supervision, and inputs supervision, providing thorough monitoring and maintenance capabilities.

Experience the future of technology with Sécheron's state-of-the-art equipment, designed for excellence and built to last.

APPLICATIONS

ORS15

15 kV / 16.7 Hz circuit breaker

ORS25

25 kV / 50 Hz circuit breaker

ORS25

25 kV / 50 Hz circuit breaker HV-pole

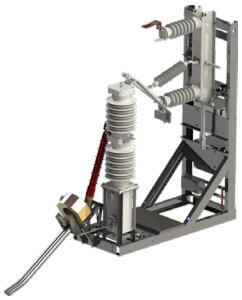
RELATED PRODUCTS

MCS

AIR INSULATED METAL CLAD SWITCHGEAR

Air insulated metal clad switchgear (MCS) is designed to feed the overhead line and can be placed trackside, in an indoor substation, or in a container.

Refer to **Brochure MCS** · SG869532BEN



SKID

OUTDOOR RAILWAY SKID MOUNTED SWITCHGEAR

Outdoor railway skid mounted switchgear (SKID) enables one fully integrated solution, which is pre-assembled and pretested, drastically reducing installation and commissioning time on site.

Refer to **Brochure SKID** · SG878667BEN

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