G&W Electric

Engineered to order. Built to last.

Viper® Reclosers

Solid Dielectric Recloser

Providing overcurrent protection for single-phase, three-phase, or single/three-phase applications

Recloser Innovation Leader

As a leading supplier of medium-voltage reclosers, G&W Electric has set the standard for innovation, reliability, and versatility. Our advanced recloser solutions are designed to meet the evolving needs of power systems, delivering unmatched performance across a wide range of applications. From distribution networks to renewable energy integration, our reclosers provide precise protection and control at every level. With the broadest range of voltage offerings in the industry, we deliver tailored solutions that empower our customers to enhance grid resilience, optimize efficiency, and adapt to future challenges with confidence.

Viper® Reclosers Overview

Viper reclosers combine the installation flexibility and time-proven reliability of electronically controlled, vacuum fault interrupters with the maintenance-free benefits of a solid dielectric insulated device.

Viper Single-Phase Reclosers

The Viper®-SP recloser provides fundamental overcurrent protection for single-phase laterals and taps. The Viper-SP recloser is paired with the SEL-351RS Kestrel relay. Available for system voltages up to 38kV, offering continuous current ratings up to 800A and interrupting capability of 12.5kA rms symmetrical.

For enhanced applications, single- and dual-phase Viper-ST reclosers are availabe using the SEL-651R2 relay, which also enables voltage sensing capabilities for these applications. Available for system voltages up to 40.5kV, offering continuous current ratings up to 1000A and up to 16kA rms symmetrical interrupting capability.

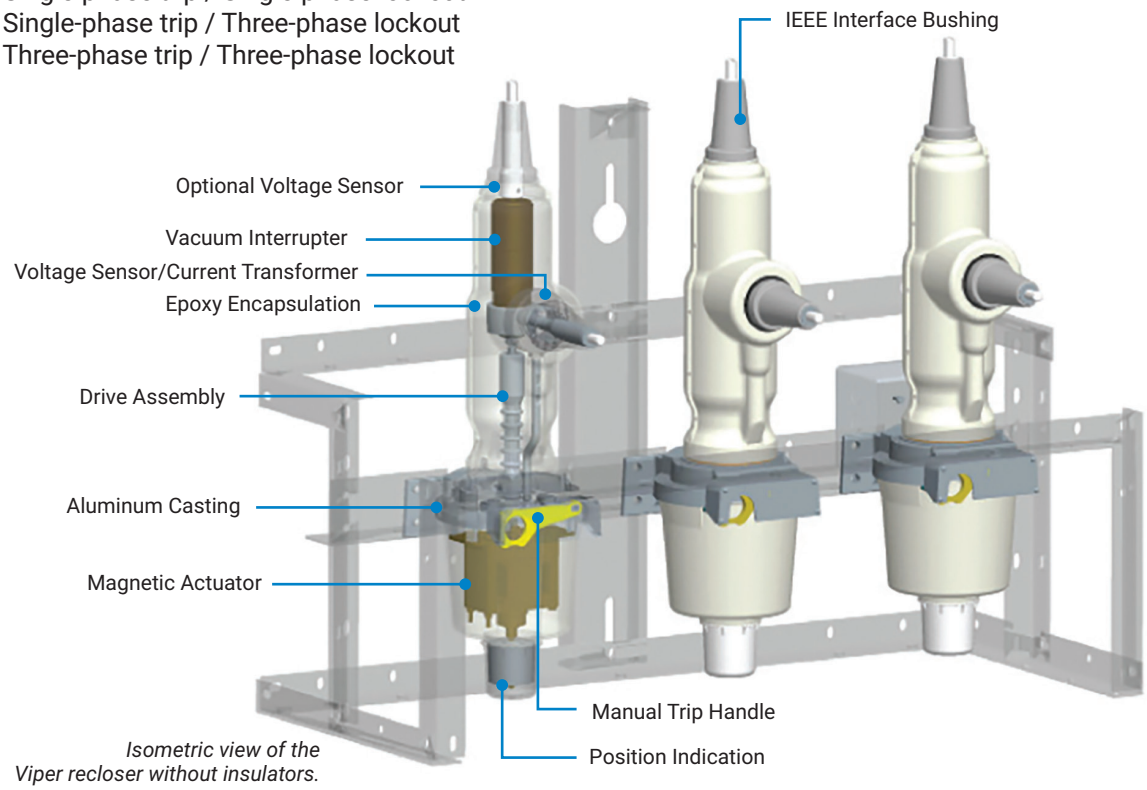
Viper®-S Reclosers

The Viper-S recloser is designed with a mechanically ganged operator for three-phase automatic or manual trip operation. Available for system voltages rated up to 38kV, offering continuous current ratings up to 1000A and interrupting capability up to 12 kA rms symmetrical. Up to 10 (52A/b) auxiliary contacts are available with the Viper S recloser.

Viper®-ST Recloser

Viper-ST recloser is designed for three distinct mechanical operational modes for systems rated up to 40.5kV, continuous current ratings up to 1000A and up to 16kA rms symmetrical interrupting capability. Operational modes:

1. Single-phase trip / Single-phase lockout
2. Single-phase trip / Three-phase lockout
3. Three-phase trip / Three-phase lockout



Isometric view of the Viper recloser without insulators.

BENEFITS

Reliable Performance

- Utilizes time-proven epoxy to fully encapsulate the vacuum interrupter.
- Offers excellent insulation while providing fully shielded construction.
- All modules are UV protected and 100% factory tested for partial discharge.
- Utilizes the latest in magnetic actuator technology.
- Interrupter and actuator assembly tested for over 10,000 open and close mechanical operations to ensure a long operating life.

Operator Safety

- Vacuum interrupter and all energized parts are sealed within solid dielectric insulation.
- Module bodies are fully grounded to provide a dead-front construction, providing optimum operator safety.
- Dead-front construction enables fully insulated installations that enhance wildlife safety.
- Dead-front construction enables mitigation of wildfire risks.
- The hot stick operable manual trip and lockout handle prohibits operation from either the control or remotely.
- Manual trip handle with true mechanical blocking further ensures against accidental close operations.
- Open and closed contact indicator verifies contact position.
- Contact status and lockout condition can also be verified at the control.

Application Flexibility

G&W Electric provides a consultative approach to your recloser design. Our engineers will provide a design that meets your specific needs. Customized control cabinets, recloser frames and Category 4 hurricane proof site specific designs are some of the options available to our customers.

- Reclosers are designed for overhead, substation and padmount applications.
- Certified for intertie connections to distributed energy resources (DERs) per IEEE 1547.
- Pole mounted reclosers can be equipped with either one horizontal and one vertical insulator or both horizontal insulators.
- Manufactured with an IEEE 386 apparatus bushing interface and removable silicone insulators for overhead applications. Industry standard dead-break connectors can be directly installed, without adapters, for padmount or riser pole applications.
- Removable silicone insulators are standard for overhead applications, providing easy field replacement if an insulator is damaged.
- Easily increase BIL with a higher rated insulator, which can be provided initially or retrofitted in the field. Increased BIL ratings are required for coastal regions and high-altitude environments.
- For dead-front padmount applications, 600A apparatus bushings or 200A deep well bushings (up to 27kV) are available.

Maintenance Free

- Solid dielectric insulation is maintenance-free.
- Electronic equipment associated with the operation of the magnetic actuator(s) is located in the control.

Viper® Recloser Operation

A recloser is an automatic switching device used on distribution systems to detect and interrupt abnormal conditions, then restore power if the fault clears. Its core function is overcurrent protection: when a fault produces current above a programmed threshold, the recloser opens, then recloses after a set time to check if the fault was temporary. If the fault remains, it follows a series of trip-and-reclose attempts before locking out. Modern reclosers also provide undervoltage and overvoltage protection, tripping for abnormal voltage conditions that signal upstream equipment issues or system instability. Most units are paired with advanced electronic controls that offer customizable protection curves, timing, and logic. These controls support SCADA integration and grid automation functions, including fault location, isolation, and service restoration (FLISR). With FLISR, reclosers communicate and coordinate with other devices to locate a faulted segment, isolate it, and restore power to unaffected sections automatically. Together, these capabilities improve reliability by clearing transient faults quickly, protecting equipment, and reducing the duration and scope of outages.

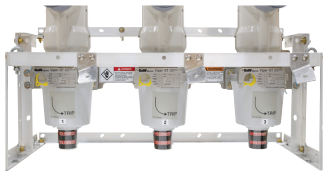
Integrated Current Transformers and Voltage Sensors

- A 1000/500:1 dual-ratio current transformer (CTs) is encapsulated within each module. An optional 400/200:1 dual-ratio CT is also available for lower current detection.
- CT accuracy is ±1%.
- Low Energy Analog (LEA) capacitive voltage sensors are encapsulated within each module. The accuracy is ±2% over the temperature range –20°C through +40°C (–4°F through +104°F) and ±4% from –60°C through +65°C (–76°F through +149°F). The voltage sensing phase angle accuracy is ±1° throughout the full temperature range.
- Three or six internal voltage sensors are available in either L- or Z-modules.

Manual Trip Operation

- The hotstick manual trip handle trips 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 using the control.
- Contact position indicator displays open or closed status of the contacts for each phase, individual phase status is also displayed at the control.
- Handle is operable from ground level or bucket truck.

Open position



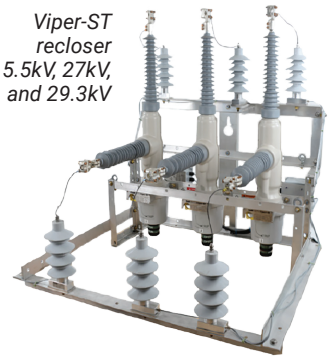
Closed position

Handle in closed position

Dead-Line Operation

- The design of the magnetic actuator system provides for local and remote operation if the AC source power is lost or interrupted.
- The control powers the recloser mechanism using external 120/240 VAC or 48/125 VDC input.
- Dead-line operation uses the control's battery for DC power. Viper®-SP and Viper®-ST reclosers include this capability standard, while the Viper®-S recloser offers it as an option.

System Augmentations



Viper-ST recloser 15.5kV, 27kV, and 29.3kV

Accusense™ Voltage Sensors

Accusense voltage sensors are an external metering-class voltage sensing solution that enables users to collect critical voltage measurements required for monitoring and optimizing grid power. Accusense voltage sensing technology eliminates the need for metering with traditional voltage transformers. Accusense voltage sensors are available on any Viper recloser configuration.

Accusense voltage sensors have been tested to IEC 60044-7:1999 and comply with 0.5 accuracy class (±0.5% Magnitude, ±0.344° Phase). They are rated to operate up to 38kV voltages, 225kV BIL, –40°C to +65°C (–40°F to +149°F) temperature range, and do not require ratio correction factors.

External CTs

Statistical measurement CTs or revenue metering CTs are available. The Viper recloser's unique design allows CTs to be placed directly on the bushings. This solution is compact and reduces wildlife intrusions associated with frame mounted CTs. CTs can be mounted on both the load and source side of the recloser.

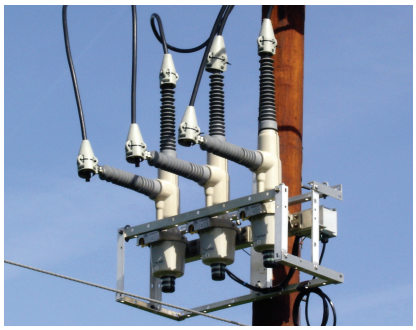
Additional Accesories

Control power transformers, wildlife guards, and arresters are also available for a complete site-ready solution.

Viper® Recloser Configurations

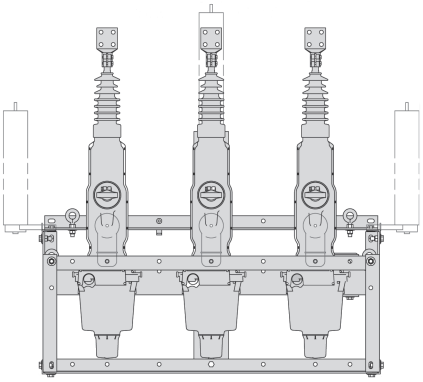
Polemount Center Frame

- Aluminum centermount frames are standard. Galvanized and stainless steel options are available.
- Frames can be designed to incorporate site-ready accessories, such as transformers, voltage sensors, and lightning arresters.

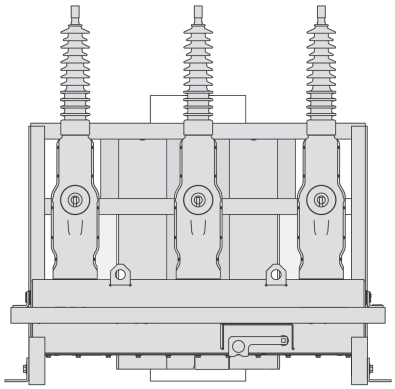


Center polemount Viper®-ST recloser

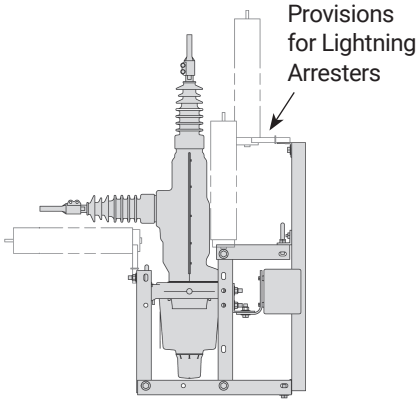
Viper®-S recloser



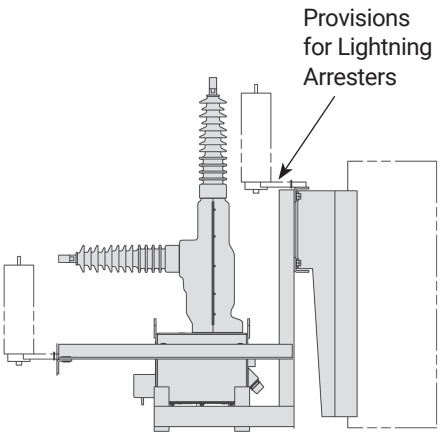
Viper-ST recloser



Viper-S recloser



Viper-ST recloser



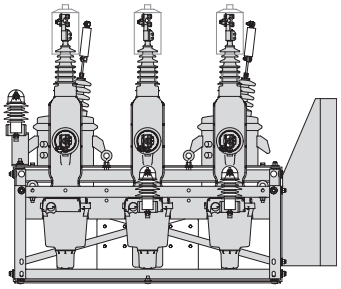
Viper-S recloser

Viper® Recloser Configurations

Alley-Arm Frame

Horizontal side mounting brackets with Z-modules are ideal for overhead configurations where all three phase conductors are on one side of the pole.

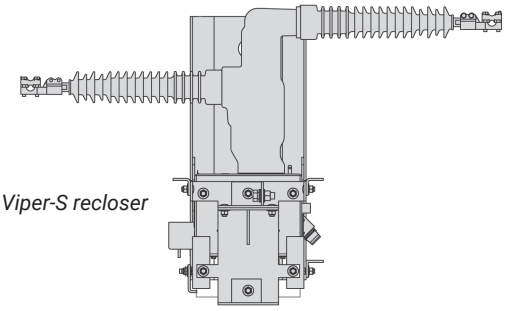
- Alley-arm frame is galvanized
- Mounting bracket can be mounted on either side to match overhead lines
- Bracket position can be changed on-site without the need for special tools
- Optional stainless steel brackets



Viper®-ST recloser

Brackets are aluminum as standard.
Note: Viper-ST 38kV and 40kV recloser frames have a minimum of 17" spacing.

Viper-S recloser Z-module shown for reference.

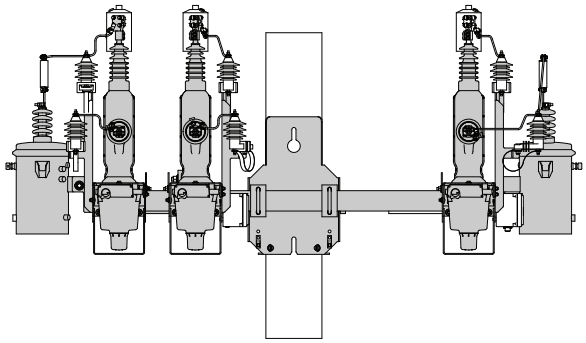


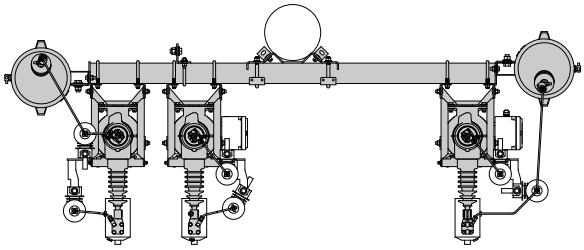
Viper-S recloser

Viper® Recloser Configurations

Cross Arm Frame (Viper®-ST recloser only)

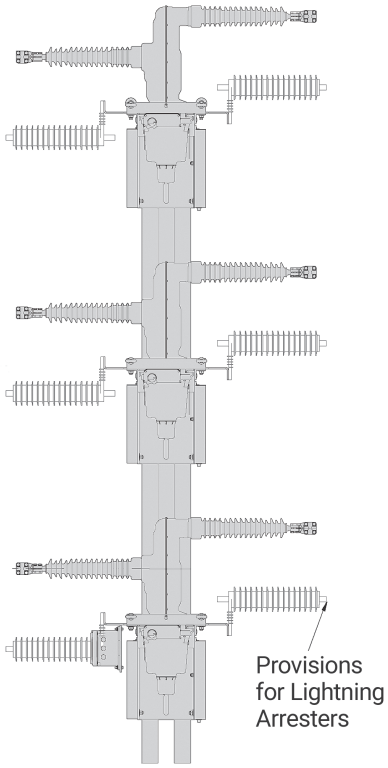
- Phase B can be moved on site, without special tools, to either side of the pole to match the overhead line configuration
- Shown as a site-ready unit
- Stainless steel options available





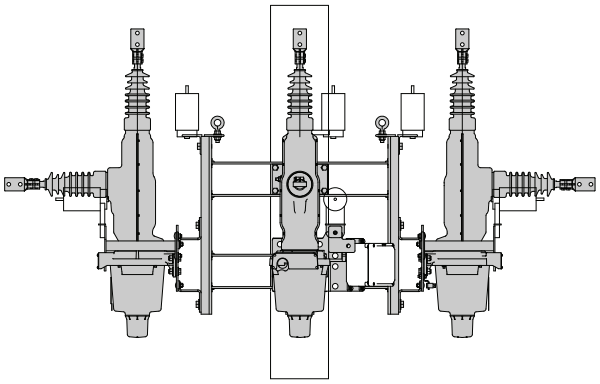
Phase-Over-Phase Vertical Frame (Viper-ST recloser only)

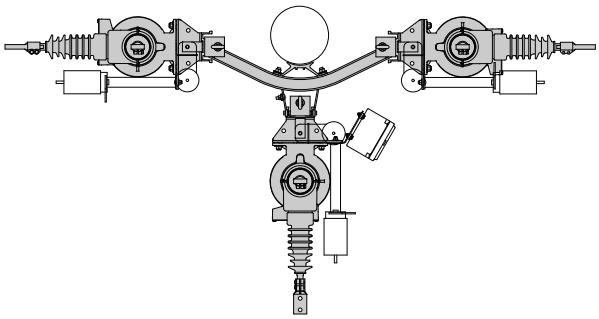
- Ideal for overhead applications where all three phase conductors are on the same side of the pole or for congested installations with minimal phase spacing
- Stainless steel option is available



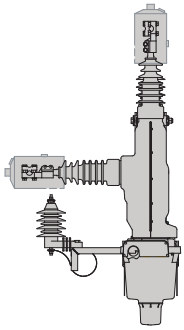
Viper® Recloser Configurations

Polemount Cluster Frame (Viper®-ST recloser only)

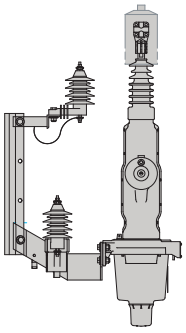




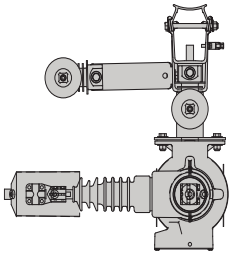
Standard Polemount Frame for L-Module Configuration (Viper®-SP recloser configurations)



Front View

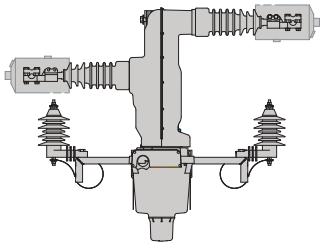


Side View

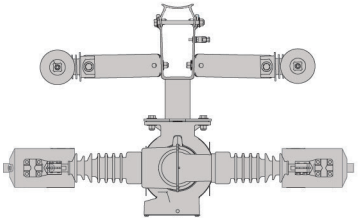


Top View

Phase-Over-Phase Horizontal Frame (Viper-ST and Viper-SP Configurations)



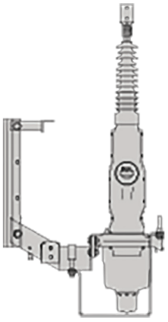
Front View



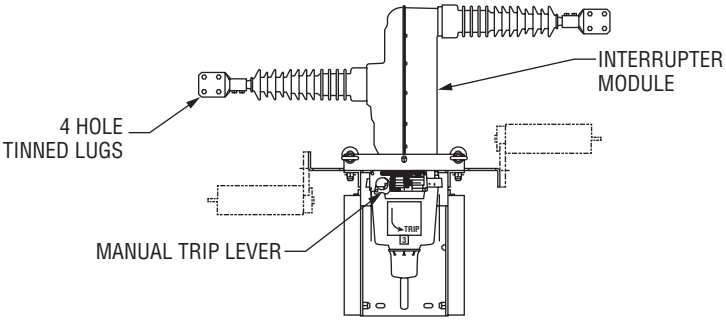
Top View

Free-Standing Frame (Viper-SP Configurations)

Provides easier handling during storage and installation.



Optional Substation or Polemount Frame with Z-Modules
(Viper-ST and Viper-SP Configurations)



Viper® Recloser Configurations

Site-Ready Configuration

Preassembled accessories help reduce recloser installation time and can include control power transformers, aerial lugs, terminal/junction boxes, wildlife protectors, and all necessary wiring. Control cables come with connectors on both ends for easier and faster setup. Custom identification markers can also be applied before shipment to further reduce installation time.

Viper® Recloser Configuration

Substation Frame

Substation frames are fully adjustable and available in galvanized steel (standard) or stainless steel, with custom configurations that support direct replacement of existing reclosers. The dead-front construction grounds the shielded solid-dielectric module to earth potential, creating a safe, touch-proof design. This approach also allows external bushing CTs to mount directly at the insulator base for metering or protection applications, including bus differential. The Viper®-S recloser mechanism housing carries an IP46 rating for strong protection against water ingress. External CTs can be installed on both the line and load sides, giving you flexible options for current measurement.

For higher creepage requirements the Viper®-ST recloser offers larger insulators to provide up to 1300mm creepage distance and 170kV BIL.

Viper-ST Recloser

Retrofit installation with Z-module. Viper-ST recloser on individual frames.

Viper-S Recloser

This Viper-S recloser design has CTs on both load and source sides and has a 45 deg angle mounting for applications requiring the same connector height.

Riser Pole

Fully dead-front construction on both modules and cable interfaces allows riser pole installations with direct IEEE 386 dead-break connectors on the horizontal bushing. This design reduces the number of poles required to protect underground-fed customers downstream of the riser pole, lowering material and installation costs while maintaining system reliability.

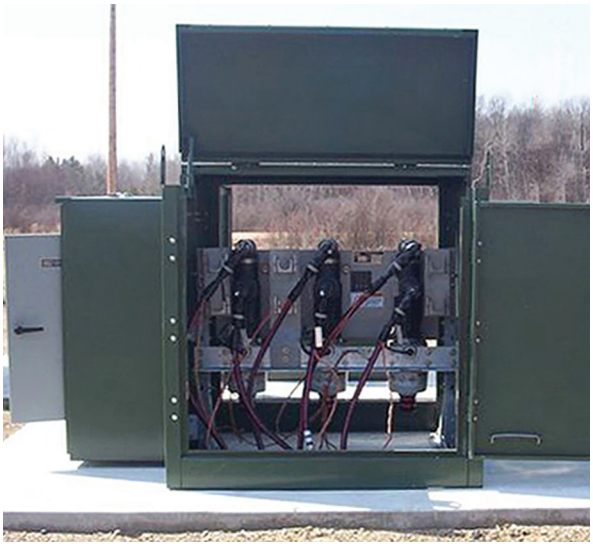
Available on all medium voltage Viper reclosers.

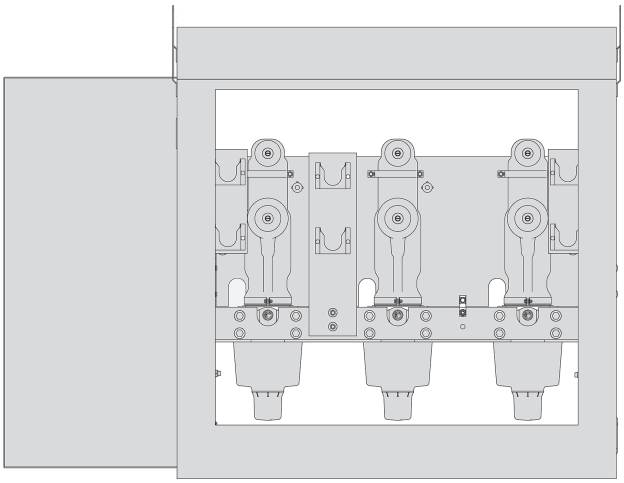
Viper® Recloser Configuration

Padmount Configurations

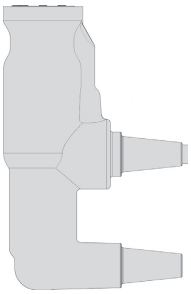
Viper padmount reclosers are well suited for applications where space is limited, substations are fenceless, or underground feeders require protection.

- The dead-front design eliminates the need for transition compartments or insulating barriers, simplifying installation and enhancing safety.
- Controls can be mounted inside the recloser enclosure or in an adjacent low-voltage cabinet.
- Can be used as a recloser, breaker or as a tie-switch.
- Up to six internal LEA voltage sensors can be provided with Z-module (front/back access) or C-module (front-only access) modules, perfect for tie points on FLISR schemes and automatic transfer applications.
- Choice of IEEE 386 600A dead-break bushings or 200A deepwell interfaces for elbow connections.
- Standard galvanized steel, with stainless steel option available.

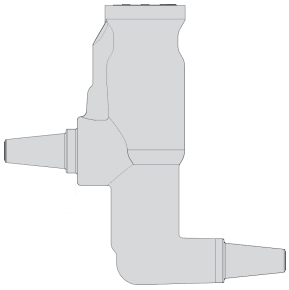




Module Configurations



C-Module



Z-Module

Viper® Recloser Applications

Reclosers play a critical role in improving distribution reliability. By applying Viper reclosers on the distribution system, permanent faults can be isolated to minimize outage areas, and temporary faults can be cleared to restore power, improving service continuity and system reliability.

The Viper recloser is engineered for flexibility, supporting stand-alone installations, complex loop schemes with sectionalizing and tie switches, feeder protection as a circuit breaker replacement, and distributed generation intertie switching. Its adaptability makes it an ideal solution for overcurrent protection and advanced distribution automation.

High-accuracy Accusense™ voltage sensors integrated with the Viper recloser enhance power optimization initiatives such as volt-var optimization (VVO), conservation voltage reduction (CVR), and end-of-line metering. With these sensors, the Viper recloser can serve as a metering point to supply data for power quality monitoring, power factor adjustments, voltage management, and peak load control. For applications requiring high-accuracy current measurement, external CTs can be installed over the Viper recloser insulators.

Stand-Alone Recloser Application

Temporary Fault Between Viper Recloser and Load

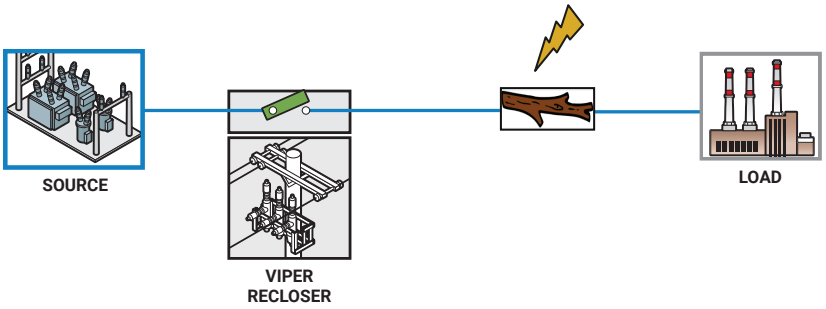


Figure 1: Stand-alone Viper recloser trips on a fault

1. A tree branch falls on the line causing a fault between the Viper recloser and the load.
2. The Viper recloser begins the reclosing sequence and trips open, as shown in Figure 1.

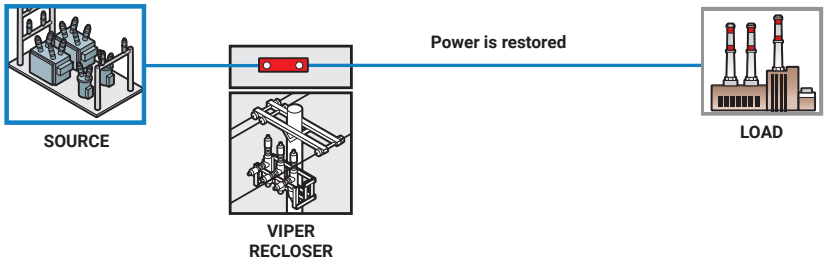


Figure 2: Stand-alone Viper recloser restores power after temporary fault cleared

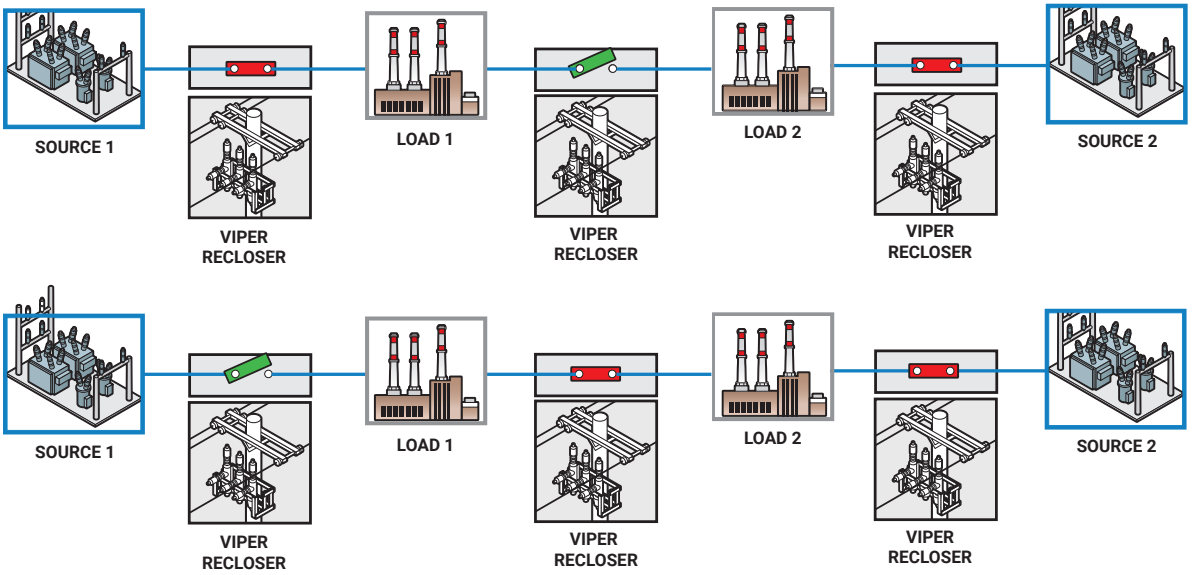
3. The tree branch has fallen from the line and the temporary fault clears.
4. The Viper recloser closes and restores power to the load, as shown in Figure 2.

Power Grid Automation Solutions

For applications requiring immediate power restoration from multiple sources to critical loads such as at hospitals, processing plants, military bases, and others.

Main-Tie-Main Application

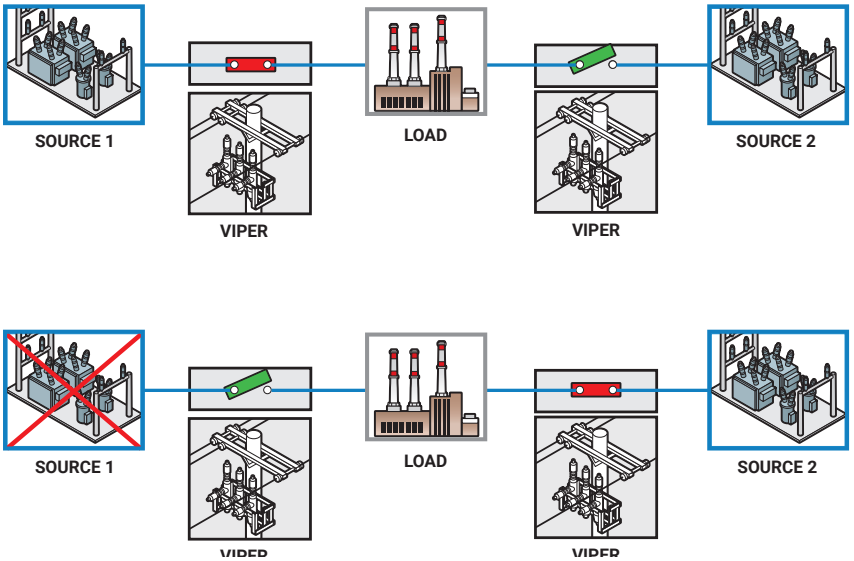
For two loads fed by two power sources to ensure power is not lost to both loads in the event of one source outage. The scheme requires three Viper® reclosers. Two installed on each power source and one between the two loads, as a normally open point. If an outage to either load is detected due to a loss of voltage on a source, the lost source is automatically isolated, and the tie switch is automatically closed to restore to the lost load.



Automatic Source Transfer Solution

For a single load fed by two power sources. The scheme requires two Viper reclosers installed on each power source with voltage sensors, current transformers, and communication between the controllers. If an outage to the load is detected due to loss of voltage on the primary source, the lost primary source is automatically isolated, and the secondary source automatically closes to restore power to the load.

Automatic Source Transfer Application (Single line example)



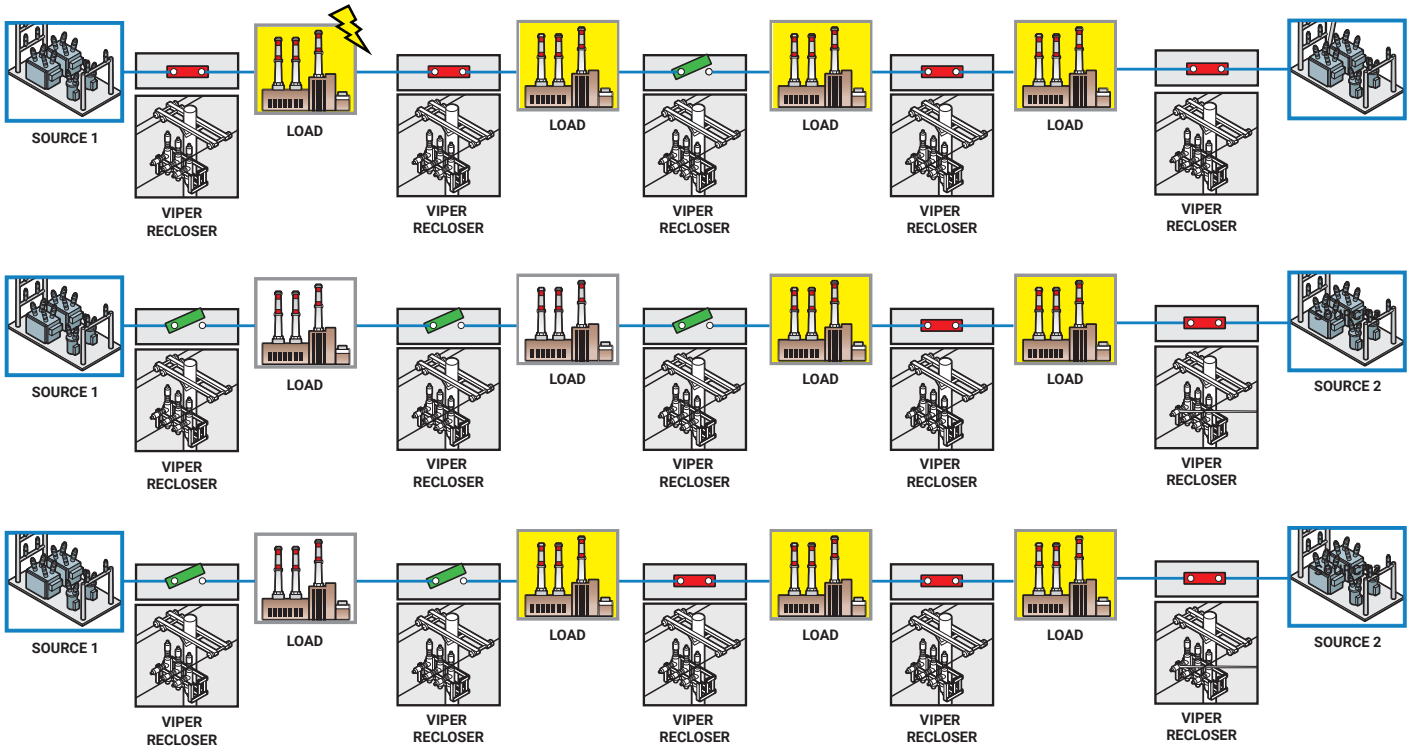
Source 1 is providing power to the load with Source 1 Viper recloser closed and Source 2 Viper recloser open.

Source 1 Viper recloser opens upon loss of voltage and Source 2 Viper recloser closes to provide power to the load from Source 2.

Power Grid Automation Solutions

Distributed FLISR Solution

Deploy Fault Location Isolation and Service Restoration (FLISR) to reduce the number of outages due to a fault or loss of source voltage. The solution automatically restores power to loads downstream of an event to improve SAIDI and SAIFI. The scheme requires multiple Viper® reclosers installed between a designated number of customers or critical loads. The Viper reclosers communicate between each other using cellular, radio, or ethernet. Capacity checking may be added if a source is unable to feed all loads.



Solution Design and Testing

The Viper® reclosers family enables utilities investing in resiliency improvements to implement automation schemes in their distribution systems that were not previously 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 recloser can be fully integrated into a centralized, SCADA-ready FLISR scheme using either wired or wireless communications.

These automation-ready solutions give utilities the flexibility to address specific operational and reliability needs across a variety of distribution 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.

VIPER®-SP RECLOSER OVERHEAD **L-MODULE** CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Impulse Level (BIL), kV	110	125	150	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	60	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	50	60	60
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5	12.5	12.5	12.5
	Withstand Current (kA, peak)	32.5	32.5	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	724	955	955
	Minimum Phase Spacing (inches)	15	15	15	15
	Temperature Range	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

NOTE: Power-frequency voltage withstand rating (wet) is not applicable for recloser with dead-break or elbow connections.

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER®-SP RECLOSER OVERHEAD **Z-MODULE** CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Impulse Level (BIL), kV	110	125	150	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	60	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	50	60	60
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5	12.5	12.5	12.5
	Withstand Current (kA, peak)	32.5	32.5	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	724	955	955
	Minimum Phase Spacing (inches)	15	15	15	15
	Temperature Range	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

NOTE: Power-frequency voltage withstand rating (wet) is not applicable for recloser with dead-break or elbow connections.

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER®-SP RECLOSER PADMOUNT **Z-MODULE** OR **C-MODULE** CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Impulse Level (BIL), kV	110	125	125	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	35	40	40	50
	DC Withstand (15 Minutes)	53	78	78	103
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5	12.5	12.5	12.5
	Withstand Current (kA, peak)	32.5	32.5	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	200A Deepwell*	Available	Available	Available	Available
	Temperature Range	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

‡ Limited to 630A for 400/200:1 CT ratios.

* 200A integral bushing interface 8 available.

Viper®-ST Single- and Double-Phase Recloser

VIPER®-ST RECLOSER SINGLE/DOUBLE OVERHEAD **L-MODULE** CONFIGURATION

Description		Rating				
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3*	38	40.5
	Voltage Sensors	1	1	1, 2	1	1
	Voltage Sensor Ratio**	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy^	2%	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	125	150	170	170
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	60	70	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	50	60	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Wet)	–	–	–	70	70
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%	±1%
	Continuous Current, A RMS†	630‡/800/1000	630‡/800/1000	630‡/800	630‡/800/1000	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5/16	12.5	12.5	12.5/16
	Withstand Current (kA, peak)	32.5/41.6	32.5/41.6	32.5	32.5	32.5/41.6
	Line Charging Current (A)	5	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	724	955	1300	1300
	Minimum Phase Spacing (inches)	15	15	15	17	17
	Temperature Range^†	–60°C to +65°C –76°F to +150°	–60°C to +65°C –76°F to +150°	–60°C to +65°C –76°F to +150°	–50°C to +65°C –58°F to +150°	–50°C to +65°C –58°F to +150°

NOTE: Power-frequency voltage withstand rating (wet) is not applicable for recloser with dead-break or elbow connections.

* 29.3 rated L-module manufactured in Canada ONLY.

** Voltages lower than 11.6kV use 2,500:1 only.

^ ±2% for temperatures from –20°C to +40°C, ±4% for temperatures from –60°C to +65°C.

† 1000A reclosers are rated at 40°C ambient temperature (from 41°C to 65°C rating is 800A.)

‡ Limited to 630A for 400/200:1 CT ratios.

Viper®-ST Single- and Double-Phase Recloser

VIPER®-ST RECLOSER SINGLE/DOUBLE OVERHEAD **Z-MODULE** CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Voltage Sensors	1	1	1,2	1,2
	Voltage Sensor Ratio*	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy**	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	125	150	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	60	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	50	60	60
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5/16	12.5	12.5
	Withstand Current (kA, peak)	32.5/41.6	32.5/41.6	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	724	955	955
	Minimum Phase Spacing (inches)	15	15	15	15
	Temperature Range**	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

NOTE: Power-frequency voltage withstand rating (wet) is not applicable for recloser with dead-break or elbow connections.

* Voltages lower than 11.6kV use 2,500:1 only.

** ±2% for temperatures from −20°C to +40°C, ±4% for temperatures from −60°C to +65°C.

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER®-ST RECLOSER SINGLE/DOUBLE PADMOUNT
Z-MODULE OR C-MODULE CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Voltage Sensors^	1, 2	1, 2	1, 2	1, 2
	Voltage Sensor Ratio*	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy**	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	125	125	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	35	40	40	50
	DC Withstand (15 Minutes)	53	78	78	103
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5/16	12.5	12.5
	Withstand Current (kA, peak)	32.5/41.6	32.5/41.6	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	25	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	200A Deepwell†	Available	Available	Available	Available
	Temperature Range**	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

* Voltages lower than 11.6kV use 2,500:1 only.

** ±2% for temperatures from −20°C to +40°C, ±4% for temperatures from −60°C to +65°C.

^ C-modules support 2 voltage sensors for 15 kV or 27 kV, while Z-modules support 2 voltage sensors for 29.3 kV or 38 kV. A single voltage sensor can be applied across all voltage ranges.

† 1 or 2 sensors are available with 200A Deepwell Z-module configurations. 200A integral bushing interface 8 available.

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER-S RECLOSER OVERHEAD **L-MODULE** CONFIGURATION

Description		Rating				
Voltage	**Nominal Frequency (Hz)**	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	12.1	15.5	27	29.3	38
	Voltage Sensors	0, 3, or 6	0, 3 or 6	0, 3 or 6	0, 3 or 6	0, 3 or 6
	Voltage Sensor Ratio	2,500:1	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy*	2%	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	110	125	125	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	50	60	60	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	45	50	50	60
Current	**CT Ratio‡**	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%	±1%
	Continuous Current, A RMS^	630‡/800	630‡/800/1000	630‡/800/1000	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5	12.5	12.5	12.5
	Withstand Current (kA, peak)	32.5/41.6	32.5	32.5	32.5	32.5
	Line Charging Current (A)	5	5	5	5	5
	Cable-Charging Current (100%) A	25	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5	1.5
Mechanical	**Mechanical Operations**	10,000	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	435	724	724	955
	Minimum Phase Spacing (inches)	15	15	15	15	15
	Temperature Range*^	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−50°C to +65°C −58°F to +150°	−50°C to +65°C −58°F to +150°

* ±2% for temperatures from −20°C to +40°C, ±4% for temperatures from −60°C to +65°C

^ 1000A reclosers are rated at 40°C ambient temperature (from 41°C to 65°C rating is 800A)

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER-S RECLOSER OVERHEAD **Z-MODULE** CONFIGURATION

Description		Rating				
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	12.1	15.5	27	29.3	38
	Voltage Sensors	0, 3, or 6	0, 3, or 6	0, 3, or 6	0, 3 or 6	0, 3 or 6
	Voltage Sensor Ratio	2,500:1	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy*	2%	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	110	125	125	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	50	60	60	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	45	50	50	60
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5	12.5	12.5	12.5
	Withstand Current (kA, peak)	32.5/41.6	32.5	32.5	32.5	32.5
	Line Charging Current (A)	5	5	5	5	5
	Cable-Charging Current (100%) A	25	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	435	724	724	955
	Minimum Phase Spacing (inches)	15	15	15	15	15
	Temperature Range*	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

* ±2% for temperatures from −20°C to +40°C, ±4% for temperatures from −60°C to +65°C.

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER-S RECLOSER PADMOUNT **Z-MODULE** OR **C-MODULE** CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Voltage Sensors^	0, 3 or 6	0, 3 or 6	0, 3 or 6	0, 3 or 6
	Voltage Sensor Ratio*	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy**	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	125	125	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	35	40	40	50
	DC Withstand (15 Minutes)	53	78	78	103
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630†/800	630†/800	630†/800	630†/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5	12.5	12.5	12.5
	Withstand Current (kA, peak)	32.5	32.5	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	200A Deepwell†	Available	Available	Available	Available
	Temperature Range**	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

* Voltages lower than 11.6kV use 2,500:1 only.

** ±2% for temperatures from −20°C to +40°C, ±4% for temperatures from −60°C to +65°C

^ C-modules support 6 voltage sensors for 15 kV or 27 kV, while Z-modules support 6 voltage sensors for 29.3 kV or 38 kV. Three voltage sensors can be applied across all voltage ranges.

† 3 or 6 sensors are available with 200A Deepwell Z-module configurations. 200A integral bushing interface 8 available.

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER-ST RECLOSER OVERHEAD **L-MODULE** CONFIGURATION

Description		Rating				
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29 .3*	38	40.5
	Voltage Sensors	0, 3 or 6	0, 3 or 6	0, 3 or 6	0, 3 or 6	0, 3 or 6
	Voltage Sensor Ratio**	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy^	2%	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	125	150	170	170
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	60	70	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	50	60	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Wet)	–	–	–	70	70
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%	±1%
	Continuous Current, A RMS†	630‡/800/1000	630‡/800/1000	630‡/800	630‡/800/1000	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5/16	12.5	12.5	12.5/16
	Withstand Current (kA, peak)	32.5/41.6	32.5/41.6	32.5	32.5	32.5/41.6
	Line Charging Current (A)	5	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	724	955	1,300	1,300
	Minimum Phase Spacing (inches)	15	15	15	17	17
	Temperature Range^†	–60°C to +65°C –76°F to +150°	–60°C to +65°C –76°F to +150°	–60°C to +65°C –76°F to +150°	–50°C to +65°C –58°F to +150°	–50°C to +65°C –58°F to +150°

NOTE: Power-frequency voltage withstand rating (wet) is not applicable for recloser with dead-break or elbow connections.

* 29.3 rated L-module manufactured in Canada ONLY.

** Voltages lower than 11.6kV use 2,500:1 only.

^ ±2% for temperatures from –20°C to +40°C, ±4% for temperatures from –60°C to +65°C.

† 1000A reclosers are rated at 40°C ambient temperature (from 41°C to 65°C rating is 800A.)

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER-ST RECLOSER OVERHEAD **Z-MODULE** CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Voltage Sensors	0, 3 or 6	0, 3 or 6	3 or 6	3 or 6
	Voltage Sensor Ratio*	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy**	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	125	150	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	50	60	70	70
	Power-Frequency Voltage Withstand Rating, kV RMS (10 Seconds Wet)	45	50	60	60
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5/16	12.5	12.5
	Withstand Current (kA, peak)	32.5/41.6	32.5/41.6	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	40	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	Creepage Distance (mm)	435	724	955	955
	Minimum Phase Spacing (inches)	15	15	15	15
	Temperature Range**	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

* Voltages lower than 11.6kV use 2,500:1 only.

** ±2% for temperatures from −20°C to +40°C, ±4% for temperatures from −60°C to +65°C.

‡ Limited to 630A for 400/200:1 CT ratios.

VIPER-ST RECLOSER PADMOUNT **Z-MODULE** OR **C-MODULE** CONFIGURATION

Description		Rating			
Voltage	Nominal Frequency (Hz)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	Rated Maximum Voltage (kV RMS)	15.5	27	29.3	38
	Voltage Sensors^	0, 3 or 6	0, 3 or 6	0, 3 or 6	0, 3 or 6
	Voltage Sensor Ratio*	2,500:1/10,000:1	10,000:1	10,000:1	10,000:1
	Voltage Sensor Accuracy**	2%	2%	2%	2%
	Impulse Level (BIL), kV	110	125	125	150
	Power-Frequency Voltage Withstand Rating, kV RMS (60 Seconds Dry)	35	40	40	50
	DC Withstand (15 Minutes)	53	78	78	103
Current	CT Ratio‡	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1	400/200:1 1000/500:1
	CT Accuracy	±1%	±1%	±1%	±1%
	Continuous Current, A RMS	630‡/800	630‡/800	630‡/800	630‡/800
	Short Circuit Interrupting Current, kA Sym, 3 Seconds	12.5/16	12.5/16	12.5	12.5
	Withstand Current (kA, peak)	32.5/41.6	32.5/41.6	32.5	32.5
	Line Charging Current (A)	5	5	5	5
	Cable-Charging Current (100%) A	25	25	25	40
	First Pole to Clear Factor (kpp)	1.5	1.5	1.5	1.5
Mechanical	Mechanical Operations	10,000	10,000	10,000	10,000
	200A Deepwell†	Available	Available	Available	Available
	Temperature Range**	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°	−60°C to +65°C −76°F to +150°

* Voltages lower than 11.6kV use 2,500:1 only.

** ±2% for temperatures from −20°C to +40°C, ±4% for temperatures from −60°C to +65°C.

^ C-modules supports 6 voltage sensors for 15 kV or 27 kV, while Z-modules supports 6 voltage sensors for 29.3 kV or 38 kV. Three voltage sensors can be applied across all voltage ranges.

† 3 or 6 sensors are available with 200A Deepwell Z-module configurations. 200A integral bushing interface 8 available.

‡ Limited to 630A for 400/200:1 CT ratios.

Controls

Control Options

SEL-651R front access control for conventional recloser applications.

Beckwith M-7679 front access control for recloser applications.

ABB RER620 front access control for recloser applications.

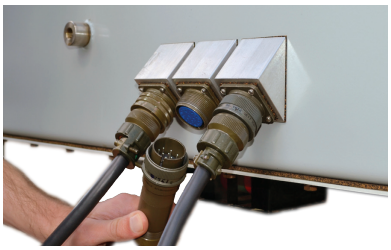
Schweitzer's SEL-351RS Kestrel front access control with swing panel enclosure. Swing-up style door also available.

MECHANISM COMPATIBILITY

Control Devices	Viper®-S Recloser 14-pin	Viper-S Recloser 19-pin	Viper®-ST Recloser	Viper®-SP Recloser	Viper®-ST Recloser Single-Phase
SEL-351RS Kestrel	–	–	–	✓	–
SEL-651RA	✓	–	–	–	–
SEL-651R2	✓	–	✓	–	✓
SEL-751	✓	✓	–	–	–
INGEPAC DA PT	✓	–	–	–	–
ABB RER620	✓	–	✓	–	–
FXD	✓	–	–	–	–
Eaton/Cooper (Form4, Form5, Form6)	✓	✓	–	–	–
Beckwith M-7679	✓	–	✓	–	–

Viper®-S Recloser Cable Connections

14-pin with 2-pin AC cable connectors.



Traditional configuration: 2-pin AC, 14-pin for control, and 8-pin 120VAC voltage sensing connectors.

Control powered solution: 8-pin quick-disconnect for LEA voltage sensors and 19-pin connector with integrated dead-line operation control.

Contact us today

1+708.388.5010 or info@gwelec.com

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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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