

# Masterclad® Medium Voltage Passive Arc-Resistant Switchgear



Square D® Masterclad medium voltage passive arc-resistant (AR) switchgear is designed with utilities and industrial customers in mind who demand the highest quality power distribution equipment available today. This switchgear and all its components meet ANSI/IEEE C37.20.2 and all other applicable ANSI, UL and CSA standards for metal-clad switchgear. The use of Masterclad medium voltage AR switchgear provides an additional degree of protection to personnel working in close proximity, while the equipment is operating.\*

The design of today's metal-clad switchgear from Schneider Electric is a carefully planned and executed evolution of the highly successful designs manufactured for nearly 30 years. The switchgear provides a multitude of features to simplify and improve application, installation and operation.

## Design features

- Voltage ratings from 2.4 kV to 15 kV (1200 A, 2000 A and 3000 A) are available for indoor, 1-high and 2-high (up to 2000 A only) applications. Vacuum circuit breakers (Type VR) are standard with ANSI interrupting ratings up to 50 kA RMS symmetrical.
- For 1200 A and 2000 A, one auxiliary compartment located above the breaker compartment can accommodate either control power transformers (CPTs) or front-mount voltage transformers (VTs).
- Front accessible standard accuracy (up to four sets) or optional high accuracy (up to two sets) window-style current transformers are mounted on 15 kV insulated primary contact bushings in the circuit breaker compartment.
- Positive ANSI interlocks prevent movement of the circuit breaker to either the test or operating positions with the circuit breaker closed.

### Notes:

- For 3000 A, an adjacent section is needed for CPTs and VTs.
- For 2-high configuration, an auxiliary section will always be needed for CPTs and VTs.



\* "In close proximity" specifically excludes working in, on, above or below the AR switchgear, such as a cable vault.

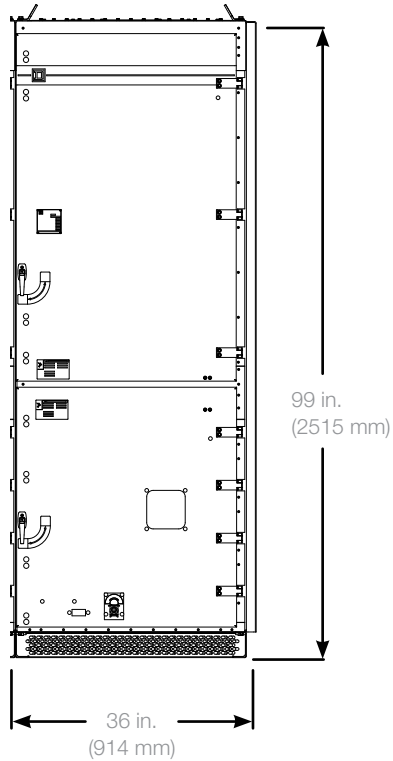


by Schneider Electric

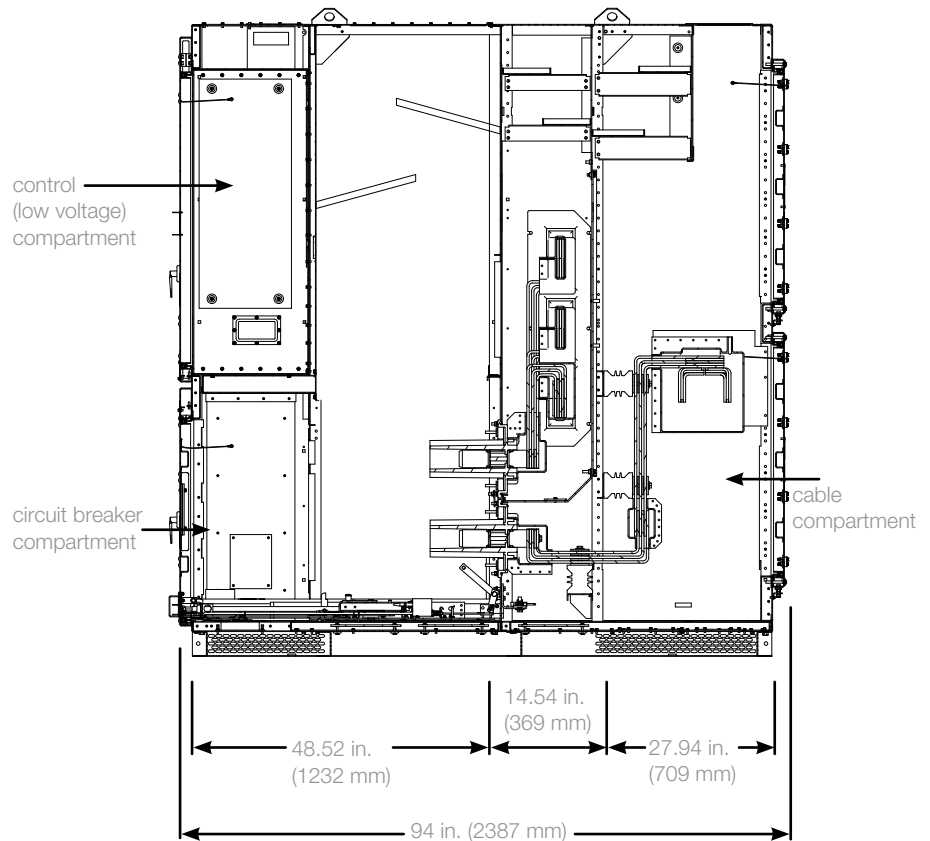
# → Construction

## 1-High configuration

Front view



Side view

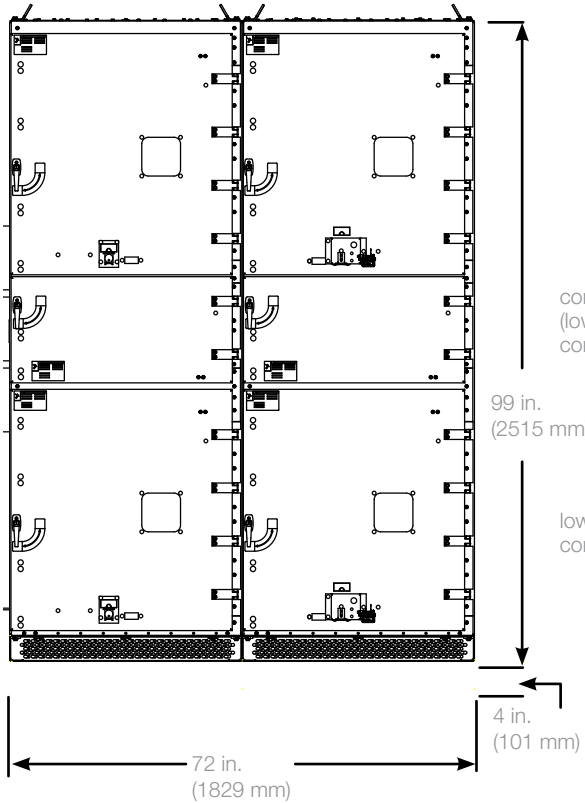


## Typical Masterclad medium voltage AR switchgear construction

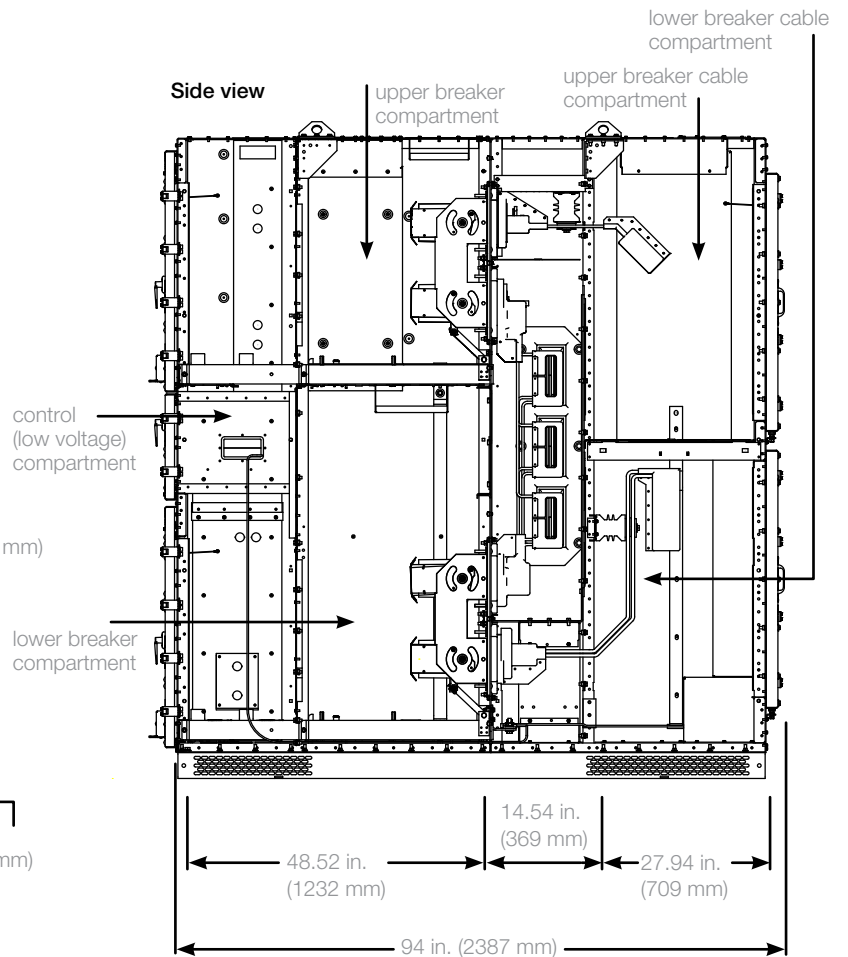
- Normally allow 72 in. working space in front of the switchgear to withdraw circuit breaker with lift truck or ramp
- For 1-high construction, all circuit breakers are located in lower compartment, as shown, with controls in upper compartment
- All sections are 36 in. wide, 99 in. high and 94 in. deep

## 2-High configuration

Front view



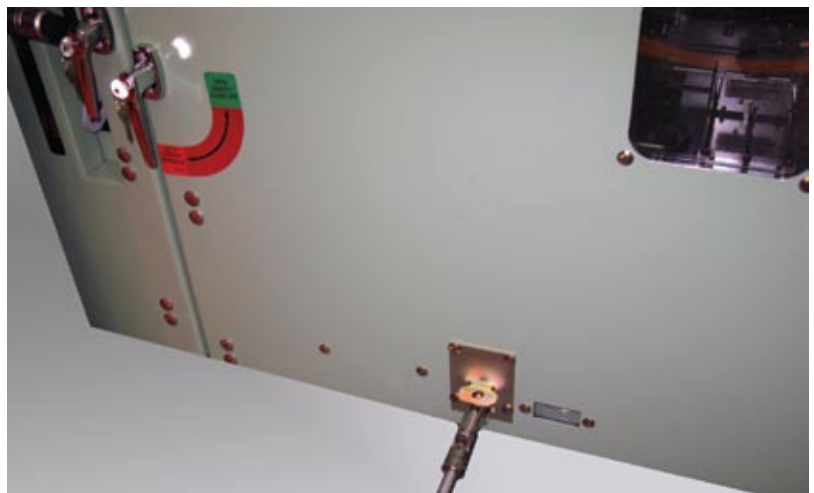
Side view



## Switchgear accessibility

In the event of an internal arcing fault, Masterclad medium voltage AR switchgear is designed and built to provide selections that accommodate two levels of switchgear accessibility\*:

- ANSI Type 1 (EEMAC Type A) – redirects and vents any gases and particles out the top so emissions do not occur at the front of the switchgear
- ANSI Type 2 (EEMAC Type B) – redirects and vents any gases and particles out the top so emissions do not occur at the front, back and sides of the switchgear (the entire periphery)



Closed door breaker racking-standard

\* Defined in the test guides ANSI/IEEE C37.20.7-2007, EEMAC G14-1987 and IEC 62271-200





“Arc-Resistant” design refers to the ability of the switchgear to withstand the effects of an internal arcing fault (defined in ANSI/IEEE C37.20.7-2007).



# → Reliability

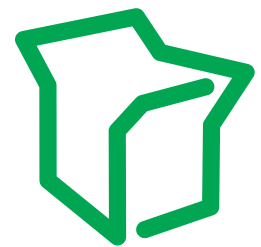


The basic cell structure of MasterClad medium voltage passive AR switchgear is assembled to ensure the utmost in rigidity and to eliminate any misalignment of circuit breakers in their cells. Line-ups can be customized to suit specific requirements.

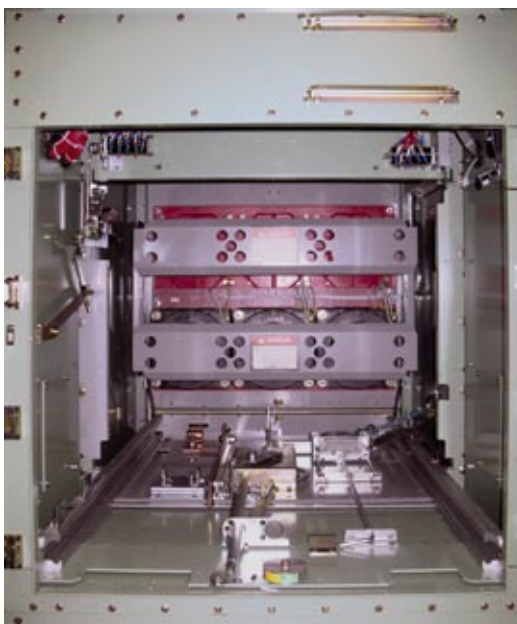
For over 30 years, Schneider Electric has been using a fluidized-bed process to insulate bus bars. This process results in a heavy-coating of track-resistant, fire-retardant, electrical-grade epoxy on all bus bars, which meets ANSI/IEEE C37.20.2 and EEMAC G8-3. This process produces an exceptionally tough and durable component.

All bus is copper. The joints are silver plated and covered with custom-molded, flexible and replaceable resin boots. The main bus bar compartment between cells is separated by molded barriers, providing excellent creepage protection, support and inter-cell isolation.

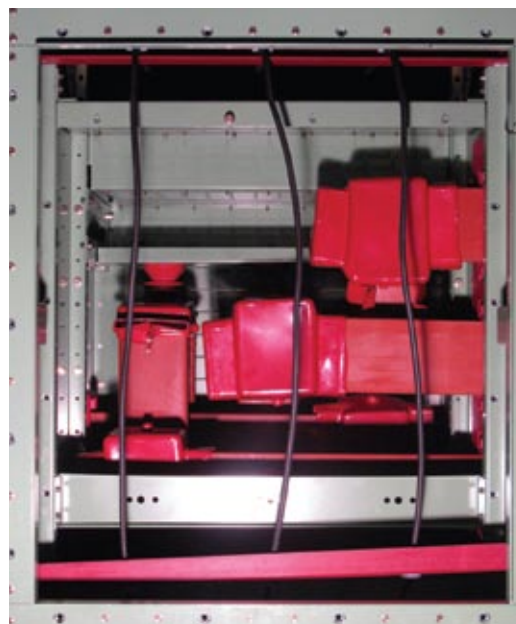
If the site has less than 16 ft of unobstructed height, from floor grade to ceiling, then exhaust plenums are required. 50 kA ratings require an arc shield (31 in. in height, if plenum is not used).



Reliability is delivered with every shipment of Masterclad medium voltage AR switchgear.



Protective shutters are closed whenever the circuit breaker is withdrawn; shutters can be padlocked in the closed position



Molded resin boots and track resistant, fire-retardant, electrical grade epoxy insulation



# → Type VR circuit breakers



Type VR circuit breakers are designed for use with Masterclad medium voltage AR switchgear and are equipped with a Type RI motor-charged, stored-energy mechanism.

## Benefits

- **Over 10,000 operations:** the inherent rigidity and mechanical strength of this circuit breaker design complements the advanced reliable and simple design of the Type RI operating mechanism
- **Precise alignment:** molded housings position the bus runbacks
- **Increased uptime:** synchronizing crossbar ensures simultaneous pole operation and is electrically and mechanically trip-free
- **Advanced protection:** fully interlocked with the switchgear cell per ANSI/IEEE C37.20.2
- **Manual charging:** non-removable handle provides manual charging of the closing springs

## Design features

- Vacuum interrupters are mounted in high-strength, molded glass-reinforced polyester insulation/support housings
- Completed pole units are bolted directly to the circuit breaker truck
- Meets or exceeds ANSI standards: circuit breakers are tested and certified to all applicable ANSI circuit breaker standards

# → Type VR circuit breaker ratings

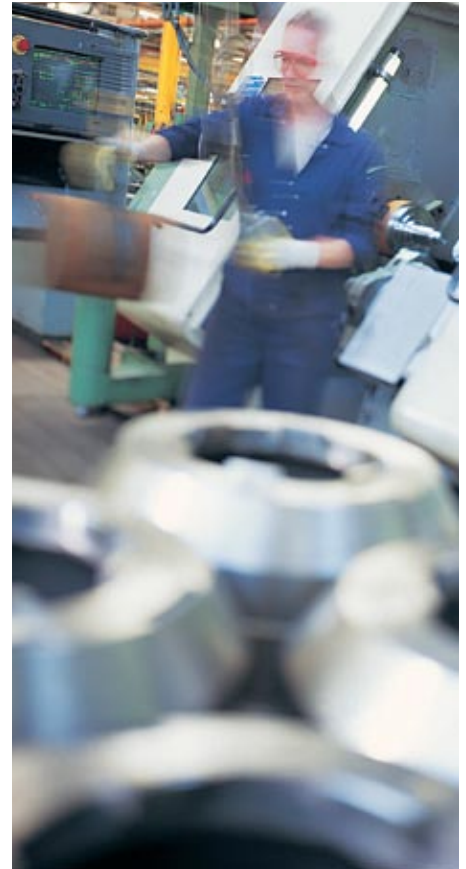
Catalog Number	MVA Rating (reference only)	Actual MVA @ Operating Voltage	Rated Continuous Current			Voltage		Dielectric Ratings		Short-circuit Current				Mechanical Endurance
			A RMS	kV RMS	K	Power Frequency kV RMS	Impulse 1.2 x 50 $\mu$ S kV peak	System Interrupting kA RMS	Close and Latch Rating kA peak	Short-Time Current Rating kA RMS	Short-Time Current Duration s	Interrupting Time Cycles	No Load Mechanical Operations	
VR-05025-12	250	330	1200	4.76	1.0	19	60	40	104	40	2	3	10,000	
VR-05025-20	250	330	2000	4.76	1.0	19	60	40	104	40	2	3	10,000	
VR-05025-30	250	330	3000	4.76	1.0	19	60	40	104	40	2	3	5000	
VR-05035-12	350	412	1200	4.76	1.0	19	60	50	130	50	2	3	5000	
VR-05035-20	350	412	2000	4.76	1.0	19	60	50	130	50	2	3	5000	
VR-05035-30	350	412	3000	4.76	1.0	19	60	50	130	50	2	3	5000	
VR-08050-12	500	572	1200	8.25	1.0	36	60	40	104	40	2	3	10,000	
VR-08050-20	500	572	2000	8.25	1.0	36	95	40	104	40	2	3	10,000	
VR-08050-30	500	572	3000	8.25	1.0	36	95	40	104	40	2	3	5000	
VR-15050-12	500	650	1200	15	1.0	36	95	25	65	25	2	3	10,000	
VR-15050-20	500	650	2000	15	1.0	36	95	25	65	25	2	3	10,000	
VR-15050-30	500	650	3000	15	1.0	36	95	25	65	25	2	3	5000	
VR-15075-12	750	1039	1200	15	1.0	36	95	40	104	40	2	3	10,000	
VR-15075-20	750	1039	2000	15	1.0	36	95	40	104	40	2	3	10,000	
VR-15075-30	750	1039	3000	15	1.0	36	95	40	104	40	2	3	5000	
VR-15100-12	1000	1299	1200	15	1.0	36	95	50	130	50	2	3	5000	
VR-15100-20	1000	1299	2000	15	1.0	36	95	50	130	50	2	3	5000	
VR-15100-30	1000	1299	3000	15	1.0	36	95	50	130	50	2	3	5000	



For more information, contact Schneider Electric by phone at 1-888-778-2733, by e-mail at [help@SquareDinfo.com](mailto:help@SquareDinfo.com) or visit [www.schneider-electric.us](http://www.schneider-electric.us)

# → Leader in Arc-resistant Switchgear Solutions

Passive and active solutions available to fit your facilities needs.




When most think of arc-resistant switchgear they visualize a passive solution which requires reinforced cubicle construction and venting the internal energy, molten metal, and debris generated during a fault event in order to meet the arc-resistant test guideline IEEE C37.20.7. Well, why not be active?

Schneider Electric offers passive arc-resistant switchgear, but we also offer the arc terminator system, an active arc-resistant switchgear solution. The arc terminator system eliminates the internal arcing fault within the switchgear in lieu of allowing the fault continue.

When properly configured, both systems fully comply with IEEE C37.20.7 with ratings up to 50 kA but use two totally different approaches.

## Schneider Electric - North American Operating Division

1415 S. Roselle Rd.  
Palatine, IL 60067  
Tel: 847-397-2800  
Fax: 847-925-7500  
[www.Schneider-Electric.us](http://www.Schneider-Electric.us)

 This document has been printed on recycled paper