

WITT EscS 7 – Earth Short Circuiting Device



voltage limiting device
with approval of the
Federal Railway
Authority Germany

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Application

Rail system with DC traction use the rails as return conductors for the traction current. The rail is insulated towards the ground. Otherwise stray currents would occur and damage buildings and other infrastructure by causing corrosion.

The electric resistance of the rail causes the return current to generate a potential towards the ground. This electric potential can be measured as a voltage between the rail or the carriage respectively and buildings, infrastructures or earth. This voltage is potentially dangerous for humans. For this reason, the DIN EN 50122 states that this voltage must be equalized if it exceeds defined thresholds. This is can be done by creating a temporary short-circuit between the rail and the ground.

Description

The WITT EscS 7 is an auto-resetting earth short-circuiting device that accords to EN 50122 regulations for the protection of public and infrastructure. It is the only product available on the market that fulfills the newest requirements of the DIN EN 50122-1 and DIN EN 50122-3 regulations. Not only does it monitor DC and AC but also the interaction between the two voltages relative to the return conductor and the ground. A combination of anti-parallel thyristors and power contactors ensures a short switching period and high current carrying capacity. This device is built in an especially compact design.

The WITT EscS 7 has been evaluated and certified by the Federal Railway Authority (Eisenbahn - Bundesamt) under the ID number: 3343340/0/016.

Function

If the set voltage curve is exceeded, the earthing short-circuiting device reacts. That means that if the criteria are fulfilled, the thyristors are triggered and simultaneously the contactor is switched. The thyristors switch in a few milliseconds, the contactor closes in approx. 60 ms. When the thyristors have been triggered, the voltage collapses to a few volts.

The thyristors remain triggered until the contactor has been closed, which is confirmed by auxiliary contacts on the contactor. Afterwards, the thyristors are turned off and the contactor takes over the load.

General Data

Power supply	110 - 230 VAC, 60 – 110 VDC
Voltage range	-10 ... +10 %
Power consumption	≤ 250 W; max. ≤ 1500 W
Humidity	0 ...100 %, not condensing
External temperature range	-25° to 40°C
Protection according to IEC 34	IP 54 / IP 65
Dimension for Vertical deployment (w × h × d)	800 x 1780 x 500 mm
Dimension for Horizontal deployment (w × h × d)	1100 x 1100 x 500 mm
Weight	250 kg
Test voltages for 30s at 50 Hz	1,5 kV AC

Triggering Voltages

Limits for parameter setting	25 ... 500 V
Accuracy voltage measurement	± 3%
Tripping time	<10 ms

Switching Ability and Measurement of Currents

On / Off	20.000 A / 800 A
Monitoring of connection / monitoring of lines	0 ... 50 V
	0 ... 600 min
Limits for parameter setting measurement of current	50 ... 800 A
Default parameters for measurement of current	800 A
Accuracy measurement of current in relation to final value of 800 A	± 10%
Switching cycles with regular maintenance	10 Million
Switching frequency (even distribution of switching activities)	360 / h

Ampacity

Short term current INCW for 50 ms	20.000 A
Rated current Ithe	800 A

Schematic Diagram

