CATALOG GW5-VS08
MAY, 2008

Viper-S®

Solid Dielectric, Three Phase Reclosers

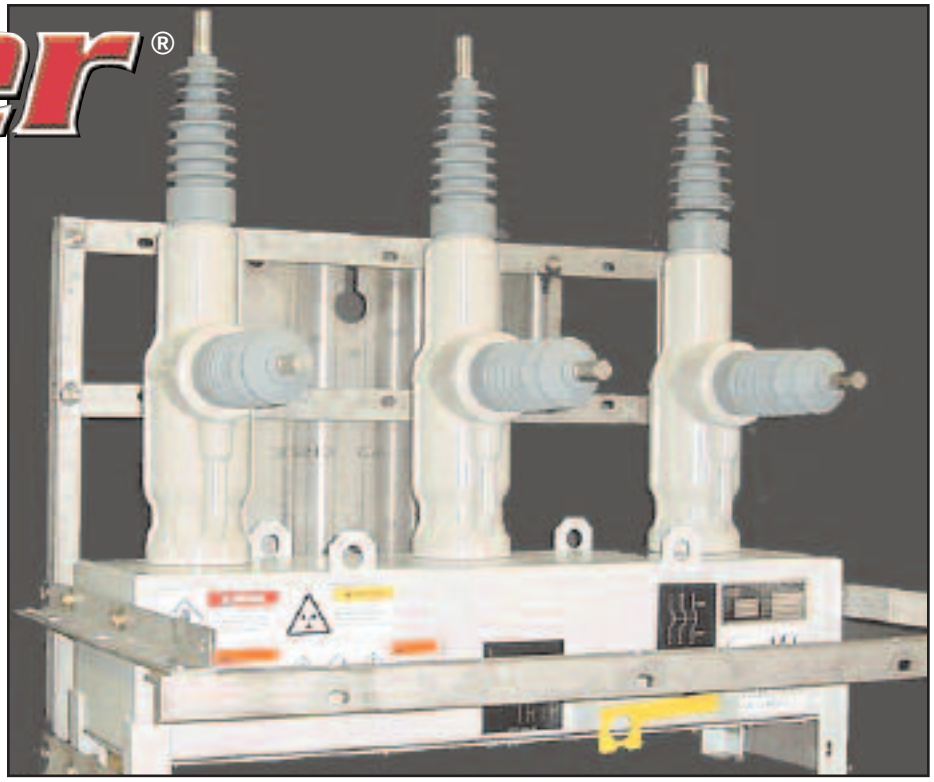
Providing electronic, three phase overcurrent protection for systems rated through 38kV, 800A continuous current, 12.5kA symmetrical interrupting

- ***Time proven, solid epoxy insulation***
- ***Control flexibility including SEL-351R, 651R, 351S, GE URC and more***
- ***Compact, lightweight construction***
- ***Maintenance-free operation***
- ***Overhead, substation and dead-front padmount designs***
- ***DC power options***
- ***Internal voltage sensing option***
- ***Various module configurations for circuit connection flexibility***
- ***External CT option for current monitoring***

G&W
Engineered to Order
Built to Last

The Viper®

G&W 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.



15kV Viper-S recloser with polemount center bracket.

FEATURES

Latest Solid Dielectric Technology - Solid dielectric 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. Dual ratio current transformers are encapsulated within each module providing either 500:1 or 1000:1 protection characteristics. CT ratios can be switched in the field.

Control Flexibility - Viper-S reclosers are designed to work with a variety of different controls including Schweitzer's SEL-351R, 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 is clearly visible and easily operated from the ground. The lockout handle prohibits operation either from the control or remotely if part of an automation scheme. An open and closed contact indicator shows the vacuum interrupter's contact position. Contact status and lockout condition can also be verified on the control.

Maintenance-free - Solid dielectric insulation provides a maintenance-free installation. The magnetic actuator and interface electronics are located in a separate compartment at the bottom of the recloser for easy access, if required.

Compact, Lightweight - The solid dielectric Viper-S weighs considerably less than comparably rated oil insulated devices. No special lifting equipment is required.

Latest Technology Magnetic Actuator - Viper-S reclosers utilize the latest in magnetic actuator technology. This highly efficient actuator consumes very little energy. The actuator offers superior, repeatable performance with few moving parts.

Reliable Performance - The interrupter and magnetic actuator assembly have been tested for over 10,000 mechanical operations to assure a long operating life.

Removable Insulators - Apparatus bushing interface with removable silicone insulators are standard for overhead applications. This feature permits easy field replacement if an insulator is damaged. Higher BIL rated insulators can also be used in high pollution areas and can be retrofitted if necessary. 600A apparatus and 200A deepwell bushings in various configurations are available for padmount applications.

Application Flexibility - Viper-S reclosers offer a variety of options to provide remote monitoring of both current and voltage. Solid dielectric modules offer a variety of cable connection options permitting easy replacement of existing reclosers. Padmounted units are dead-front and can be configured for either front or front/back access to cables and operators. Polemounted units can be oriented either horizontal or vertical in a variety of configurations. Adjustable substation frames can be oriented to accommodate optimum load and line side aerial connection.

Silicone insulators are removable.

OPERATION OPTIONS

Dead-line operation - Permits using the batteries located in the control 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 capabillity to open or close the recloser.

DC power options - Permits the use of 48V or 125V DC power for the recloser.

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

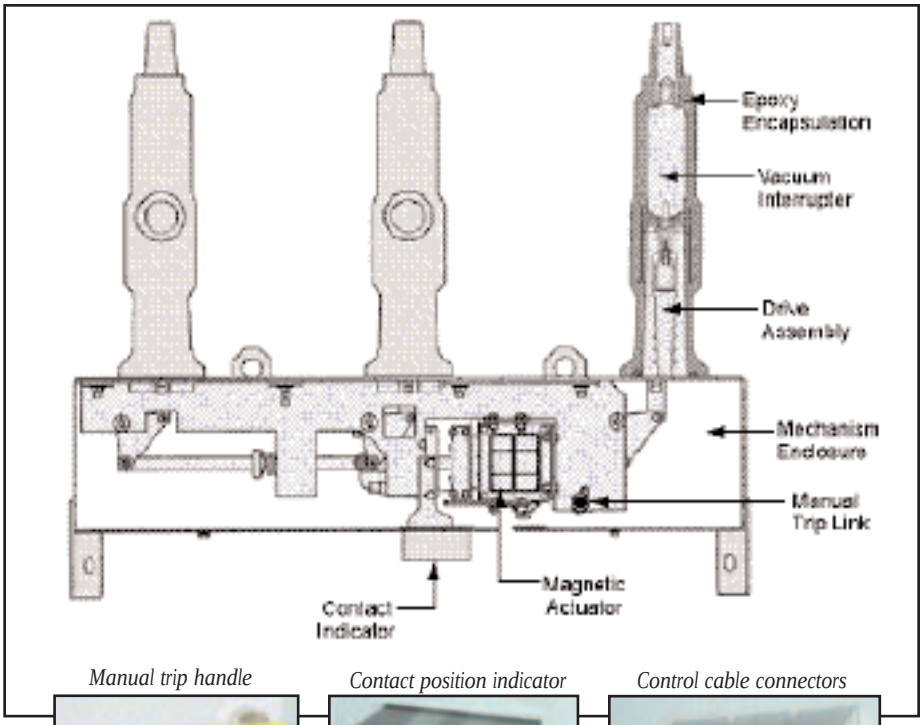
MANUAL TRIP OPERATION

For manual trip and lockout operation, a handle is provided permitting hookstick operation. Pulling the handle down trips and locks out the recloser. A contact position indicator is provided indicating open or closed status of the contacts. The contact status is also displayed at the recloser control. Operation of the manual trip handle also disables any local or remote closing operation until the handle is reset. Once reset, the recloser can be closed from the control.

CONTROL CAPABILITIES

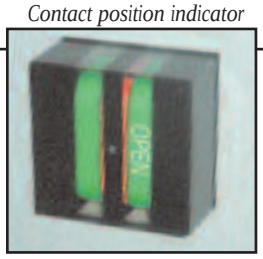
Various style controls are available depending upon application requirements. Typical control settings include:

- 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.



Manual trip handle

Contact position indicator



Control cable connectors

CONTROL CONNECTIONS

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

CATALOG NUMBER

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

APPLICATIONS

- Sectionalizing schemes
- Distributed automatic transfer
- Distribution automation
- Circuit breaker alternative
- Relay protection
- Revenue grade metering
- Open bus ties

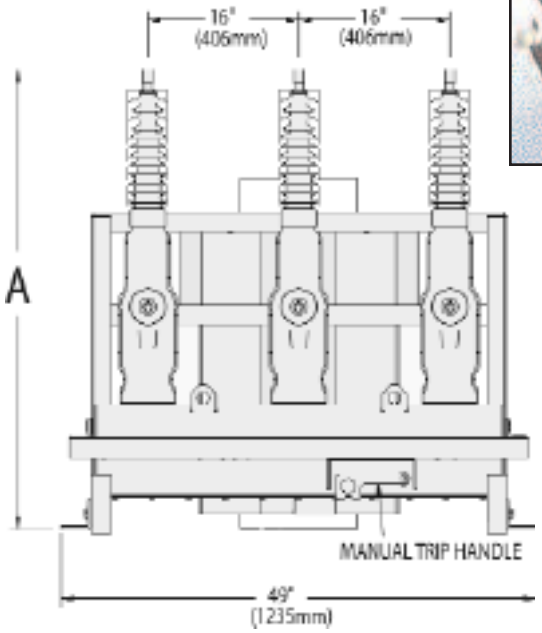
Schweitzer SEL-351R control

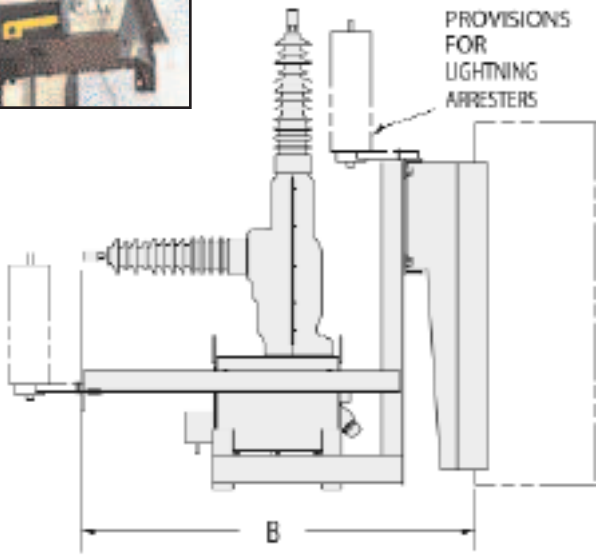
POLEMOUNT CENTER BRACKET

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

Approx. Dimensions - ins. (mm)

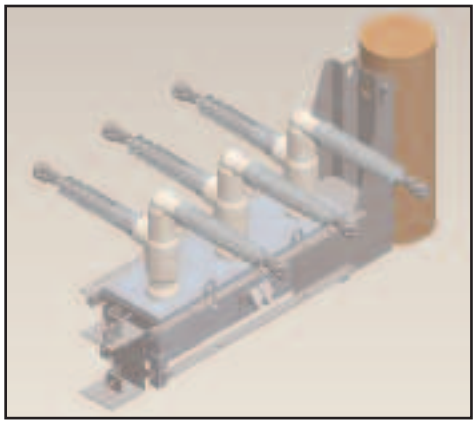
	15.5kV	27kV	38kV
A	42 (1067)	47 (1204)	51 (1295)
B	39 (991)	44 (1118)	48 (1219)



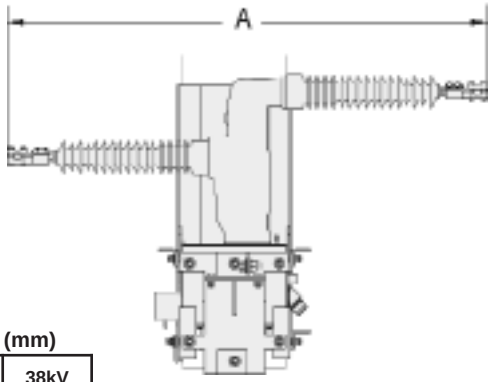


POLEMOUNT SIDE BRACKETS

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)

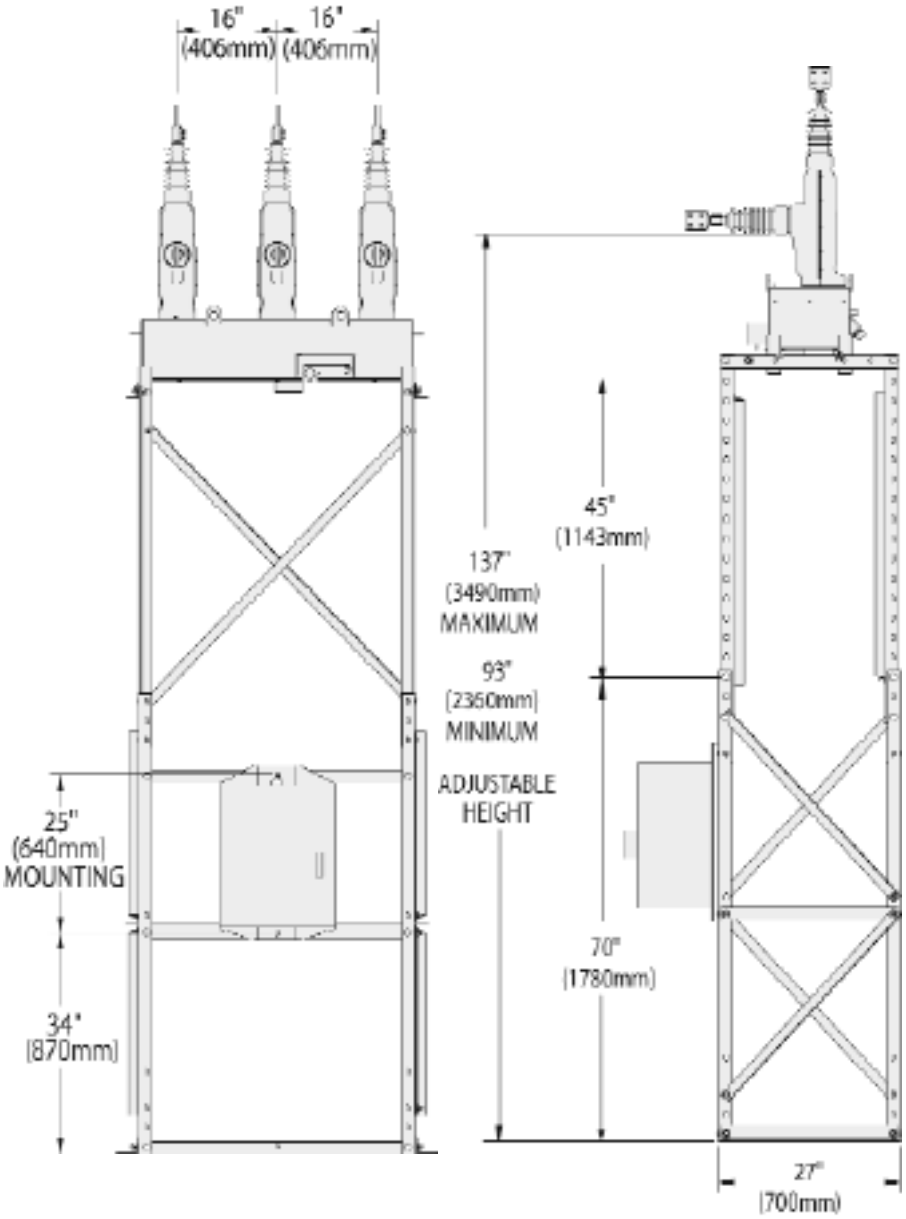
SUBSTATION MOUNT

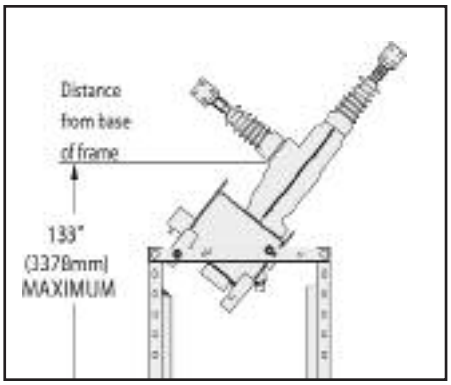
Dimensions are approximate. Do not use for construction.

Standard substation frames are galvanized and adjustable for ease of installation and aerial connection. Controls can be mounted on the front, back or side. Stainless steel is available.

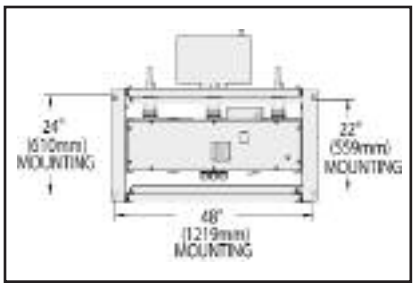
Custom frames are available to meet specific customer requirements including conversion of existing frames for direct replacement of existing reclosers.

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





Drawing (above) shows 45º angle mounting for applications requiring the same load and line side connector height.



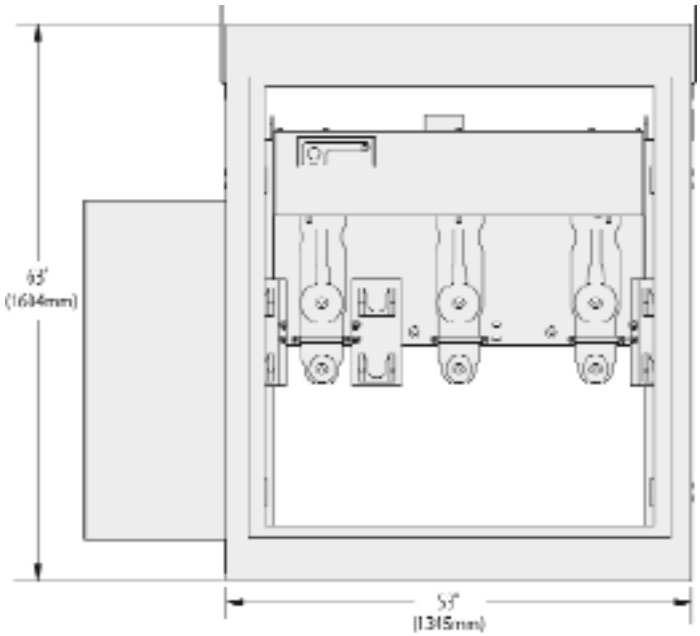
Bottom View

PADMOUNT APPLICATIONS

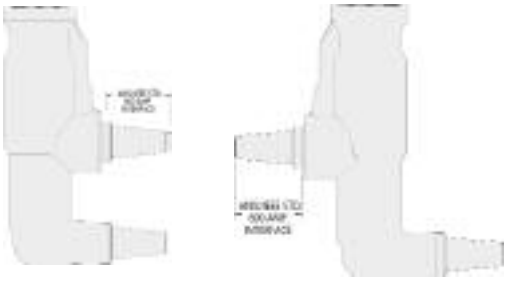
For applications where space is limited at the substation or where underground feeders require protection, Viper-S solid dielectric reclosers can provide an ideal solution using a dead-front padmount design. In this configuration, the cable connections can be provided with either a standard IEEE 600A apparatus or 200A deepwell interface 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

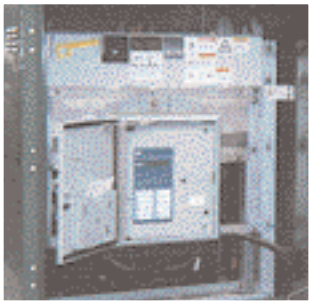


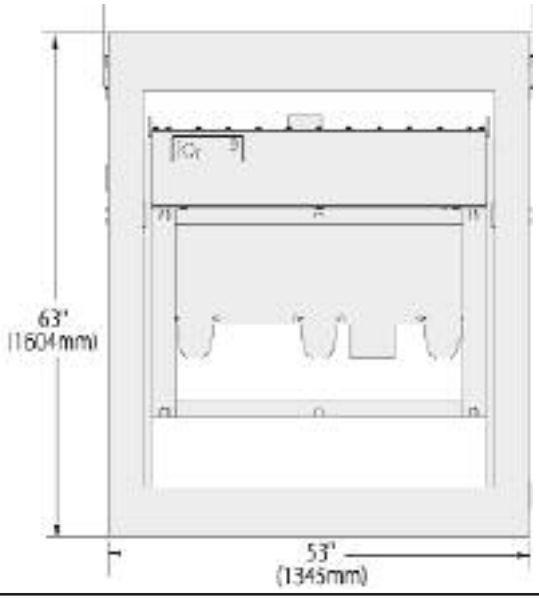
"C" Module "Z" Module

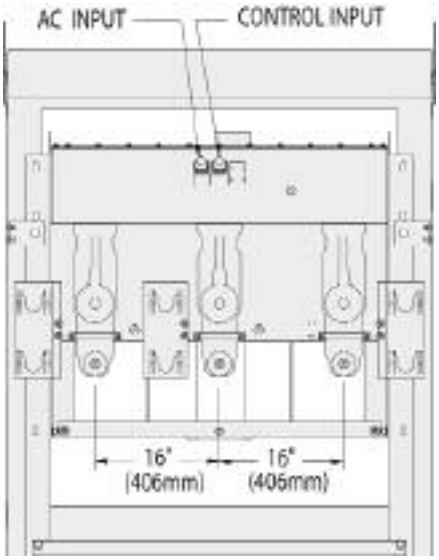
Photo (right) shows a front/back configuration using Z modules.

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.







TYPICAL SPECIFICATIONS

A. GENERAL

This specification covers the requirements for an electronically controlled, automatic three phase, solid dielectric vacuum recloser for distribution systems through 38kV. The recloser shall be manufactured by G&W Electric designated as Viper-S Solid Dielectric Recloser. Recloser configuration shall be (*check one):*

_____ Polemount design
_____ Substation mount design
_____ Padmount, dead-front design

The manufacturer shall be ISO 9001:2000 and ISO 14001:2004 certified.

B. DESIGN RATINGS AND STANDARDS

Reclosers shall be designed, tested and built per latest version of ANSI C37.60 standards. Certified test reports shall be provided. The recloser shall be rated: *(select column)*

Maximum Design Voltage, kV	15.5	27	38
Impulse level (BIL), kV	110	125	150
Continuous & load break current, A	800	800	800
8-hour Overload, A	960	960	960
60Hz Withstand, kV rms			
One minute (dry)	50	60	70
10 second (wet)	45	50	60
Interrupting Current, kA rms sym.	12.5	12.5	12.5
Making Current,			
RMS, asym, kA	20	20	20
Peak, asym, kA	32	32	32
Short Circuit Current, kA sym., 3 second	12.5	12.5	12.5
Mechanical endurance, operations	10k	10k	10k

C. RECLOSER CONSTRUCTION

C1. Mechanism Enclosure

The magnetic actuator and corresponding linkage assembly shall be housed within an integral, air insulated, stainless steel enclosure. A bolted panel at the bottom of the mechanism enclosure shall permit easy access if maintenance is required. All hardware shall be made of stainless steel or brass for maximum corrosion-resistance. An air vent shall be provided. The mechanism enclosure shall be painted light gray using a corrosion-resistant epoxy paint. The mechanism enclosure shall be provided with lifting provisions. Ground bosses shall be provided for system ground.

C2. Operating Mechanism

The operating mechanism shall utilize a magnetic actuator for opening and closing of the vacuum interrupters. The actuator shall be powered by capacitors located in the mechanism enclosure. The manual trip and lockout handle shall be made of stainless steel for maximum corrosion resistance. The operating temperature range shall be -40ºC to +65ºC. Vacuum interrupter contact position indication shall be accomplished using green (open) and red (closed) indicators located at the bottom of the mechanism enclosure.

C3. Vacuum Interrupters

Interruption of the fault or load current shall be accomplished through vacuum interrupters located inside the solid dielectric modules. The modules shall be fully shielded and incorporate UV protection.

C4. Solid Dielectric Modules

The solid dielectric modules shall utilize a time proven EPOX solid dielectric epoxy insulation to fully encapsulate each of the three vacuum interrupters. The solid dielectric modules shall be fully shielded and incorporate a high impact poly-carbonate, track resistant, UV stable covering. A dual ratio, 500:1 and 1000:1, current transformer and voltage sensor shall be integrally molded into each module. Modules shall be molded with one (1) source side and one (1) load side, ANSI apparatus bushing interface.

C5. Bushings

Cable bushings shall be *(check one):*

___ Air insulated, removable silicone insulators over ANSI apparatus bushing interface.

For padmount design:

___ 600A apparatus bushings.
___ 200A deepwell bushings.

D. OPERATION

Monitoring of the circuit shall be accomplished using internal, multi-ratio current transformers. The unit shall be powered by an external 120 VAC source.

Recloser sequencing, tripping and overcurrent sensing shall be an automatic function of the electronic control. If a fault current is sensed on any phase, the recloser will trip all three phases. Manual trip and lockout shall be provided by an external, hookstick operable handle. Operation of the manual trip handle shall disable any local or remote closing operation until the handle is reset. An operations counter viewable through a window at the bottom of the mechanism enclosure shall be provided.

E. MOUNTING

Lifting eyes shall be provided. Mounting provisions shall be supplied as follows:

___ Galvanized polemount center bracket with arrester provisions on the load and line side insulators. Stainless steel optional.
___ Galvanized polemount horizontal side bracket with arrester provisions on the load and line side insulators. Stainless steel optional.
___ Galvanized adjustable substation frame. Stainless steel optional.
___ Galvanized substation frame for 45° recloser mounting. Stainless steel optional.
___ Dead-front front access padmount design with galvanized steel enclosure. Stainless steel enclosure optional.
___ Dead-front front/back access padmount design with galvanized steel enclosure. Stainless steel enclosure optional.

TYPICAL SPECIFICATIONS continued

F. PADMOUNT ENCLOSURE
(if applicable)
Enclosures shall be made of 12 gauge galvanized or stainless steel and manufactured to ANSI C37.72 and C57.12.28 standards. The enclosure shall be mounted independently to facilitate cable installation. Enclosures shall be tamper-resistant incorporating hinged access door(s) with pentahead locking bolt(s) and provisions for padlocking. The enclosure shall be provided with lifting provisions and painted with a Munsell 7.0GY3.29/1.5 green finish.

G. ELECTRONIC CONTROLS
The recloser shall be controlled using the following control:
___ SEL-351R
___ SEL-651R
___ SEL-351S package including painted steel enclosure, relay, connectorized control cable and 24V control power supply.
___ GE URC
___ None (ordered separately)

Control cable and connections shall permit easy field retrofit from other style reclosers to the recloser. The controls shall be user programmable.

H. FACTORY PRODUCTION TESTS
Each individual recloser shall undergo a mechanical operation check verifying contact closing/opening velocity, travel profile, timing and phase synchronicity. The recloser shall be AC hi-pot tested one minute phase-to-phase, phase-to-ground and across the open contacts. Circuit resistance shall be checked on all phases. Timing tests shall be conducted to verify TCC performance.

I. STANDARD COMPONENTS
The following shall be included as standard:
- Stainless steel mechanism enclosure painted light gray using a corrosion-resistant epoxy paint with ultra-violet protection.
- Stainless steel and brass fasteners
- Lifting provisions
- Operations counter
- Grounding provisions
- Corrosion-resistant three line diagram and nameplate(s)
- Manual trip and lockout handle
- AC input cable
- Control cable
- Provision for lightning arresters (overhead applications only)

J. OPTIONS *(check)*
The following options shall be supplied:
___ NEMA 2-hole aerial lugs
___ NEMA 4-hole aerial lugs
___ Clamp style aerial lugs (#2 - 500 kcmil)
___ Clamp style aerial lugs (250-750 kcmil)
___ 4/0 brass eyebolt style ground lug(s)
___ Dead-line operation permitting using the batteries located in the control (351R only) for operation of the reclos er if AC input power is lost. A remote status signal reports the operational sta tus of the interrupter power supply per mitting remote indication of the con trol's capabillity to open or close the recloser.
___ Internal voltage sensing permitting voltage reading for network reconfiguration applications. Povides a sec - ondary 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 padmount enclosure
___ 48 VDC power supply
___ 125 VDC power supply
___ Cold temperature operation to -60ºC.
___ External CTs for current monitoring supplied individually
___ External CTs mounted on a single fixture with flexible conduit
___ High impact, UV stable wild life 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.

ISO 9001:2000 Certified Company

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Built to Last

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