

Viper[®]-S

Solid Dielectric, Three Phase Reclosers

Providing electronic, three phase overcurrent protection for systems rated through

38kV, 800A continuous current, 12.5kA symmetrical interrupting



- Reliable performance
- Control flexibility including SEL-351R, Falcon™, 651R, 351S, GE URC and more
- Operator safety including mechanical block
- Maintenance-free operation
- Overhead, substation and dead-front padmount designs
- Ease of installation
- Ease of automation
- Internal voltage sensing
- Application flexibility
- Various module configurations for circuit connection flexibility
- Smart Grid/Lazer™ solutions

CATALOG VS11
January, 2011

G&W

Engineered to Order
Built to Last

G&W's Viper-S solid dielectric, three phase reclosers combine the time proven reliability of electronically controlled, vacuum fault interrupters with the maintenance benefits of a solid dielectric insulated device. The reclosers are designed for three phase automatic or manual trip operation providing overcurrent protection for systems rated up to 38kV maximum, 800A continuous, and 12.5kA rms symmetrical interrupting.

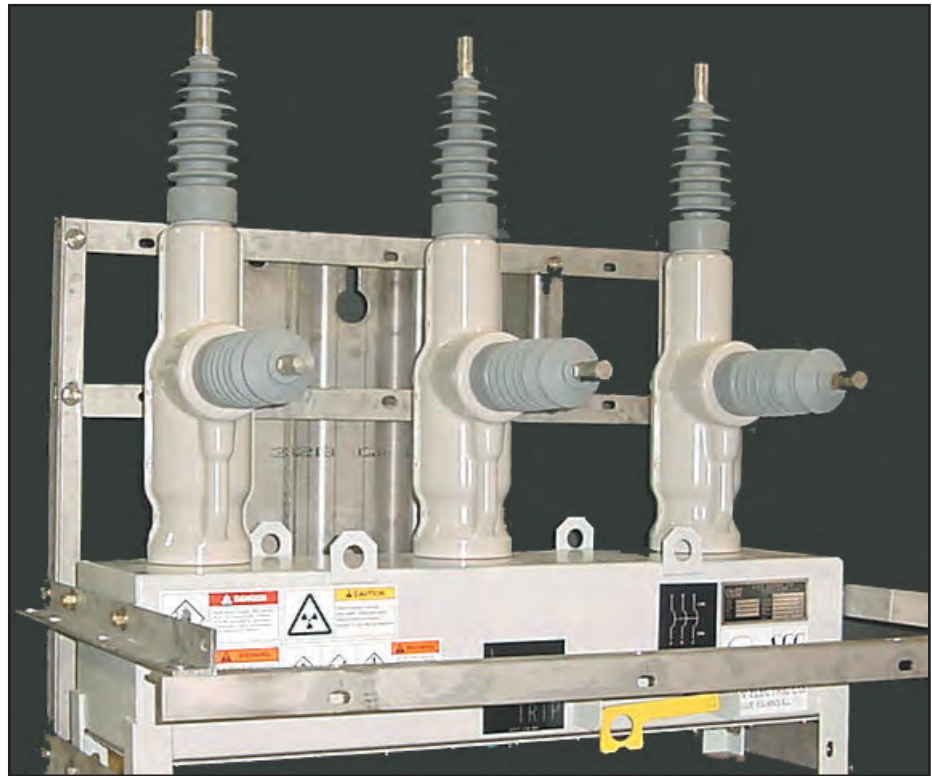
FEATURES

Reliable performance - Viper-S reclosers utilize G&W's time proven epoxy polymer system to fully encapsulate the vacuum interrupters. This system provides excellent insulation properties while providing fully shielded, void-free construction. All modules are UV protected and 100% factory tested for partial discharge. The Viper-S recloser utilizes the latest in magnetic actuator technology. The interrupter and actuator assembly are tested annually for 10,000 mechanical operations to ensure a long service life. If AC power is lost, the recloser has enough stored energy to trip once, after the control sends the trip command, within a 24 hour period.

Control Flexibility - Viper-S reclosers are designed to work with a variety of different controls including Schweitzer's SEL-351R, Falcon™, SEL-651R, SEL-351S, GE's URC and others.

Operator Safety - Vacuum interrupters are sealed within a solid dielectric insulation. A hookstick operable manual trip and lockout handle prohibits operation either from the control or remotely. A mechanical blocking device further assures against accidental close through the handle. An open and closed contact indicator verifies contact position. Contact status and lockout condition can also be verified at the control.

Maintenance-free - Solid dielectric insulation provides a maintenance-free installation. Electronic equipment associated with the



▲ 15kV Viper-S recloser with polemount center bracket.

operation of the magnetic actuator(s) are located in the control.

Ease of Installation - The Viper-S is lightweight and compact. Site-ready designs provide all accessories including bracket, arresters and voltage transformers preassembled prior to shipment significantly reducing installation time. One single control cable brings all current, breaker status and trip/close information into the control.

Application Flexibility - Units are designed for overhead, substation and padmount applications. Polemounted units can be equipped with either horizontal or vertical insulators. Removable silicone insulators are standard for overhead applications. This feature permits easy field replacement if an insulator is damaged. Higher external BIL rated insulators can also be retrofitted if necessary.

Smart Grid / Lazer Automation Solutions - The Viper-S is automation ready, simplifying conversion for any future automation requirements. A multi-ratio current transformer is encapsulated within the module. The current transformer is provided at ratios of 500:1 and 1000:1. Inputs to

the control are field changeable. CT accuracy is +/-1%. Optional capacitive style voltage sensors encapsulated within each module permit voltage reading for network reconfiguration while eliminating the need for add-on sensors and cabling. Voltage amplitude sensing accuracy to +/- 5% over the temperature range +65°C through -20°C when tested as a system. External voltage and current sensors can also be used depending on application requirements.

Complete Lazer automation packages are available offering a pre-engineered solution for applications requiring intelligent automatic switching and power restoration. The packages feature one or more protective relays, (typically Schweitzer), equipped with distribution and communication capabilities. Available communication devices include fiber optic transceivers and wireless radio.

CATALOG NUMBER

| | |
|------------------------------------------------------|-------------------|
| 15.5kV |VIP378ER-12S |
| 27kV |VIP388ER-12S |
| 38kV |VIP398ER-12S |
| Approximate weight less bracket = 325 lbs. (148 kg). | |

OPERATION OPTIONS

Dead-line operation - Permits using the batteries located in the control for operation of the recloser if AC control power is lost. A remote status signal reports the operational status of the interrupter power supply permitting remote indication of the control's capability to open or close the recloser.

Custom Relay Solutions (CRS) -

The CRS option permits using 48VDC or 125VDC control logic voltage as an alternative to traditional 14-pin SEL, Cooper and GE controls which use 24VDC for control logic. Recloser power is not affected. This flexibility reduces installed cost for retrofit projects by limiting the need to change relays or replacing the input/output boards.

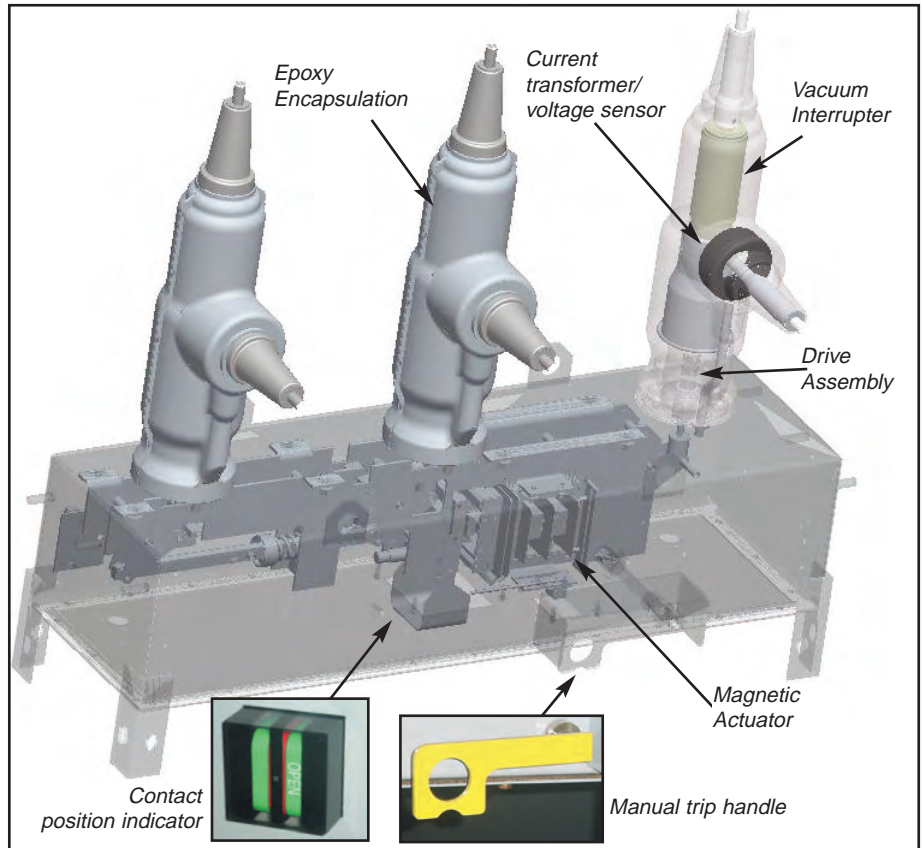
Internal voltage sensing - Permits voltage reading for network reconfiguration applications and provides a secondary analog 120V AC output accepted by most relays.

MANUAL TRIP OPERATION

Operation of the hookstick operable manual trip handle trips and locks out the recloser. A contact position indicator is provided indicating open or closed status of the contacts. Module contact status is also displayed at the control. Operation of the manual trip handle disables any local or remote closing operation until the handle is reset. A mechanical blocking device further assures against accidental close through the handle. The handle is operable from ground level. Once reset, the recloser can be closed from the control.

CONTROL CONNECTIONS

Twist style connectors make cable connection between control and recloser extremely easy. The traditional 14-pin recloser control connector design is the same as other "Cooper" style reclosers permitting easy change out of previously installed controls and/or reclosers.



CONTROL CAPABILITIES

Various style controls are available depending upon application requirements. Typical control settings include:

- Minimum trip for phase, ground and sensitive ground faults.
- Numerous preprogrammed and user-defined time current curves for sensing phase or ground faults.
- Three independent recloser interval times. Capable of up to four shots to lockout.
- Reset time.
- Sequence coordination.
- Cold load pickup.
- Advanced parameters. Refer to control specifications for more details.



▲ Control cable connections

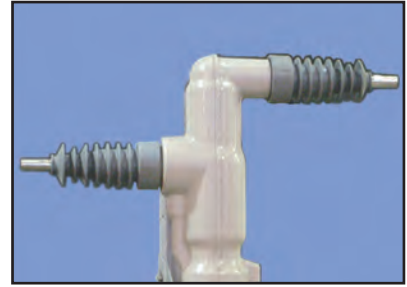


▲ Schweitzer SEL-351R control



INSULATOR FLEXIBILITY

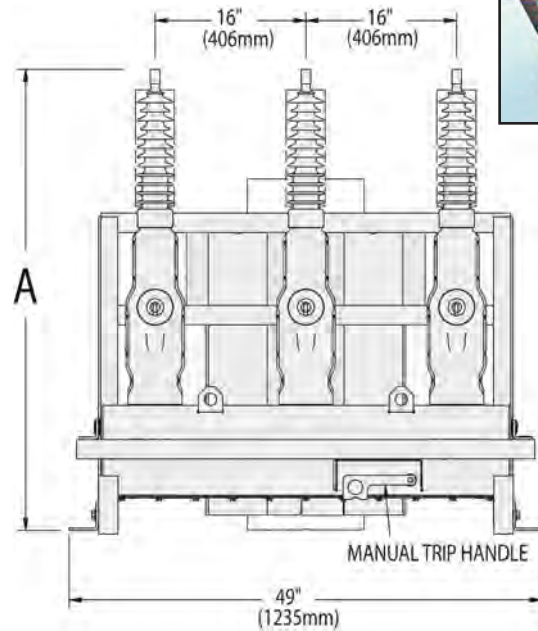
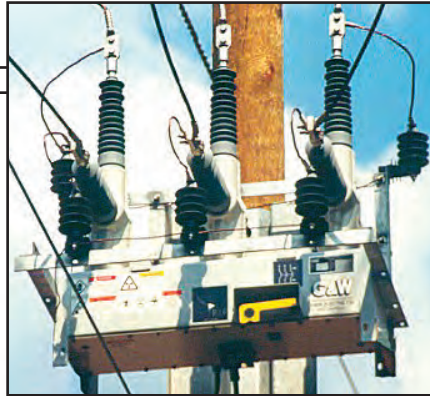
Polemounted units can be equipped with either horizontal or vertical insulators. Removable silicone insulators are standard for overhead applications. This feature permits easy field replacement if an insulator is damaged. Higher external BIL rated insulators can also be retrofitted if necessary.



▲ Shown with horizontal insulator configuration.

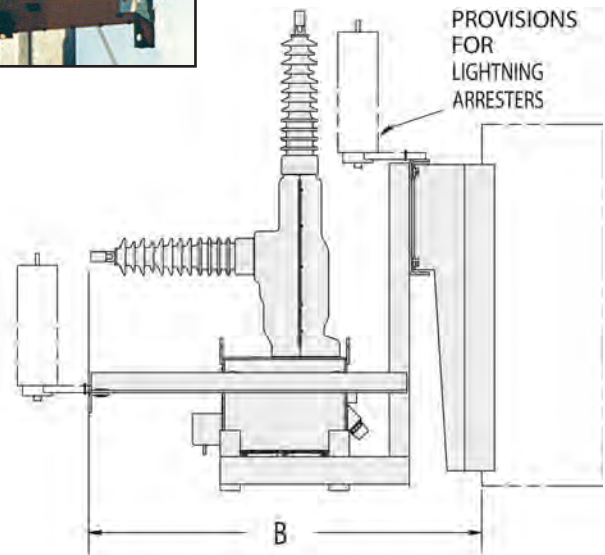
POLEMOUNT CENTER BRACKET

Dimensions are approximate. Do not use for construction. Galvanized brackets are standard. Stainless steel is available.



Approx. Dimensions - ins. (mm)

| | 15.5kV | 27kV | 38kV |
|---|-----------|-----------|-----------|
| A | 42 (1067) | 47 (1204) | 51 (1295) |
| B | 39 (991) | 44 (1118) | 48 (1219) |



POLEMOUNT SIDE BRACKETS

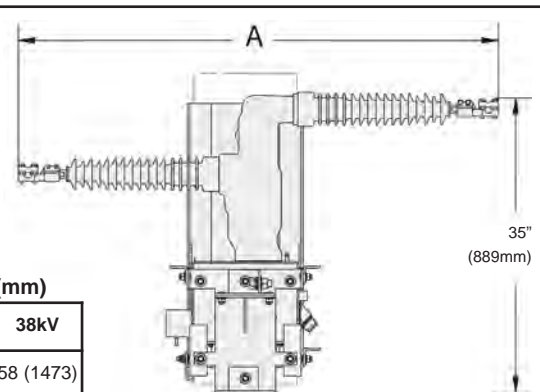
Dimensions are approximate. Do not use for construction. Galvanized brackets are standard. Stainless steel is available.



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

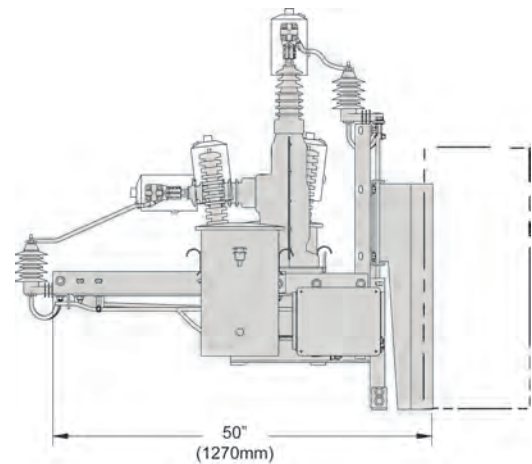
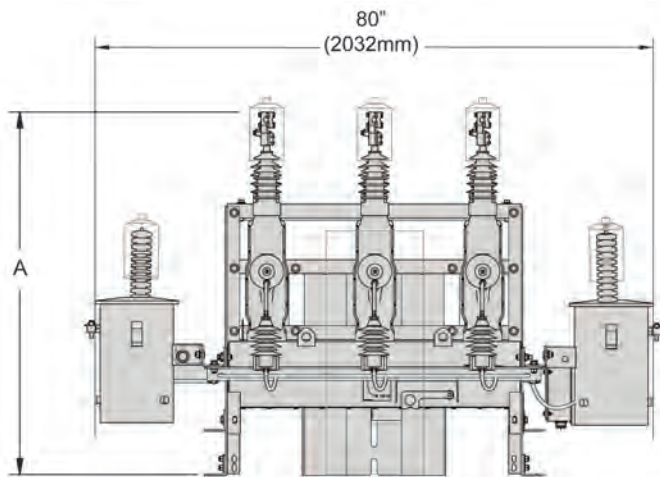
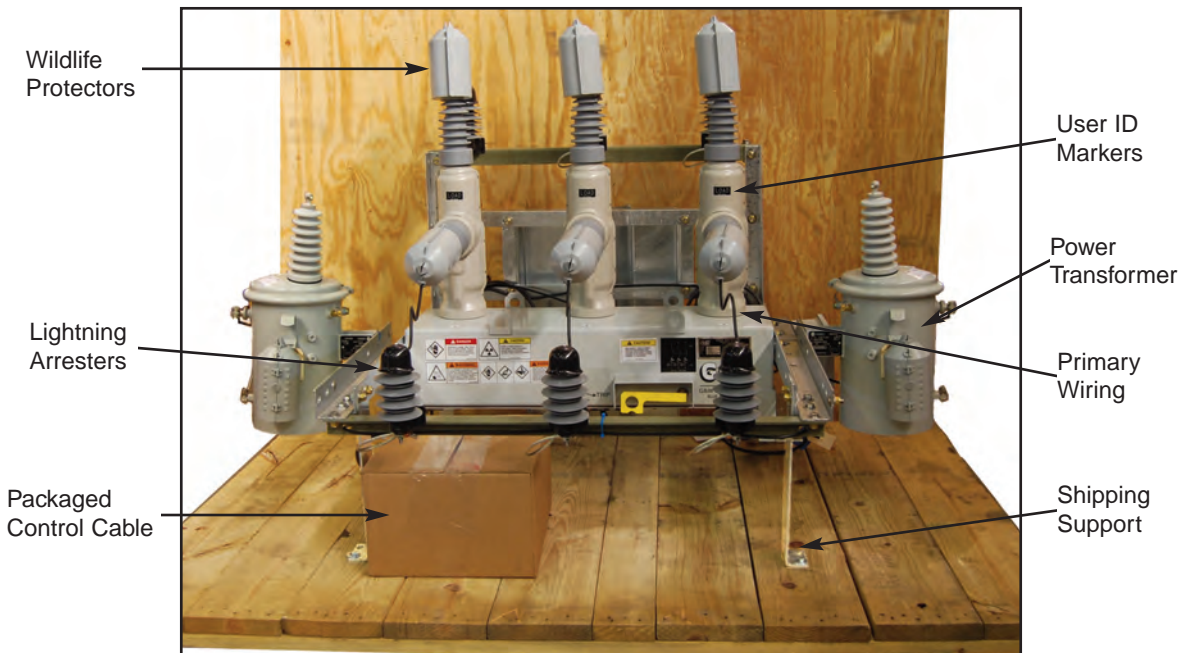
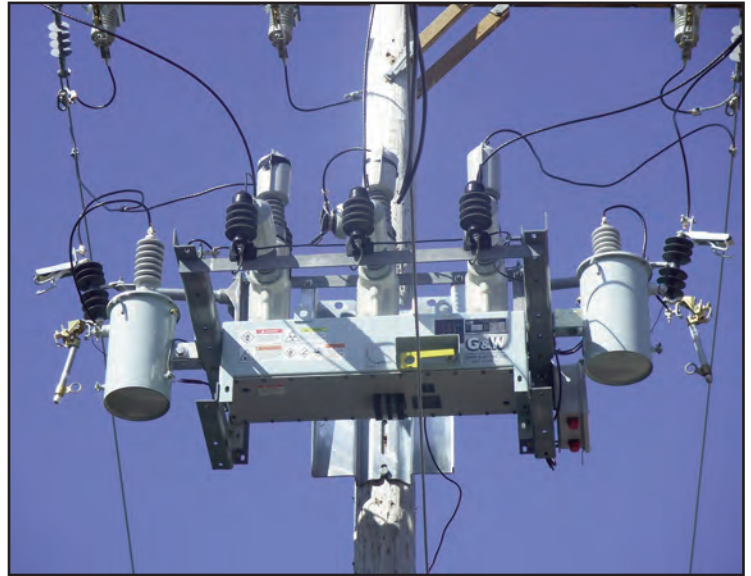
Approx. Dimensions - ins. (mm)

| | 15.5kV | 27kV | 38kV |
|---|-----------|-----------|-----------|
| A | 42 (1067) | 50 (1270) | 58 (1473) |



Polemount Site-Ready Assembly

Preassembly of all auxiliary equipment significantly reduces recloser preparation time for product installation in the field. Includes potential transformers or voltage transformers, arresters, aerial lugs, terminal/junction boxes, wildlife protectors and all associated wiring. Control cables are connectorized on both ends and cut to length for a cleaner installation. User identification markers can be applied to each unit prior to shipment further reducing installation time.



Approx. Dimensions - ins.(mm)

| | 15.5kV | 27kV | 38kV |
|---|-----------|-----------|-----------|
| A | 54 (1378) | 58 (1473) | 62 (1575) |

SUBSTATION MOUNT

Dimensions are approximate. Do not use for construction.

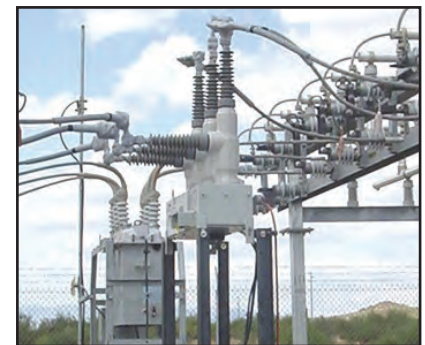
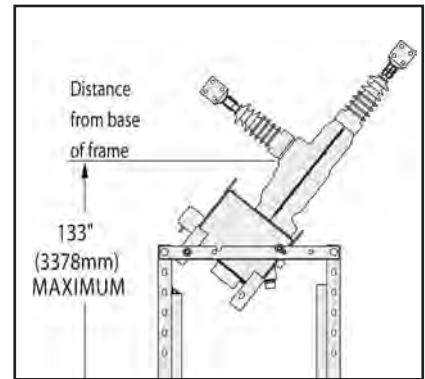
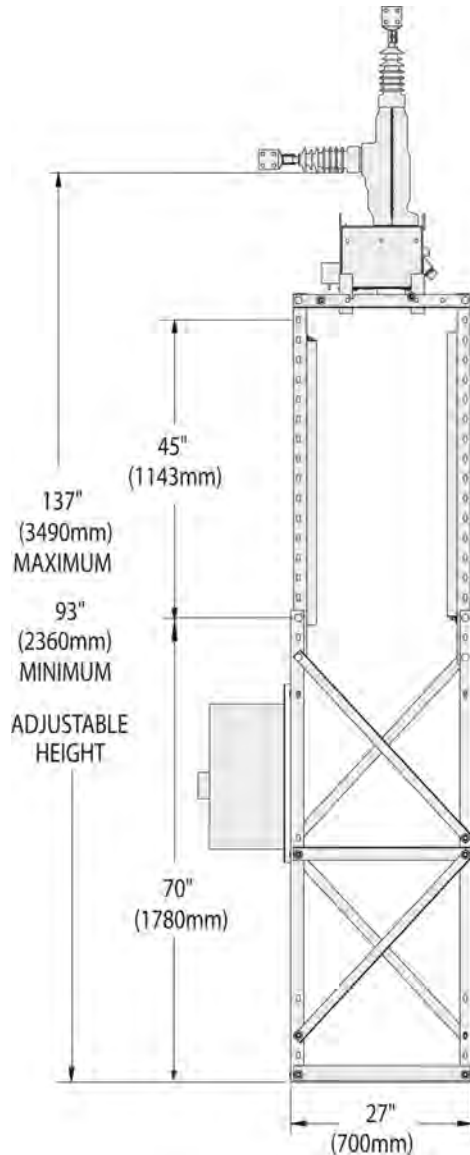
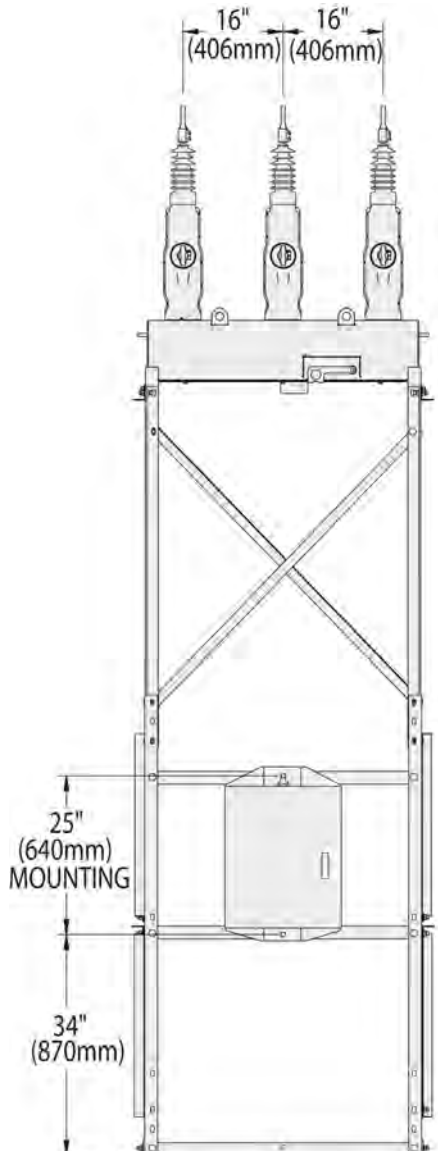


Frames are adjustable. Standard frames are galvanized. Stainless steel is available. Custom frames available including conversion for direct replacement of existing reclosers.

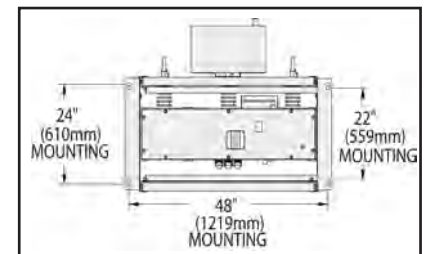
Dead-tank construction makes it ideal for substation circuit breaker applications and ensures the shielded solid dielectric module is grounded to earth potential.

◀ Picture shows 45° angle mounting for applications requiring the same load and line side connector height.

For applications where extended creepage is required, larger insulators can be applied up to 940mm and 150kV BIL. External bushing CTs can be mounted at the base of the insulator where they can be used for metering or relay protection schemes like bus differential. The mechanism housing for substation applications is rated IP46 for maximum protection from water intrusion.



▲ Photo shows a custom mounted frame required for replacement of previously installed oil filled equipment.



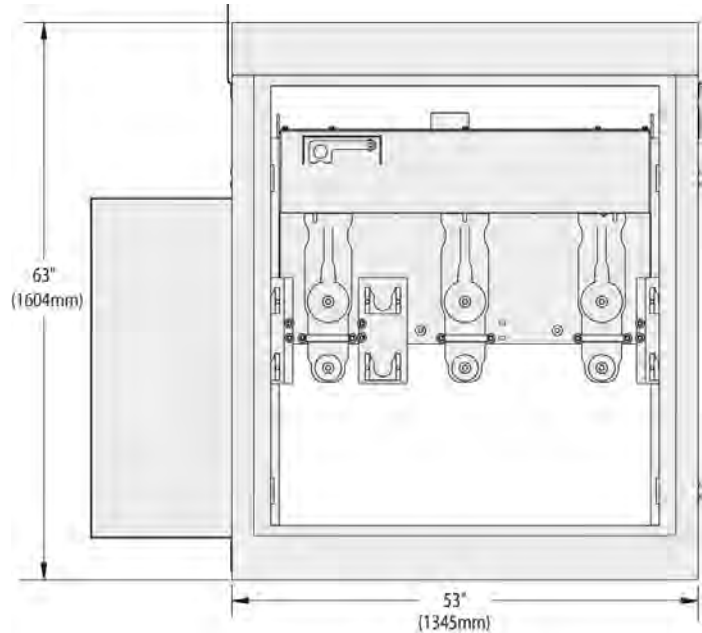
Bottom View

PADMOUNT APPLICATIONS

For applications where space is limited at the substation or where underground feeders require protection, Viper-S solid dielectric reclosers can provide an ideal solution using a dead-front padmount design. In this configuration, the cable connections can be provided with either a standard IEEE apparatus or deepwell bushing for elbow connectors. Different style modules permit either all front access or front/back access to cable connections and operators depending on user preference. Controls can be mounted directly to the recloser frame or within a separate adjacent enclosure.

Padmount Reclosers with Front Access

Dimensions are approximate. Do not use for construction. Galvanized steel enclosures are standard. Stainless steel is available. Drawing shows a front access design to cables and operator. The control is mounted in a separate side enclosure. C modules are shown.



Module Configurations

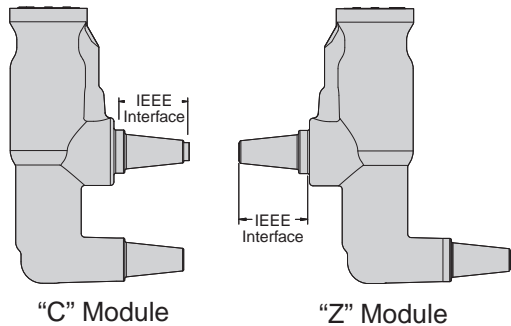
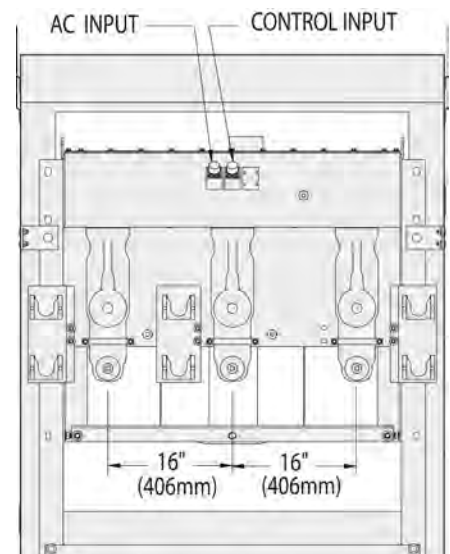
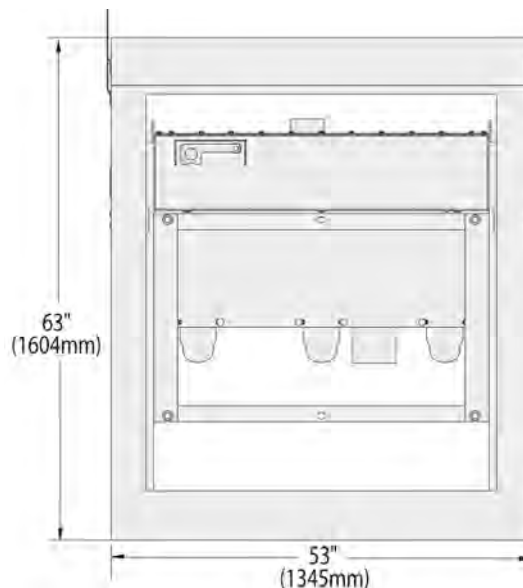


Photo shows a front/back configuration using Z modules.



Padmount Reclosers with Front / Back Access

Dimensions are approximate. Do not use for construction. Galvanized steel enclosures are standard. Stainless steel is available. Drawing shows separate compartments for the cable and operator. The control is mounted directly to the frame. C modules are shown.



DESIGN RATINGS AND STANDARDS

Reclosers are designed, tested and built per latest version of IEEE C37.60 standards. Certified test reports are provided. The reclosers are rated:

Maximum Design Voltage,
 kV15.5.....2738
 Impulse level (BIL),
 kV110 ..125 ...150
 Continuous & load break
 current, A800.....800 ..800
 8-hour Overload,
 A960 ...960 ..960
 60Hz Withstand, kV rms
 One minute (dry) ..506070
 10 second (wet)....455060
 Interrupting Current,
 kA rms sym.,12.5 ..12.5..12.5
 Making Current,
 RMS, asym, kA202020
 Peak, asym, kA3232.....32
 Short Circuit Current, 3 seconds
 kA sym.,12.5 ..12.5 ..12.5
 Mechanical endurance,
 operations10k10k....10k
 Temperature range, -40°C to +65°C
 (-40°F to 150°F)

OPTIONS

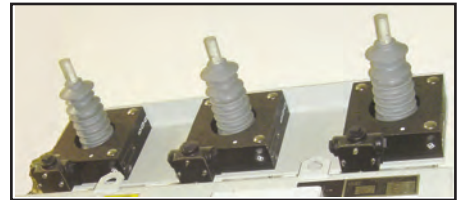
The following options are supplied:

- ___ NEMA 2-hole aerial lugs
- ___ NEMA 4-hole aerial lugs
- ___ Clamp aerial lugs (#2 - 500 kcmil)
- ___ Clamp aerial lugs (250-750 kcmil)
- ___ 4/0 brass eyebolt ground lug(s)
- ___ Dead-line operation permitting using the batteries located in the control (351R only) for operation of the recloser if AC input power is lost. A remote status signal reports the operational status of the interrupter power supply permitting remote indication of the control's capability to open or close the recloser.

- ___ Internal voltage sensing permitting voltage reading for network reconfiguration applications. Provides a secondary analog 120VAC output accepted by most relays.
- ___ Stainless steel polemount center bracket
- ___ Stainless steel polemount horizontal side bracket
- ___ Stainless steel adjustable substation frame
- ___ Stainless steel substation frame for 45° recloser mounting
- ___ Stainless steel dead-front front access padmount design
- ___ Stainless steel dead-front front/back access padmount design
- ___ 48VDC power supply
- ___ 125VDC power supply
- ___ 48VDC heater
- ___ 125VDC heater
- ___ CRS control logic voltage 48VDC
- ___ CRS control logic voltage 125VDC
- ___ Cold temperature operation to -50°C
- ___ External CTs for current monitoring supplied individually
- ___ External CTs mounted on a single fixture with flexible conduit
- ___ High impact, UV stable wildlife protectors for source and load insulators



▲ External mounted CTs provide current monitoring on both the load and line side. Individual CTs and cabling are available.



▲ CTs can be supplied factory mounted on a single fixture with flexible conduit for the cables.



▲ NEMA 4-hole, 2-hole and clamp style aerial lugs



▲ High impact, UV stable wildlife protectors for source and load insulators

ISO 9001:2008 Certified Company

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