

# Medium-Voltage Substation Circuit Breakers

Powersub Type FVR  
Vacuum Circuit Breaker



# Advanced Technology for Improved Reliability

For more than four decades, Myers Power Products has led the switchgear market in quality for the electric industry, delivering highly reliable products for utilities and other high demand industries. By combining the latest developments in circuit breaker technology with world-renowned quality, the Powersub™ Type FVR Vacuum Substation Circuit Breakers from Myers Controlled Power are the most advanced medium-voltage circuit breakers available.

- **Compliance to ANSI standards**  
Designed and tested to comply with IEEE/ANSI standards for outdoor circuit breakers.
- **ISO 9001 certification**  
Designed and manufactured in a facility that is Quality Systems Certified by Underwriters Laboratories, Inc. to ISO 9001.
- **Arc-resistant construction**  
As standard, the 600 - 2000 A ratings of the FVR have arc-resistant construction in accordance with EEMAC and IEC standards for Type B enclosures.

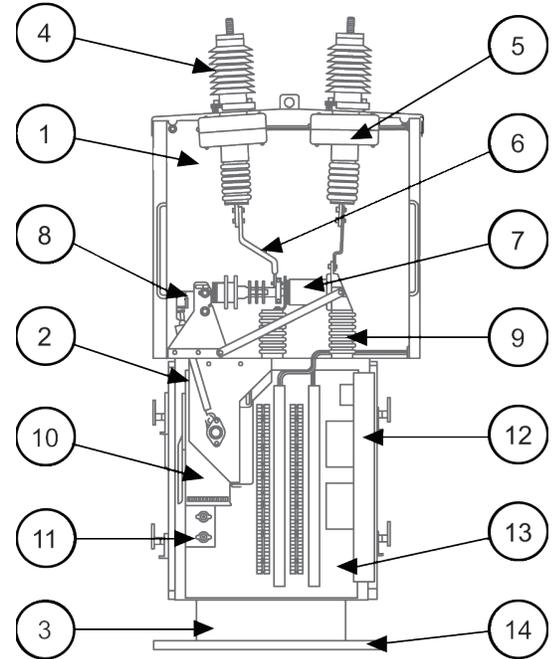
## Benefits

- **High-speed operation** - Interrupting time of three cycles or less.
- **Long life** - Hermetically sealed interrupters protect contacts from corroding elements and contamination.
- **Ease of maintenance** - Interrupter assemblies and contact wear indicators accessible via a bolted panel.
- **Reliability** - A minimum of moving parts on the proven motor-driven, spring-charged Type RI mechanism.
- **Durability** - Robust design tested to the highest IBC-2000 seismic standard.  
Other seismic standards may be evaluated upon request.
- **Flexibility** - Breaker height is adjustable from minimum to maximum in 3 in. increments.

## Standard Features

- Window for viewing status indicators and operation counter.
- Ground pads located on both sides of enclosure. A #4 cable connects from the roof and HV/LV compartment to the ground pads to ensure a solidly grounded enclosure.
- Painted adjustable legs with galvanized base channels.
- All external hardware is stainless steel.
- Optimized relay panel (32 5/8 in. W x 33 7/8 in. H) for instrumentation.
- 12-pole auxiliary switch (6 'a' & 6 'b' contacts), latch check switch and emergency cutout switch standard.
- All outer doors latch open at approximately 160 degrees, except the 200 kV BIL unit, which latch open to 120 degrees.
- Type RI mechanism with integral manual charging handle.

**FVR Breaker Detail  
110, 125, 150, & 200kV BIL**



1. High-voltage compartment
2. Low-voltage compartment
3. Adjustable legs
4. Entrance bushings
5. Current transformers
6. Flexible connector
7. Vacuum interrupter bottle
8. Drive bar assembly
9. Stand off insulator
10. Mechanism
11. Auxiliary switches
12. Relay and instrument door
13. Control mounting panel
14. Galvanized base channel

## Additional Features & Ratings

- 15-38 kV, 1200-4000 A, up to 50 kA.
- Self-cooled up through 3000 A (no fan circuitry).
- High-voltage panels are light (~251bs) for ease of removal and reinstallation.
- Height adjustable range of 24 in. for 110/125 kV BIL and 21 in. for 150/200 kV BIL.
- Two pad-lockable handles on each outer door.
- Hinged doors utilized on common access areas.
- Optional adjustable stainless steel legs available.
- Local mounting of lightning arresters available.

# FVR Vacuum Circuit Breaker Ratings

Substation Circuit Breaker Catalog Number	Voltage Max. kV rms	Continuous Current at Hz, A, rms	Insulation Level Test Voltage		Short Circuit Current kA rms at Max. kV	Max. Symmetrical Interrupting Capability kA rms	Rated Permissible Tripping Delay Y Seconds	Three-second Current Carrying Capability kA rms	Close and Latching Capability kA Peak
			Low Frequency kV rms	Impulse kV Crest					
FVR 1 06 11 12A	15.5	600	50	110	12	12	2	12	32
FVR 1 08 11 16A		800			16	16		16	43
FVR 1 12 11 12A	15.5	1200	50	110	12	12	2	12	32
FVR 1 12 11 16A					16	16		16	43
FVR 1 12 11 20A					20	20		20	54
FVR 1 12 11 25A					25	25		25	68
FVR 1 12 11 31A					31.5	31.5		31.5	85
FVR 1 12 11 40A					40	40		40	108
FVR 1 12 11 50A					50	50		50	130
FVR 1 20 11 12A	15.5	2000	50	110	12	12	2	12	32
FVR 1 20 11 16A					16	16		16	43
FVR 1 20 11 20A					20	20		20	54
FVR 1 20 11 25A					25	25		25	68
FVR 1 20 11 31A					31.5	31.5		31.5	85
FVR 1 20 11 40A					40	40		40	108
FVR 1 20 11 50A					50	50		50	130
FVR 1 30 11 12A	15.5	3000	50	110	12	12	2	12	32
FVR 1 30 11 16A					16	16		16	43
FVR 1 30 11 20A					20	20		20	54
FVR 1 30 11 25A					25	25		25	68
FVR 1 30 11 31A					31.5	31.5		31.5	85
FVR 1 30 11 40A					40	40		40	108
FVR 1 30 11 50A					50	50		50	130
FVR 1 35 11 20A	15.5	3500	50	110	20	20	2	20	54
FVR 1 35 11 25A					25	25		25	68
FVR 1 35 11 31A					31.5	31.5		31.5	85
FVR 1 35 11 40A					40	40		40	108
FVR 1 35 11 50A					50	50		50	130
FVR 1 40 11 20A	15.5	4000	50	110	20	20	2	20	54
FVR 1 40 11 25A					25	25		25	68
FVR 1 40 11 31A					31.5	31.5		31.5	85
FVR 1 40 11 40A					40	40		40	108
FVR 1 40 11 50A					50	50		50	130
FVR 2 12 12 12A	27	1200	60	125 (150)	12	12	2	12	32
FVR 2 12 12 16A					16	16		16	43
FVR 2 12 12 20A					20	20		20	54
FVR 2 12 12 25A					25	25		25	68
FVR 2 20 12 12A	27	2000	60	125 (150)	12	12	2	12	32
FVR 2 20 12 16A					16	16		16	43
FVR 2 20 12 20A					20	20		20	54
FVR 2 20 12 25A					25	25		25	68
FVR 2 12 15 31A	27	1200	80	150	31.5	31.5	2	31.5	85
FVR 2 20 15 31A		2000							
FVR 3 12 15 12A	38	1200	80	150	12	12	2	12	32
FVR 3 12 15 16A					16	16		16	43
FVR 3 12 15 20A					20	20		20	54
FVR 3 12 15 25A					25	25		25	68
FVR 3 12 15 31A					31.5	31.5		31.5	85
FVR 3 20 15 12A	38	2000	80	150	12	12	2	12	32
FVR 3 20 15 16A					16	16		16	43
FVR 3 20 15 20A					20	20		20	54
FVR 3 20 15 25A					25	25		25	68
FVR 3 20 15 31A					31.5	31.5		31.5	85
FVR 3 12 20 12A	38	1200	80	200	12	12	2	12	32
FVR 3 12 20 16A					16	16		16	43
FVR 3 12 20 20A					20	20		20	54
FVR 3 12 20 25A					25	25		25	68

All ratings are based on three-cycle interrupting time and voltage range factor, k = 1.0

Type  
FVR – Vacuum

Voltage class  
1 – 15.5 kV  
2 – 27 kV  
3 – 38 kV

Continuous current rating  
06 – 600 A  
08 – 800 A  
12 – 1200 A  
20 – 2000 A  
30 – 3000 A  
35 – 3500 A  
40 – 4000 A

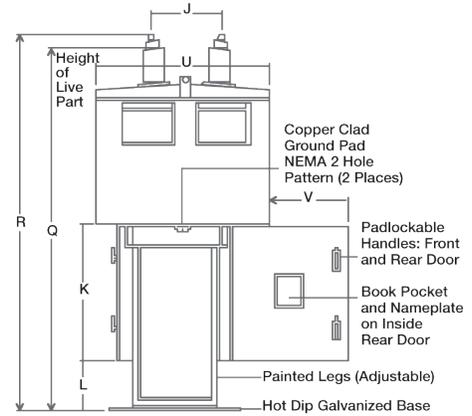
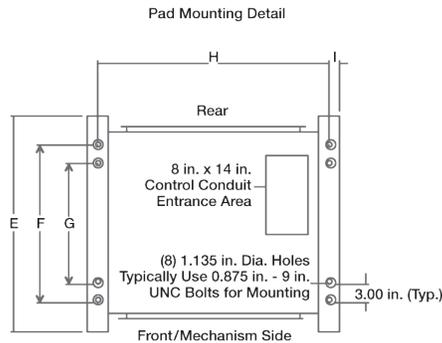
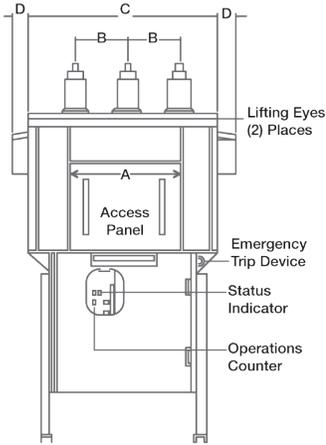
BIL rating  
11 – 110 kV  
12 – 125 kV  
15 – 150 kV  
20 – 200 kV

Interrupting rating  
12 – 12 kA  
16 – 16 kA  
20 – 20 kA  
25 – 25 kA  
31 – 31.5 kA  
40 – 40 kA  
50 – 50 kA

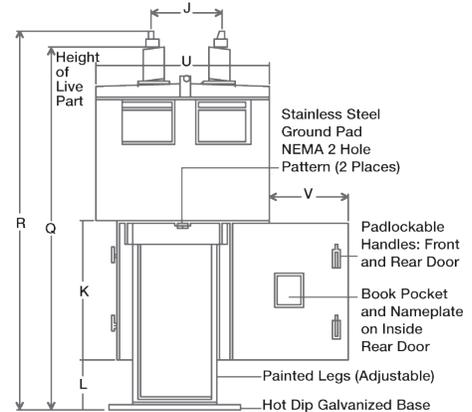
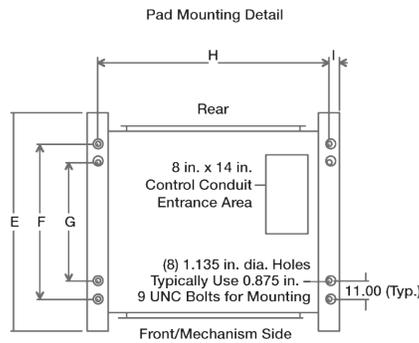
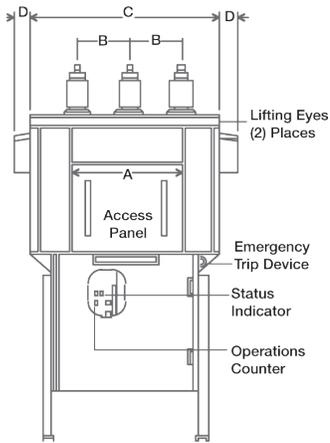
( ) Indicates optional BIL ratings.

# Dimensions 15, 27, and 38 kV Type FVR

## FVR = 110, 125, 150 kV BIL



## FVR = 200 kV BIL



200 kV BIL

Breaker Type	A	B	C	D*	E	F	G	H	I	J	K	L (Max)	L (Min)	Q (Max)	Q (Min)	R (Max)	R (Min)	U	V
<b>110 kV BIL</b>	32.62	15.00	55.50	4.25	38.00	27.00	21.00	44.00	2.00	20.00	39.12	31.94	7.94	122.38	98.38	125.88	101.88	44.00	31.75
<b>125 kV BIL</b>	32.62	15.00	55.50	4.25	38.00	27.00	21.00	44.00	2.00	20.00	39.12	31.94	7.94	122.38	98.38	125.88	101.88	44.00	31.75
<b>150 kV BIL</b>	32.62	17.00	63.50	4.25	38.00	27.00	21.00	52.50	1.75	17.25	39.12	25.94	4.94	122.75	101.75	126.25	105.25	50.75	27.00
<b>200 kV BIL</b>	38.50	19.50	74.00	4.25	54.00	43.00	21.00	52.50	1.75	29.50	39.12	25.94	4.94	137.75	116.75	140.75	119.75	68.50	22.85

D\* = 13.00 for 3000 A, 3500 A & 4000 A (110 kV BIL)

Note: Dimensions subject to change and not for construction. All dimensions are approximate and are in inches.

**For more information call 866-MY-MYERS or visit us online at [www.myerspowerproducts.com](http://www.myerspowerproducts.com)**

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### Why Choose Myers Power Products?

Myers Power Products offers a broad range of service solutions to support any manufacturers' electrical distribution equipment. Whether the solution is refurbishment, replacement, maintenance, or recommendations to optimize your existing system, our nationwide network of qualified experts offers a complete service package.