TAVRIDA ELECTRIC

Excellence in Engineering

Retrofit solutions
Tavrida Electric

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Tavrida Electric has nearly 30 years of experience in Retrofit. Thanks to the unique design of Tavrida Electric circuit breaker even the most complex switchgear can be refurbished and upgraded.

Retrofit is a cost and time efficient alternative to the worn-out switchgear replacement. It is possible to replace oil or SF6 circuit breaker with Tavrida Electric vacuum circuit breaker. Compared to full switchgear replacement retrofit allows the switchboard to be refurbished within short time without long power supply outages.

Retrofit offers the following benefits:

- Reliability of a brand new switchgear.

- Saving on CAPEX by renewing only the worn-out parts while benefiting from new technologies.

- OPEX reduced due to the modern maintenance free TEL VCB.

- Increased personnel safety:
- Mitigate risks of electrical flash fatalities.
- Mitigate risks of power outages resulting in dangerous accidents.

- Possibility to further increase the performance by implementation of:

- Fast transfer switch – restores the power supply in less than 50 ms to ensure the uninterrupted process.

- Fast acting Arc Flash Protection – fault clearing time less than 30 ms – increases the safety of personnel and limits the switchgear damage in the event of internal arc fault.

Tavrida Electric circuit breakers ensure:

Maintenance-free operation:
- 30 years of maintenance-free operation.
- Continuous self-supervision of the whole trip and close circuit.

Most Compact dimensions, minimum weight, any spatial orientation:
- VCB can be easily installed in any switchgear panel type.

Environmentally friendly:
- SF6-free vacuum circuit breakers.

High operational speed:
- The fastest VCB on the market with Opening/Closing time of 35(12*)/60(24*) ms

Long life and high reliability VCBs:
- 30 000 close-open cycles.
- Life expectancy of at least 30 years.

KEMA product certification
- Quality is verified in top international testing laboratories.

* Special configuration available with opening time of 12 ms, closing time of 24 ms and breaking time of 22 ms.

Retrofit designs

Within the last 25 years, we have desgined more than 30 retrofit solutions including such as Brown Boweri, Reyrolle LMT, LMS, LMR, Hawker Siddeley switchgear types and many more.

Brown Boweri type BBC (HB) Switchgear	Reyrolle type LMT,LMS,LMR type switchgear	Hawker Siddeley switchgear type V4/6-6 CB (maybe South Wales)	Actom switchgear Type SBV2 CB
			
GEC type AG 16	Yaskawa Fluropack switchgear type 6E25BB	SACE(HA1) type switchgear	Delle Alsthom switchgear type HL420
			

Tavrida Electric retrofit solutions are widely implemented in South Africa, and we are proud to have such international global companies as AngloGold Ashanti and Sibanye Stillwater and many others among our customers.

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

VCB type tests are done by KEMA.

Retrofit in mining industry

As long as sustainable safe production continues to be a key focus area for the mining industries, there is no better option than the most reliable TEL VCBs for switchgear retrofit.

Tavrida Electric's vacuum circuit breakers provide protection and ensure the correct operation of various mining equipment and secondary systems such as jumbo drills, crushers, conveyors, hoisting, electric motors and drives, pumping systems, ventilation fans, and many others. The maintenance process entails many difficulties and harsh conditions:

Conditions:
- High ambient temperatures
- Vibrations
- Heavy pollution (particles, gases)
- Confined spaces

Problems associated with the maintenance:
- Long distance to travel underground to access switchgear in mines
- Repair works are difficult in confined spaces

Maintenance-free design of Tavrida Electric VCB's eliminates such problems!

Switchgear used in mines must be reliable. Failure of circuit breaker may lead to power outages resulting in mine flooding, workers' suffocation, fire explosion. Due to a simplified design, Tavrida Electric's vacuum circuit breaker has 20 times higher reliability than the conventional circuit breakers, and meets all customer's requirements.

Tavrida Electric mine switchgear solutions are highly appreciated in the mining industry and provide the lowest possible life cycle cost, the highest safety, reliability, system availability, short project implementation time and maintenance-free design. Tavrida electric's vacuum circuit breakers are installed and demonstrating high performance in the following mines:

- Mponeng Gold mine (one of the most substantial-output gold mines in the world). It is also currently the world's deepest mine from ground level.
- TauTona Gold mine. it is home to the world's deepest mining operations, rivalled only by the Mponeng gold mine.
- Savuka Gold mine. The 3rd deepest mine as per its maximum operating depth.
- Driefontein mine (Driefontein represents one of the largest uranium reserves in South Africa).
- Moab Khotsong mine.
- South Deep mine.
- Great Noligwa Gold mine, and many others.

Retrofit in chemical industry

The growth in the industry is resulting in the increasing power demand and increasing load on switchgear equipment.

The reliable switchgear is the utmost importance, the single failure can lead to very high losses due to dameges to the production equipment, production and causes significant danger to human lives and environment.

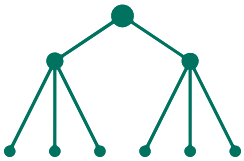
The chemical industry is characterized by complex processes that rely heavily on maximum accuracy and safety.

Industry-specific challenges

- Strong environmental regulation
- Safety of personnel and operation

TEL retrofit solution

- SF6 free VCB, explosion free vacuum as an arc extinguishing medium. Reliable operation eliminates the possibility of any environment hazards caused by switchgear malfunction.
- 30 years of maintenance-free and reliable operation



Power distribution challenges

- Increasing loads
- Power quality and reliability

TEL retrofit solution

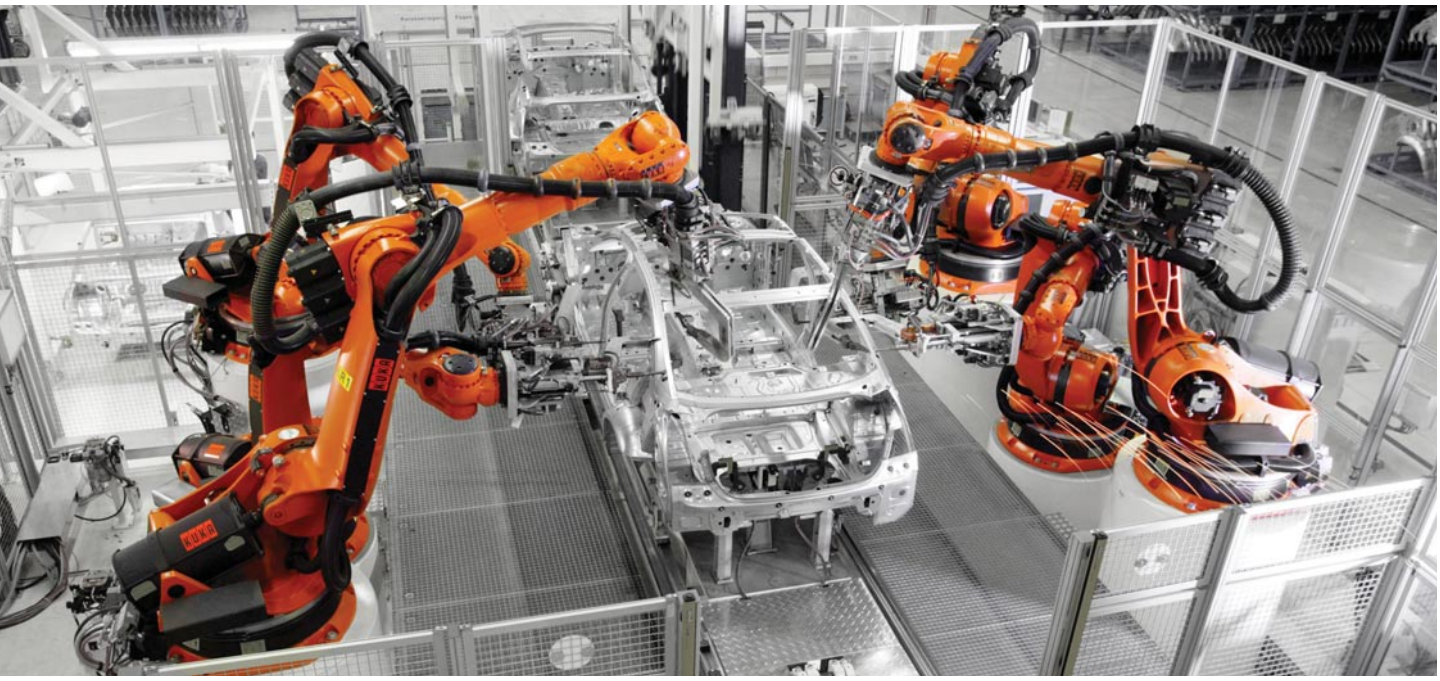
- Replacing obsolete circuit breakers with modern VCB with the ratings meeting customers' needs
- Ability to integrate smart solutions like Fast Transfer Switch to provide the most reliable quality power supply

UTILITIES

Renewing the whole switchgear is rarely an option due to the cost and project time constraints. In this case Tavrida Electric retrofit solution allows the old switchgear to be restored with no outages to the customers, within very short time (3..4 times quicker than replacement) and by the fracture of the new switchgear cost (nearly twice cheaper)

TEL solutions are maintenance-free and allow to lower OPEX.

TEL retrofit solutions are subjected to routine and type tests, so they comply with the legal regulations.



AUTOMOTIVE INDUSTRY

The automotive industry is always focused on high reliability and efficiency during production and in all manufacturing processes.

Automotive production is running 24 hours a day, 7 days a week, and any downtime in the manufacturing process leads to huge financial losses.

The obsolete and old switchgear, which is more likely to fail during operation, does not comply with the core principles of the automotive industry. The maintenance of outdated switchgears is often costly and time-consuming. As a money-saving alternative, we offer the improvement and replacement of switchgears and switchgear components.

Tavrida Electric company provides the solution and all the services to replace old oil or SF6 gas circuit breakers with the modern maintenance-free vacuum circuit breakers. Understanding automotive industry working process and specifics, we refurbish the switchgear (replacement of the switchgear truck) in a short while to minimize losses caused by power supply outages.

Technical parameters of the vacuum circuit breakers applicable for retrofit solutions

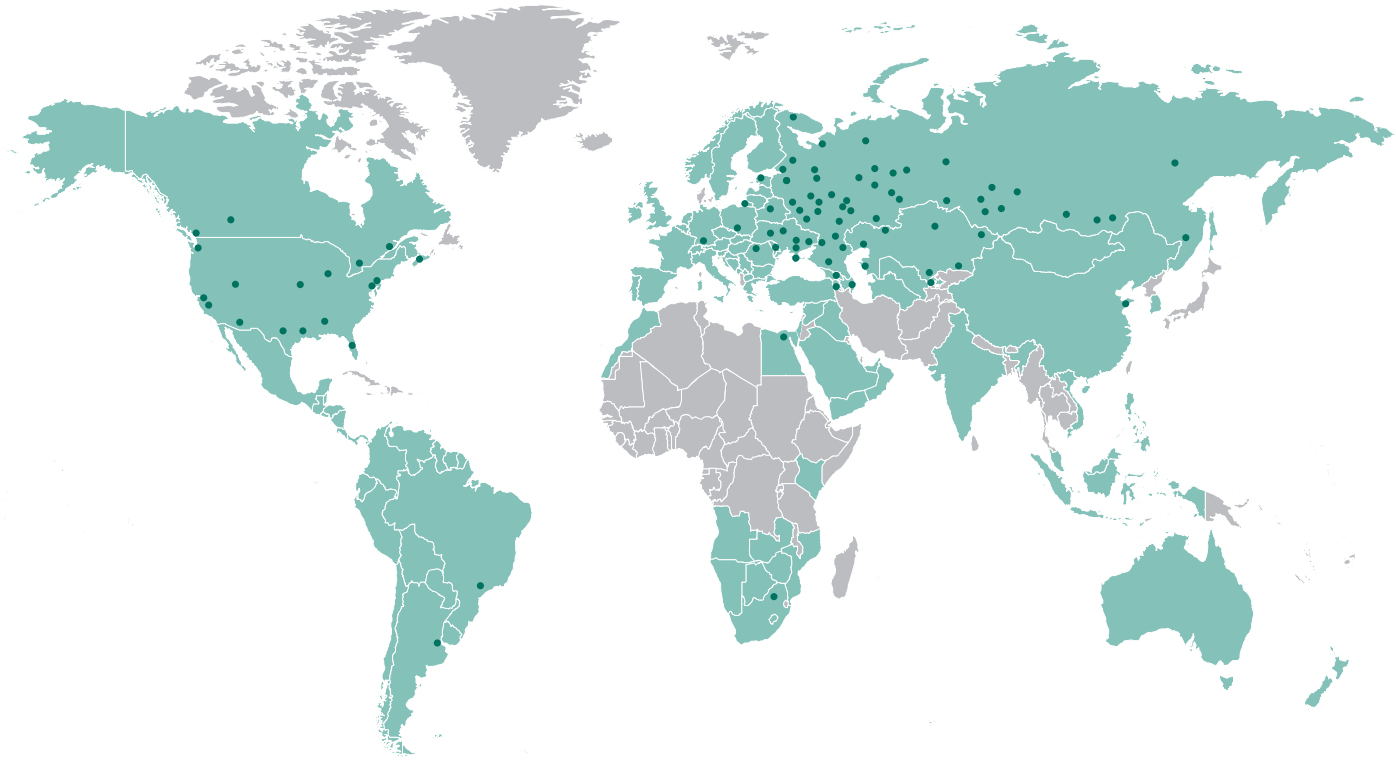
Type		VCB15_LD	VCB25_LD	VCB15_SHELL	VCB15_MD
Rated voltage (Ur)	kV	⩽ 12	⩽ 24	⩽ 17.5	⩽ 17.5
Rated normal current (Ir)	A	⩽ 800	⩽ 800	⩽ 2000	⩽ 1250
Rated power frequency withstand voltage (Ud)	kV	28 (42)*	50	38 (42)*	38 (42)*
Rated lightning impulse withstand voltage (Up)	kV	75	125	95	95
Rated short-circuit breaking current (Isc),	kA	⩽ 20	⩽ 16	⩽ 31.5	⩽ 31.5
Rated peak withstand current (Ip)	kA	⩽ 50	⩽ 40	⩽ 82	⩽ 82
Rated frequency (fr)	Hz	50/60			
Mechanical life (CO-cycles)		50 000	30 000	30 000	30 000
Operating cycles, (rated breaking current)		100	100	50	50
Closing time	ms	⩽ 70	⩽ 70	⩽ 60 (24)**	⩽ 60 (24)**
Opening time	ms	⩽ 35	⩽ 35	⩽ 35 (12)**	⩽ 35 (12)**
Break time	ms	⩽ 45	⩽ 45	⩽ 45 (22)**	⩽ 45 (22)**
Resistance of main circuit	μOhm	⩽ 40	⩽ 40	⩽ 18	⩽ 17
Weight	kg	34	35	51	33
Temperature range	°C	-25 ... +55			

* *Value in brackets means it was tested according to GB1984-2003.*
** *Special configuration available with opening time of 12 ms, closing time of 24 ms and breaking time of 22 ms.*

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/trip capacitors of CM_16_1(60_x_x)	⩽ 25 W
Charging the close/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

If you would like to obtain more detailed information about our retrofit solutions or become one of our local partners, please feel free to contact us



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