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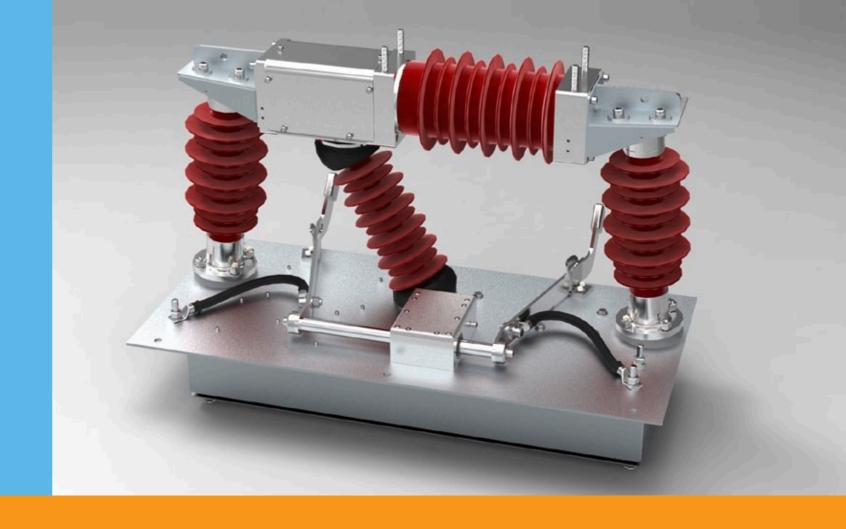
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Part numbers in this brochure are RoHS Compliant*, unless marked otherwise

as defined www.te.com/leadfre

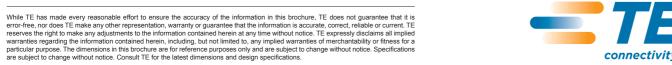


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Introducing

VESA Rolling Stock Vacuum Circuit Breaker for Electric Trains

TE Connectivity's (TE) optimized VESA vacuum circuit breaker for railway electrification is the first completely electro-magnetically operated system for 25kV and 15kV vehicles. More than 800 units on four continents, with the first unit installed over five years ago, generate an unbeatable proven reliability and thus lead the electrical rail vehicle market into a new era.

Electro-magnetically operated VESA AC vacuum circuit breakers are lighter weight than the pneumatic circuit breakers, easy to install, provide higher levels of safety and need less energy to be operated. Providing the market with a lower total installed cost solution, allowing removal of bulky pneumatic systems, this innovative TE solution offers an exciting and reliable product for both new designs and refurbishment programs. Decide to reduce your total cost of ownership and choose TE's greener way to more efficiency.





KEY FEATURES

- 25/15 kV vehicle mounted circuit breaker optimized for use in the rail environment
- Electro-magnetic operation no compressed air required
- Solid insulation with no internal creepage paths to eliminate internal flashovers
- Low height and weight compared to existing technologies
- Fits industry standard footprint making it suitable for new-build and retrofit applications
- Available with integral earthing switch saving space and expense
- Can be interlocked with train safety/control systems
- High reliability and low maintenance reducing total life-cycle costs

APPLICATIONS

- Suitable for 25kV/15kV AC applications and others upon request
- Rolling stock

PRODUCT DIMENSIONS

- Height: 490 mm (+ 140 mm below roof, excluding earth switch connection)
- Base plate dimensions: 940 x 430 mm
- Weight with earthing switch: 105 kg
- · Weight without earthing switch 95 kg

PRINCIPLE OF OPERATION

The unit is operated electro-magnetically, no pneumatic connection is needed. It uses a small amount of current from the train's low voltage power supply and an in-built storage capacitor to change the state of a magnetic actuator. To open or close the circuit breaker, a command signal is applied to the low voltage control circuit which then supplies power to the actuator. As the actuator changes state, it moves the contacts in the vacuum interrupter via an external drive rod. Minimum power is required to hold the contacts closed. The unit interfaces with the electronic control system on the train and the control logic can be customized to individual applications.

STANDARDS AND TESTING

VESA vacuum circuit breakers are designed to be compliant with IEC 60077-4, EN50121-3-2, EN61373, EN60529, EN62217 Ed1/CDV, EN50124-1 and other major specifications used in the rail industry.

A qualification test program has been completed including:

- Power switching and short time current
- Impulse withstand voltage
- AC withstand voltage
- FMC
- Shock and vibration
- IP 66 rating
- · Ice build up
- 250,000 no-load operations

Auxiliary contacts are provided for the main circuit and for the position of the earthing switch.

connectivity

ELECTRO-MAGNETICALLY OPERATED VESA VACUUM CIRCUIT BREAKERS

- No pneumatics involved
- Backwards compatible
- Compact design
- Significant energy savings
- Weight savings (unit and train systems)
- Longer lifetime
- Less maintenance costs
- Reduced carbon footprint
- · Less costs of ownership

PRODUCT OFFERING

Part Number	Model	Description
1-2191020-1	RS-AVCB-ECB-101	With earth arms
1-2191021-1	RS-AVCB-ENN-102	Without earth arms

TYPICAL RATINGS

This table gives typical ratings for a 25kV VESA vacuum circuit breaker. Ratings for 15kV VESA circuit breakers are available on request.

Characteristic	Value	
Nominal line supply voltage (U _n)	25 kV	
Rated operational voltage (U _e)	30 kV	
Rated operational frequency (f)	50 Hz	
Rated dielectric withstand (U _{so})	75 kVrms	
Rated impulse withstand voltage ($\mathbf{U}_{\mathrm{imp}}$)	170 kV	
Rated operational current	1000 Arms	
Rated making / breaking capacity	50 / 20 kA	
Rated short time withstand current	25kA / 1s	
Closing time	42 ms (typical)	
Contact separation time	18ms (typical)	
Low voltage circuit supply	24, 48, 72, 110 -30/+25% Vdc	
Operating temperature range	-50 to +70°C	
Height	Above roof line: 490 mm Below roof line: 140 mm	
Base plate dimensions	940 x 430 mm	
Weight – with earthing switch – without earthing switch	105 kg 95 kg	

