

Vacuum Circuit Breakers

VCB15/25

Data sheet



Maintenance free

The switching module's robust design guarantees up to 50,000 rated current and 100 full rated short circuit CO operations with no maintenance required.



Continuous self-supervision

The whole trip and close circuit supervision come in a single package with any VCB. In the event of a malfunction, it will be indicated locally with LED and remotely via relay contacts.



Most compact dimension and weight

With a weight starting from 34 kg, Tavrída Electric's circuit breakers are the lightest in their class which significantly simplifies the installation process.



Any spatial orientation

Adjustment and mounting flexibility for the optimization of switchgear design, which allows to define how to make primary and secondary connections, saving even more space.



High operational speed

Opening and closing times as low as 12 ms and 24 ms respectively, enabling the implementation of fast transfer switching, arc flash mitigation or fault current limitation.

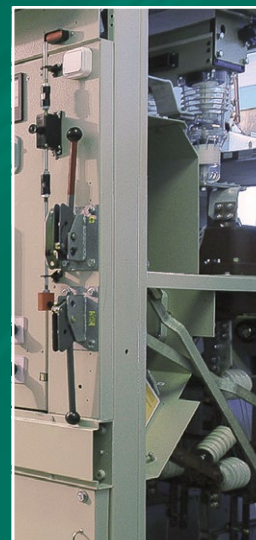


Single phase option

The perfect match for applications like transformers or generators with neutral earthing, server rooms and point on wave switching.

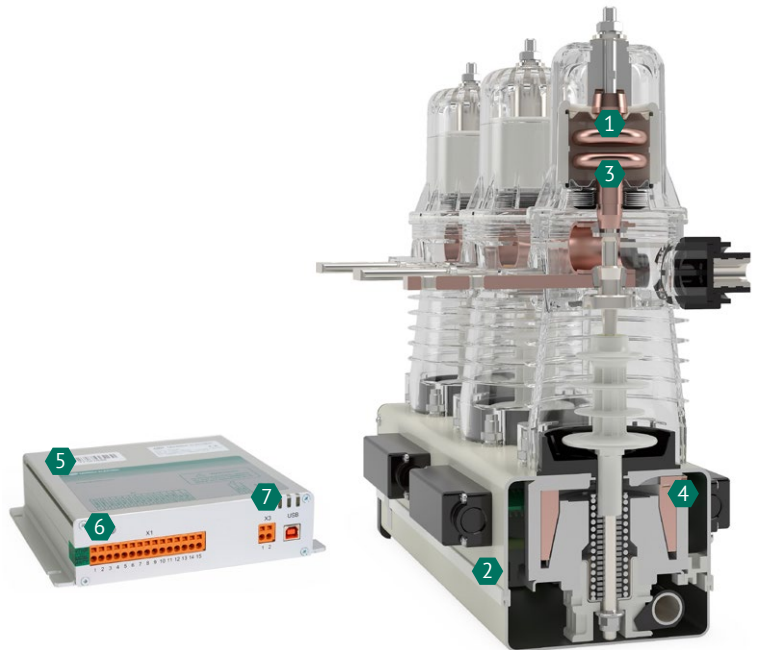
Tavrída Electric is a world-class manufacturer of medium voltage switchgear such as Vacuum Circuit Breakers & Automatic Circuit Reclosers. The VCB series circuit breaker is the result of extensive R&D efforts to provide outstanding performance for compact switchgear designs, retrofit programs, and special applications.

After 27 years on the market, the VCB series install base has reached 500,000 units worldwide continuing to resolve most ambitious customer problems.



Design and operation

- 1 Tavrída Electric manufactures compact vacuum interrupters with high interrupting performance and an extraordinarily long mechanical and electrical lifespan.
- 2 The patented design of the actuator allows it to be installed directly underneath each pole. The design is optimal in terms of reliability, dimensions, weight and ease of installation.
- 3 The use of robot welded steel discs as opposed to folded bellows eliminates the main failure point of conventional vacuum interrupter designs and maintains a high vacuum for its entire lifetime.
- 4 The actuator is not dependent on the auxiliary power supply quality. The actuator mechanism design enables both local and remote operation.
- 5 The energy for switching operations is stored in the CM16. This reduces the auxiliary power supply need to 1/10 of a conventional circuit breaker and enables significant savings on Substation UPS and auxiliary equipment.
- 6 Embedded intelligence - the CM's continuous self-supervision function monitors control switching modules, functional wiring and auxiliary power supply quality. In the event of a malfunction, a notification will be sent to the operator and indicated by inbuilt LEDs.



- 7 The CM can be conveniently installed at a distance from the circuit breaker and connected by means of flexible leads. It significantly simplifies the installation and allows the CM to be installed in the LV compartment.

Certificates

Tavrída Electric VCBs are designed and manufactured to strictly comply with the latest version of IEC 62271-100.

Each assembled VCB is subjected to routine testing in accordance with IEEE C37.60/IEC 62271-100 at the factory.

TYPE TESTS

- Dielectric tests
- Measurement of the resistance of the main circuit
- Temperature rise test
- Short-time withstand current and peak withstand current tests
- Extended mechanical operation tests
- Short-circuit current making and breaking tests
- Single and double earth fault tests
- Shortline fault tests
- EMC tests for control electronics
- Extended electrical endurance tests
- Capacitive currents switching tests

ROUTINE TESTS

- Visual check and functionality tests
- Dielectric withstand tests
- Measurement of the resistance of main circuit
- Mechanical operation tests



Technical parameters

PARAMETER	VCB15_LD	VCB15_SHELL	VCB25_LD
Rated data			
Rated voltage (Ur)	≤ 12 kV	≤ 17.5 kV	≤ 24 kV
Rated normal current (Ir)	≤ 800 A	≤ 2000 A	≤ 800 A
Rated power frequency withstand voltage (Ud)	28 (42) kV*	38 (42) kV*	50 kV
Rated lightning impulse withstand voltage (peak) (Up)	75 kV	95 kV	125 kV
Rated short-circuit breaking current (Isc)	≤ 20 kA	≤ 31.5 kA	≤ 16 kA
Rated peak withstand current (Ip)	≤ 50 kA	≤ 82 kA	≤ 40 kA
Rated short-time withstand current (Ik)	≤ 20 kA	≤ 31.5 kA	≤ 16 kA
Rated duration of short circuit (tk)	4 s		
Rated frequency (fr)	50/60 Hz		
Switching performance			
Mechanical life (CO-cycles)	50,000	30,000	30,000
Operating cycles, rated current (CO-cycles)	100	50	100
Closing time	≤ 70 ms	≤ 60 ms**	≤ 70 ms
Opening time	≤ 35 ms	≤ 35 ms**	≤ 35 ms
Break time	≤ 45 ms	≤ 45 ms	≤ 45 ms
Rated operating sequence	O-0.3s-CO-15s-CO		
General information			
Resistance of main circuit	≤ 40 μOhm	≤ 18 μOhm	≤ 40 μOhm
Weight	34-36 kg	51-55 kg	35-38 kg
Weight of single phase ISM	13 kg	-	14 kg
Temperature range	-25 °C ... +55 °C	-25 °C ... +55 °C	-25 °C ... +55 °C
Altitude above sea level	≤ 1000 m		
Relative humidity in 24 hours	≤ 95 %		
Relative humidity over 1 month	≤ 90 %		
Degree of protection according to IEC 60529	IP 40		
Type of driving mechanism	Monostable magnetic actuator		
Number of available auxiliary contacts for three-phase ISM	6 NO + 6 NC		
Number of available auxiliary contacts for single-phase ISM	2 NO + 2 NC		
Control module			
Weight of CM	1 kg		
Overall dimensions of CM	190x165x45 mm		
Rated range of supply voltage of CM_16_1(60_x_x)	24V to 60V DC		
Rated range of supply voltage of CM_16_1(220_x_x)	110V to 220V AC/DC		
Operating range (80-120%) of CM_16_1(60_x_x)	19V to 72V DC		
Operating range (80-120%) of CM_16_1(220_x_x)	85V to 265V AC/DC		
Charging the close and trip capacitors of CM_16_1(60_x_x)	≤ 25 W		
Charging the close and trip capacitors of CM_16_1(220_x_x)	≤ 42 W AC / ≤ 37 W DC		
Standby power consumption of CM_16_1(60_x_x)	≤ 5 W		
Standby power consumption of CM_16_1(220_x_x)	≤ 7 W AC / ≤ 5 W DC		

* Value in brackets - tested in accordance with GB1984-2003

** Special configuration available with opening times of 12 ms and closing times of 24 ms



Control module Electromagnetic Compatibility (EMC)

PARAMETER	APPLICABLE STANDARD	RATED VALUE
EMC parameters		
Electrostatic discharge	IEC 60255-26 IEC 61000-4-2	8 kV contact 15 kV air
Radiated EM field immunity	IEC 60255-26 IEC 61000-4-3	80 MHz – 3 GHz Sweep & spot AM 1 kHz 80% 10 V/m
Fast transient burst immunity	IEC 60255-26 IEC62271-1 IEC 61000-4-4	4 kV common mode
Surge immunity	IEC 60255-26 IEC 61000-4-5	4 kV common mode 2 kV differential mode
Conducted disturbance induced by radio frequency fields	IEC 60255-26 IEC 61000-4-6	150 kHz – 80 MHz AM 1 kHz 80% 10 V
Power frequency magnetic field	IEC 60255-26 IEC 61000-4-8	100 A/m continuously 1000 A/m 1 sec
Pulse magnetic field	IEC 61000-4-9	1000 A/m
100 kHz damped oscillatory magnetic field	IEC 61000-4-10	100 A/m
1 MHz damped oscillatory magnetic field	IEC 61000-4-10	100 A/m
AC voltage dips and interruptions	IEC 60255-26 IEC 61000-4-11	ΔU 30% 1 period ΔU 60% 50 periods ΔU 100% 5 periods ΔU 100% 50 periods
Power frequency disturbance voltage	IEC 60255-26 IEC 61000-4-16	300 V common mode 150 V differential mode
100 kHz and 1 MHz damped oscillatory wave immunity	IEC 60255-26 IEC 62271-1 IEC 61000-4-18	2.5 kV common mode 1 kV differential mode
Ripple on DC power supply	IEC 60255-26 IEC 61000-4-27	10% of supply voltage, 100 Hz
DC voltage dips and interruptions	IEC 60255-26 IEC 62271-100 IEC 61000-4-29	ΔU 30% 2 sec ΔU 60% 2 sec ΔU 100% 0,3 sec ± 20 % 10 sec

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