



Sitras SCD – Short-circuiting device

Voltage-limiting device for DC traction power supply

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In DC traction systems impermissible touch voltages may occur between return circuit and structure earth due to operational currents, short-circuit currents and the interaction of AC and DC traction power supply systems. The persistence of these voltages must be prevented by means of a voltage-limiting device acc. to IEC 62128 / EN 50122.

Sitras® SCD reduces excessively high voltages by reliably short-circuiting the return circuit and structure earth temporarily. Furthermore, the formation of stray currents is minimized by automatic opening of the short-circuiting device.

Features

- Fulfills all the criteria acc. to IEC 62128-1 / EN 50122-1
- Optional evaluation of combined voltages fulfilling all requirements specified by EN 50122-3
- Operational safety and reliability due to high current carrying capacity and verification by type testing in accordance with EN 50526-2
- Maximum protection for persons and equipment due to rapid response time and optional lightning protection
- High functionality and ease of use due to programmable controller with display and keypad
- Earthquake tested versions available

Application

Protection against personal injury

Impermissible touch voltages are prevented; the right dimensioning and setting of the complete system is required

Monitoring of the potential of the return circuit

Earth faults in the contact line are detected, thus enabling them to be cleared by feeder substations

Protection of installation

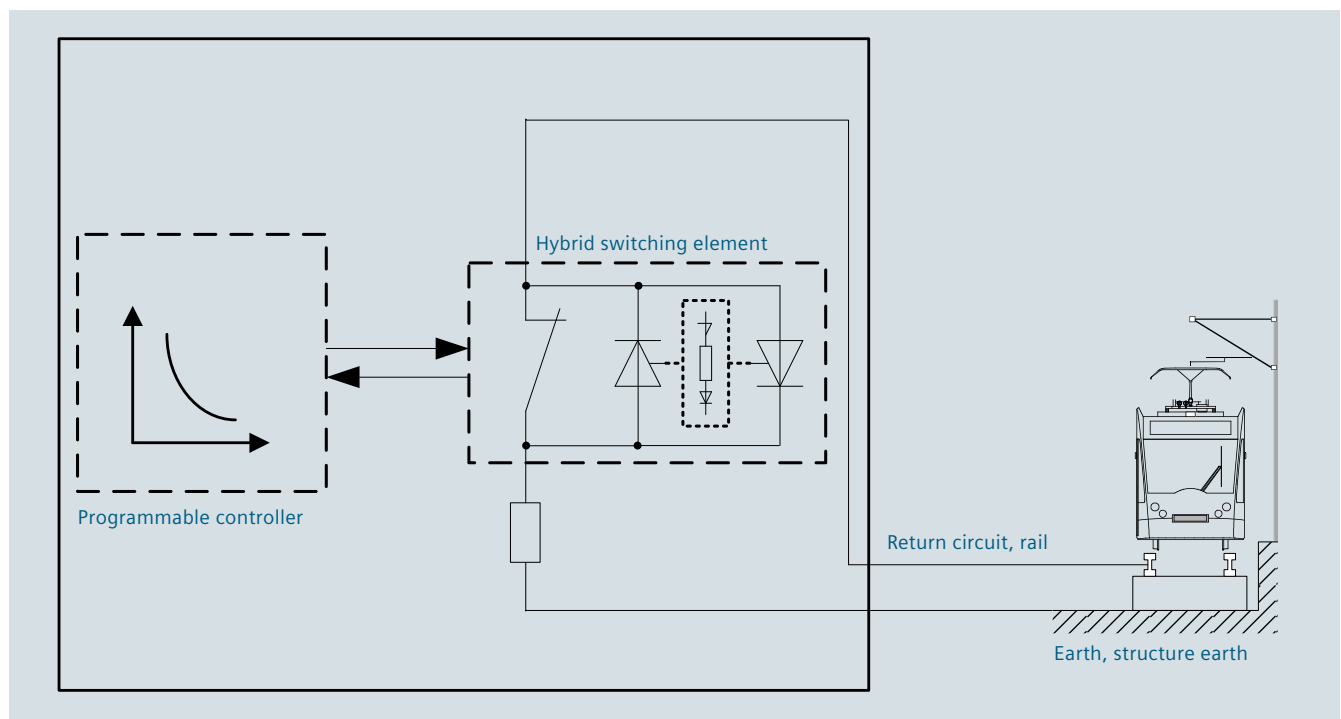
Overvoltages in the installation, e.g. due to lightning, are prevented

Design / main components

The metal cabinet for indoor floor installation contains the following main components:

- Hybrid switching element, consisting of DC contactor (NC contact) and thyristor instantaneous trip with triggering board
- Measuring circuits for voltage and current
- Programmable controller, optionally with Profinet interface

For outdoor application, the short-circuiting device can optionally be provided with a plastic cabinet.



Block diagram Sitras SCD

Function

“Active” mode

In its basic state, the main contact of the DC contactor is open and the thyristor instantaneous trip is not conductive. The voltage between the return circuit and the equipotential bonding busbar is measured and the voltage over time evaluated.

If one of the limits stored in the programmable controller is exceeded, the DC contactor closes. The limits are stored in the form of voltage-time characteristic curves and can be parameterized. For the workshop area, it is possible to change over to a separate characteristic curve.

In the short-time range, voltage evaluation takes place in parallel to the programmable controller in the thyristors triggering board. Its hardware circuit triggers the thyristor directly. The current flow is detected via a shunt and then the DC contactor is closed.

Sitras SCD opens automatically when the set closing time expires, the current is not critical and a blocking condition does not exist.

“Inactive” mode

If required, Sitras SCD can short-circuit both potentials without causing the contacts of the contactor to open automatically. This function can be used during maintenance work. The contacts of the contactor only open after the system has changed back to “active” mode

Blocking

If the number of trips within a specific time is unusually high, opening of the DC contactor is blocked and Sitras SCD remains in a state that ensures the safety of persons. The same applies if there is a very high current for a long time. All the values can be parameterized.

Blocking can be acknowledged locally or via a remote control link and thus cancelled.

Control voltage failure

Sitras SCD operates on the closed-circuit principle. This ensures that even if the control voltage fails, the return circuit and the equipotential bonding busbar are automatically short-circuited and that the system is safe for persons.

After the control voltage has been reconnected, Sitras SCD returns to the state it was in before failure of the control voltage.

Technical data

Sitras SCD			
Maximum system voltage U_n	[V]		3,000
Rated current I_{Ne}	[A]	800	1,500
Rated short-time current I_{Ncw} (250 ms) (peak value \hat{I}_{Ncw})	[kA] [kA]	24 / 35 (36 / 50)	50 (80)
Supply voltage	[V AC]		230
Mechanical lifespan	[switching operations]		> 1,000,000
Dimensions (H x W x D)	[mm]		1,800 x 600 x 500
Color			RAL 7047
Degree of protection			IP40
Weight	[kg]		160...220

Security information

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

For more information about industrial security, please visit:
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