ESTRA-MBS-SECUB

High-speed circuit breaker panels
Type SECUB
GENERAL INFORMATION

With a complete range of equipment and a leading expertise in DC traction power substations, Sècheron SA is a world leader and major partner for electrification of DC traction networks.

Covering all activities from calculation, network design and engineering, up to the production of the DC Systems, Sècheron SA can offer customers and partners tailor made solutions based on a modular concept and standard products.

Our equipment is developed on world leading technology and proven worldwide design and acceptance. In-house technology covers all key devices applied in the DC Systems (Rectifiers, DC HSCB, Disconnect Switches, Protection Relays, Measuring Amplifiers, etc.).

/// DC SWITCHGEAR FOR LIGHT RAIL APPLICATIONS

The MBS-SECUB cubicle is a compact DC switchgear solution designed for DC traction substations powering light transportation systems such as tramways, LRT, trolleybuses, monorails and LIM.

MBS-SECUB completes the range of Sècheron DC switchgear that covers heavy duty transportation systems.

MBS-SECUB is the improved evolution of the SECUB which has been widely installed in various networks for more than 10 years.

/// MAIN FEATURES

- Rated current up to 2500 A (main circuit)
- Rated voltage up to 900 VDC
- Metal enclosed switchgear compartment equipped with high-speed circuit-breaker
- Bi-directional current interruption
- Rated short-circuit current up to 70 kA (100 kA peak)
- Equipped with a high-performance control and protection relay type SEPCOS
- Designed according to EN50123 and IEC61992 standards

MAIN BENEFITS

- Strong, compact and durable cubicle.
- Modular construction.
- Limited maintenance with easy access to all parts.
- Possibility to install cubicle directly against a wall
- Front access to all equipment.
HSCB DC SWITCHGEAR: DESCRIPTION

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

The MBS-SECUB 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.

The DC breaker panel type MBS-SECUB 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

/// 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.

/// PROTECTION AND CONTROL SYSTEM
The protection and control system is located at the front of the cubicle. This low-voltage compartment contains low-voltage components and ensures the protection through the SEPCOS, protection and control 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.

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.

Active equipment is located on the trolley.
HSCB DC SWITCHGEAR: CHARACTERISTICS

<table>
<thead>
<tr>
<th>CUBICLE TYPE</th>
<th>Symbol</th>
<th>Unit</th>
<th>MBS-SECUB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated service current</td>
<td>$I_{ne}$</td>
<td>[A]</td>
<td>2500</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>$U_{ne}$</td>
<td>[VDC]</td>
<td>900</td>
</tr>
<tr>
<td>Circuit breaker type</td>
<td>-</td>
<td>-</td>
<td>UR26</td>
</tr>
<tr>
<td>Power frequency withstand voltage</td>
<td>-</td>
<td>[kV]</td>
<td>5.5/9.2</td>
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<tr>
<td>Main busbar</td>
<td>$I_{e}$</td>
<td>[kA]</td>
<td>Up to 6</td>
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<tr>
<td>Busbar rating - Connection</td>
<td>-</td>
<td>[A]</td>
<td>2500</td>
</tr>
<tr>
<td>Rated short-circuit current</td>
<td>$I_{Nc}/I_{nss}$</td>
<td>[kA]</td>
<td>70/100</td>
</tr>
<tr>
<td>Protection degree</td>
<td>-</td>
<td>-</td>
<td>IP20 or IP42</td>
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<tr>
<td>Ambient temperature range</td>
<td>$T$</td>
<td>[°C]</td>
<td>-5 to +40</td>
</tr>
<tr>
<td>Typical weight</td>
<td>-</td>
<td>[kg]</td>
<td>500</td>
</tr>
<tr>
<td>Dimensions (W x D x H)</td>
<td>-</td>
<td>[mm]</td>
<td>500 x 1400 x 2400</td>
</tr>
</tbody>
</table>

For further characteristics: Please refer to the data sheet for the individual circuit-breaker type.

Designed according to standard specifications EN 50123 and IEC 61992.

HSCB DC SWITCHGEAR: COMPOSITION

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

For further details and specifications, please refer to the data sheet for the individual circuit-breaker type.
Installation of lightning arrester for outgoing feeder is available upon request.

**HSCB DC SWITCHGEAR: MAIN DIMENSIONS**
CONTROL AND PROTECTION RELAY

SEPCOS is a protection and control 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 normalized programming.
- 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. DDL +/-, Imax +/-, etc.).

/// CONTROL FUNCTIONS
- HSCB ON/OFF control with electric or magnetic holding.
- Intertripping, automatic reclosing, anti-pumping, line test function.
- External synchronization of the PLC, measurement supervisor control.

/// OPEN TO ALL CUSTOMER NETWORKS AND PROTOCOLS
- TCP/IP: Modbus-TCP.
- Specific TCP/IP based power distribution protocols: IEC 60870-5-104, IEC 61850, DNP 3.0.
- Fieldbus: Modbus-RTU, Profieldus-DP.

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

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

STANDARDS

Approved type test reports available.

<table>
<thead>
<tr>
<th>Main features</th>
<th>MBS-SECUB</th>
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</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>900 VDC</td>
</tr>
<tr>
<td>Rated service current</td>
<td>2500 A</td>
</tr>
<tr>
<td>Rated making &amp; breaking capacity</td>
<td>70 /100 kA</td>
</tr>
<tr>
<td>Rated track time constant</td>
<td>100 ms</td>
</tr>
<tr>
<td>Duty classes</td>
<td>f, e, d</td>
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<tr>
<td>Degree of protection</td>
<td>IP42</td>
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</tbody>
</table>

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<tr>
<th>Main features</th>
<th>MBS-SECUB</th>
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<tbody>
<tr>
<td>Rated voltage</td>
<td>900 VDC</td>
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<tr>
<td>Rated insulation voltage</td>
<td>1800 V</td>
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<tr>
<td>Prospective current under arcing conditions</td>
<td>70/100 kA</td>
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<tr>
<td>Permissible arc duration</td>
<td>150 ms</td>
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<tr>
<td>Degree of protection</td>
<td>IP42</td>
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