

3KVCC OVERVOLTAGE LIMITER

DUCATI Energia has realized the Voltage Limiter (unidirectional and bidirectional) for ground TE protection circuits for lines at 3KVcc, both on planning and application level. The task of this device is to ensure an electric safe connection between the ground TE protection circuit and the TE back circuit of the Italian Railway Network's 3KVcc supply system.

The Voltage Limiter has been designed to accomplish all the required functions, having, moreover, as task, the maximum flexibility to adapt to all the characteristics and the evolution of the plants.

Project Point of View

DUCATI Energia has developed the project tightly following the operative praxises regarding the design quality insurance, testing in laboratory the operation of the product, in accordance with the in force CENELEC rules.

The architecture of the Voltage Limiter uses a power thyristor through a control board, made up of two threshold's circuits. The thyristor begins to conduct, through a first starter circuit (first trigger circuit) when the voltage of the rail line is positive compared to the TE pole and it exceeds the pre-fixed level (150V). The primary starter circuit, to give higher reliability to the system, is supported by a second circuit, called secondary circuit (second trigger circuit), which starts at the same voltage level of the primary starter circuit, but in a longer time.



Constitutional elements of the Transient Soppessor

Under the operational point of view the bidirectional voltage limiter can be descibed and splitted into:



- power thyristor
- power diode
- varistor
- two control modules to start the controlled semiconductor (thyristor)

The power thyristor ensures the directional connection between the TE back circuit (+) and the ground TE protection circuit (-).

The power diode, connected in antiparallel to the thyristor, ensures the permanent directional connection between the TE protection circuit (+) and the TE back circuit (-).

The transient soppessor (varistor) has the task to protect the integrity of the power semiconductors in case of atmospheric origin's overvoltage.

The starter circuits have the task to activate the thyristor.

When the voltage applied to the device reaches the pre-foxed threshold for the primer, the thyristor begins to conduct immediately after the first delay (first Trigger). If the primary starter circuit doesn't work correctly, the second trigger circuit must start, after a pre-fixed time, the thyristor.