

# Automatic circuit reclosers

## Rec15/25\_AL1\_5s

### Data sheet



#### Smart control and protection

A variety of protection and automation functions: IEC-104, DNP3 and Modbus communication protocols, up to 48 hrs of operation on battery and smart battery charger.



#### Maintenance free

The switching module's robust design guaranties 30,000 rated current and 50 full rated short circuit O-CO operations with no maintenance required.



#### Lightest weight

With a weight of less than 72 kg, the switching module is the lightest in its class and the quickest to install.



#### Plug & play design

Customer convenience comes first – the recloser is supplied ready for installation with single lift mounting kit. All configurations and functional testing are done at the factory on request.



#### Customer service

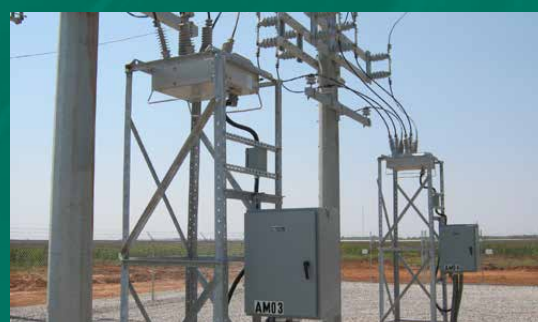
Outstanding customer service before, during and after a purchase provided by a team of highly qualified engineers and managers.



#### Versatile in applications

A truly adaptable recloser that can be applied for radial or ring feeder automation, substation automation and renewables. Other functions include distributed generation or important loads connection points.

Tavrida Electric is a world-class manufacturer of vacuum interrupters, magnetic actuators, circuit breaker modules and automatic circuit reclosers. The OSM Series is a field proven, reliable and flexible system that can be used as a switch, circuit breaker, substation breaker, sectionalizer or distribution recloser. With over 55,000 installations worldwide, the OSM Series has demonstrated unrivalled dependability in the most extreme environments.



## Design and operation

- 1 The air insulated, corrosion-resistant tank incorporates a solidly insulated circuit breaker, sensors and auxiliary mechanisms.
- 2 Each of the six bushings are made of UV stable, hydrophobic polymer, that guarantees reliable performance in heavily polluted areas. Confirmed by environmental testing in KIPTS\*.
- 3 The 6x current and voltage high accuracy sensors allow for measurements to be taken from either side of the recloser.
- 4 Mechanical trip hook for OSM manual operation. For superior linesman safety, the hook in the downwards position electrically isolates the actuator's circuit to prevent the possibility of any unintended recloser operation.
- 5 The recloser protects the network against overcurrent, earth faults, over- and under-voltage, over- and under-frequency, current and voltage imbalances, and many other problems. The control box has an embedded RTU that provides communication with SCADA over various communication protocols: DNP3, Modbus and IEC-104.



- 6 The Tavrida Electric recloser is equipped with a galvanized steel mounting bracket which allows installation of the recloser on different type of poles, e.g. concrete or wooden. The mounting bracket is partially assembled for fast and convenient preparation for installation.
- 7 All components are supplied in a single box to minimize time during handling and installation.

\* Koeberg Insulator Pollution Test Station (KIPTS) is known internationally as a severe environmental testing facility run by ESKOM, in South Africa

## Recloser certificates

The Rec series automatic circuit reclosers are designed and manufactured to strictly comply with the latest revisions of IEEE C37.60 and IEC 62271-111.

Tavrida Electric autoreclosers' compliance to international standards have been confirmed by large international test centers, such as KEMA and CESI.

Each assembled Rec series recloser is subjected to routine testing in accordance with IEEE C37.60/IEC 62271-111 at the factory. Routine tests include:

### TYPE TESTS

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

### ROUTINE TESTS

- Visual check and functionality tests
- Dielectric withstand test
- Measurement of the resistance of main circuit
- Reclosing and overcurrent calibration
- Mechanical operation test
- Partial discharge test



## Technical parameters

PARAMETER	REC15_AL1_5S	REC25_AL1_5S
<b>Rated data</b>		
Rated maximum voltage (Ur)	15.5 kV	27 kV
Rated continuous current (Ir)	630 A	
Rated short-duration powerfrequency withstand voltage (Ud), 1 min dry	50 kV	60 kV
Rated lightning impulse withstand voltage (peak) (Up)	110 kV	125 kV
Rated short-circuit breaking current (Isc)	16 kA	12.5 kA
Rated peak withstand current (Ip)	41.6 kA	32.5 kA
Rated short-time withstand current (Ik)	16 kA	12.5 kA
Rated duration of short circuit (tk)	4 s	
Rated cable-charging current switching	10 A	25 A
Rated line-charging current switching	2 A	5 A
Rated frequency (fr)	50/60 Hz	

### Switching performance

Mechanical life (CO-cycles)	30,000
Operating cycles, rated current (CO-cycles)	30,000
Closing time, not more than	77 ms
Opening time for overcurrent protection according to IEC 62271-111/C37.60, not more than (at $I > 2 \times I_p$ )	43 ms
Clearing time for overcurrent protection according to IEC 62271-111/C37.60, not more than (at $I > 2 \times I_p$ )	51 ms
Rated operating sequence	O-0.1s-CO-2s-CO-2s-CO

### General information

Main circuit resistance	< 85 $\mu\Omega$ m	< 95 $\mu\Omega$ m
Weight	68 kg	72 kg
Altitude	2000 m (derating according to ANSI C37.60 applied above 1000 m)	
Solar radiation	$\leq 1.1 \text{ kW/m}^2$	
Temperature range	-40 °C ... +55 °C	
Degree of protection	IP 65	
Pollution level	Very heavy (as per IEC 60815)	

### Power supply characteristics

PARAMETER	VALUE
Supply voltage range, V	85 ÷ 265 AC, 110 ÷ 220 DC*
Rated power consumption, VA, not more	40
Maximum power consumption, VA, not more	75
Duration of operation without auxiliary supply, hours	48

\* Note that additional DC circuit breakers are required.

### Communications

INTERFACES		PROTOCOLS	
RS-232	Bluetooth	IEC 60870-5-104	Modbus
RS-485	Ethernet	DNP3	TELARM® Protocol
Wi-Fi	USB		
GPRS			



## Accessories selection



### Primary connectors

Two or four hole NEMA pads for primary cable connections. Made out of aluminum alloy with Sn-Bi coating. Size of holes is 14 mm.



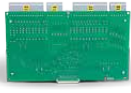
### Local wireless connection

Bluetooth or Wi-Fi module provides the ability to connect Recloser Control Cubicle with a computer for local control and monitoring.



### Bird protection

Custom designed bird guards provide protection against wildlife.



### Input/Output module

IO module has 12 galvanically isolated inputs and outputs with normally open and closed contacts.



### USB to Ethernet adaptor

USB-to-Ethernet adaptor allows a direct connection from the recloser to a network.



### VT mounting holder

Universal holder for auxiliary voltage transformer with mounting provisions from 200x140 mm up to 280x220 mm.



### Interface test set

Custom designed testing tool to test recloser protection and automation functions.

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