GE Energy

Medium voltage switchgear for the full range of applications

4.76kV-38kV

imagination at work

Medium voltage switchgear from a company you can trust

Reaching from 4.76kV to 38kV and including leading-edge arc resistant technology across the line, GE delivers medium voltage switchgear solutions for every application, everywhere.

GE has reached agreement with Powell to provide 27kV and 38kV switchgear as well as a full range of arc resistant technology to allow us to meet the increasingly demanding requirements of medium voltage switchgear users. The scope of the combined line is matched by the depth of the engineering and the unsurpassed level of performance and reliability.

This is one more unmistakable sign of GE's long-term commitment to delivering the complete range of electrical distribution equipment and systems you need for every industrial application.

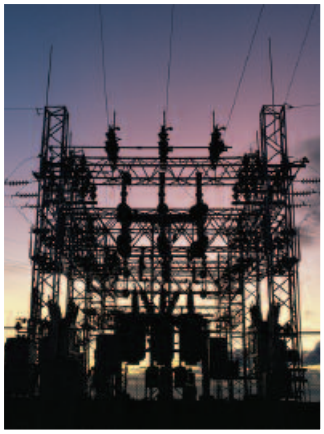
POWER/VAC®
4.76kV – 15kV

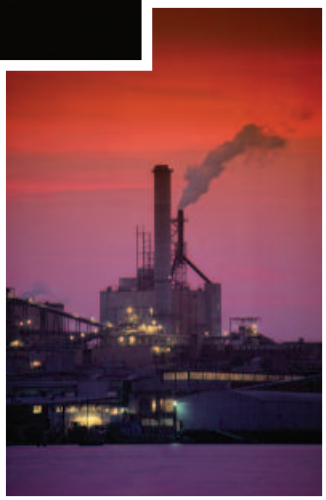
PV System 27® and PV System 38®
27kV – 38kV

Arc Resistant Switchgear
4.76kV – 38kV

Medium voltage switchgear for the full range of applications









POWER/VAC®
4.76kV-15kV switchgear

Not only was GE first to market vacuum interrupter technology, we *invented* it. And, with an installed base of 125,000 units, POWER/VAC continues to bring you high quality, low maintenance and long life.

POWER/VAC switchgear incorporates the compartment concept with grounded metal barriers that segregate primary functions so that no live parts are exposed. Safety interlocks are standard, as are closed door racking and storage, breaker position indicator and positively actuated safety shutters.

It meets a wide variety of protection and switching applications. All functional units – incoming line, radial feeders, feeder bypass, bus-tie, bus-entrance and auxiliary units – are available to give you wide latitude in system planning. These, plus the versatility of one- or two-high stacking, afford maximum value for your application dollar.

At the heart of every POWER/VAC switchgear is the vacuum interrupter, which delivers fast, quiet power switching and precise arc extinction. Oil gas or high pressure air is not needed to aid interruption, resulting in a simpler, more reliable breaker.

POWER/VAC breakers feature easy-to-read controls and indicators, an easily inspected primary disconnect, contact erosion indicator and precisely tooled breaker mechanisms. A lower compartment roll-in breaker is available for indoor or walk-in outdoor switchgear.

Standardization and interchangeability of POWER/VAC breakers greatly simplify maintenance and training. For example, all breakers are the same size, and most frame parts, primary conductors, disconnects and mechanisms are interchangeable.

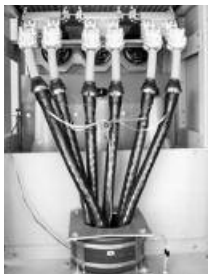
The main bus compartment is completely isolated by 11 gauge metal barriers. Bus bars insulated with high dielectric epoxy pass through track-resistant polyester glass barriers between cubicles.

The secondary disconnect combines the contact reliability of a plug with the self-aligning convenience of sliding contacts.

Current transformers are located behind mechanically actuated safety shutters and a barrier that isolates the primary disconnect as the breaker is moved into the disconnect position.

Voltage transformer trays are automatically grounded on withdrawal, which provides isolation from primary connections.

Dry type control power transformers are insulated with molded resin epoxy and mounted in a drawout tray for easy access.



Even two-breaker vertical sections offer ample space for terminating up to two 750 MCM cables per phase.

POWER/VAC Specifications

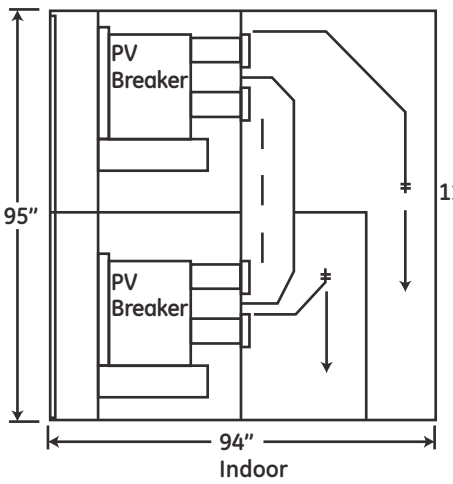
Standards

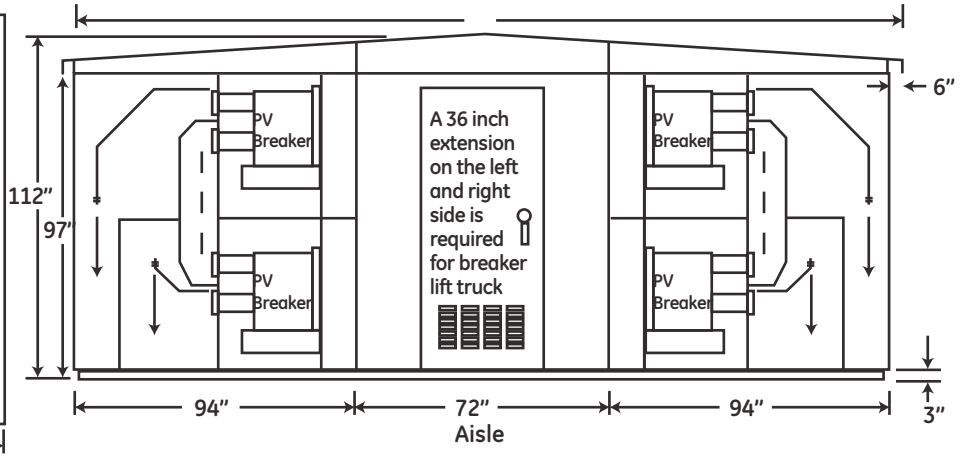
POWER/VAC switchgear is fully tested to all applicable ANSI, IEEE and NEMA standards.

Weights & Dimensions

Equipment Rating		Indoor						Outdoor					
4.76, 8.25 & 15KV		Height (in)	Depth (in)[1]	2-High Breaker Vertical Section (less breakers)		Auxiliary Vertical Section		Height (in)	Depth (in)[1]	2-High Breaker Vertical Section (less breakers)		Auxiliary Vertical Section	
Current Rating (Amps)	Breaker Weight (lbs)			Width (in)	Weight (lbs)	Width (in)	Weight (lbs)			Width (in)	Weight (lbs)	Width (in)	Weight (lbs)
1200	550	95	94	36	3050	36	2950	111 OD. 112 PA or CA	106 OD, 181 PA, 272 CA	36	3550	36	3450
2000	650				3100		3000				3600		3500
3000	780				3180		3080				3680		3580
3500	850				3280		3180				3780		3680
4000	860				3300		3200				3800		3700

1 An optional 82" depth is available for some indoor applications. Consult factory.
2 For common aisle (CA) construction, add 1500 pounds to weight of 2 indoor vertical sections.
3 Standard front aisle space required 66". Reduced front aisle space of 58" is available on indoor construction.
4 Weights listed are for estimating purposes only.
5 For protected aisle (PA) construction, add 1100 pounds to weight of each outdoor vertical section.





Outdoor Common Aisle

Typical Sections

Circuit Breaker Characteristics

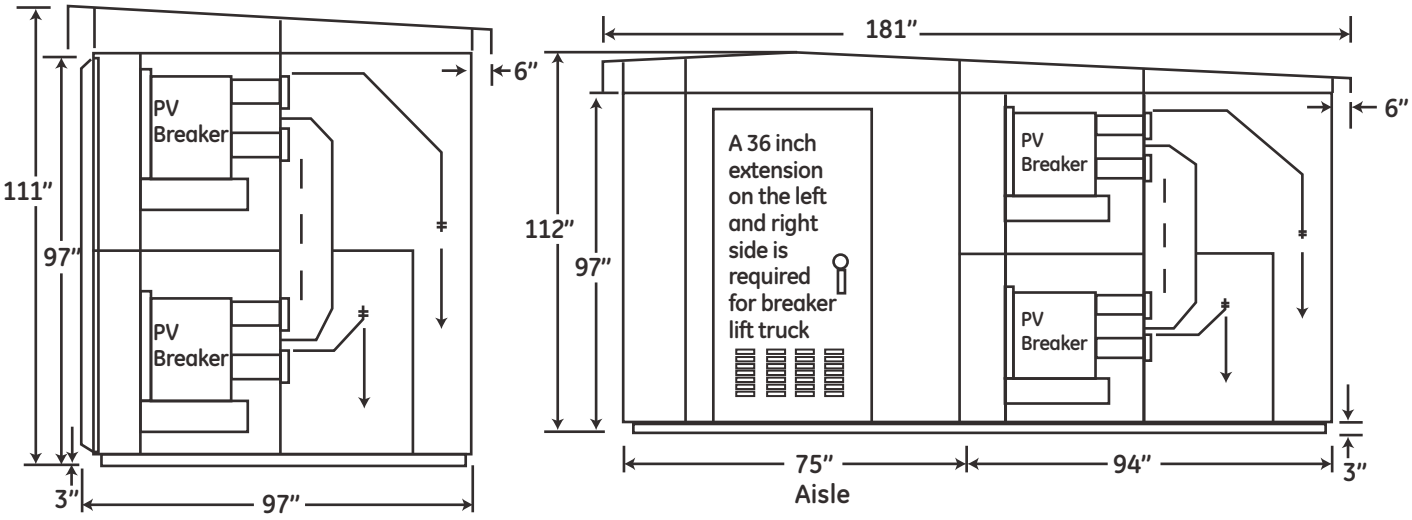
Rated Maximum Voltage (kV rms)[1]	Rated Voltage Range (k Factor)	Insulation Withstand Test Voltages		Rated Continuous Current at 60Hz (Amps rms)[2]	Rated Short Circuit at Maximum kV (kA rms)[3]	Rated Interrupting Time (cycles)	Rated Maximum Voltage Divided by K (kV rms)	Maximum Symmetrical Interrupting Capability and Short Time Current (kA rms)	Closing and Latching Capability 2.7K times Rated Short Circuit Current (kA Crest)
		Low Frequency (kV rms)	Full Wave Impulse (kV Crest)						
4.76	1.0	19	60	1200-4000	31.5	3 or 5	2	31.5	82
					40	3 or 5	2	40	104
					50	3 or 5	2	50	130
					63[4]	3 or 5	2	63	164
8.25	1.0	36	95	1200-4000	40	3 or 5	2	40	104
					50[4]	3 or 5	2	50	130
					63[4]	3 or 5	2	63	164
					20	3 or 5	2	20	52
15	1.0	36	95	1200-4000	25	3 or 5	2	25	64
					31.5	3 or 5	2	31.5	82
					40	3 or 5	2	40	104
					50	3 or 5	2	50	130
					63	3 or 5	2	63	164

[1] Maximum voltage for which the breaked is designed and upper limit of operation

[2] 4000A rating is forced air aooled, indoor construction only. 3500A must be derated to 3250A in outdoor construction.

[3] Within the limitations stated in ANSI C37.04.

[4] Exceeds ANSI C37.06 preferred ratings.



Outdoor Non-Walkin

Outdoor Protected Aisle

PV System 27® & PV System 38®
27-38kV switchgear

PV System 27/38 delivers advanced vacuum circuit breaker technology and uncompromising attention to every detail – top to bottom, inside and out. You receive superior performance and functional simplicity.

The metal-clad compartment construction protects via grounded compartments, conductor insulation and live part shielding. When breakers are moved to the test position, grounded aluminum shutters automatically cover both line and load stabs. Each circuit breaker cell features closed-door racking, closed door mechanical trip and lockout features.

The silver-plated tubular copper main bus features fully rated epoxy insulation, and bolted joints use fully qualified vinyl cover boots. Main bus support comes from cycloaliphatic epoxy insulators. Custom designed clamping type stand-off insulators are molded of urethane for tubular bus support. A continuous silver-plated copper ground bus runs the entire length of the assembly. To enhance safety, it can carry the rated short circuit current of the installed circuit breakers for 2 seconds.

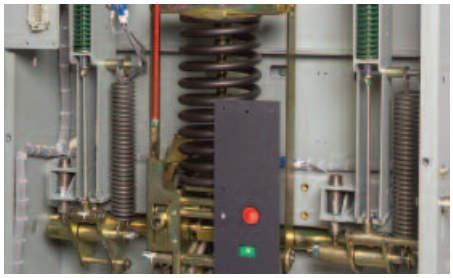
The structure allows trouble-free installation and operation. Rear compartment doors simplify installation and inspection. There is ample cable space for either top or bottom entry, and rear terminal areas are customized as needed. Vertical structures can be added later at either end.

PV System 27/38 circuit breakers are powerful, user friendly and reliable. Controls and indicators are clearly identified, and the main springs can be charged from the front as well. True closed-door racking adds a layer of protection.

Hipoxy 2000® bus insulation delivers high electrical characteristics, and it will not chip, crack or flake.

The voltage transformer drawout assembly provides a positive internal ground in the disconnected position. Interlocks and an insulated automatic shutter assembly further enhance safety.

A 24-point, front-connected umbilical cord between the breaker and the cubicle forms a secondary control interface that allows both external testing of the control circuitry and positive visual indication of proper connection.



A patented, low-impact mechanism precisely manages the delivery of operating speed and force. Front accessibility simplifies inspections, while fewer moving parts minimize maintenance and maximize reliability.

Generous panel space and auxiliary compartments accommodate protective relays, meters and instruments.

Surrounding the vacuum interrupter on three sides, a housing (which doubles as a phase insulator) makes removal and inspection fast and simple.

PV System 27 & PV System 38 Specifications

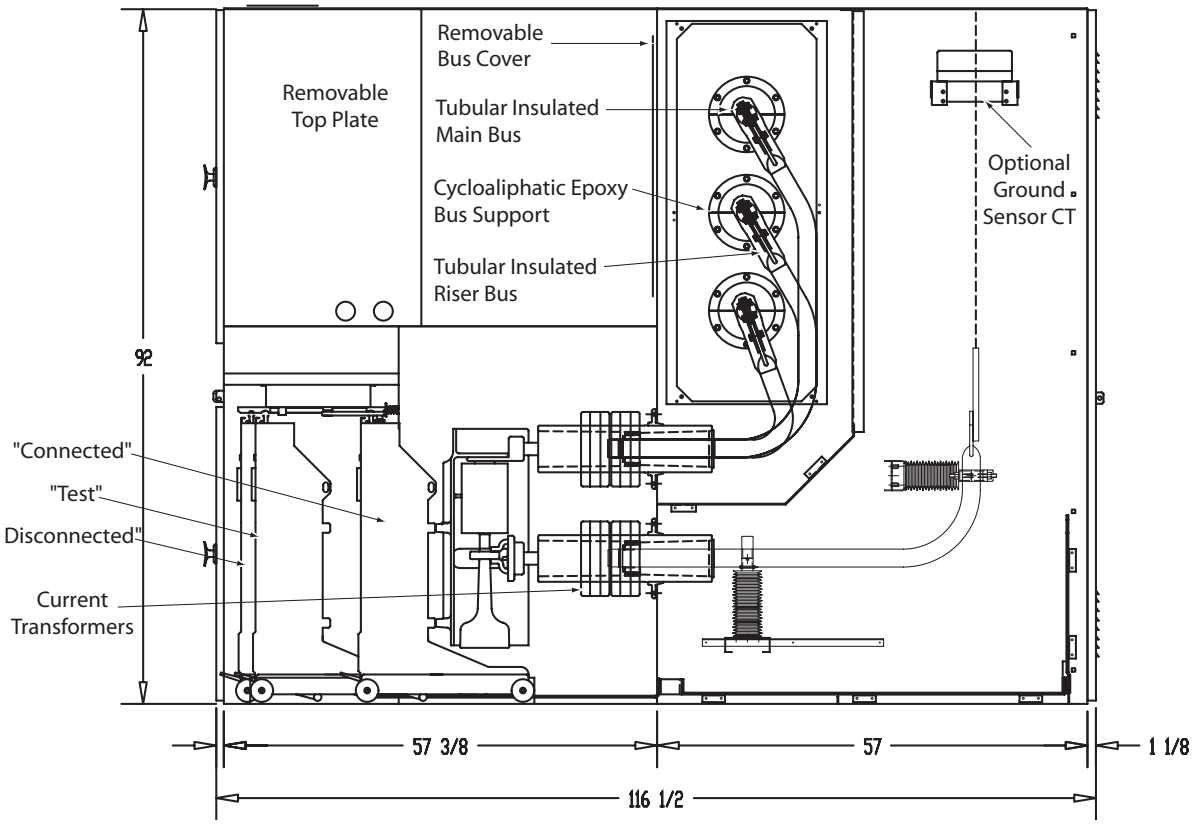
Standards

PV System 27 and PV System 38 switchgear is fully tested to all applicable ANSI, IEEE and NEMA standards.

Weights & Dimensions

Voltage (kV)	Continuous Current (A)	Width (in.)	Height (in.)	Depth (in.)	Instrument Door Height (in.)	Weight (lbs.)
27	1200/2000	40	92	116.5	40	3000
38	1200/2000	40	92	116.5	40	3000

Typical Sections



Breaker Characteristics

Circuit Breaker Characteristics

Rated Maximum Voltage (kV rms)	Rated Voltage Range (k Factor)	Insulation Withstand Test Voltages		Rated Continuous Current at 60Hz (Amps rms)	Rated Short Circuit at Maximum kV (kA rms)	Rated Interrupting Time (cycles)	Rated Maximum Voltage Divided by K (kV rms)	Maximum Symmetrical Interrupting Capability and Short Time Current (kA rms)	Closing and Latching Capability 2.7K times Rated Short Circuit Current (kA Crest)
		Low Frequency (kV rms)	Full Wave Impulse (kV Crest)						
27	1.0	60	125	1200/2000	25	3	27.0	25	67
					40	3	27.0	40	108
38.0	1.0	80	150	1200/2000	40	3 or 5	38.0	40	108

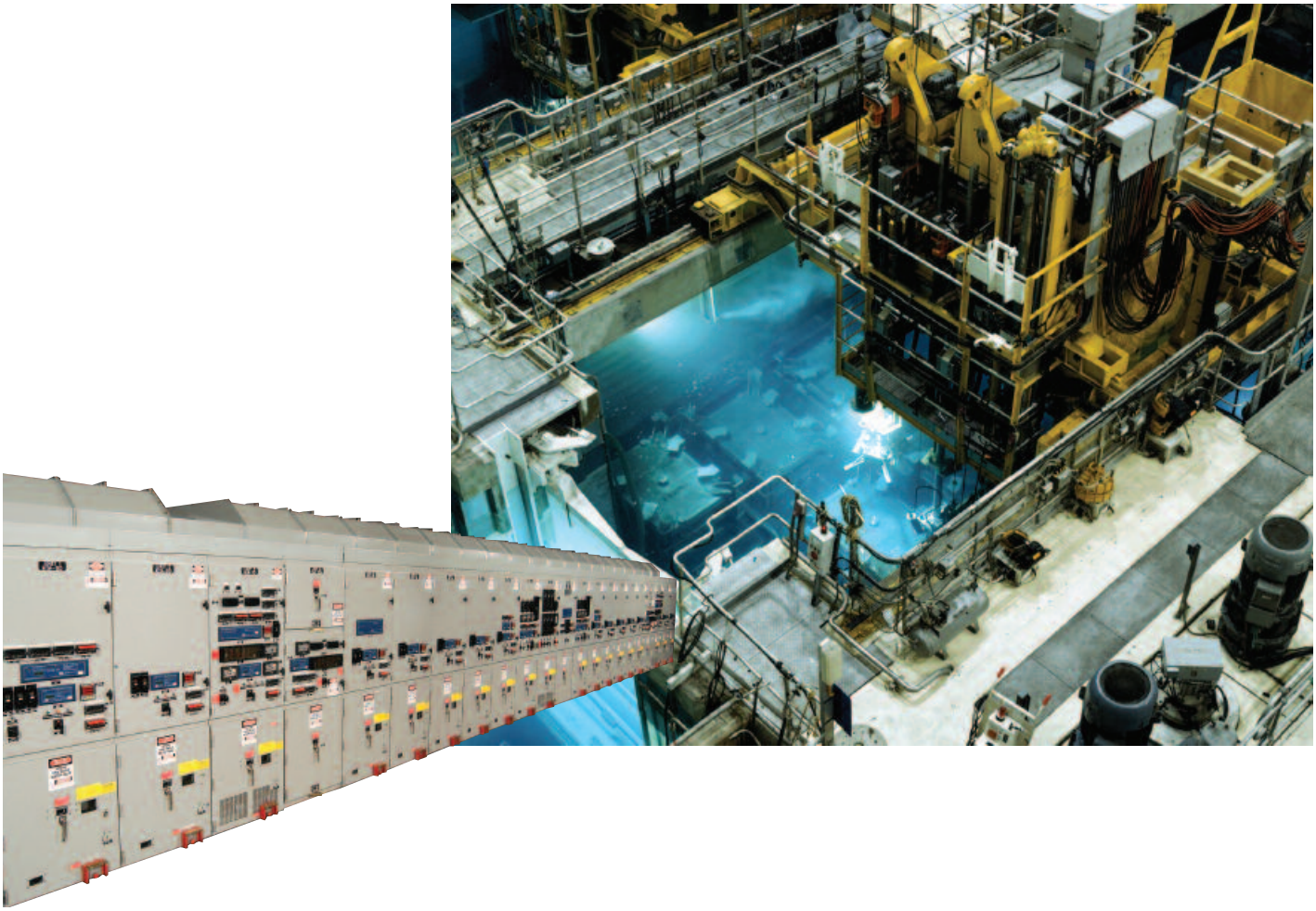
Connected

Disconnected

Withdrawn

Arc Resistant Switchgear
4.76kV-38kV

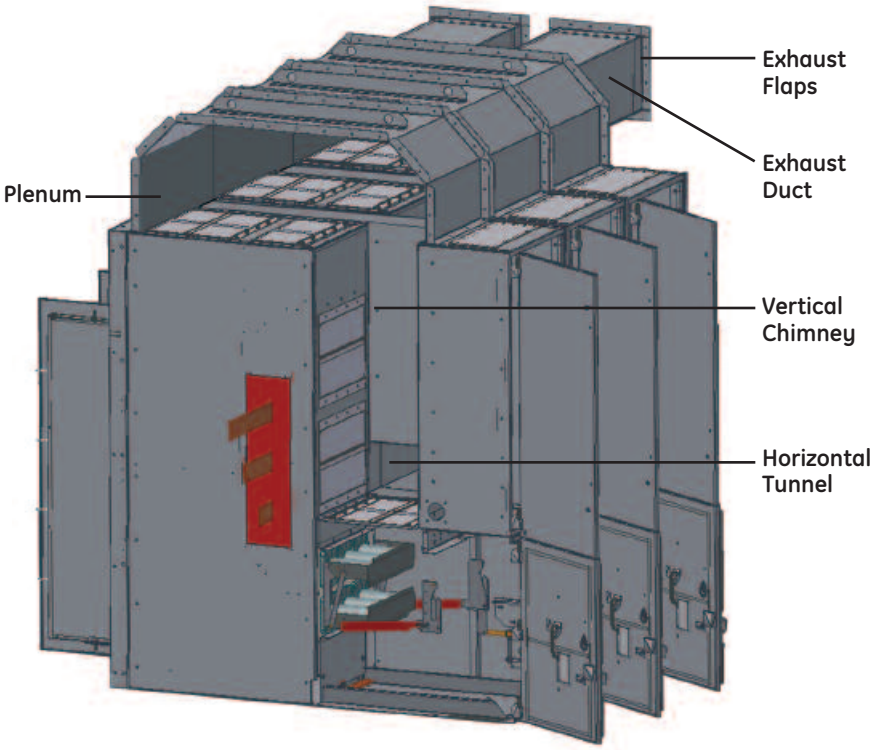
Arc resistant switchgear channels the energy released during an internal arc fault in ways that minimize the potential for injury to personnel and damage to surrounding equipment.



Across the line, this switchgear leads the way in arc resistant technology. It's available in ANSI Type 1 or Type 2 construction with no larger footprint than the standard switchgear design.

Circuit breakers are interlocked so they cannot be opened, closed or racked to the connected position with the arc resistant door open. This minimizes the opportunity for operator error.

But arc resistant protection is important at every step, not just when opening and closing the circuit breaker, so our single-latch doors close and engage in a single action, which provides virtually automatic protection for the operator. The pressure release venting panels are maintenance-free.



This arc resistant design can reduce the NFPA-70E requirement for personal protective equipment (PPE).

The arc resistant rear access door with secure latch pins.

The arc resistant rear doors and plenum of a two-high design.

The plenum allows for indoor installation of arc resistant switchgear.

Type 1 & Type 2 Configurations (IEEE C.37.20.7.2001)

Feature	4.76-15kV		27-38kV	
	Type 1	Type 2	Type 1	Type 2
Front cells and front doors employ unique arc resistant construction	✔	✔	✔	✔
Rear cells and rear doors employ unique arc resistant construction		✔		✔
Pressure relief vents on circuit breaker and auxiliary bus compartments	✔	✔	✔	✔
Pressure relief vents on circuit breaker, main bus and cable connection compartments	✔	✔	✔	✔
Available with one circuit breaker or auxiliary rollout per section	✔	✔	✔	✔
Available with one or two circuit breakers per section (maximum 3000A connected load)	✔	✔		
No external openings on front of the equipment that allow the escape of hot gases or debris	✔	✔	✔	✔
No external openings on any exposed side of the equipment to allow the escape of hot gases or debris		✔		✔
All entrances into the instrument compartments made with a fitting designed to minimize entrance of gas during a fault	✔	✔	✔	✔
Closed door racking of circuit breakers	✔	✔	✔	✔
Closed door racking of all VTs and CPTs	✔	✔		

Arc Resistant Switchgear Specifications

Standards

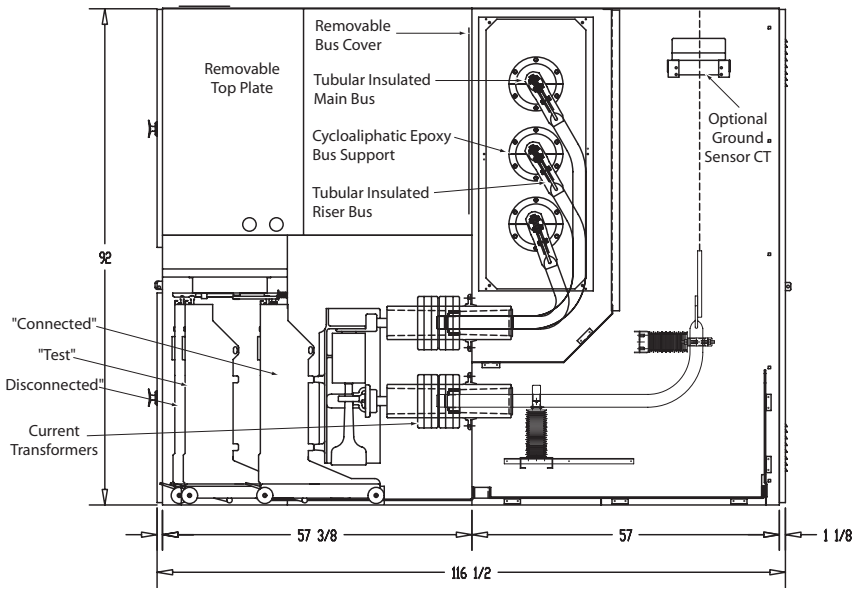
Arc resistant switchgear is fully tested to all applicable ANSI, IEEE and NEMA standards.

Ratings & Dimensions

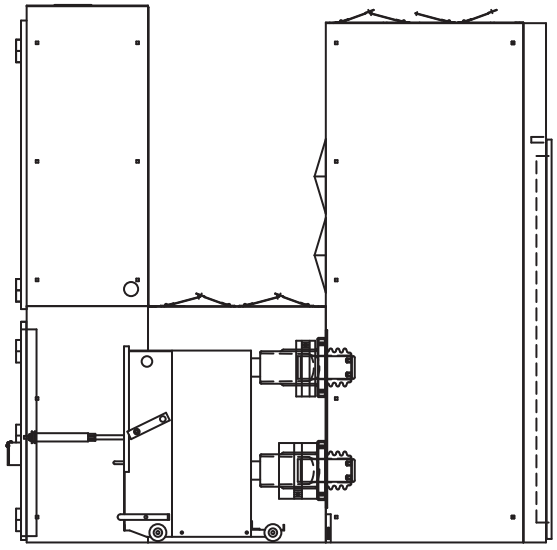
Ratings			Configuration				Dimensions[3] (in.)			
Voltage (kV)	Continuous Current (amperes)	Maximum Internal Arcing Short-Circuit Current[1] (kA)	Circuit Breaker Lower	Rollout Lower[4]	Circuit Breaker Upper	Rollout Upper[4]	Width	Height	Depth	Instrument Door Height[5]
5	1200/2000	50	X				26	95	89	57
5	1200/2000	50		X(2)			26	95	89	19
5	1200	50	X		X		26	95	89	19
5	1200/2000	50	X			X(2)	26	95	89	19
5/15	1200/2000	63	X				36	95/105	95/105	50/60
5/15	1200/2000	63		X			36	95/105	95/105	50/60
5/15	1200/2000	63	X		X		36	95/105	105	9/19
5/15	1200/2000	63	X			X	36	95/105	95/105	25/35
5/15	3000	63	X				36	95/105	95/105	50/60
5/15	3000	63	X			X	36	105	105	60
5/15	4000[2]	50	X				36	95/105	95/105	50/60
27/38	1200/2000	40	X				40	92	116.5	40

[1] Internal Arcing Short-Circuit Current is based on IEEE C37.20.7 Type 2 with the recommended fault duration of 0.5s.
[2] 4000A designs are forced-cooled. No devices may be placed above the circuit breaker.
[3] Dimensions may be altered based on Internal Arcing Short-Circuit Current and configuration. Height does not include a plenum. Add 30 inches for standard plenum designs. Overall dimensions for a line-up of switchgear will be based on the largest size requirements for any given section.
[4] In the 26" design it is possible to have two auxiliary rollout devices in the upper or lower positions, indicated by (2). In 36" designs only one auxiliary rollout is possible in a given location.
[5] Approximate useable space on instrument door will be less than shown.

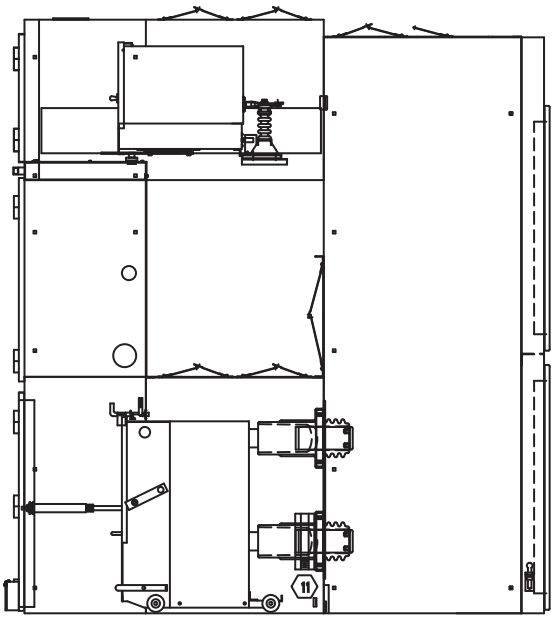
Typical 27/38kV Sections



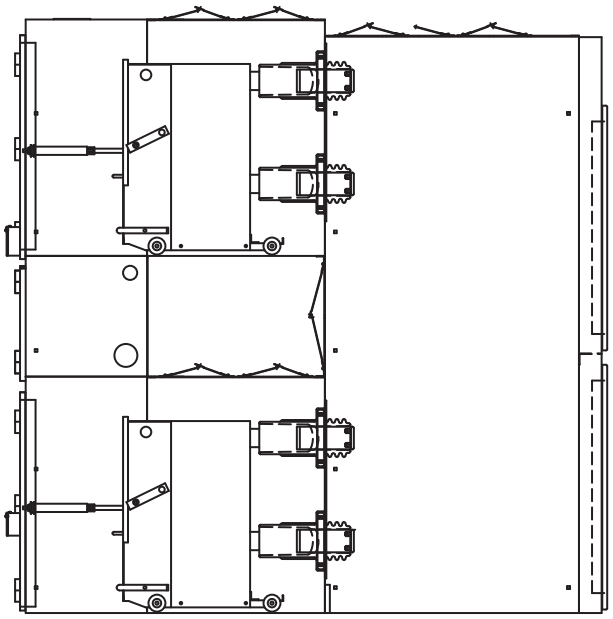
Typical 15kV Sections



One-high construction with circuit breaker in the lower compartment and venting above (95/105" high x 95/105" deep)



One-high construction with circuit breaker in the lower compartment and a PT/CPT roll-out above (95/105" high x 95/105" deep)



Two-high construction with circuit breaker in the lower and upper compartments (95/105" high x 105" deep)

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imagination at work

DEA-398A (09/11)