

Distribution Reclosers



Southern
States

The Power of Ideas

INTRODUCTION

As the demand for improved reliability and resiliency of the grid continues to increase, distribution level utilities must implement efficient strategies to minimize the impact of both planned and unplanned power interruptions. When reclosers are used to sectionalize the feeder, they can automatically reduce the outage size upstream, by not requiring manual intervention and switching. When they are combined with automation systems, a downstream reduction of the outage area can be achieved, only leaving the affected feeder segment out of power. By restoring power faster, utilities can minimize lost revenues that would otherwise take place during an outage. In addition, this can help to eliminate regulatory fines associated with poor reliability numbers such as SAIDI.

Over the years, the industry has seen a transition from mechanically operated hydraulic oil-filled reclosers to more robust, digitally operated vacuum reclosers that have a longer life and are more reliable. This has helped to provide reductions in maintenance, better integration with SCADA and automation systems, as well as increased environmental compliance.

In a vendor agnostic manner, Southern States was able to understand unresolved customer needs and identify gaps in the distribution market for reclosers. In collaboration with these utilities, Southern States developed a product that helps achieve improved system reliability, cost efficiency, and versatility.

The bulletin highlights our recloser product line's customer-driven design approach, application flexibility, as well as ratings and technical information to guide the selection process by the utility.

Southern States Recloser Device



*Protection Devices That Support
Greater System Resiliency*

SOUTHERN STATES RECLOSER

Southern States' Distribution Automation Solutions are economical vacuum switching devices that offer greater reliability and improved cost efficiency to a distribution system. Its flexible standard designs allows utilities to employ the automated switch as a sectionalizer or recloser, available with SEL 751, 651RA, 651R, Beckwith M7679, or Siemens programmable automation controllers, which can be manually or remotely operated with SCADA. This all-in-one product can help utilities reduce total inventory, minimize training requirements, as well as provide applicational flexibility to their systems.

DESIGN FEATURES

- 360° position indicator
- 19 LED fault indicating lights
- Six built-in resistive voltage sensors (*<1% rated accuracy*)
- HCEP encapsulated vacuum interrupters
- Standard 5-year warranty
- Painted 304 stainless steel tank / cabinet



APPLICATION CHART

STANDARD PRODUCT COMPARISON			
<i>Features / Benefits:</i>	Ganged Operated Recloser	Triple Tank / Triple Single Recloser	Single Tank / Triple Single Recloser
<i>Three Phase Operation Capability</i>	✓	✓	✓
<i>Independent Phase Operation</i>	✗	✓	✓
<i>No. of Fault / Position Indicators</i>	1	3	3
<i>Phase Spacing</i>	15.5 in.	19.5 - 30 in.	15.5 in.
<i>Optional Animal Guards</i>	✓	✓	✓
<i>Optional Arrester & Transformer Brackets</i>	✓	✓	✓

RATINGS

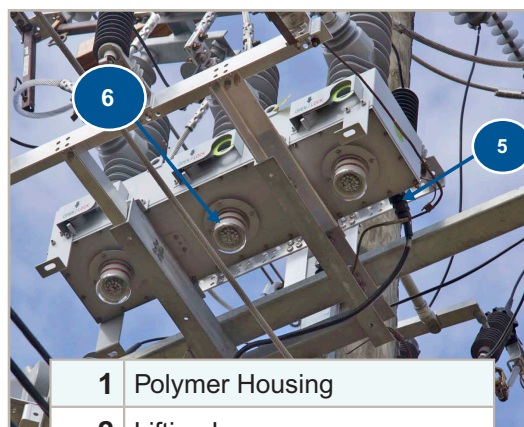
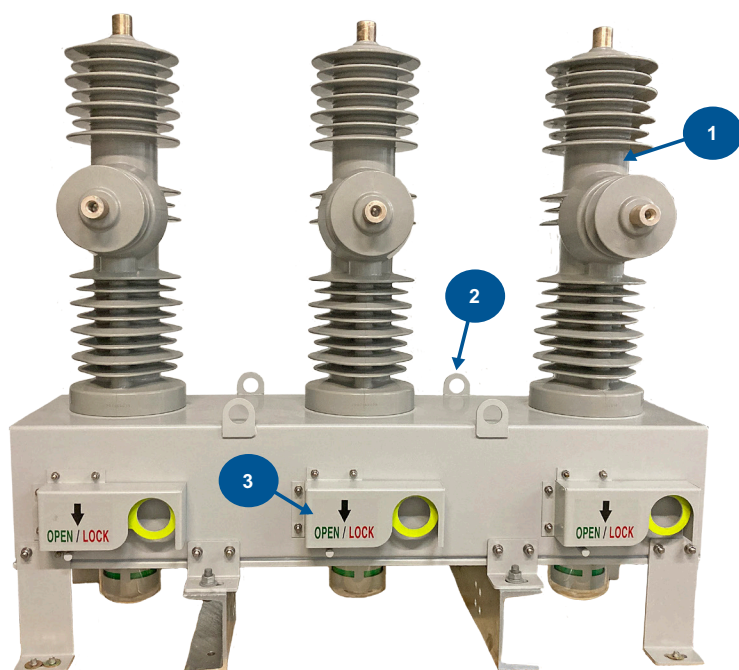
SWITCH SPECIFICATIONS

Maximum Voltage	15.5 kV	27 kV	38 kV
Continuous Current	900 A		
Basic Insulation Level (BIL)	110 kV	150 kV	170 kV
Symmetrical Interrupting Current	16 kA	12.5 kA	
Asymmetric Peak Making Current	40 kA	32.5 kA	
Weight of Mechanism	265 lbs	308 lbs	440 lbs
Weight of Standard Mounting Bracket	73 lbs		
<u>Creepage Distances (mm / in):</u>			
<i>Terminal to Terminal</i>	673 / 26.5	876 / 34.5	1160 / 45.7
<i>Lower Terminal to Ground</i>	679 / 26.7	938 / 36.9	1500 / 59.0
IEC Pollution Class Terminal to Ground	Very Heavy		
Mechanical Life (Close / Open Operations)	10,000		
Ambient Temperature (°C)	-40 to +60		

CONTROL CABINET & OTHER SPECIFICATIONS

Control Cabinet	Southern States LLC
Cabinet Enclosure Type	NEMA 4X
Cabinet & Tank Material	304 Stainless Steel (Painted)
Control / Power Cables	Included, 35' or 50' standard
	Optional, custom length available
Voltage Sensors	6 x resistive sensors (<1% accuracy)
Fault Indicator	19 LED lights visible on the bottom of the tank
Interrupter Housing Material	Hydrophobic cycloaliphatic epoxy (HCEP)
Mounting Orientation Available	Horizontal & Vertical

FEATURES & BENEFITS



1	Polymer Housing
2	Lifting Lug
3	Manual Handle (Open/Lock)
4	Nameplate
5	Mil Spec Control Connection
6	Fault & Position Indicator



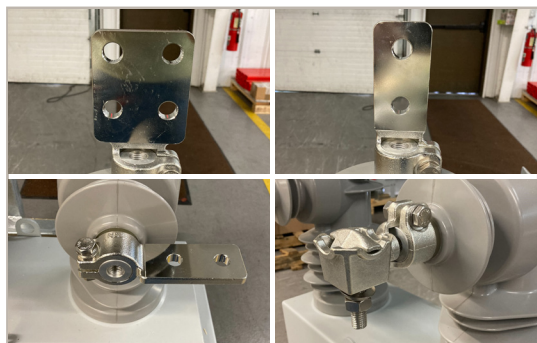
360° FIELD OF VIEW FAULT & POSITION INDICATOR

- Open / closed position can be clearly identified
- Replaceable tempered glass cover addresses visibility concerns of other market options which may use plastic or epoxy
- SCADA controllable 19-LED fault indication
- Flashing light supports fault identification from the ground
- Fault type can be identified for triple-single recloser models

90° ROTATED POLES (*OPTIONAL*)

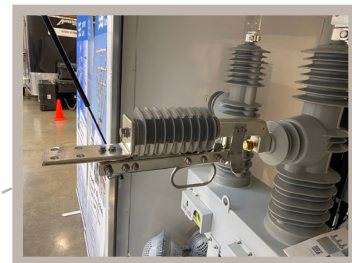
- Greater horizontal terminal to terminal clearance
- Avoid flashover situations caused by wildlife
- Shorter jumpers result in easier installation
- Available with 15 kV and 27 kV recloser models

FEATURES & BENEFITS



NEMA TERMINAL PADS

- High conductivity tin-plated copper
- Available options include:
 - 2 hole flat pad straight
 - 2 hole flat pad 90°
 - 4 hole flat pad
 - Clamp style aerial lug
 - Bolt on air gap switch

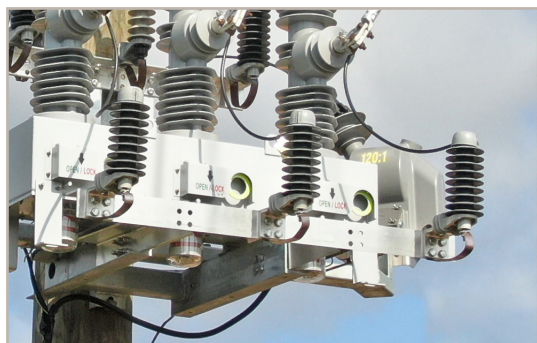


CONTROL, POWER, & TESTING CABLES

- Terminated control cables - No point to point wiring
- 32' or 52' standard control & power cable lengths
- Security sleeves & armored cable option available
- SLLC supplied test cables that will work with Omicron CMC style test or equivalent
- Omicron supplied test cables available for Arco test set

WILDLIFE GUARDS (*OPTIONAL*)

- Provides protection of energized connection points
- Minimizes operational and avian risks that can lead to outages
- Durable and effective in all weather conditions
- Easy and minimal installation requirements
- Top, side, and 90° terminal fittings available
- Fire rated V-0 per UL 94 standard
- Mesh & bolt on air gap switch wildlife guards available

SURGE ARRESTERS & BRACKETS (*OPTIONAL*)

- Protects recloser from over-voltage transients caused by external (lightning) or internal (switching) events.
- Minimizes risk of customer interruption
- Available with 15 kV, 27 kV, and 38 kV recloser models
- Optional factory mounted and grounded arresters
- Site ready configuration available

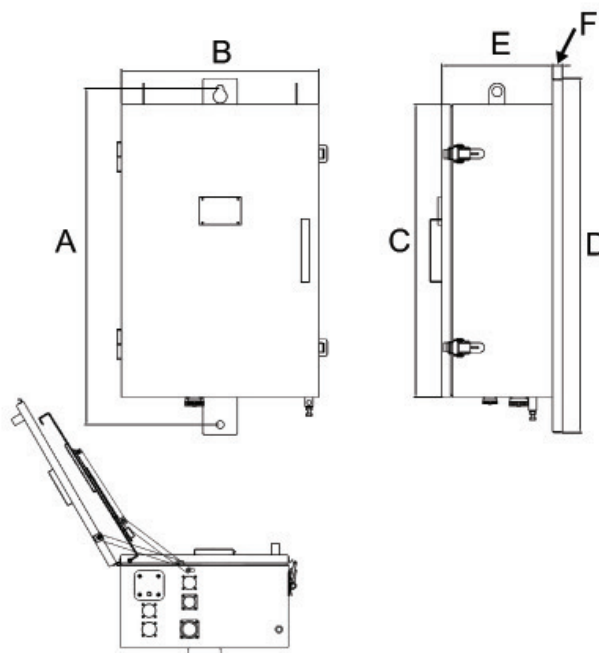
RELAYS & CONTROLS

CONTROL CABINETS



DIMENSIONS

	2411 / 751 Control Cabinet	651RA Control Cabinet	651R Control Cabinet
A	29.9" (760 mm)	33.5" (850 mm)	35.8" (910 mm)
B	17.7" (450 mm)	19.7" (500 mm)	19.7" (500 mm)
C	25.6" (650 mm)	29.1" (740 mm)	31.5" (800 mm)
D	31.9" (810 mm)	35.4" (900 mm)	37.8" (960 mm)
E	10" (250 mm)	11" (280 mm)	13.4" (340 mm)
F	1" (25 mm)	1" (25 mm)	1" (25 mm)



RELAYS & CONTROLS

RELAY OPTIONS



SEL-751 4 & 8-BUTTON

- Most economical solution for Southern States device from SEL
- 4-button 751 is suggested for SCADA controlled switches or sectionalizers, both with fault indication
- 8-button 751 is suggested for ganged recloser controller utilizing IEEE/ANSI U or C curves for protections, or sectionalizers where 3-shot, 2-shot, and switch mode are desired pre-configured selections and 4 voltage inputs are available



SEL-651RA

- Full functioned and featured ganged recloser controller from SEL
- Recommended ganged recloser controller, supporting the full line of protection curves, and all 6 voltage inputs



SEL-651R

- Full functioned and featured triple single recloser controller from SEL
- Provides phase independent operation of recloser and supports the full line of protection curves and all 6 voltage inputs



BECKWITH M-7679

- Full functioned and featured triple single recloser controller
- Provides phase independent operation of recloser and supports the full line of protection curves and all 6 voltage inputs
- Economic price point makes this relay a good solution for ganged recloser controller as well



SIEMENS SIPROTEC

available

NOTE: All relays come with 10-year manufacturer warranty, support high impedance fault detection, easily integrate into SCADA or distribution automation systems. Automated throw over scheme is available as an add-on service.

Other customer specified relays are available upon request.

DESIGNS & DIMENSIONS

Ganged Horizontal Reclosers

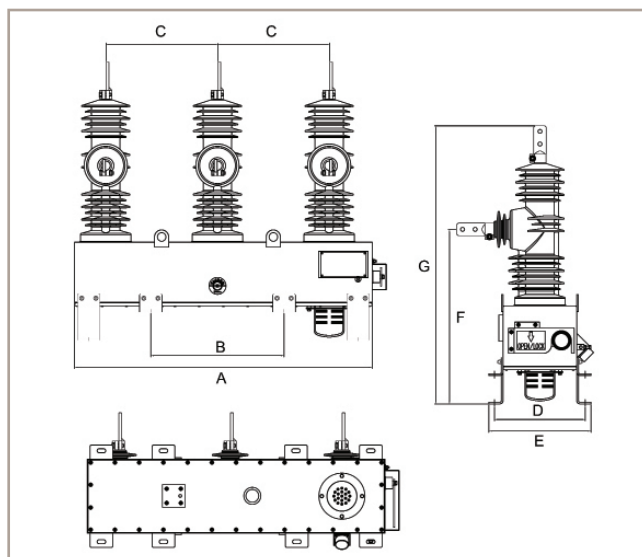


Figure	15.5 kV	27 kV	38 kV
A	41.34" (1050 mm)	41.34" (1050 mm)	42.9" (1090 mm)
B	18.5" (470 mm)	18.5" (470 mm)	18.5" (470 mm)
C	15.5" (394 mm)	15.5" (394 mm)	15.5" (394 mm)
D	12.6" (320 mm)	13.8" (350 mm)	14.2" (360 mm)
E	14.17" (360 mm)	15.4" (390 mm)	15.75" (400 mm)
F	25.1" (638 mm)	27.23" (692 mm)	31.5" (800 mm)
G	39.5" (1003 mm)	43.17" (1096.5 mm)	48.7" (1237 mm)

90° Ganged Horizontal Reclosers

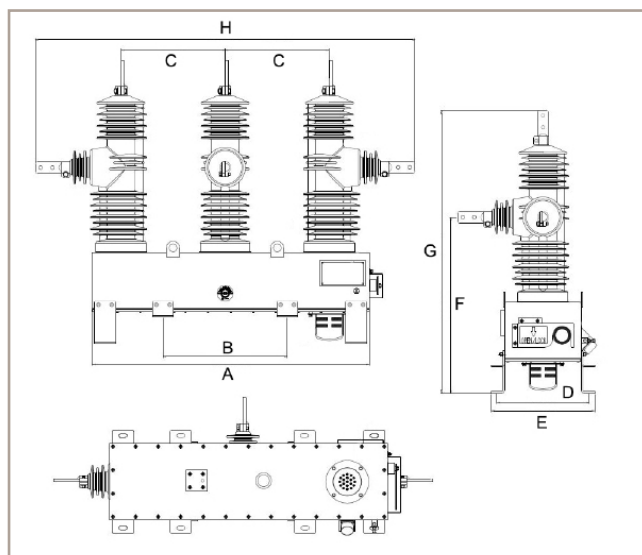


Figure	15.5 kV	27 kV
A	41.34" (1050 mm)	41.34" (1050 mm)
B	18.5" (470 mm)	18.5" (470 mm)
C	15.5" (394 mm)	15.5" (394 mm)
D	12.6" (320 mm)	13.8" (350 mm)
E	14.17" (360 mm)	15.4" (390 mm)
F	25.1" (638 mm)	27.2" (691 mm)
G	39.5" (1003 mm)	43.2" (1097 mm)
H	54" (1374 mm)	56.5" (1436 mm)

DESIGNS & DIMENSIONS

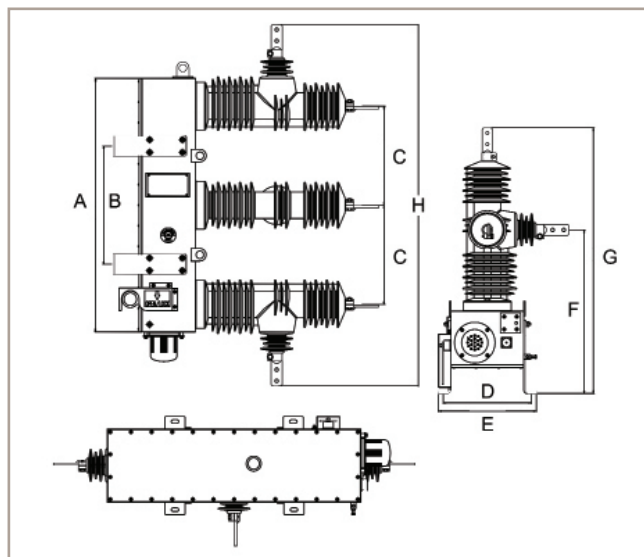
Ganged 90° Vertical Reclosers

Figure	15.5 kV	27 kV
A	39.69" (1008 mm)	39.69" (1008 mm)
B	18.5" (470 mm)	18.5" (470 mm)
C	15.5" (394 mm)	15.5" (394 mm)
D	12.6" (320 mm)	13.8" (350 mm)
E	14.17" (360 mm)	15.4" (390 mm)
F	23.46" (596 mm)	25.6" (650 mm)
G	37.84" (961 mm)	41.5" (1054 mm)
H	54" (1374 mm)	56.5" (1436 mm)

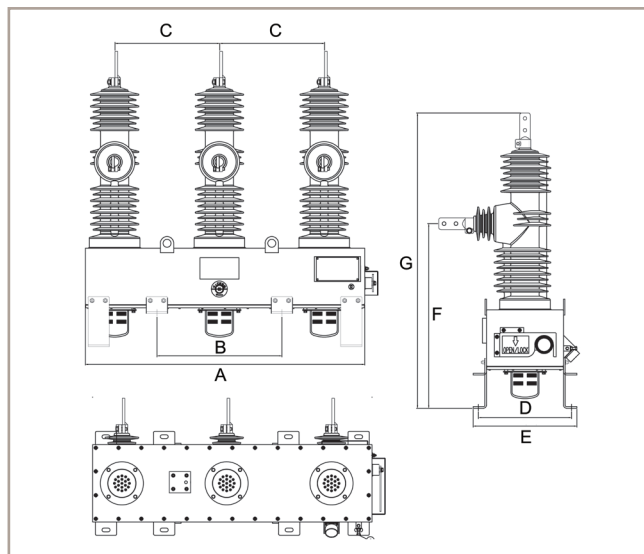
Single Handle, Triple Single Reclosers

Figure	15.5 kV	27 kV
A	41.34" (1050 mm)	41.34" (1050 mm)
B	18.5" (470 mm)	18.5" (470 mm)
C	15.5" (394 mm)	15.5" (394 mm)
D	12.6" (320 mm)	13.8" (350 mm)
E	14.17" (360 mm)	15.4" (390 mm)
F	25.1" (638 mm)	27.3" (693 mm)
G	39.5" (1003 mm)	43.6" (1108 mm)

DESIGNS & DIMENSIONS

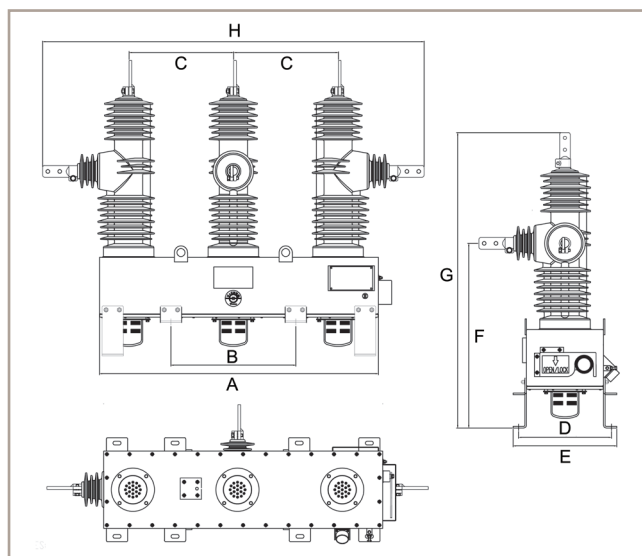
Single Handle, Triple Single 90° Reclosers

Figure	15.5 kV	27 kV
A	41.34" (1050 mm)	41.34" (1050 mm)
B	18.5" (470 mm)	18.5" (470 mm)
C	15.5" (394 mm)	15.5" (394 mm)
D	12.6" (320 mm)	13.8" (350 mm)
E	14.17" (360 mm)	15.4" (390 mm)
F	25.1" (638 mm)	27.3" (692.5 mm)
G	39.5" (1003 mm)	43.6" (1108 mm)
H	54" (1374 mm)	56.5" (1436 mm)

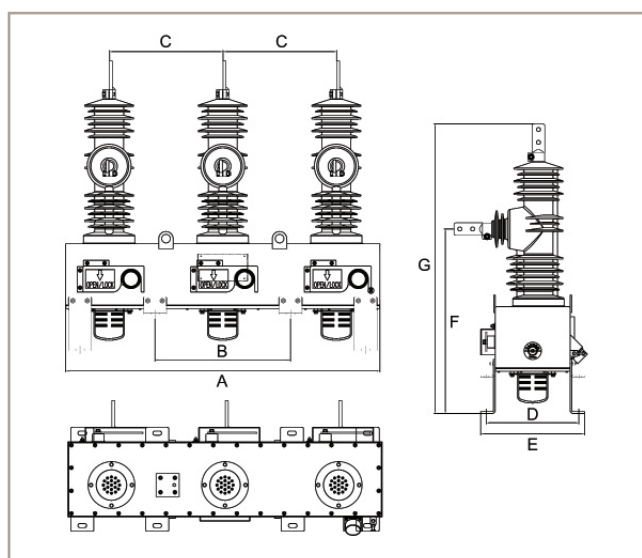
Triple Handle, Triple Single Reclosers

Figure	15.5 kV	27 kV
A	42.9" (1090 mm)	42.9" (1090 mm)
B	18.5" (470 mm)	18.5" (470 mm)
C	15.5" (394 mm)	15.5" (394 mm)
D	12.6" (320 mm)	13.8" (350 mm)
E	14.17" (360 mm)	15.4" (390 mm)
F	25.1" (638 mm)	27.23" (692 mm)
G	39.5" (1003 mm)	43.6" (1108 mm)

DESIGNS & DIMENSIONS

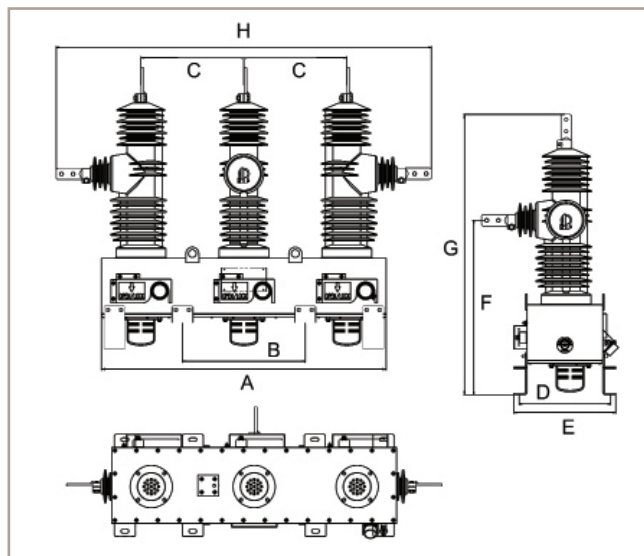
Triple Handle, Triple Single 90° Reclosers

Figure	15.5 kV	27 kV
A	42.9" (1090 mm)	42.9" (1090 mm)
B	18.5" (470 mm)	18.5" (470 mm)
C	15.5" (394 mm)	15.5" (394 mm)
D	12.6" (320 mm)	13.8" (350 mm)
E	14.17" (360 mm)	15.4" (390 mm)
F	25.14" (638.5 mm)	27.3" (692.5)
G	39.5" (1003 mm)	43.6" (1108 mm)
H	54" (1374 mm)	56.5" (1436 mm)

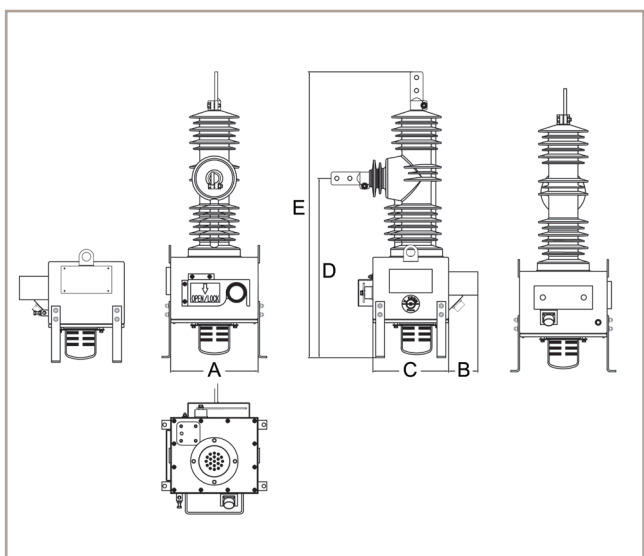
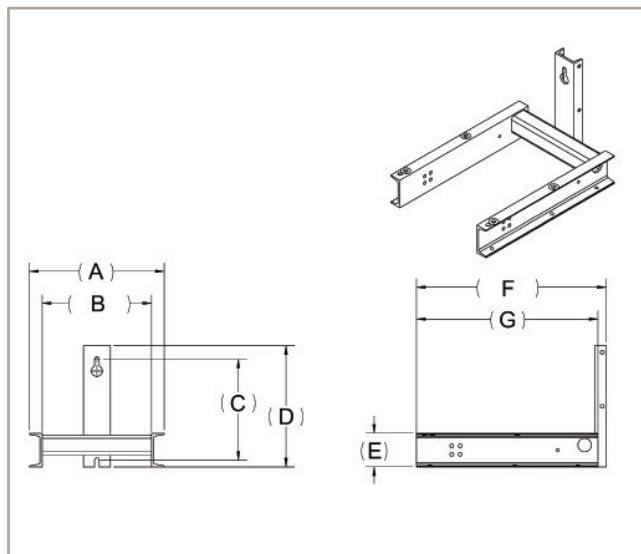
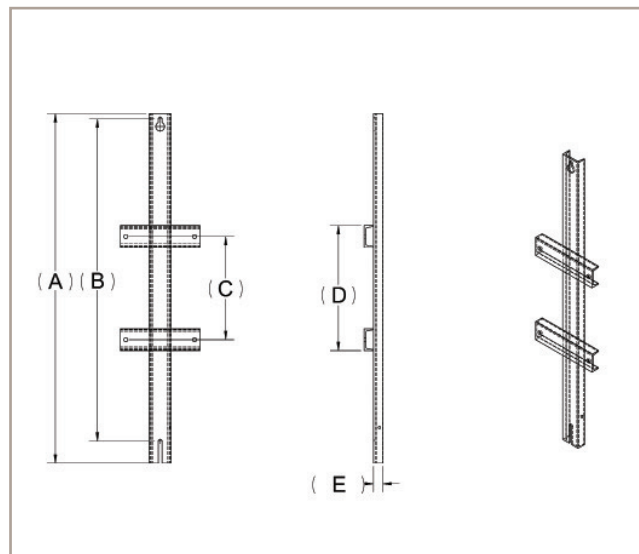
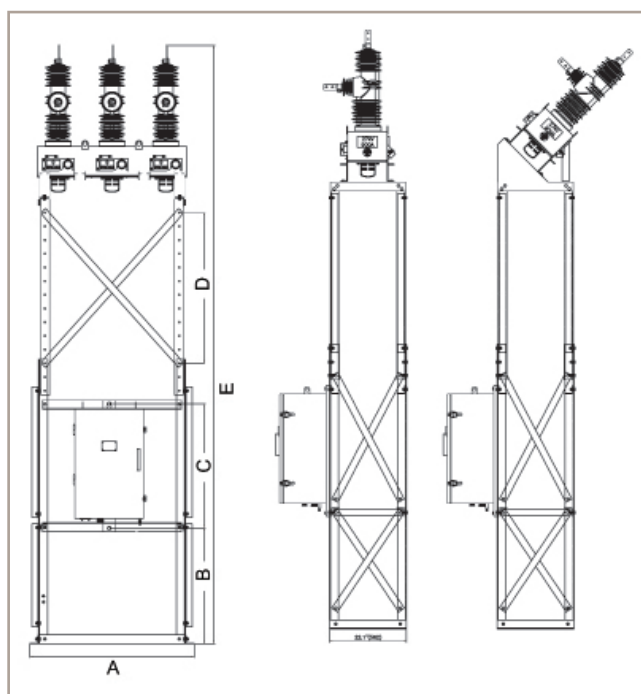
Triple Tank, Triple Single Reclosers

Figure	15.5 kV	27 kV
A	11.8" (300 mm)	11.8" (300 mm)
B	4" (100 mm)	4" (100 mm)
C	10.25" (260 mm)	11.4" (290 mm)
D	24.13" (613 mm)	26.7" (677 mm)
E	38.48" (977.5 mm)	43" (1092 mm)

SINGLE TANK MOUNTING

HORIZONTAL MOUNTING BRACKET**VERTICAL MOUNTING BRACKET**

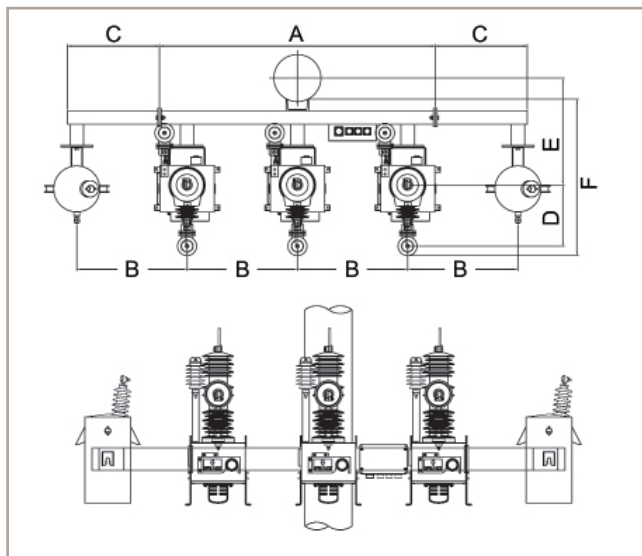
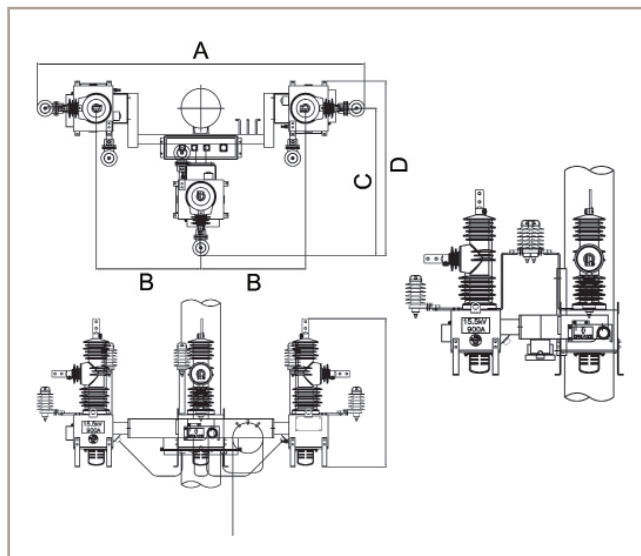
DESIGN	A	B	C	D	E	F	G
<i>Horizontal Mounting Bracket - 15 kV & 27 kV</i>	21.4" (544 mm)	16.36" (414 mm)	21" (533.8")	24" (609.6 mm)	5" (127 mm)	29.5" (749.3 mm)	28" (711.2 mm)
<i>Horizontal Mounting Bracket - 38 kV</i>	21.4" (544 mm)	16.36" (414 mm)	21.2" (538.8")	24" (609.6 mm)	5" (127 mm)	30.5" (788 mm)	29" (735.8 mm)
<i>Vertical Mounting Bracket - 15 kV & 27 kV</i>	64" (1625 mm)	59" (1500 mm)	18.5" (470 mm)	22.5" (570 mm)	2" (50 mm)		

SUBSTATION MOUNT

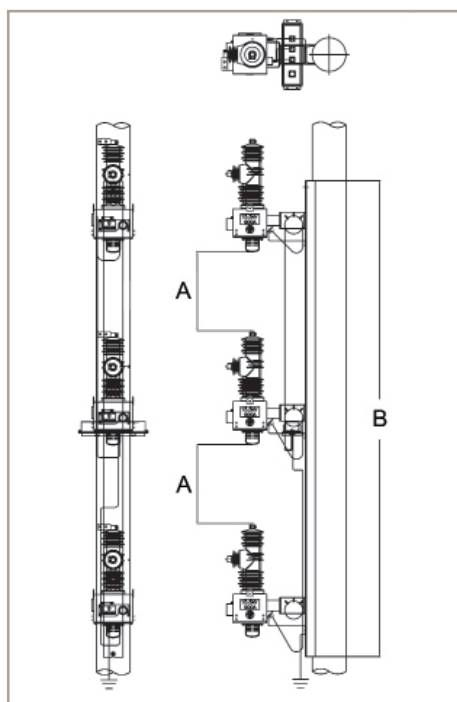
DESIGN	A	B	C*	D	E Max
<i>15 kV Substation Mount</i>	47.17" (1109 mm)	25.36" (644.1 mm)	35.80" (909.3 mm)	43.30" (1100 mm)	160.17" (4068 mm)
<i>27 kV Substation Mount</i>	47.17" (1109 mm)	25.36" (644.1 mm)	35.80" (909.3 mm)	43.30" (1100 mm)	164.27" (4173 mm)

* Measurement shown is for SEL 651R & 651RA cabinets - For SEL 751 cabinet, "C" measurement is 29.9" (760 mm)

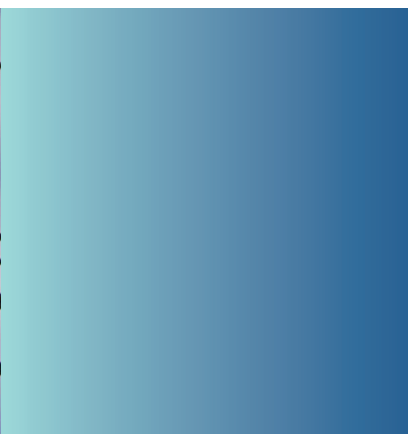
TRIPLE TANK MOUNTING

STANDARD MOUNT (with PT Bracket Extension)**CLUSTER MOUNT**

DESIGN	A	B	C	D	E	F
<i>Standard Mount - 15 kV</i>	60" (1524 mm)	24" (609.6 mm)	13.3" (338 mm)	23.2" (590 mm)	34" (865 mm)	38.5" (978 mm)
<i>Standard Mount - 27 kV</i>	60" (1524 mm)	24" (609.6 mm)	14" (357 mm)	24.4" (620.5 mm)	36" (914.5 mm)	41.1" (1044 mm)
<i>Cluster Mount - 15 kV & 27 kV</i>	85.3" (2166 mm)	27.2" (691 mm)	38.3" (971 mm)	45.3" (1151 mm)		

VERTICAL MOUNT

DESIGN	A	B
<i>15 kV Vertical Mount</i>	24" (609.6 mm)	145.7" (3700 mm)
<i>27 kV Vertical Mount</i>	24" (609.6 mm)	153.2" (3890 mm)



Promotional
Overview Video



Installation
Overview Video



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