

# Vertical draw-out switchgear retrofit-kit

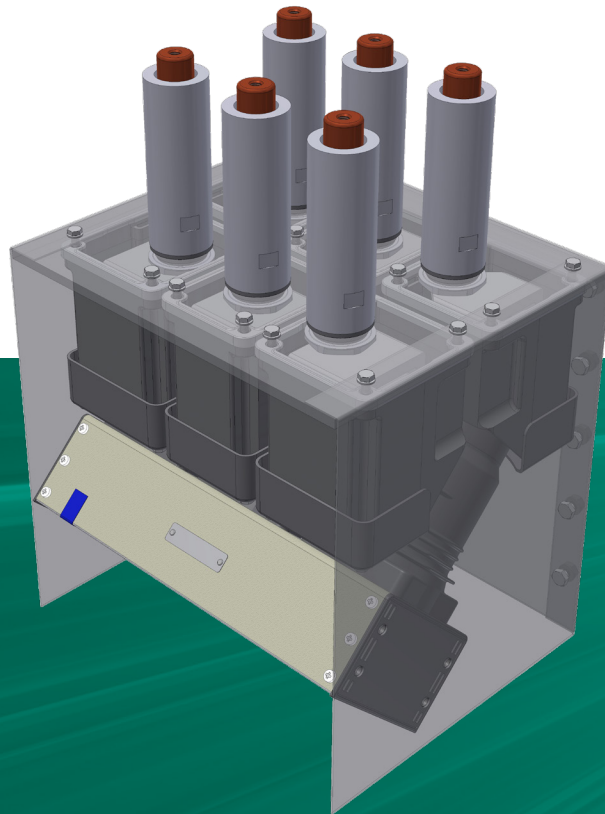
**UP TO 5 YEAR  
WARRANTY**

Vacuum Circuit Breakers for

- AG16 type switchgear
- Reyrolle LMT, LMS, LMR switchgear
- Brush and Hawker Siddeley switchgear



Tavrida Electric solutions ensure reliable power system operation in more than 80 countries.



- 12 kV systems (up to 95 kV BIL)
- 1250 A continuous rated current
- 31.5 kA short circuit breaking current
- 30 000 CO operations at full load
- 50 CO operations at rated breaking current
- Maintenance free

Tavrida Electric is a world-class manufacturer of medium voltage switchgear such as Vacuum Circuit Breakers & Automatic Circuit Reclosers.

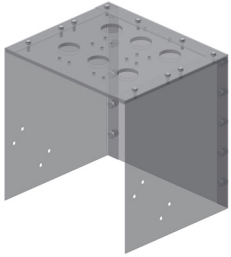
We have nearly 30 years of experience in Retrofit. Thanks to the unique design of Tavrida Electric circuit breaker even the most complex switchgear can be refurbished and upgraded.

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



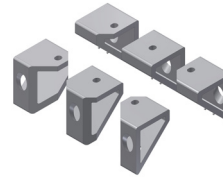
## Kit core components

Tavrida Electric offers a reliable robust retrofit solution that guarantees full protection from electrical flash fatalities and many other accidents, without the outrageous costs of having to replace the entire switchgear panel. At the same time it will provide the trouble-free durability that you would expect from a brand new panel.



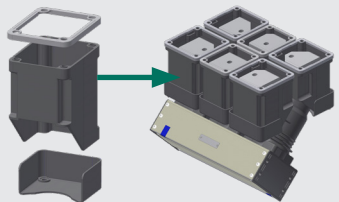
### Surrounding insulation kit:

Side and top covers are intended for insulation of live parts from the panel grounded sides, operator walls and grounded sealing of panel primary circuit compartment.



### Terminal interconnection interfaces:

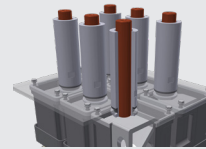
Intermediate terminals are providing correct contact arms position corresponding to vertical drawout unit type. Additionally big surface of the interface is acting as a radiator and interface has decreased resistance thanks to the two separate ways of current flow.



### Terminal insulation kit:

To withstand 95kV (peak) BIL and 38kV (RMS) PFWV additional insulation of terminal interconnection interface is designed. The kit includes:

- dielectric masks -to protect phase-to-phase and phase-to-surrounding gaps;
- dielectric bottom covers for lower terminal masks -to protect phase-to-actuator tank gap.



### Contact arm insulation kit:

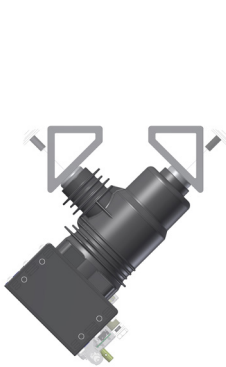
To withstand 95kV (peak) BIL and 38kV (RMS) PFWV additional dielectric tubes for the contact arms are designed. The length of the dielectric tubes is adjustable, meaning that the dielectric tubes can be shortened to fit to the contact arms length.



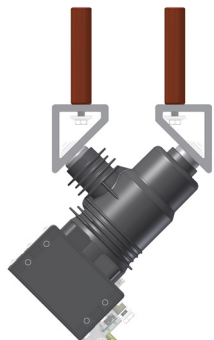
### Draw-out unit interlock interface:

Tavrida Electric developed the interlocking system using flexible cables which allows to integrate the new lockout control and lockout indicator into the existing original switchgear. Flexible cables allow to install the handle of the interlock in the most convenient location on the draw-out unit.

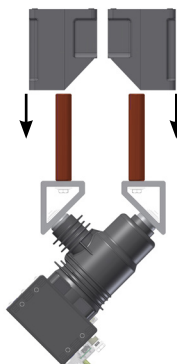
## Retrofit kit assembly



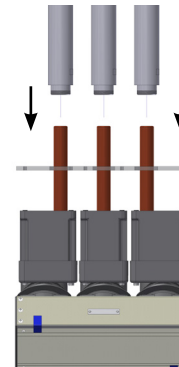
Mount the terminal interconnection interfaces



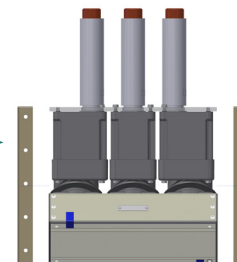
Attach the contact arms



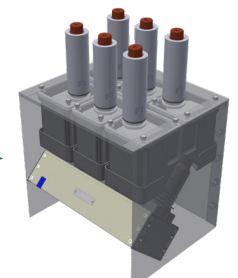
Install the terminals insulation



Install the contact arms insulation



Mount the surrounding insulation kit

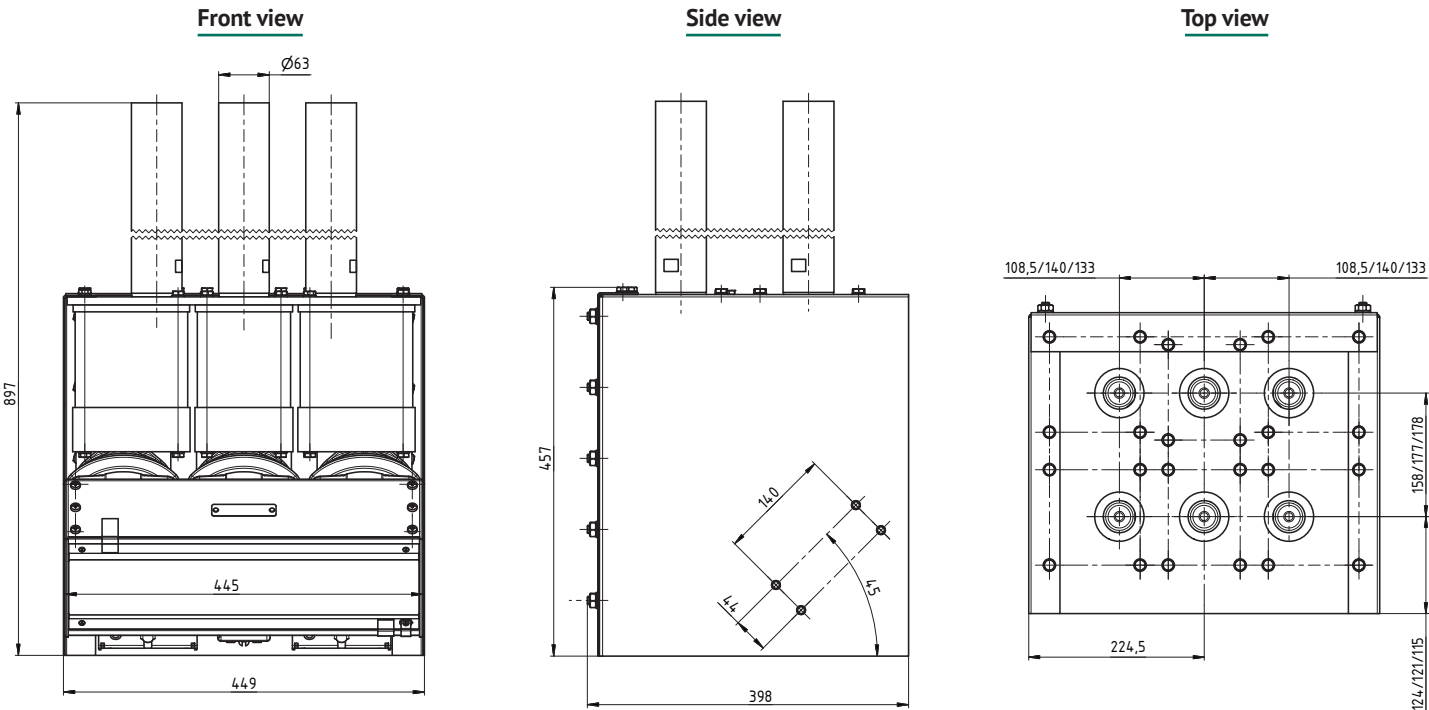


VCB with the retrofit kit assembled

Dimensional drawings

Reyrolle LMT, LMS, LMR, AG16, Hawker Siddeley switchgear types differ from each other in distance between terminals and phase center distance, so Tavrida Electric retrofit kit offers the following options:

- The kit with phase center distance = 133 mm, distance between terminals = 178 mm;
- The kit with phase center distance = 108,5 mm, distance between terminals = 158mm;
- The kit with phase center distance = 140 mm, distance between terminals = 177mm;
- Other configurations on demand.



Basic Operating Parameters

PARAMETER	RETROFIT KIT
Rated voltage (Ur)	12 kV
Rated normal current (Ir)	1250 A
Rated power frequency withstand voltage (Ud)	38 (42) kV*
Rated lightning impulse withstand voltage (peak) (Up)	95 kV
Rated short-circuit breaking current (Isc)	31.5 kA
Rated frequency (fr)	50 Hz
Mechanical life (CO-cycles)	30,000
Operating cycles, rated breaking current (CO-cycles)	50
Closing time	≤ 60 ms**
Opening time	≤ 35 ms**
Break time	≤ 45 ms**
Temperature range	-25 °C ... +55 °C
Number of available auxiliary contacts	6 NO + 6 NC
Rated auxiliary supply voltage	24V to 60V DC or 110V to 220V AC/DC

\* Value in brackets - tested in accordance with GB1984-2003  
\*\* Special configuration available with opening times of 12 ms, closing times of 24 ms and breaking time of 22 ms.