WITT EscS 701 – Voltage Limiter

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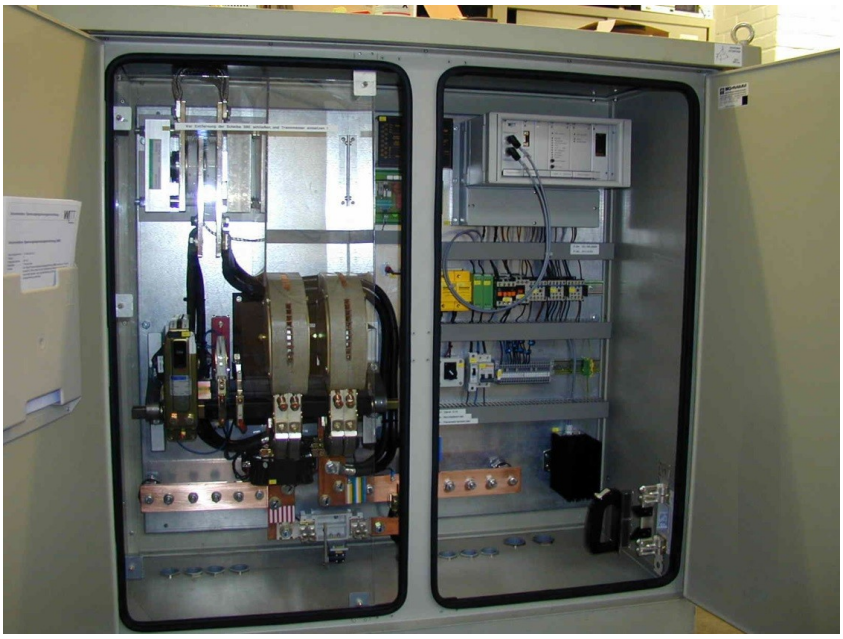

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Application

Rail systems with DC traction use the running rail as return conductor for the traction current. The rail is insulated against ground. Otherwise stray currents would occur and damage buildings and other infrastructure through corrosion.
The return current flowing through the rail generates a potential against earth through the electric resistance of the rail. This electric potential can be measured as a voltage between the rail or the carriage respectively and buildings and other infrastructure or earth. This voltage is potentially dangerous for persons. Because of that in DIN EN 50122 it is stipulated that this voltage must be removed if it exceeds defined thresholds. This is facilitated by a temporary short circuit between rail and earth.

Description

The WITT EscS 701 is a self-resetting earth arrestor according to DIN EN 50122. The product is parameterizable. The monitoring of the DC- and AC- voltage differences is carried out between the return conductor and ground. The combination of anti-parallel arranged thyristors and a power contactor guarantees a low switching time as well as a high current load capacity.

Function

When the entered voltage curve for DC or AC is exceeded the earth arrestor responds, meaning after the turn on criteria are fulfilled the thyristors are triggered and the power contactor is switched simultaneously. The thyristors have a switching time of a couple of milliseconds and the power contactor has a closing time of approx. 150 ms. By triggering the thyristors, the voltage drops down to only a few volts. The thyristors stay triggered until the helping contacts of the power contactor detect its closure. Afterwards the thyristors are stopped the power contactor takes over the load.
The WITT EscS 701 was specifically developed for situations, where there is an interaction between the 15kV power system of the regular railroad and a DC power system.

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General Data

Supply Voltage	230 V AC or 220 V DC
Voltage range	-30 ...+10 %
Power consumption	250 VA; at point of switching 1500 VA
Humidity	0 ...100 %, not condensing
Outdoor temperature range	-25 ... 40 °C
Protection according to IEC 34	IP 65
Switching cycles with Imax	≈ 50.000
Test voltages:	
Cabinet outside for 60s at 50 Hz	7,5 kVAC
All Poles (grounding, reports, auxiliary voltage) against each other	1,5 kVAC
Dimensions without USV and remote-control system (W x H x D)	1200 x 1200 x 500 mm
Dimensions with USV and remote-control system (W x H x D)	2000 x 1200 x 500 mm

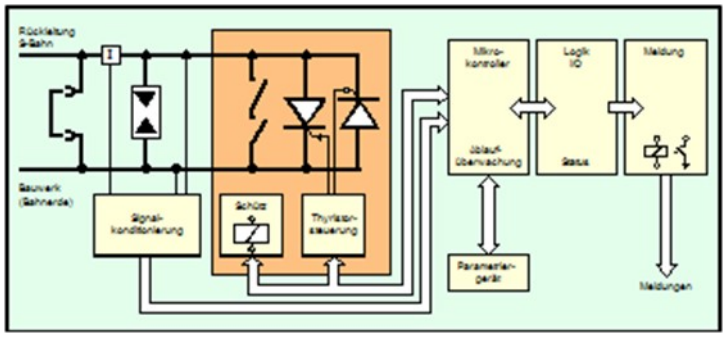
Short Circuit Currents

DC for 15 ms	15 kA
DC for 1 s	3 kA
DC for 20 s	2 kA
DC for 60 s	1 kA
AC for 60 ms peak	30 kA
AC for 1 s	400 A
AC for 60 s	300 A

Switch-Off Currents

Adjustment limits	50... 800 AAC, ADC
Accuracy of current measurement	± 10 %

Schematic Diagram



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