

Typical Specifications

VIPER[®]-SP SOLID DIELECTRIC, SINGLE PHASE RECLOSERS

PART 1- GENERAL

1.1 DESCRIPTION

This specification covers the requirements for an electronically controlled, solid dielectric vacuum recloser for use on single phase distribution systems through 38 kV. The recloser shall be manufactured by G&W Electric Company and designated as the Viper[®]-SP, solid dielectric recloser.

1.2 QUALITY ASSURANCE

- A. Manufacturer Qualifications: The chosen manufacturer shall have at least 10 years experience in manufacturing solid dielectric reclosers. The manufacturer of the reclosers shall be completely and solely responsible for the performance of the reclosers well as the complete integrated assembly as rated.
- B. The manufacturer shall furnish certification of ratings of the reclosers upon request.
- C. The recloser shall comply with requirements of the latest revisions of applicable industry standards, including:
 - a) IEEE C37.60
 - b) IEEE 386
- D. The recloser manufacturer shall be ISO 9001 and 14001 certified.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Reclosers shall be shipped preassembled at the factory. No field assembly shall be required.
- B. The contractor, if applicable, shall handle, transfer and move the reclosers in accordance with manufacturer's recommendations.

PART 2- PRODUCTS

2.1 RECLOSER CONFIGURATION

- A. Recloser configuration shall be available with insulator orientation as follows:
 - ___ 90° (L) with insulators top and side
 - ___ Horizontal (Z) with insulators front and back
- B. Recloser mounting configuration shall be (choose one):
 - ___ Polemount
 - ___ Substation, 90°
 - ___ Substation, 45°
 - ___ Padmount, dead-front
 - ___ Site-ready with bracket and arresters preassembled
 - ___ Orientation mounting bracket for left, centered or right installation

2.2 RECLOSER CONSTRUCTION

A. Mechanism Enclosure

The magnetic actuator and corresponding linkage assembly shall be housed within a high impact, UV stable, air insulated, poly-carbonate enclosure. A contact position indicator and air vent shall be provided. Lifting provisions shall be provided.

B. Operating Mechanism

The operating mechanism shall utilize a magnetic actuator for opening and closing of the vacuum interrupter. The magnetic actuator shall be powered by capacitors located in the control enclosure. The manual trip and lockout handle shall be made of aluminum for maximum corrosion resistance. A mechanical block device shall further prohibit accidental closing when the manual trip handle is used. The operating temperature range shall be -60°C to +65°C. Vacuum interrupter contact position indication shall be accomplished using green (open) and red (closed) indicators located on the bottom of the mechanism enclosure and through LEDs located inside the control.

C. Vacuum Interrupters

Interruption of the fault or load current shall be accomplished through vacuum interrupters located inside the solid dielectric modules.

D. Solid Dielectric Modules

The solid dielectric module shall utilize a time proven EPOX solid dielectric insulation to fully encapsulate the three vacuum interrupters. The solid dielectric module shall be fully shielded and incorporate a high impact polycarbonate, track resistant, UV stable covering. The module shall be dead tank or dead front technology and shall conduct a fault to ground through their external surface in case of a flash over. The operating temperature range shall be -60° to +65°C. A dual ratio, 500/1000:1 or optional dual ratio 400/200:1 current transformer shall be molded into the module. The module shall be molded with one (1) source side and one (1) load side, IEEE apparatus bushing interface.

E. Smart Grid / Lazer Automation

The recloser shall be automation ready, simplifying conversion for any future automation requirements. A multi-ratio current transformer shall be encapsulated within the module. The current transformer inputs to the control shall be field changeable. CT accuracy shall be +/-1%.

F. Electronic Control

The recloser shall be controlled using the Schweitzer SEL-351RS Kestrel control.

2.3 DESIGN RATINGS

A. Reclosers

The recloser shall be rated (choose appropriate column):

SELECTION OF RATINGS	IEEE/IEC		
	15.5	27	38
Maximum Design Voltage, kV	15.5	27	38
Impulse Level (BIL) Voltage, kV	110	125	150
Continuous and Load Break Current, Amperes	800/1000*	800/1000*	800
8-hour Overload, Amperes	960	960	960
Interrupting Rating, RMS, kA	12.5	12.5	12.5
Making Current: RMS, asym, kA	20	20	20
Making Current: Peak, asym, kA	32	32	32
Short Circuit Current, kA sym. , 3 seconds	12.5	12.5	12.5
60Hz Withstand, kV rms: Dry, 1 minute	50	60	70
60Hz Withstand, kV rms: Wet, 10 seconds	45	50	60
Mechanical Endurance, Operations	10k	10k	10k

*1000A continuous current available with the following conditions: L-shaped module configuration, NEMA-4 hole or clamp style lugs, and operating temperature range of -60°C through +40°C

B. IEEE C37.60 Fault Interrupting Duty

Percent of Maximum: Interrupting Rating	Approx. Interrupting: Current Amps	No. of Fault: Interruptions
15-20%	2000	44
45-55%	6000	56
90-100%	12000	16
Total Number of Fault Interruptions: 116		

2.4 CABLE BUSHINGS

Cable bushings shall be (choose one):

- Air insulated, removable silicone insulators over an IEEE 386 apparatus bushing interface

For Padmount design:

- 600 amp Apparatus bushing
- 200 amp Deepwell bushing

2.5 FACTORY PRODUCTION TESTS

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

2.6 STANDARD COMPONENTS

The following shall be included as standard:

- Lifting provisions
- Grounding provisions
- Manual trip and mechanical lockout handle
- SEL-351RS control and associated control cable
- Corrosion-resistant name plates
- Solid dielectric epoxy module with internal dual ratio CT
- Arrester mounting provisions (overhead applications only)
- Field changeable silicone insulators

2.7 OPTIONS

The following options shall be supplied: (check as appropriate):

- ___ 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
- ___ Stainless steel polemount bracket with arrester provisions on the load and source side
- ___ Dead-front padmounted design with stainless steel enclosure
- ___ External 1.0 KVA oil transformer for 120 VAC supply power with hardware to mount on standard aluminum frame
- ___ External 0.75 KVA solid dielectric transformer for 120 VAC supply power with hardware to mount on standard aluminum frame
- ___ High impact, UV stable wildlife protectors for source and load insulators
- ___ External CTs for current monitoring
- ___ Connectorized option (replaced hardwired pig tail)
- ___ Dual ratio 400/200:1 current transformer
- ___ Orientation mounting bracket for left, centered or right installation

2.8 LABELING

A. Hazard Alerting Signs

Appropriate hazard signs shall be applied to each unit, frame or enclosure (if applicable). A Danger sign shall warn of hazardous voltage and the need for qualified operating personnel. Warning signs shall warn against product misapplication in excess of fault ratings and the hazards when accessing moving components inside the mechanism housing. Caution signs shall warn of harmful X-ray potential.

B. Nameplates, Ratings Labels, and Connection Diagrams

Each recloser shall be provided with a nameplate label indicating the manufacturer's name, catalog number, date of manufacture, serial number, and ratings. Ratings listed on nameplate shall indicate the following: voltage rating, BIL, continuous current, and interrupting current.