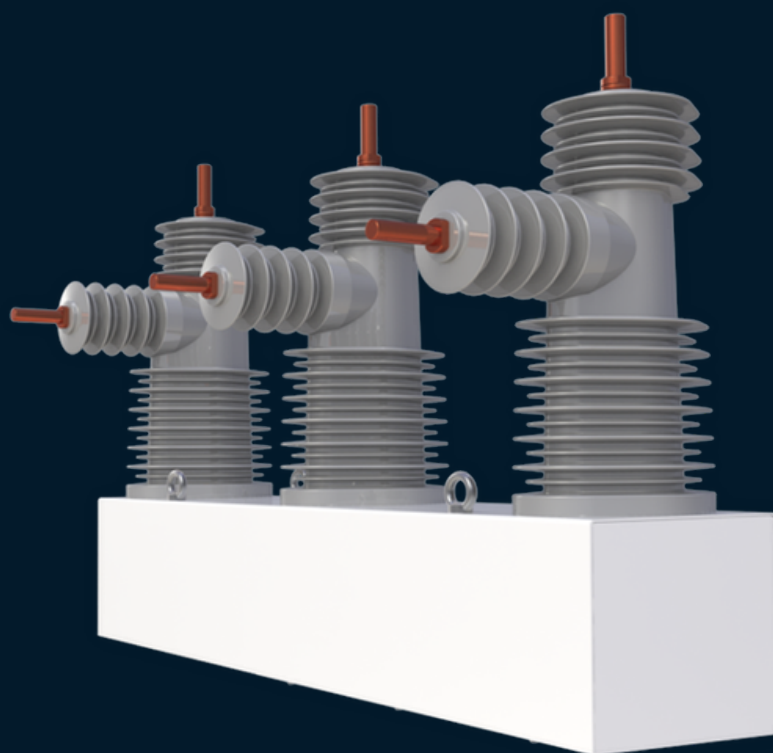


RECLOSER

AUTOMATIC THREE-PHASE CIRCUIT RECLOSER

Standards

IEC 62271-111, IEEE C37.60



CIRCUIT RECLOSER

Description

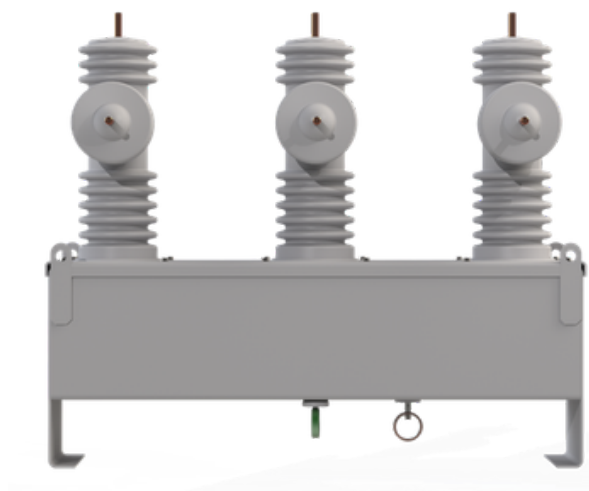
Equipped with load-switching technology thanks to the vacuum arc extinguishing element, HVEX Three-phase Circuit Recloser can eliminate intermittent faults in pre-programmed activation cycles, providing greater robustness against locking failures.

A modern control platform, completely redesigned to meet a variety of customer profiles, regardless of the specific characteristics of the utility or the type of load. This includes extensive networks for industrial loads, as well as those requiring massive and coordinated operation (self-healing).

The equipment can be parameterized through its various communication buses. It supports DNP 3.0, IEC 60870-5-101, and IEC 60870-5-104 protocols.

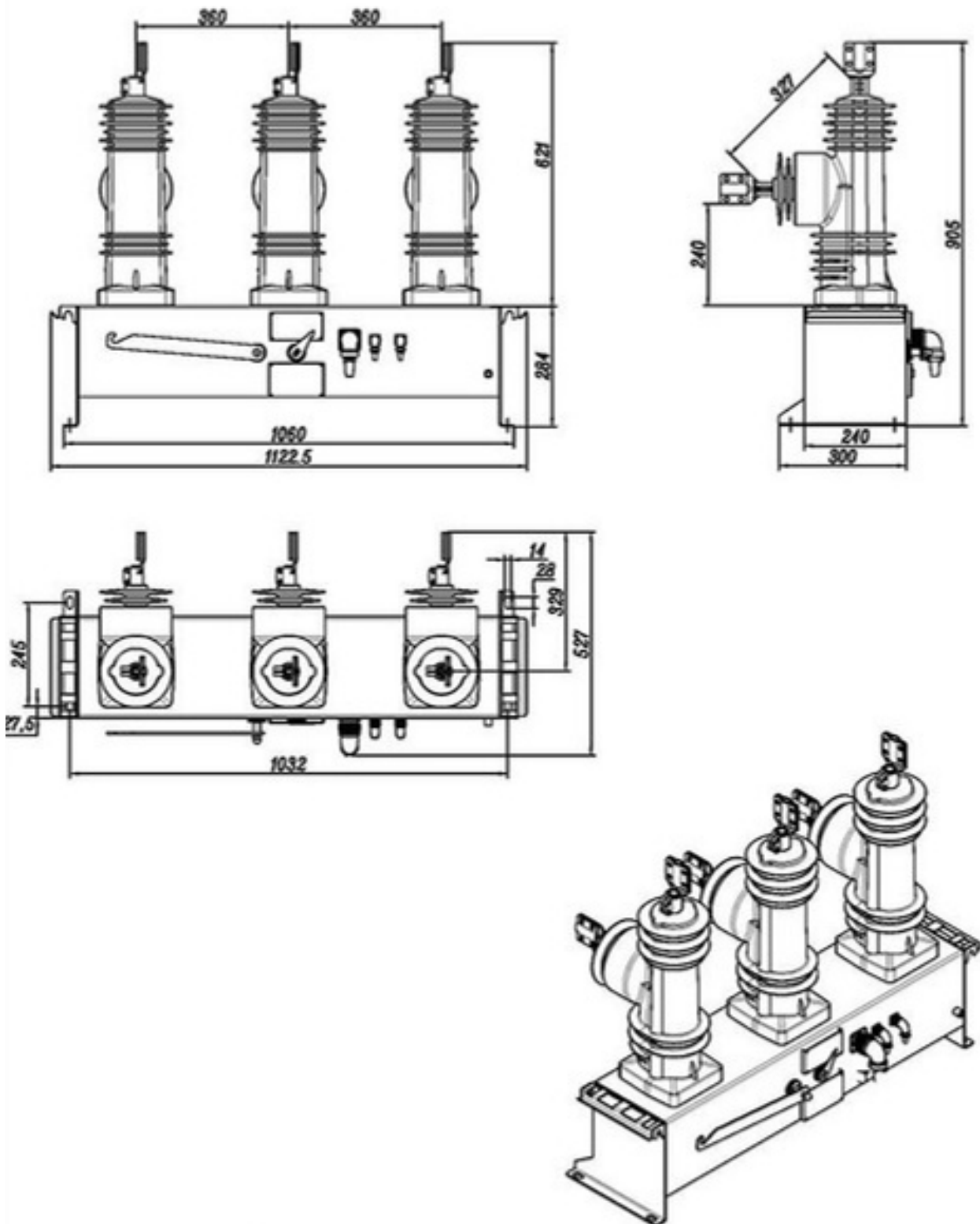
Functionalities

- It features a three-phase structure, with each phase combined with a vacuum switch and sealed-pole operation isolator.
- The permanent magnet mechanism adopts a three-phase connection, mounted in a sealed stainless steel enclosure.
- The cabinet has an IP65 protection rating.
- The magnetic mechanism has a locking function to maintain the mechanism's operation in good condition and keep the ON/OFF condition by electromagnetic locking.
- Triggering is done by a capacitor existing in the control unit.
- This energy storage element can operate even in transient events and low battery conditions.
- It has a manual opening/closing function to operate the automatic recloser between ON/OFF positions, through the lever that indicates ON/OFF.
- Easy observation by the operator of the ground conditions.
- The main insulated pole is made of cycloaliphatic epoxy resin with a silicone insulating coating that is anti-ultraviolet and highly hydrophobic.
- Control panel in stainless steel with protected cables.



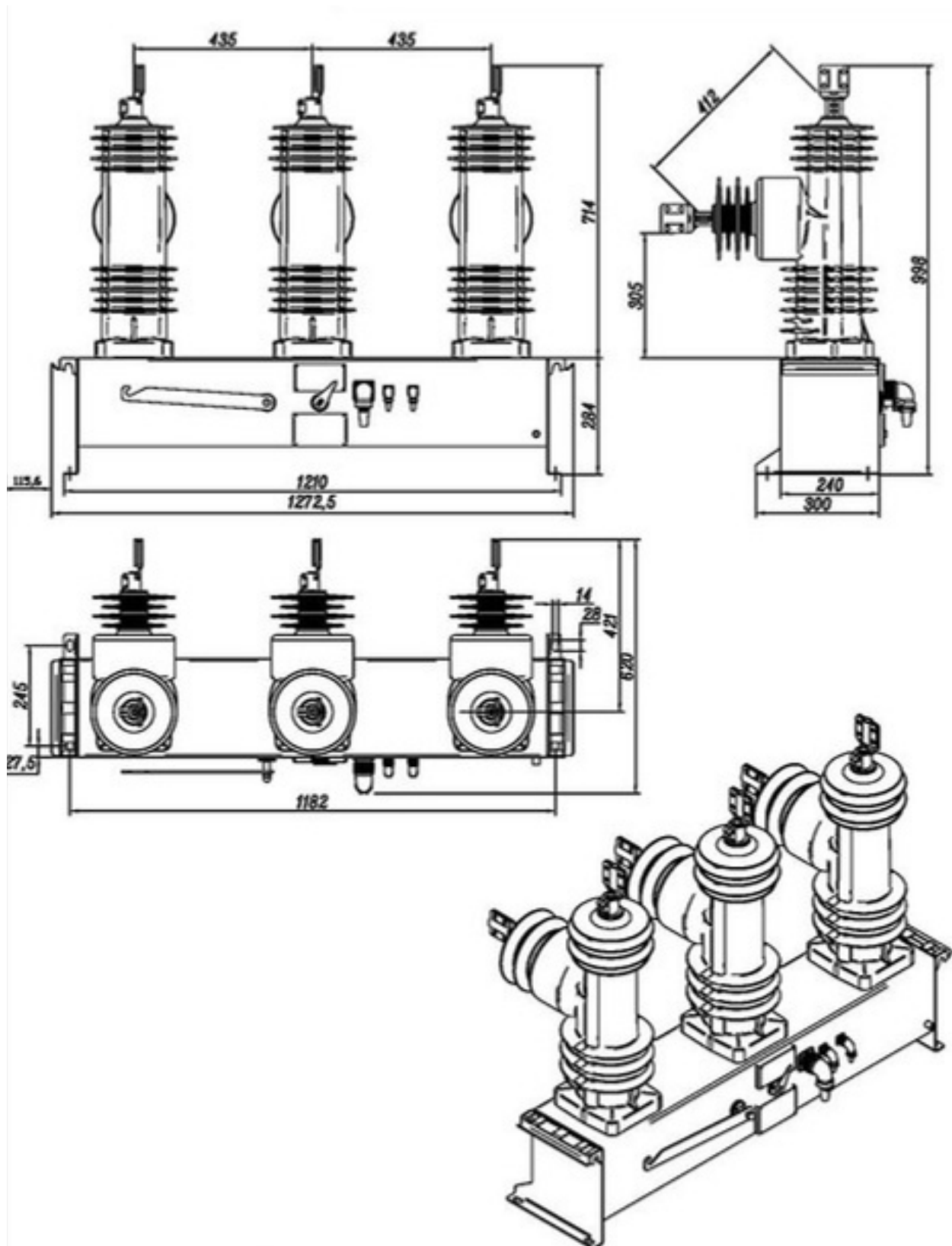
CIRCUIT RECLOSER

Dimensions 15 kV



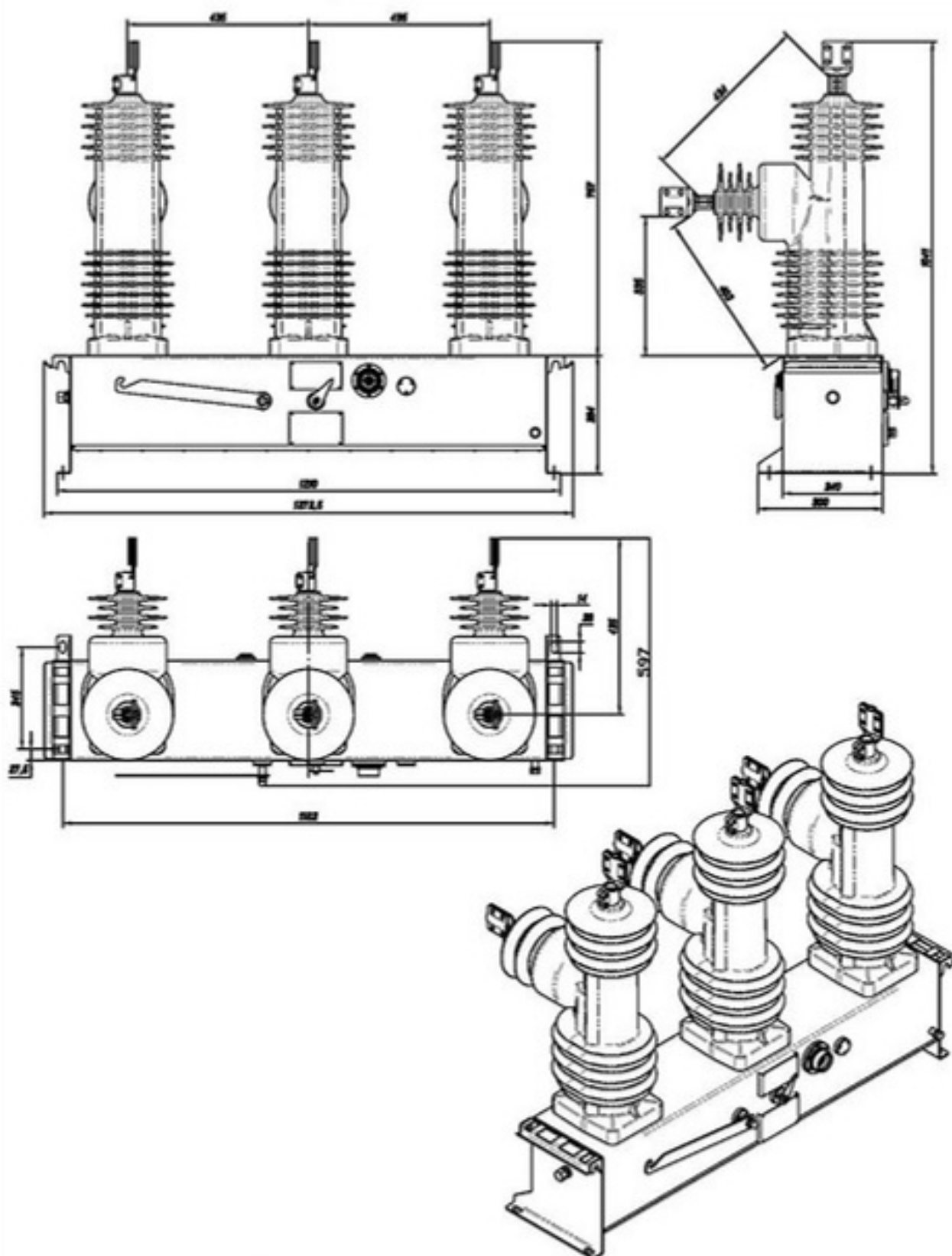
CIRCUIT RECLOSER

Dimensions 27 kV



CIRCUIT RECLOSER

Dimensions 38 kV



CIRCUIT RECLOSER

Functionalities

- **For the consumer:**

Reduction in FEC and DEC, as the recloser will have the capability to restore service for temporary faults, whether they are single-phase, two-phase, or three-phase.

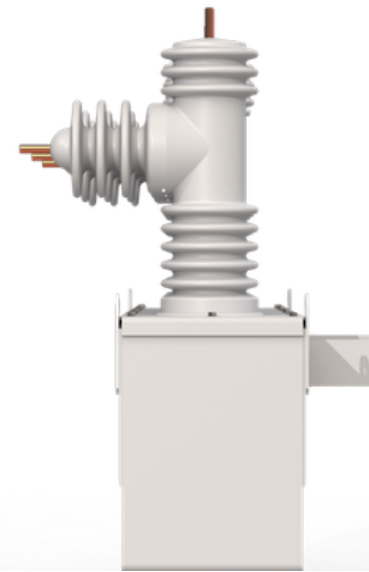
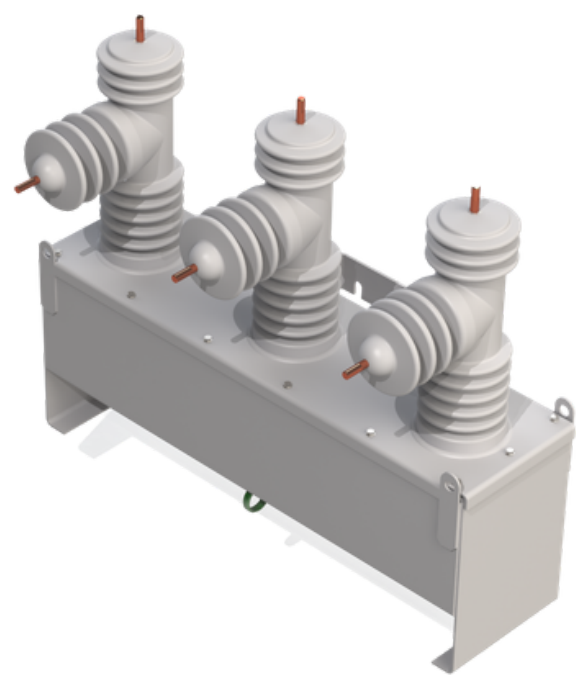
- **For the utility company:**

Improvement in their energy quality indicators and reduction in operation and maintenance costs.

Operation

The automatic three-phase recloser is a switchgear device designed for load switching that is parameterized and controlled to protect and restore the electrical system in case of a fault, considering that most issues in the electrical grid are transient and a brief outage followed by re-energization is sufficient to resolve such problems.

The recloser has a series of settings for its tripping conditions; if any of these conditions are met, the recloser switches open and initiate a cycle of reclosing attempts. If the reclosing is successful, the system is restored; however, if issues persist during reclosing, the device locks open, preventing fault propagation and safeguarding the rest of the electrical network.

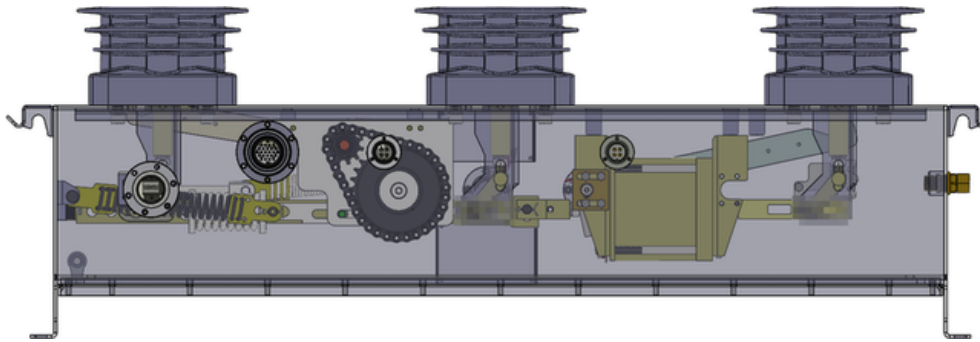


E	Silicone Rubber Poles
F	Epoxy resin poles
G	Magnetic actuator (gas insulated)
M	Magnetic Actuator (Air Insulated)
N	Spring mechanism (air insulated)

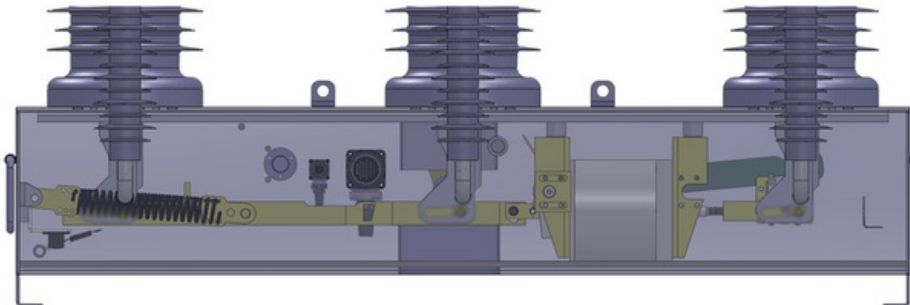
CIRCUIT RECLOSER

Internal Mechanism

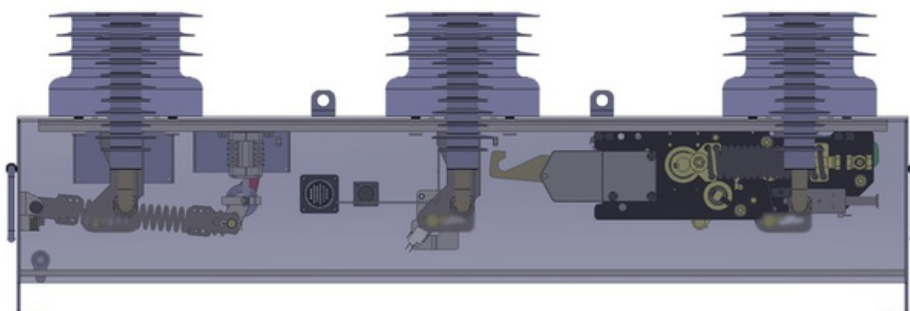
G: Magnetic Actuator (Gas Insulated)



M: Magnetic Actuator (Air Insulated)



N: Spring Mechanism (Air Insulated)



CIRCUIT RECLOSER

Accessories

Pole mounting bracket:

single/double column (includes control panel, lightning arrester and TP mounting brackets)



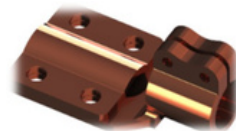
Auxiliary PT: control electronics power supply, secondary output as requested, 300VA load, types (dry/oil)



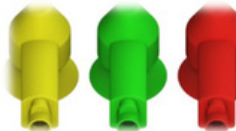
Lightning arrester: overvoltage protection as per request (6 pieces per set)



Terminals: T2 copper, NEMA standard, rated current 630A (6 pieces per set)



HV protective covers: 200 kV NBI, 3 pieces per set



Control cable: isolation from external interference



Note: These accessories are optional and must be requested during the purchase process

Technical Specifications - Recloser 15 kV

Rated maximum voltage		15 kV
Rated maximum current		400 / 630 / 800 / 1250 A
Rated frequency		50 / 60 Hz
Rated symmetrical breaking current (RMS)		12,5 / 16 / 20 / 25 kA
Rated asymmetrical peak withstand current		31,5 / 40 / 50 / 63 kA
Rated 1min power frequency withstand voltage	E	28 / 36 kV
	F	36 / 50 kV
	G	45 / 55 kV
Rated lightning impulse voltage	E	95 kV
	F	110 kV
	G	120 kV
Operation sequence	N	C-0.3s-CO-180s-CO
	M	C-0.5s-CO-2s-CO-5s-CO
Mechanical lifespan	N	10000 operations
	M	30000 operations
Power supply and operation voltage		110 / 220 V, Customized
Current Transformers ratio		400 - 1 A, Customized
Number of voltage sensors	E	≤ 3
	F	≤ 6
Opening time	N	≤ 50 ms
	M	≤ 30 ms
Cosing time	N	≤ 60 ms
	M	≤ 40 ms

Technical Specifications - Recloser 15 kV

Minimum creepage distance	31 mm / kV, Level 4	
Minimum distance between phases	360 mm	
Potential transformer secondary voltage	110 / 220 V, Customized	
Cable lenght	6, 8, 12 m, Customized	
Cable clamp	E	NEMA 2 holes
	F	NEMA 4 holes
Lightning arrester	≤ 6	
Mounting type	Single / double column	

Technical Specifications - Recloser 27 kV

Rated maximum voltage		27 kV
Rated maximum current		400 / 630 / 800 / 1250 A
Rated frequency		50 / 60 Hz
Rated symmetrical breaking current (RMS)		12,5 / 16 / 20 / 25 kA
Rated asymmetrical peak withstand current		31,5 / 40 / 50 / 63 kA
Rated 1min power frequency withstand voltage	E	60 kV
	F	65 kV
	G	70 kV
Rated lightning impulse voltage	E	125 kV
	F	140 kV
	G	150 kV
Operation sequence	N	C-0.3s-CO-180s-CO
	M	C-0.5s-CO-2s-CO-5s-CO
Mechanical lifespan	N	10000 operations
	M	30000 operations
Power supply and operation voltage		110 / 220 V, Customized
Current Transformers ratio		400 - 1 A, Customized
Number of voltage sensors	E	≤ 3
	F	≤ 6
Opening time	N	≤ 50 ms
	M	≤ 30 ms
Cosing time	N	≤ 60 ms
	M	≤ 40 ms

Technical Specifications - Recloser 27 kV

Minimum creepage distance		31 mm / kV, Level 4
Minimum distance between phases		380 mm
Potential transformer secondary voltage		110 / 220 V, Customized
Cable lenght		6, 8, 12 m, Customized
Cable clamp	E	NEMA 2 holes
	F	NEMA 4 holes
Lightning arrester		≤ 6
Mounting type		Single / double column

Technical Specifications - Recloser 38 kV

Rated maximum voltage		38 kV
Rated maximum current		400 / 630 / 800 / 1250 A
Rated frequency		50 / 60 Hz
Rated symmetrical breaking current (RMS)		12,5 / 16 / 20 / 25 kA
Rated asymmetrical peak withstand current		31,5 / 40 / 50 / 63 kA
Rated 1min power frequency withstand voltage	E	70 kV
	F	85 kV
	G	90 kV
Rated lightning impulse voltage	E	170 kV
	F	185 kV
	G	195 kV
Operation sequence	N	C-0.3s-CO-180s-CO
	M	C-0.5s-CO-2s-CO-5s-CO
Mechanical lifespan	N	10000 operations
	M	30000 operations
Power supply and operation voltage		110 / 220 V, Customized
Current Transformers ratio		400 - 1 A, Customized
Number of voltage sensors	E	≤ 3
	F	≤ 6
Opening time	N	≤ 50 ms
	M	≤ 30 ms
Cosing time	N	≤ 60 ms
	M	≤ 40 ms

Technical Specifications - Recloser 38 kV

Minimum creepage distance		31 mm / kV, Nivel 4
Minimum distance between phases		435 mm
Potential transformer secondary voltage		110 / 220 V, Customized
Cable lenght		6, 8, 12 m, Customized
Cable clamp	E	NEMA 2 holes
	F	NEMA 4 holes
Lightning arrester		≤ 6
Mounting type		Single / double column

Technical Specifications - Control Cabinet

Power supply	24 VDC (20 to 29 VDC)
Maximum power consumption	10 W
Frequency	50 Hz / 60 Hz
Analog input	• 4 for Current • 6 for Us Voltage • 2 for U0 Voltage
Current Transformer input ratio	1 A or 5 A
Binary inputs	8
Binary input rated voltage	24 VDC
Binary input threshold voltage	18 VDC
Binary input reaction time	< 20 ms
RTD/mA inputs	4 mA to 20 mA
Binary outputs	4
Binary output rated voltage	250 VAC
Relay dimensions	253 x 172 x 167 mm
Temperature	• Operation: -25°C a 70°C • Storage: -40°C a 85°C
Relay weight	3,5 kg
Protection degrees	• Front panel: IP54 • Back panel: IP20

Technical Specifications - Control Cabinet

Records

- Faults
- Disturbances
- SOE (Sequence of events)

Protection

- Alarm
- Trip

Ports

Debbuging

Ethernet RJ45(Front)

Communication

- Serial RS232/485
- 10/100 Base-T Ethernet RJ45 (Back)

Protocols

- IEC 101/104
- DNP3.0
- Modbus (RTU/ASCII - TCP/IP)

Control

- Opening
- Closing
- Battery test
- Authorization level

Automation schemes

- Loop
- Auto-changeover

Interface

LCD

10 lines x 20 characters

LED's

- 16 programmable
- Fault indicator
- Self-check, Pick-up, Trip

Date format

12h/24h day, month, year

Protection setting group

5

Protection Functions (ANSI)

50 P N	Instantaneous overcurrent
51 P N	Time overcurrent
67 P N	Directional overcurrent
64 N-SEF	Sensitive earth fault
46	Negative sequence overcurrent
59	Overvoltage
27	Undervoltage
79	Reclosing
25	Synchronism-Check
81 O U R	Frequency (Over, Under, Rate of change)
EF	Earth fault
IR	Inrush Restraint
CLP	Cold Load Pick-up
HLT	Hot Line Tag
LGC	Protection settings group: 5

Measurement and Monitoring

I	Phase, Earth, Sensitive earth Current
3I	Three-phase Current
I _o	Residual Current
I ₁ /I ₂	Sequence component Currents
U	Phase, Line Voltages (Power/Load sizes)
3U	Three-phase Voltage (U _a , U _b , U _c /U _r , U _s , U _t)
U _o	Residual Voltage (Power/Load)
U ₁ /U ₂ -U ₁ '/U ₂ '	Sequence component Voltages
VDC	Battery voltage
P/Q/S	Power (Active, Reactive, Apparent) (Single/Three-phase)
EP/EQ/ES	Energy (Active, Reactive, Apparent) (Single/Three-phase)
PF	Power Factor (Single/Three-phase)
f	Frequency
PQM3I	Current Harmonic Distortion (THD) (2nd a 11th)
PQM3U	Voltage Harmonic Distortion (THD) (2nd a 11th)
Sincronismo	Amplitude, Frequency, Angle
True RMS	Voltages / Currents

Measurement and Monitoring

Demand

Currents, Voltages, Power, Energy, PF, Frequency,
Harmonics

Additional

Power Quality, Load profile, Disturbance records, Graphs

We provide solutions for improvement of electrical energy generation, transmission and distribution efficiency, quality and reliability. With a highly specialized and experienced team in research, development and innovation, HVEX develops tailor-made solutions for Brazilian and foreign markets. Wide range of products with solutions focused on signal transduction, measurement, monitoring and protection.



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