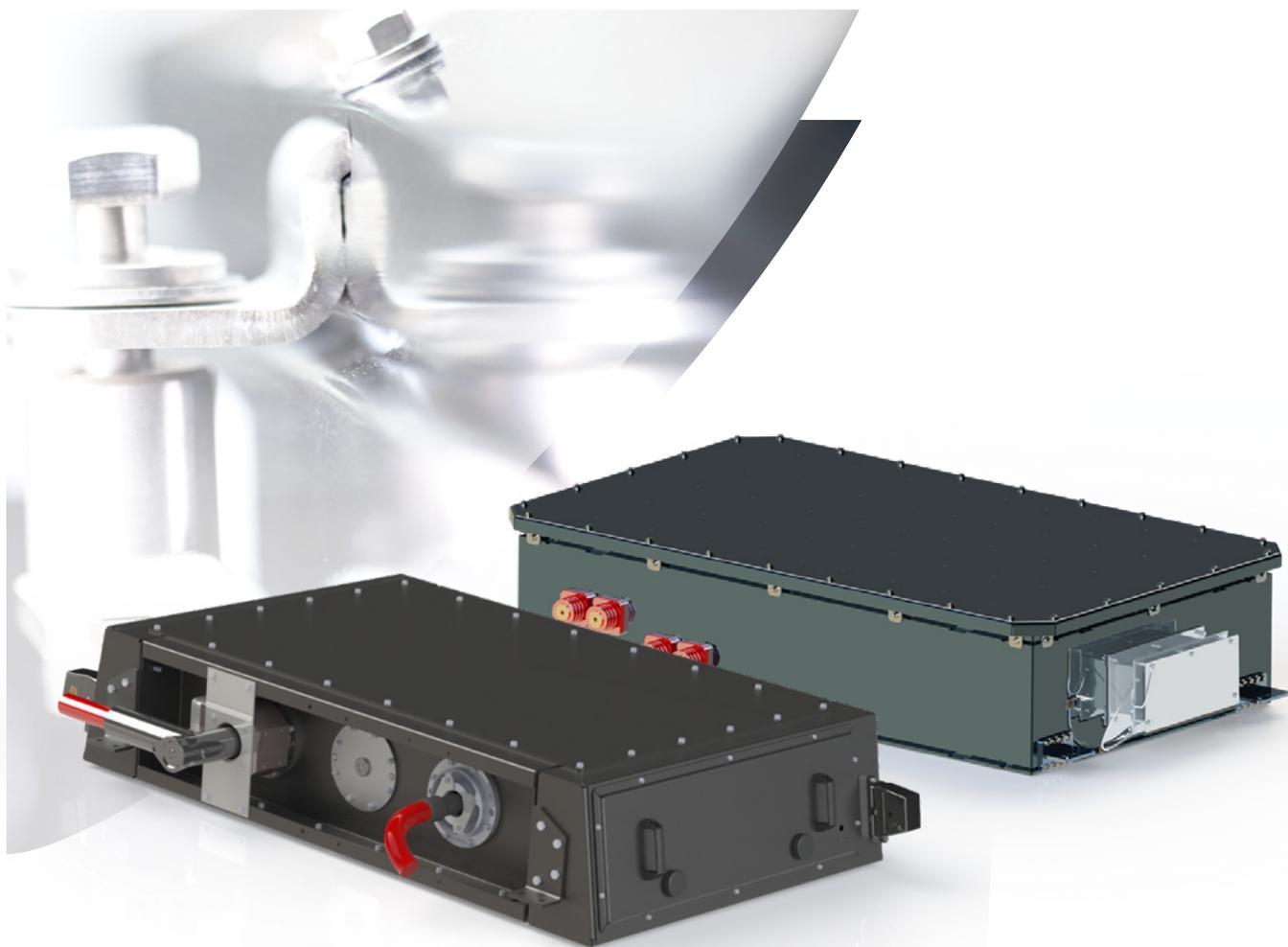


AC-DC HIGH VOLTAGE INTEGRATED SOLUTIONS

Type **SLIMBOX**

RAIL VEHICLES



GENERAL INFORMATION

Sécheron brings decades of experience designing and manufacturing electrical safety components and systems for the traction circuits powering trains, high-speed trains, locomotives, and EMUs on AC or DC rail networks. Car builders seeking high performance, reduced engineering work and easier vehicle manufacturing combined with lower maintenance for rail

vehicles running on 1.5 kV_{DC}, 3 kV_{DC} and 15 kV_{AC}, 25 kV_{AC} networks worldwide.

The Sécheron **SLIMBOX** enclosure includes our AC or DC circuit breakers and various high- and low-voltage components. The compact, smart enclosure ensures safe and efficient integration of high-voltage components in vehicle roof, vehicle under-frame or indoor installations.

Each **SLIMBOX** is engineered and configured to meet the needs of your project, taking into account integrated functions and interfaces with the vehicle. We primarily use Sécheron components and can include other devices from best-in-class suppliers to provide you with a turnkey solution.

TYPICAL APPLICATIONS

AC/DC application

Sécheron supplies all equipment named on the above view.



MAIN BENEFITS

Car builders

- ✓ Reduced engineering work and risks
- ✓ More efficient logistics and installation
- ✓ Eliminates the need for roof cut-outs
- ✓ Reduced footprint and height
- ✓ One-stop shop for all components
- ✓ Reduced project overall costs
- ✓ Design according to application requirements and customer wishes
- ✓ Reduce assembly times, procurement costs and the coordination of many suppliers to save your valuable resources.

Vehicle operators

- ✓ Protection against harsh environmental conditions
- ✓ Airborne & structural noise reduction
- ✓ Lower Total Cost of Ownership (TCO)
- ✓ Reduced maintenance costs
- ✓ Expert customer support
- ✓ Worldwide after-sales service
- ✓ Integrated low height and low weight system.
- ✓ Customized HV interfaces
- ✓ High insulation

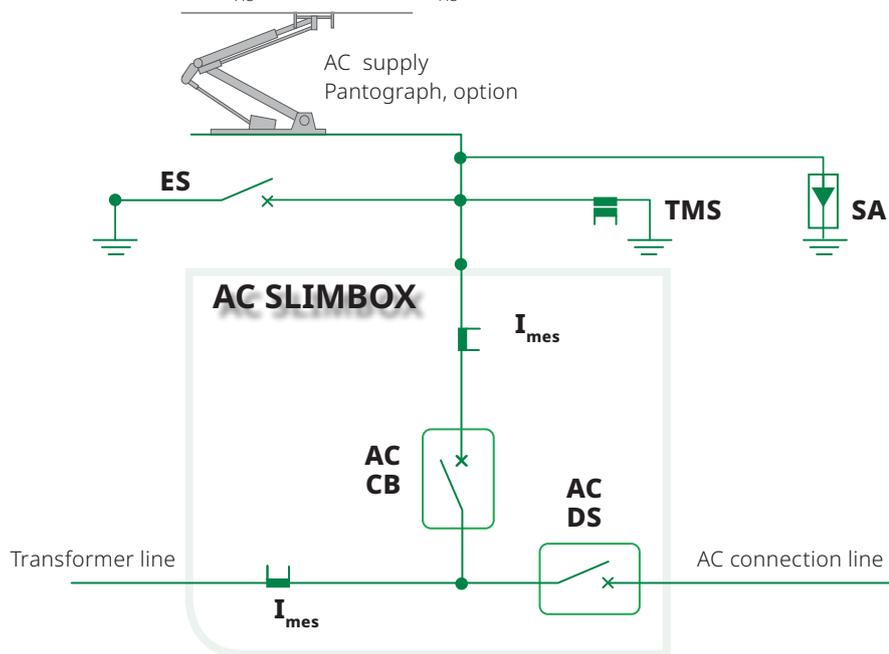
AC SLIMBOX

MAIN FEATURES

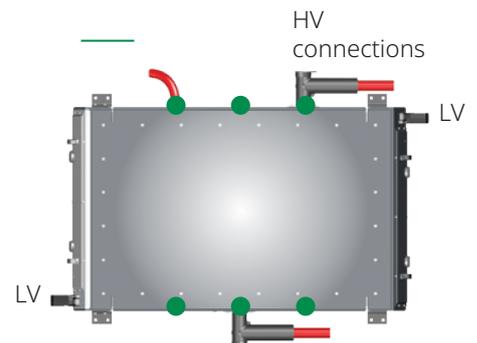
- Compact multi-functional system incorporating AC circuit breaker, AC disconnecter and current measurements on a single 1469 mm x 1017 mm footprint.
- For low height integration (under 380 mm).
- Suitable for 15 kV_{AC} and/or 25 kV_{AC} networks.
- Rated impulse withstand voltage (1.2 / 50 μs):
U_{Ni} = 125 kV
- Conventional free air thermal current: up to 630 A
- Electric operation (closing and holding)
- Operation in ambient temperature from -40 °C to +40°C
- Reference standards: IEC/EN 60077-4, IEC/EN 61373, EN 50121-3-2, EN 45545.

TYPICAL APPLICATIONS

15 kV_{AC} (16.7 Hz) ; 25 kV_{AC} (50/60 Hz)

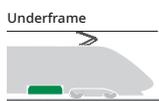
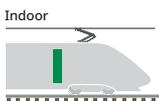
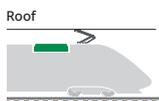


- SA** : Surge arrester
- I_{mes}** : Current measurement
- TMS** : AC voltage measurement
- AC CB** : AC circuit breaker
- AC DS** : AC disconnecter
- ES** : Earthing switch device



6 HV connections are available depending of the configurations

Installation possibilities

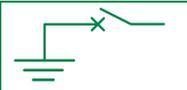


Sécheron supplies all equipment named on the above view.

AC SLIMBOX TYPICAL DATASHEET

	Symbol	Unit	Single voltage		Dual voltage	
MAIN HIGH VOLTAGE CIRCUIT						
Nominal voltage	U_n	[kV]	15	25	15	25
Rated operational voltage	U_r	[kV]	17.25	27.5	17.25	27.5
Rated insulation voltage	U_{Nm}	[kV]	17.25	27.5	17.25	27.5
Rated operational frequency	f_r	[Hz]	16.7	50 or 60	16.7	50
Overtoltage category	OV		4	3	4	3
Rated impulse withstand voltage (1.2/50 μ s)	U_{Ni}	[kV]	125	125	125	
Rated power-frequency withstand voltage (50 Hz, 1 min)	U_a	[kV]	50	50	50	
Conventional free air thermal current ⁽¹⁾	I_{th}	[A]	630	up to 400	up to 630	
Rated short-time withstand current (1 s)	I_{cw}	[kA]	25	20	25	
Short-time withstand current (0.1 s)	I_{cw}	[kA]	40	N.A.	40	
⁽¹⁾ at Tamb=+40°C. •						
HIGH VOLTAGE INTERFACE						
HV connections (standard or customized bushings and terminal connections)			1 or 2 (Input) 1 to 4 (Outputs)			
LOW VOLTAGE AUXILIARY CIRCUIT						
Nominal voltage	U_n	[Vdc]	24 to 110			
Voltage range			[0.7 - 1.25] U_n			
LOW VOLTAGE INTERFACE						
Connector type			1 to 2 (Harting Han HPR 24B)			
OPERATING CONDITIONS						
Installation			indoor or outdoor			
Protection index	IP		56 (outdoor)			
Altitude		[m]	$\leq 2,000$			
Working ambient temperature (outside SLIMBOX)		[°C]	-40 to +45			
Pollution degree (inside SLIMBOX)	PD		3			
APPLICABLE STANDARDS						
Insulation coordination			EN 50124-1 / IEC 62497-1			
Vibrations & shocks			IEC 61373: 2010 (Category 1 - Class A)			
EMC			EN 50121-3-2 / IEC 62236-3-2			
Environmental conditions			EN 50125 / IEC 62498			
Fire safety			EN 45545-2			
EXECUTION						
Slimbox Colour			RAL 7016			

AC SLIMBOX OPTIONAL INTEGRATION

	ES	Earthing switch device
	U_{mes}	Voltage measurement device

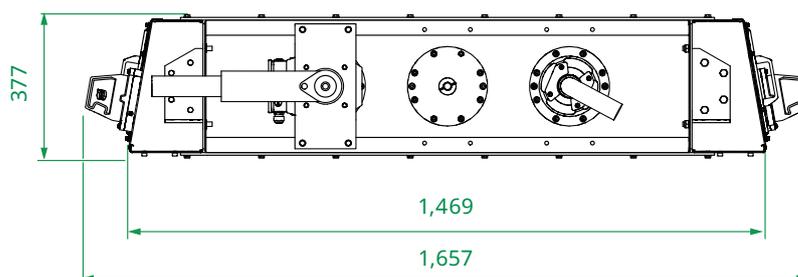
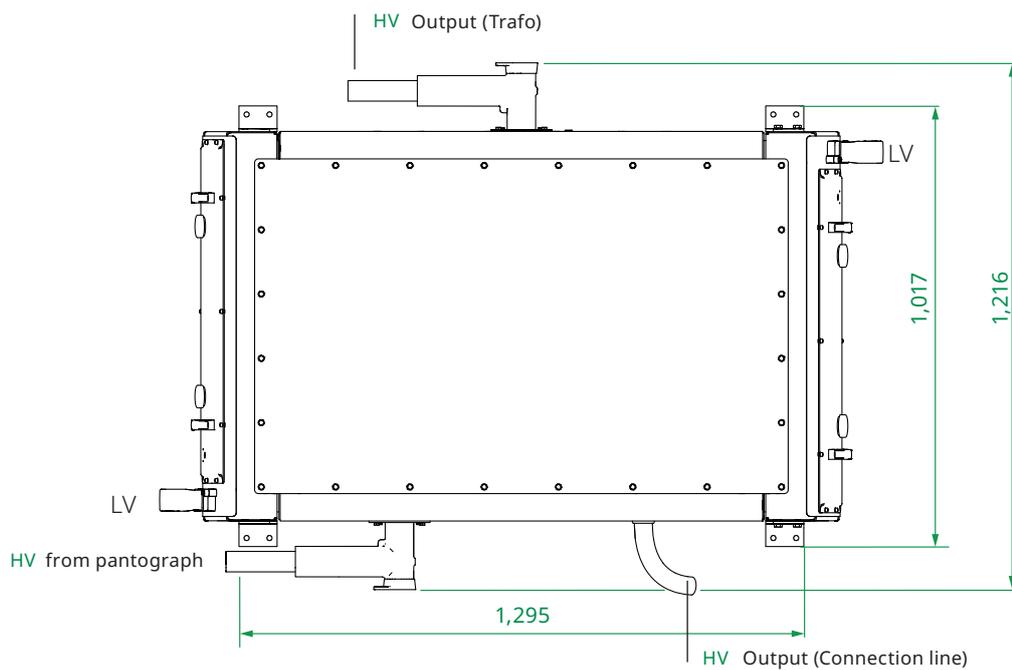
To be defined by Sécheron upon customer's specifications

AC SLIMBOX MAIN DIMENSIONS

AC SLIMBOX TYPICAL DIMENSIONS



Tolerances are according to ISO 2768-CL



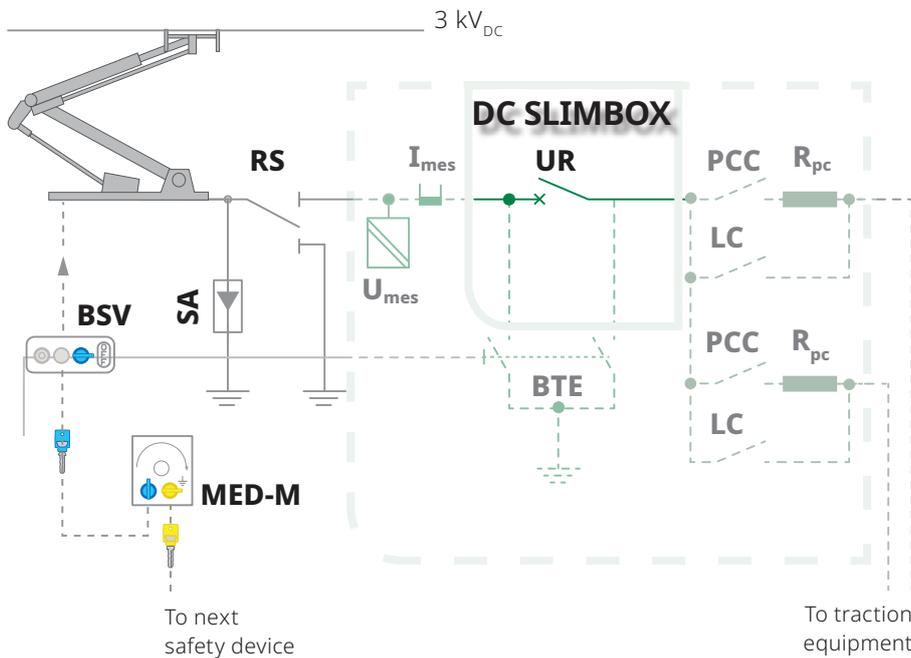
Longitudinal and transversal dimensions may vary according to the options, please contact Sécheron.

DC SLIMBOX

MAIN FEATURES

- Compact multi-functional system incorporating DC circuit breaker.
- on a single 1653mm x 993 mm footprint.
- For low height integration (under 330 mm)
- Suitable for applications and networks up to 3 kV_{DC}.
- Rated impulse withstand voltage (1.2 / 50 μs):
U_{Ni} = 20 kV.
- Conventional free air thermal current: up to 2,000 A.
- Electro-magnetic closing with electric holding.
- Operation in ambient temperature from -40 °C to +50°C.
- Reference standards: IEC/EN 60077-3, IEC/EN 61373, EN 45545-2.

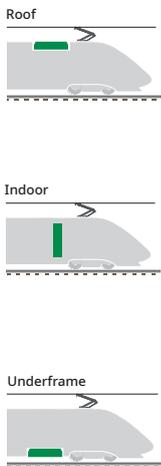
TYPICAL APPLICATIONS



- BSV** : Pantograph interlocking box
- MED-M** : Manual earthing device
- SA** : Surge arrester
- RS** : Disconnector & Earthing
- UR** : High speed DC circuit breaker
- : Optional
- BTE** : Earthing device
- PCC** : Precharging contactor
- LC** : Line contactor BMS
- R_{pc}** : Precharging resistor
- I_{mes}** : Current measurement
- U_{mes}** : Voltage measurement

Let us analyse your traction scheme and prepare a proposal for a **SLIMBOX** adapted to your application and to a safe operation of the integrated components.

Installation possibilities



Sécheron supplies all equipment named on the above view.

DC SLIMBOX TYPICAL DATASHEET

	Symbol	Unit	Single voltage
MAIN HIGH VOLTAGE CIRCUIT			
Nominal voltage	U_n	[V]	3,000 ⁽¹⁾
Rated operational voltage	U_r	[V]	3,600
Rated insulation voltage	U_{Nm}	[V]	3,600
Overtoltage category ⁽²⁾	OV		3
Rated impulse withstand voltage (1.2/50 μ s) ⁽²⁾	U_{Ni}	[kV]	20
Rated power-frequency withstand voltage (50 Hz, 1 mn) ⁽²⁾	U_a	[kV]	9.2
Maximum breaking capacity	A_2/T_1	[kA/ms]	50/0
Conventional free air thermal current ⁽³⁾	I_{th}	[A]	up to 2,000
<small>⁽¹⁾ For other nominal voltage, please contact Sécheron. ⁽²⁾ Components inside the Slimbox may have different and higher insulation performances. ⁽³⁾ at Tamb=+40°C.</small>			
HIGH VOLTAGE INTERFACE			
Cable glands (M32x1.5 or M40x1.5) (cable glands for not shielded cables as a standard)			1 or 2 (Inputs) 1 to 4 (Outputs)
LOW VOLTAGE AUXILIARY CIRCUIT			
Nominal voltage	U_n	[Vbc]	24 to 110
Voltage range			[0.7 - 1.25] Un
LOW VOLTAGE INTERFACE			
Connector type			1 to 3 (Harting Han HPR 24B)
OPERATING CONDITIONS			
Installation			Indoor or outdoor
Protection index	IP		56 (outdoor)
Altitude		[m]	$\leq 2,000$
Working ambient temperature (outside SLIMBOX)		[°C]	-40 to +45
Pollution degree (inside SLIMBOX)	PD		3
APPLICABLE STANDARDS			
Insulation coordination			EN 50124-1 / IEC 62497-2
Short-circuit tests			EN/IEC 60077-3
Vibrations & shocks			IEC 61373: 2010 (Category 1 - Class A)
EMC			EN 50121-3-2 / IEC 62236-3-2
Environmental conditions			EN 50125 / IEC 62498
Fire safety			EN 45545-2
EXECUTION			
Slimbox Colour			RAL 7016 (outdoor) / Natural colour (indoor)

DC SLIMBOX TYPICAL CONFIGURATIONS

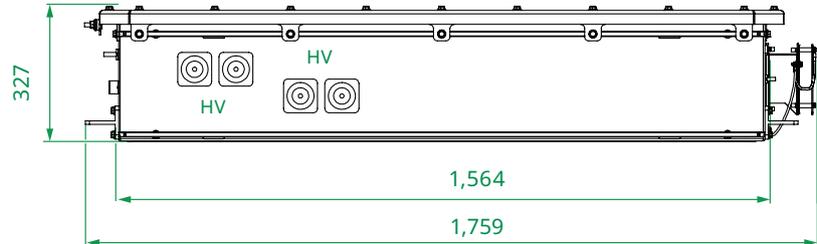
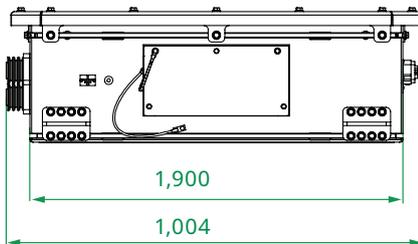
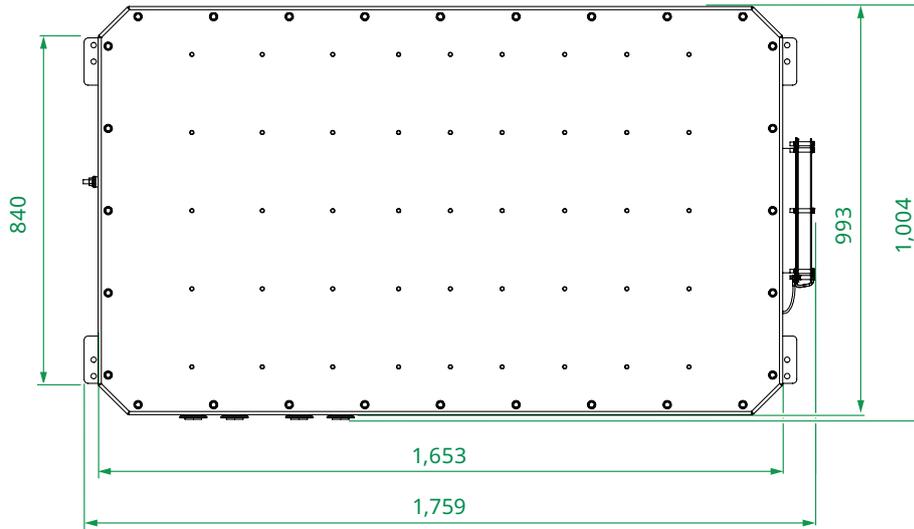
FUNCTIONS	VOLTAGE [V _{DC}]	PRODUCTS
DC circuit breaker	3,000	 UR26
OPTIONAL INTEGRATION		
Measurement	3,000	 Current measurement Voltage measurement
Earthing device		 BTE03.04A 2 & 4-Poles manual operation
Line switching & precharging		 BMS line contactor PCC precharging contactor Charging resistor (ceramic type)
Bushing		

DC SLIMBOX MAIN DIMENSIONS

DC SLIMBOX TYPICAL DIMENSIONS



Tolerances are according to ISO 2768-cl



Longitudinal and transversal dimensions may vary according to the options, please contact Sécheron.



Sécheron SA
Rue du Pré-Bouvier 25
1242 Satigny - Geneva
CH-Switzerland

www.secheron.com
Tel: +41 22 739 41 11
Fax: +41 22 739 48 11
ess@secheron.com