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Sitras DSG

DC switchgear for DC traction power supply

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The Sitras® DSG DC switchgear is used in the power supply for DC railways in mass transit and mainline systems.

Sitras DSG is a type-tested, metal-enclosed, compartmentalized switchgear unit for indoor installation and meets all the requirements placed in today's DC traction power supply systems.

Features

- Low life-cycle costs due to low maintenance requirement and insensitivity to environmental influences
- Small space requirement because all components are easily accessible from the front
- Safe and reliable, as verified by type tests according to EN 50123-6 and IEC 61992-6
- Arc-fault tested and earthquake tested panels available
- Flexible due to modular designed panel types

Design

Construction

The panels are designed for indoor installation in a steel cabinet system. On the top, the switchgear panels are covered by a perforated metal grating. Optional the panels can be equipped with a dripwater protection made of zinc-plated steel.
Behind the upper door is the low-voltage compartment. Through the lower door, it is possible to gain access to the switch compartment. The separate compartments are shown in cross section below.

The switchgear has a busbar system. A bypass busbar is also installed in the case of switchgear types with a bypass panel.

All the main components are easily accessible from the front, therefore the panels are suitable for wall mounting.

Low-voltage compartment

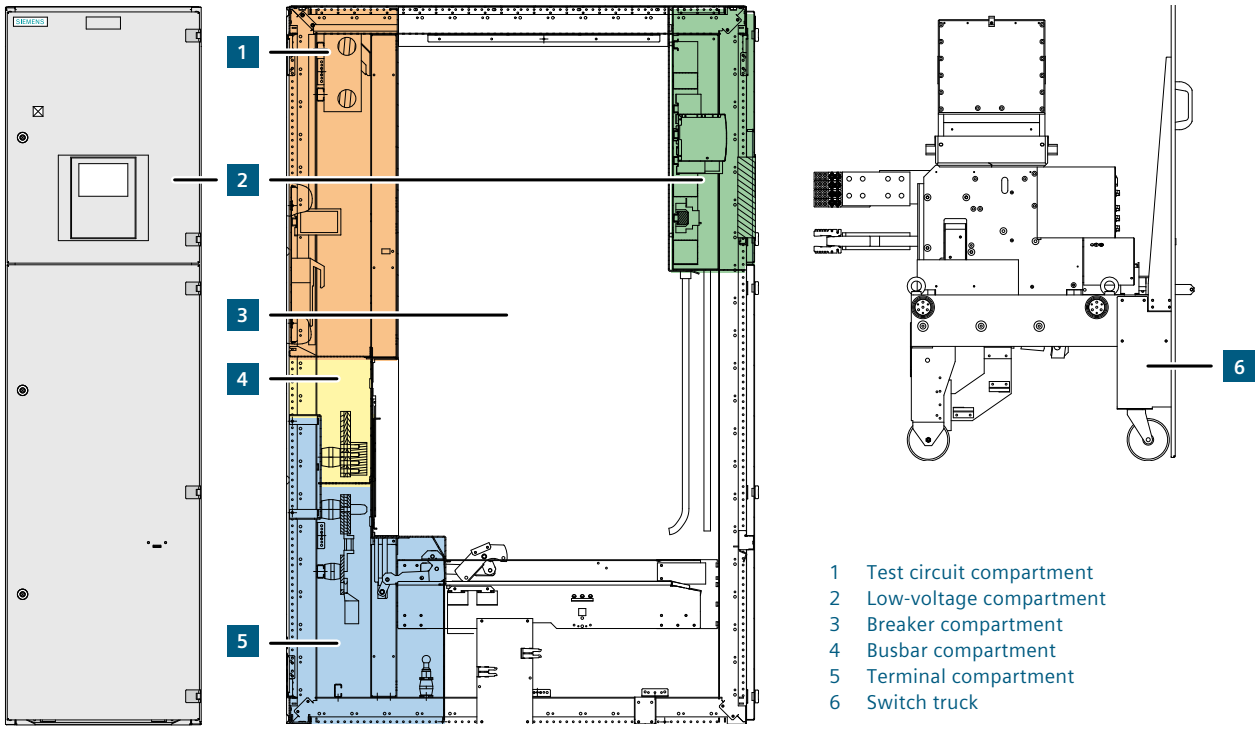
The control, protection and signalling devices are installed in the low-voltage compartment. These built-in devices are shielded by metal compartmentalization against electromagnetic interference. Mounting the protection and control devices inside the low-voltage compartment eliminates the need for parameter adaptations when the switch truck is replaced.

DC high-speed circuit-breaker panel

The switchgear panels consist of a stationary part and the switch truck with the DC high-speed circuit-breaker. The high-speed circuit-breaker, together with the necessary plug-in connections, is mounted on the switch truck. Thanks to steering rollers, its low weight and an easy unlatching and inserting mechanism the switch truck can be easily operated.

Disconnector panel

Depending on realization, one or more disconnectors, shunt resistors and, if needed, other devices are built into the switch compartment. The disconnectors can be equipped with hand-operated or motor-operated mechanism.



1 Test circuit compartment
2 Low-voltage compartment
3 Breaker compartment
4 Busbar compartment
5 Terminal compartment
6 Switch truck

Section feeder panel: Front view and sectional view

Panel types

Panel types	DC high-speed circuit-breaker panel	Disconnector panel
Incoming panel	■	■
Combined incoming / return line panel		■
Section feeder panel	■	
Section feeder panel with bypass disconnector	■	
Bypass panel	■	
Coupler panel	■	■
Return line panel		■

Incoming panel
- With disconnector: for standard requirements and substations with two rectifiers or more
- With DC high-speed circuit-breaker: selectivity thanks to detection and switch-off of reverse currents in case of rectifier faults

Combined incoming / return line panel
- Preferred for small compact substations with only one rectifier

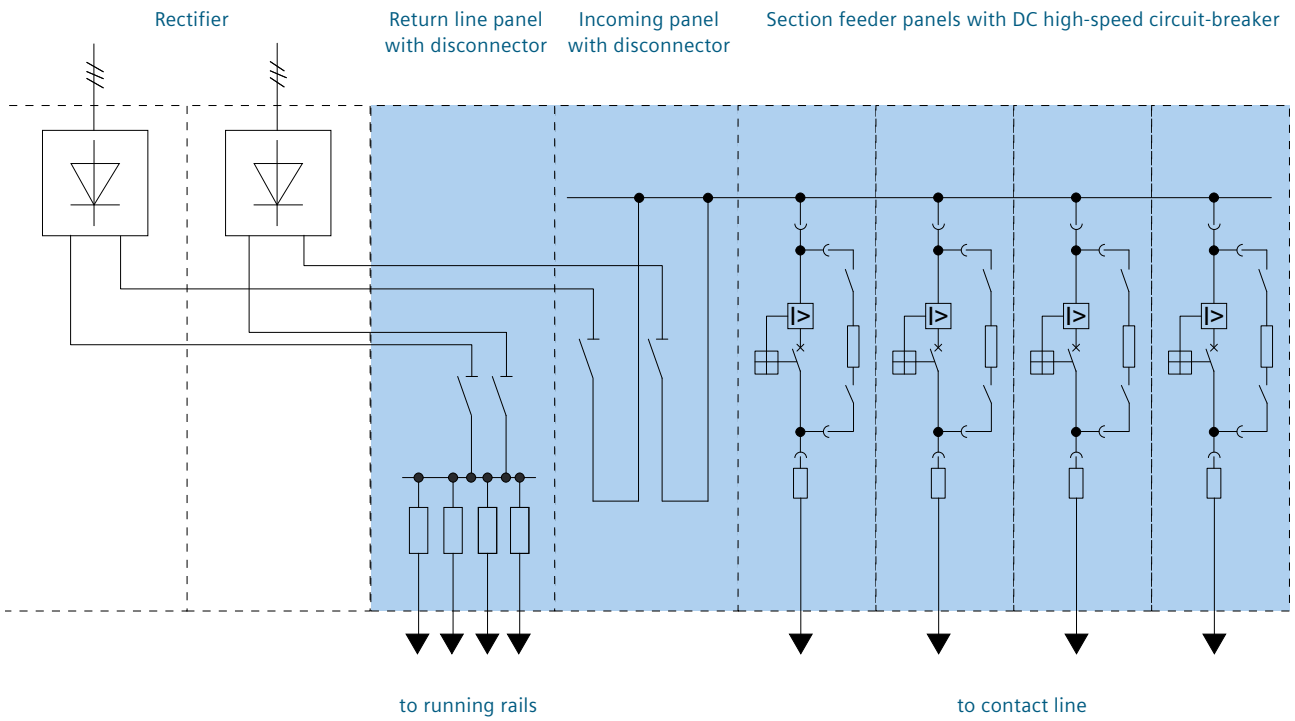
Section feeder panel
- For standard requirements

Section feeder panel with bypass disconnector
- For increasing availability (in combination with bypass panel)

Bypass panel
- For increasing availability (in combination with section feeder panel with bypass disconnector)

Coupler panel
- For disconnection and connection of switchgear sections or contact line sections

Return line panel
- For standard requirements and substations with two rectifiers or more



Example for arrangement of panels

Technical data

Nominal voltage	[V]	600 / 750	1,500	3,000
Rated voltage UNe	[V]	900	1,800	3,600
Rated insulation voltage U_{Nm}	[kV]	2	2	4
Impulse voltage withstand level U_{Ni} (1.2 / 50 µs)	[kV]	18	18	30 / 40
Power frequency withstand voltage U_a (50 Hz, 1 min)	[kV]	8.3	8.3	18.5
Rated current, busbar I_{Ne}*	[kA]	4.7...10	4.7...10	4.7...10
Rated current, feeder I_{Ne}*	[kA]	2.6...8	2.6...6	2.6...4
Rated short-circuit-current I_{NSS}* (peak value $\hat{I}_{NSS}$)	[kA] [kA]	125 (180)	80 (115)	40 (57)
Rated track time constant T_{Nc}	[ms]	100	80	30
Rated earth fault current I_{Ncwe}	[kA]	50	50	50

* other values on request

Mechanical data

Nominal voltage	[V]	600 / 750	1,500	3,000
Height Height with roof (dripwater protection)	[mm] [mm]	2,200 2,300	2,200 2,300	2,200 2,300
Width (optional)	[mm] [mm]	600 (800)	600 (800)	800
Depth	[mm]	1,400	1,400	1,500
Maximum weight – Switchgear cubicle with high-speed circuit-breaker incl. switch truck – Switchgear cubicle with high-speed circuit-breaker incl. switch truck and bypass disconnector – Switch truck with high-speed circuit-breaker	 [kg] [kg] [kg]	 600 660 190	 630 690 210	 690 750 230
Minimum height of room	[mm]	2,400	2,400	2,400
Minimum width of corridor in front of plant	[mm]	1,200	1,200	1,200
Degree of protection according to IEC 60529 – above / with optional roof – sidewards / with optional roof		IP20D / IP21D IP40D / IP41	IP20D / IP21D IP40D / IP41	IP20D / IP21D IP40D / IP41
Maximum ambient temperature	[°C]	40	40	40
Maximum installation height above sea level	[m]	2,000	2,000	2,000

Sitras DSG / Product information
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