Viper®-HV

The World's First Transmission Recloser Solution

Reliable overcurrent protection for transmission lines

G&W Electric

Engineered to order. Built to last.

G&W Electric Recloser Innovation Leader

As a leading supplier of distribution reclosers, G&W Electric has set the standard for innovation, reliability, and versatility for over 40 years. Our advanced recloser solutions are engineered to meet the rigorous demands of modern power systems, delivering unmatched performance across a wide range of applications. We provide tailored solutions that enable customers to enhance grid resilience, optimize efficiency, and adapt to future challenges with confidence.

The Viper®-HV recloser has been used for many years on transmission systems, consistently providing fast fault detection, rapid isolation, and automated restoration. With a wide selection of relay options, it meets demanding transmission requirements while enhancing overall system reliability.

VIPER-HV 72.5KV RECLOSER OVERVIEW

The Viper-HV recloser delivers overcurrent protection that isolates faults and automatically restores service for temporary events on overhead transmission lines, enabling utilities to place protection directly on transmission structures. This eliminates the need for costly substations that were traditionally required to achieve midspan or tap protection.

The Viper-HV recloser is a cost-efficient, modular, turnkey design that supports multiple configurations, including phase-over-phase and crossarm versions, to match existing line infrastructure.

Built with magnetically actuated vacuum fault interrupters and maintenance-free solid dielectric insulation, the Viper-HV recloser is rated up to 72.5kV and has three distinct mechanical operating modes:

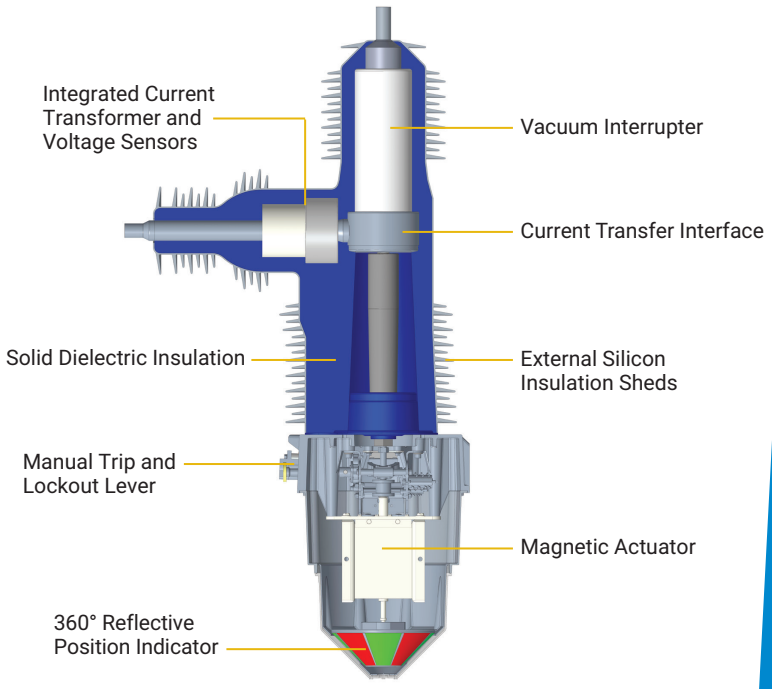
- Single-phase trip / Single-phase lockout
- Single-phase trip / Three-phase lockout
- Three-phase trip / Three-phase lockout

RECLOSER OPERATION PRINCIPLE

The Viper®-HV recloser monitors transmission lines using internal multi-ratio current transformers (CT) and line side voltage sensors. The system is powered by an external 120/240 VAC power source with energy to operate the recloser mechanism provided directly from the control.

Solid Dielectric Modules

The environmentally friendly solid dielectric insulation is maintenance-free, reducing costs while enhancing reliability. With superior environmental resilience, the Viper-HV recloser delivers dependable performance in extreme temperatures and humidity, making it ideal for coastal, desert, and high-altitude environments. Each solid dielectric module undergoes rigorous partial discharge testing to ensure long-term reliability and insulation integrity.



Integrated Current and Voltage Sensing

A multi-ratio current transformer (CT) is encapsulated within each module. The CTs are designed and tested to IEC standard 60044-1 with an accuracy class of C50/10P20 or 5P20 at 50/60Hz with a burden of 2.5VA.

Low Energy Analog (LEA) capacitive voltage sensors are encapsulated within each horizonal module. The accuracy is +/– 2% for temperatures from –20°C to +40°C, and +/-4% for temperatures from –60°C to +65°C

Manual Operation

The hot stick manual trip handle opens and locks out the selected phase, or all three phases according to the control settings, disabling any local or remote closing operation until the handle is reset.

Once reset, the recloser can be closed locally, using the control. The contact position indicator displays open or closed status of the contacts for each phase. The individual phase status is also displayed at the control.

The manual trip handle is operable from ground level or from a bucket truck.

Dead-Line Operation

The Viper-HV recloser design incorporates a magnetic actuator system, which provides for local and remote operation if the AC source power is lost or interrupted. Dead-line operation allows the recloser to operate utilizing the DC power from the battery located in the control.

Viper-HV Recloser Operating Sequence

O - 0.3 sec - CO - 2 **sec** - CO - 5 sec - CO - Lockout

Circuit Breaker Operating Sequence

Rapid sequence:
O - 0.3 sec - CO - 3 **min** - Lockout

Standard sequence:
O - 15 sec - CO - 3 min - Lockout

Viper®-HV Recloser Ratings

IEC 62271-111 (2019) / ANSI C37.60 (2018) WITH RATINGS FROM ANSI C37.04 AND C37.09 STANDARDS

	Viper-HV Recloser	
Voltage	Nominal Frequency (Hz)	50 / 60
	Rated Maximum Voltage (kV RMS)	72.5
	Voltage Sensors	3
	Voltage Sensor Ratio	15000:1
	Voltage Sensor Accuracy*	±2%
	Impulse Level (BIL), kV	350
	Power-Frequency Voltage Withstand Rating, kV RMS(60 Seconds Dry)	160
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Wet)	160
Current	CT Ratio	300:1, 400:1, 500:1, 800:1, 1100:1, 1200:1, 1500:1, 1600:1, & 2000:1
	CT Accuracy	5P20 (IEC) (International Standard) C50 (IEEE) / 10P20 (IEC) (US Domestic Standard)
	Continuous Current, A RMS†	1200
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	31.5
	Withstand Current (kA, peak)	82
	Out of Phase Switching Current Test	105kV @ 7.9kA
	Line Charging Current (A)	20
	Cable-Charging Current (100%) A	250
	First Pole to Clear Factor (kpp)	1.5 / 1.3
Mechanical	Mechanical Operations	10,000
	Top Terminal Creepage Distance—Z-side (mm)	4065
	SideTerminal Creepage Distance—Y-side (mm)	3553
	Terminal Creepage Distance (mm)	3442
	Tracking and Erosion Test (IEC 62217:2012, Clause 9.3.3) (hours)	5000
	Moisture Ingress	IPx5
	Hurricane Rating	F4
	Operation Cycle	O - 0.3 sec - CO - 2 sec CO - 5 sec - CO - Lockout
	Temperature Range	–40C to +65°C –40°F to +149°F

* ±2% for temperatures from -20°C to +40°C, ±4% for temperatures from –40°C to +65°C.

† Consult your G&W Electric sales representative for additional amperage ratings.

Features and Accessories

CONTROL/RELAYS

The Viper®-HV recloser is provided as an integrated package paired with a state-of-the-art protective relay. A variety of relays are available for automation-ready systems. All controls include an uninterruptible power supply (UPS) with a battery backup.

- Control cabinet options include mild steel, stainless steel, and bullet proof
- IP45 rated controls
- Optional lineman's panel
- Standard test switches
- Standard integrated battery backup system is provided
- Provisions for optional radios, modems, or gateways including auxiliary power for these accessories
- Communication mounting options include rack mount, panel mount, shelf mount, and rear mount

AC POWER REQUIREMENTS

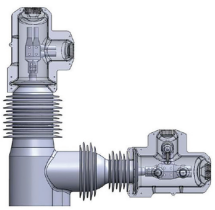
- Power for the system is required from an external AC supply. External 2kVA potential transformer (PT) can be supplied as needed

INTEGRATED SENSORS

- (3) 2000:1 internal multi-ratio current transformers (CTs) with various taps ranging from 300:1 up to 2000:1
- (3) 15,000:1 internal voltage sensors

SITE-READY OPTIONS

- Custom fit wildlife protectors
- Power transformers
- Custom mounting frames
- Category 4 Hurricane designs
- External LEA high-accuracy voltage sensors



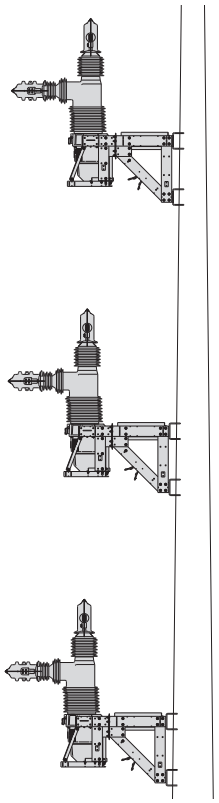
CONTROL RELAY CHOICES

Feature	SEL-651R2	SEL-421	SEL-411L	SEL-T401L	INGEPAC EF LD
	Advanced Recloser Control	Protection, Automation, and Control System	Advanced Line Differential Protection, Automation, and Control System	Ultra High-Speed Line Relay	Line Differential Protection Relay
Traveling Wave Protection			X	X	
Line Current Diffential Protection			X		X
Single Phase Trip	X				
Directional Phase Fault Detection	X	X	X	X	X
Synchrophasor Support		X	X	X	
Broken Conductor Detection			X		X
Server Rack Form Factor	X	X	X	X	X
Oscillography and Event Reports	X	X	X	X	X
Dual CT Architecture Support		X	X	X	
Statistical Measurements	X	X	X	X	X

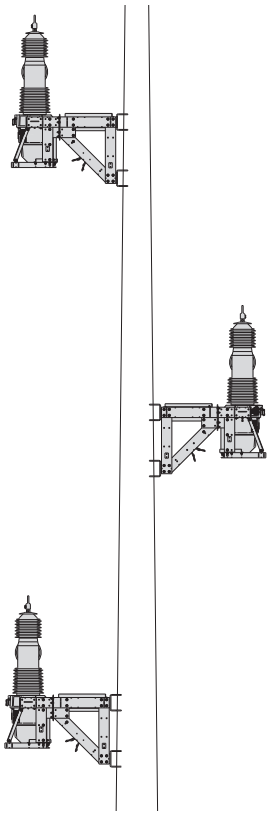
Configurations

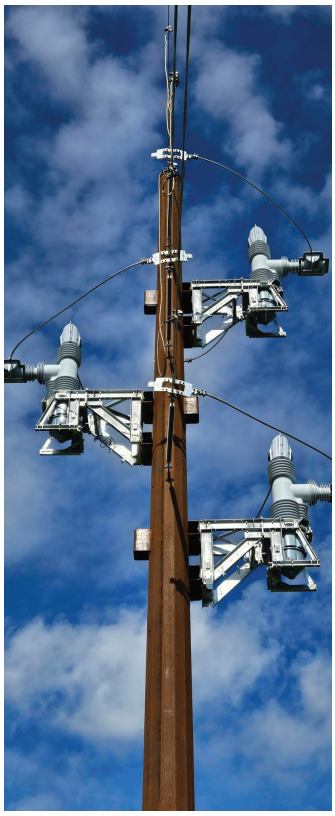
The Viper®-HV recloser offers ultimate user flexibility by providing a variety of configurations to match your existing infrastructure. Available in the following configurations:

Phase-Over-Phase

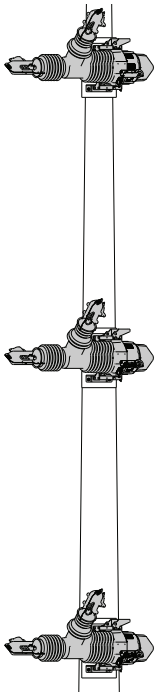


Staggered Phase-Over-Phase

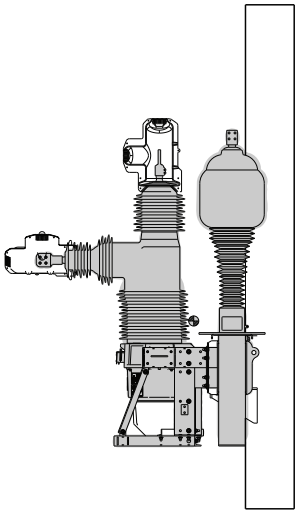




Horizontal Mounting



Crossarm



Renderings are for demonstration purposes only and not an exact application representation.

Installation Support

As part of our design process, our engineering team can provide 3D modeled layouts to ensure overall design is compatible with your transmission structure.

POWER GRID AUTOMATION SOLUTIONS

The Viper®-HV recloser enables utilities investing in resiliency improvements to implement automation schemes in their transmission systems that were previously not possible. It supports time-proven automation functions such as source transfer and fault location, isolation, and reconfiguration (FLISR). The magnetically actuated interrupter delivers source transfer speeds of 10 cycles or less when paired with fiber-enabled communication devices. Additionally, the Viper-HV recloser can be fully integrated into a centralized SCADA-ready FLISR scheme using either wired or wireless communications.

G&W Electric's automation-ready solutions provide utilities the flexibility to address specific operational and reliability needs across a variety of transmission applications. Once an automation solution is fully engineered and built, the complete system can be validated with a factory acceptance test, minimizing on-site disruptions. G&W Electric also offers on-site commissioning and integration services to ensure projects are completed properly through energization.

Contact us today

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G&W Electric

Engineered to order. Built to last.

Since 1905, G&W Electric has been a leading provider of innovative power grid solutions including the latest in load and fault interrupting switches; reclosers; sensors; system protection equipment; power grid automation; transmission and distribution cable terminations; and joints and other cable accessories. G&W Electric is headquartered in Bolingbrook, Illinois, U.S.A., with manufacturing facilities and sales support in more than 100 countries, including Canada, Italy, China, Mexico, Brazil, India and Singapore. We help our customers meet their challenges and gain a competitive edge through a suite of advanced products and technical services.

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