TRACTION
POWER
SYSTEMS

Sécheron

HIGH-SPEED CIRCUIT BREAKER PANELS

ESTRA-**MBS-HD**

(EN/IEC STANDARDS)

ESTRA

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.

GENERAL INFORMATION

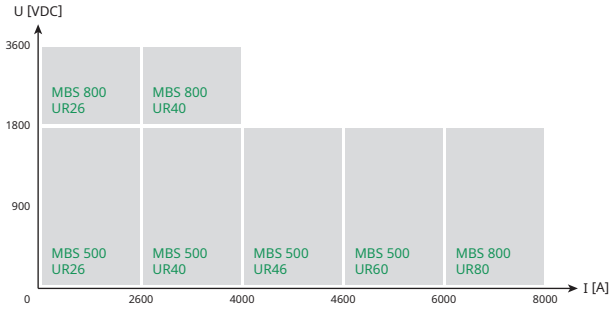
DC traction networks require safe power distribution and reliable control systems.

The MBS 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.

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.

RANGE



MAIN BENEFITS

- Heavy duty performances
- Limited maintenance with easy access to all parts
- Very compact with minimum depth
- Possibility to install cubicles directly against a wall
- Front access to all equipment
- Extended modular line-up
- Long life time
- Safe and reliable

MAIN CHARACTERISTICS

Standard product range	Symbol	Unit	Values				
			MBS 800				
			MBS 500				
Rated service current	I_{Ne}	[A]	2 500	4 000	6 000	8 000	4 000
Rated voltage	U_{Ne}	[V_{DC}]	900/1 800	900/1 800	900/1 800	900/1 800	3 600
Circuit breaker type	-	-	UR26	UR40	UR60	UR80	UR40
Power frequency withstand voltage - Active part to earth (50 Hz, 1 min) (1)	U_a	[kV]	6.9/9.2	6.9/9.2	6.9/9.2	6.9/9.2	18.5
Rated impulse voltage Active part to earth (1.2/50µs)	U_{Ni}	[kV]	15/20	15/20	15/20	15/20	40
Main busbar	I_e	[kA]			Up to 11		
Busbar rating - Connection	-	[A]	2 500	4 000	6 000	8 000	4 000
Rated short-circuit current - T_{Nc} 100 ms (900 V_{DC}) - T_{Nc} 31.5 ms (1800 V_{DC}) - T_{Nc} 31.5 ms (3600 V_{DC})	I_{Nss} / $\hat{I}_{Nss}$	[kA]	125/178 80/113 -	125/178 80/113 -	125/178 100/142 -	125/178 - -	- - 40/57
Protection degree	-	-	IP20 or IP42				
Temperature range (without derating)	T	[°C]	-5 to +40				
Dimensions (W/D/H)	-	[mm]	500 or 800 (2) / 1 400 (3) / 2 400				
Typical weight	-	[kg]	500	550	650	700	

(1) Compliant with OV4 category.
(2) UR80 and UR40 (3 kV) fit only in 800 mm MBS. *For further characteristics, please refer to the datasheet of the individual circuit breaker type.*
(3) Other depth available for specific execution.

STANDARDS

Sécheron considers itself as the equipment supplier that invests the most in the type testing and certification of its products. MBS is fully type tested and compliant with the railway standards:

- **IEC 61992 (EN 50123)** | Railway applications – Fixed installations – DC switchgear
- **IEC 60980 (EN 60980)** | Recommended practices for seismic qualification of electrical equipment of the safety system for nuclear generating stations

Main features	Symbol	Unit	MBS 500		MBS 800	
Rated voltage	U_{Ne}	[V_{DC}]	900	1 800	900	3 600
Rated service current	I_{Ne}	[A]	6000	6 000	8 000	4 000
Rated making & breaking capacity	I_{Nss} / $\hat{I}_{Nss}$	[kA]	125/180	100/142	134/190	40/57
Rated track time constant	T_{Nc}	[ms]	100	31.5	100	31.5
Duty classes	-	-	f, e, d			
Degree of protection	-	-	IP42			

Internal Arc tests – *According to EN 50123-6/A1:2015 standard*

Main features	Symbol	Unit	MBS 500
Rated voltage	U_{Ne}	[V_{DC}]	900/1 800
Rated insulation voltage	U_{Nm}	[V]	3 000
Prospective current under arcing conditions	I_{Narc} / $\hat{I}_{Narc}$	[kA]	100/143
Permissible arc duration	-	[ms]	150
Degree of protection	-	-	IP42

DESCRIPTION

The DC breaker panel type MBS-HD 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

MBS-HD feeder panel

Rear high-voltage busbar compartment

The high-voltage compartment is at the rear of the cubicle. It contains the main busbar, cable connections, voltage and current measuring and, where applicable, disconnector switches.

Control and protection system

The control and protection system is located at the front of the cubicle. Low-voltage components in the upper compartment are protected by the SEPCOS control & protection relay.

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. All trolleys are exchangeable by one of the same type and are easy to manoeuvre.

Active equipment is located on the trolley.

MBS-HD feeder trolley

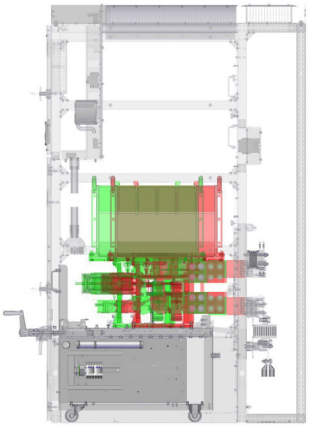
Trolley positions

The withdrawable high-speed circuit breaker trolley has four positions:

- Service position
- Test position
- Disconnected position
- Removed position

When the trolley is in service position, the front high-voltage door is locked and it is not possible to access the trolley. When high-voltage is applied to the breaker, it must be open before the trolley can be moved from service to test position.

The trolley is moved from one position to another either manually by an external handle or electrically via the SEPCOS touch screen display. In this way, user's security is ensured. Trolleys can be encoded to ensure that they cannot be exchanged for a trolley of another type.



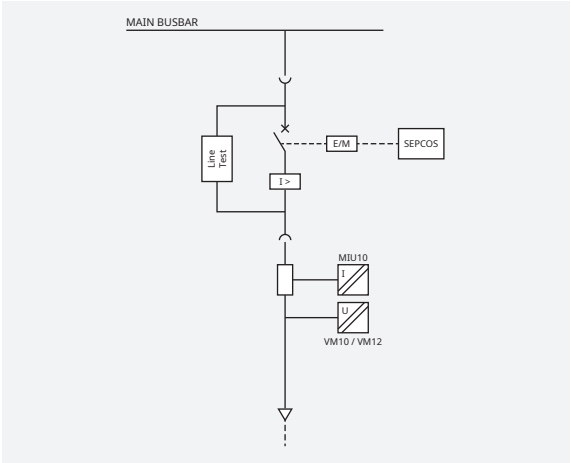
Service and test positions

Optional: Motorized trolley

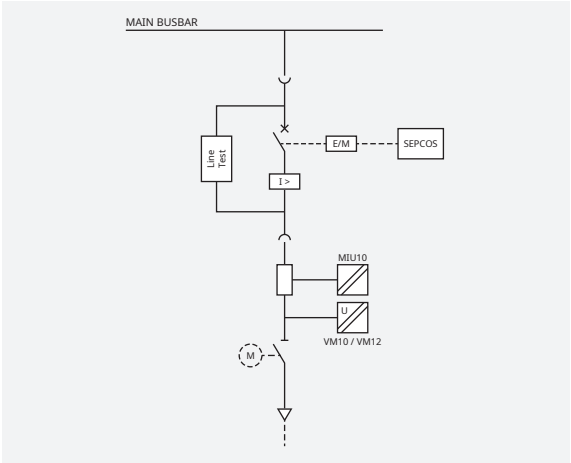
The motorized trolley is an available option that allows the trolley to be disconnected remotely, thus replacing the line isolating disconnecting switch. Motor is embedded on the trolley.

APPLICATIONS

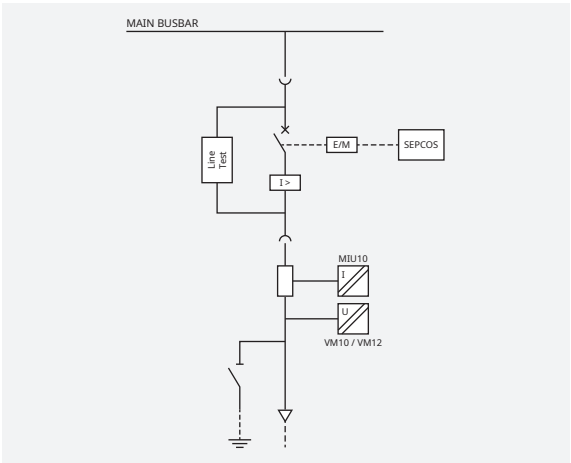
Line feeder



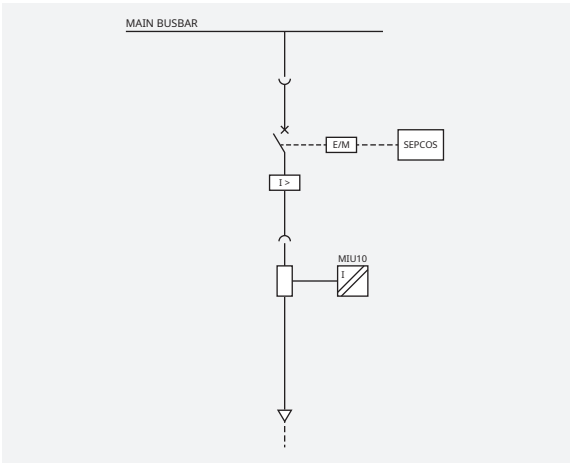
Line feeder with isolating switch



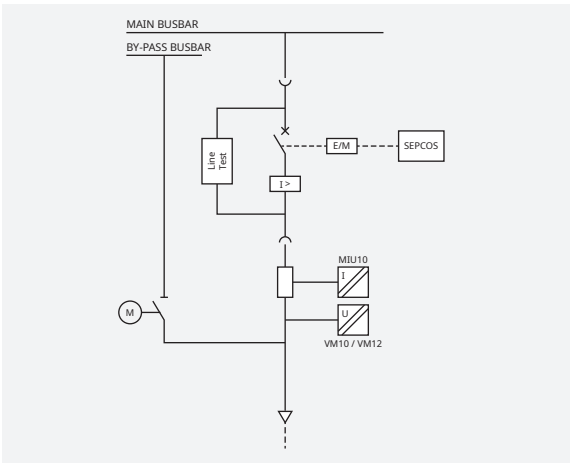
Line feeder with earthing switch



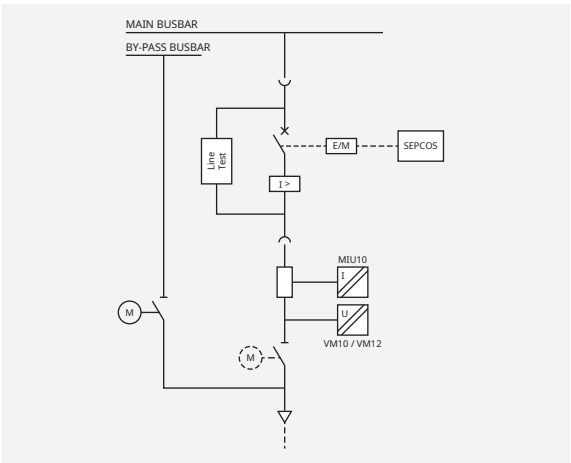
Rectifier breaker



Line feeder with by-pass



Line feeder with by-pass & isolating switch

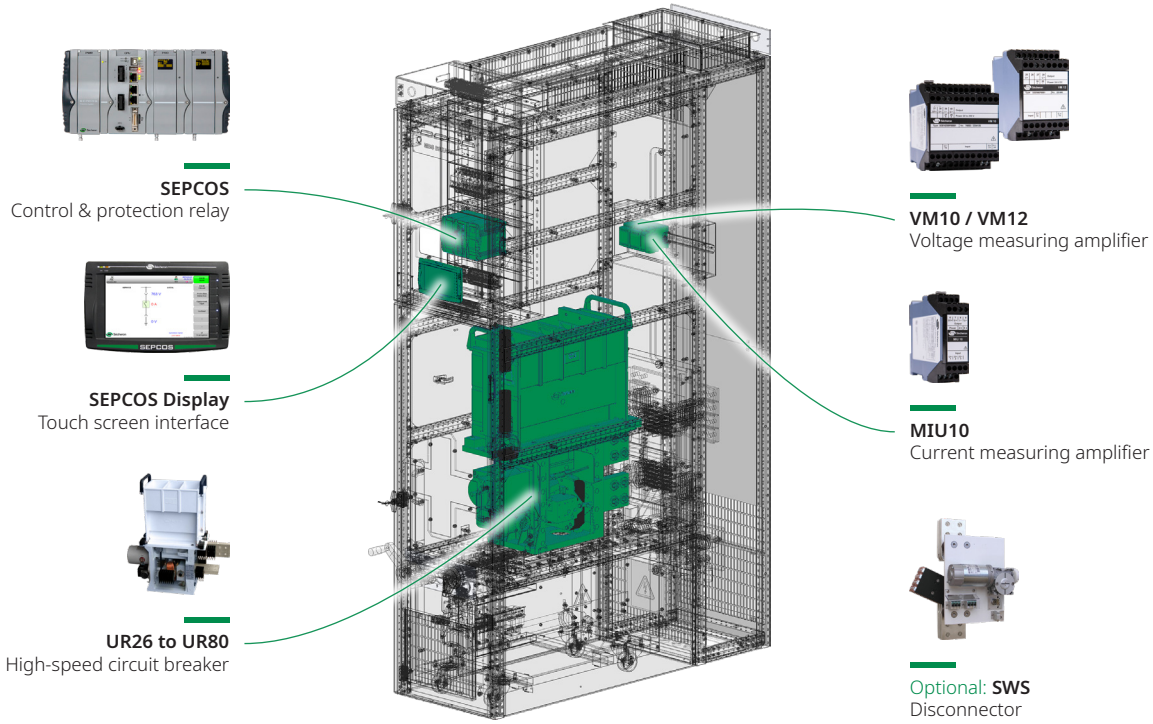


Installation of lightning arrester for outgoing feeder is available upon request. More available upon request.

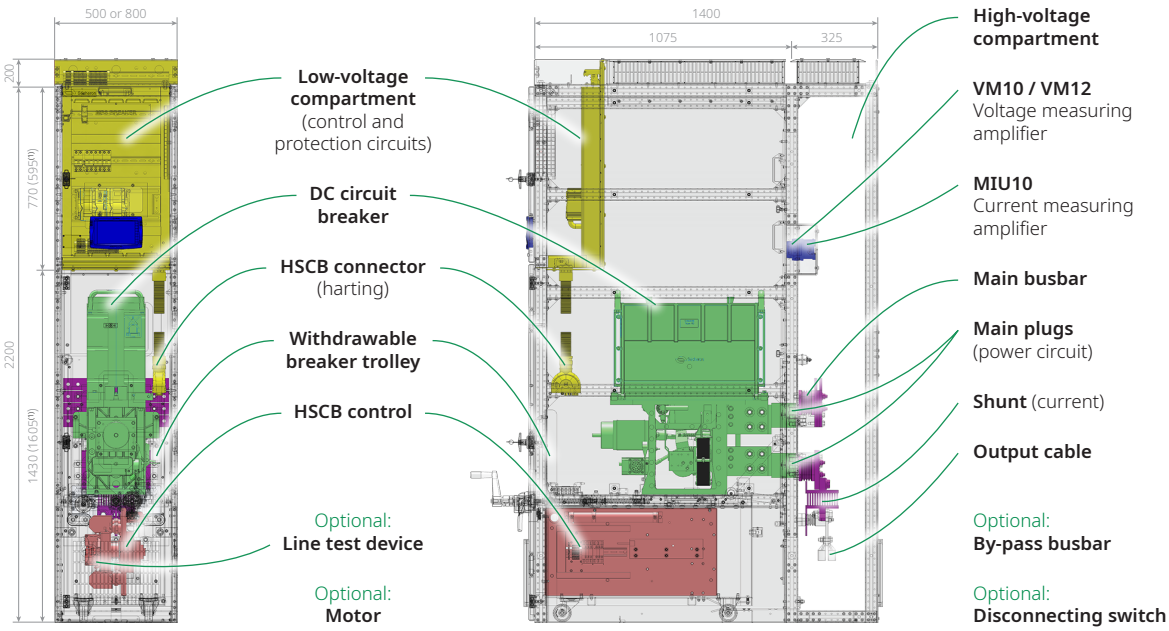
MECHANICAL CHARACTERISTICS

COMPOSITION

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



MAIN DIMENSIONS



(1) For 3600 VDC cubicle.

RELATED PRODUCTS

SEPCOS

CONTROL & PROTECTION RELAYS

SEPCOS is a control and protection unit that is applied to the outgoing feeder or the incoming HSCB cubicles in the DC traction substation.

Main features

- Modular PLC concept, PLC programming (IEC 61131)
- Fully approved in railway substation environment IEC 60255-22
- High noise immunity thanks to sampling rate at 40 microseconds and 16 bits A-D converter

Protection functions

- All typical protection functions (e.g. di/dt +/-, Imax +/-, etc.)

Control functions

- HSCB On/Off control with electric or magnetic holding
- Intertripping, automatic reclosing, anti-pumping, line test function
- NTP synchronization of the PLC, measurement supervisor control
- NTP synchronization of the PLC, measurement supervisor control

Open to all customer networks and protocols

- TCP/IP: Modbus-TCP, Profinet
- Specific TCP/IP based power distribution protocols: IEC 60870-5-104, IEC 61850, DNP 3.0
- Fieldbus: Modbus-RTU, Profibus-DP

SEPCOS in a low-voltage compartment

SEPCOS Display:
SEPCOS may be controlled and parametrized through a user-friendly 7" color touch screen display located on the front door of the cubicle.

S-Web:
All functions are available through a web-server, including visualization trends.

Refer to **Brochure SEPCOS** · SG825866BEN

SEPCOS-PRISM

CONTROL & PROTECTION RELAYS

- Compact product
- Door mounting
- Increase space in the low-voltage compartment

Refer to **Brochure SEPCOS-PRISM** · SG847023BEN

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