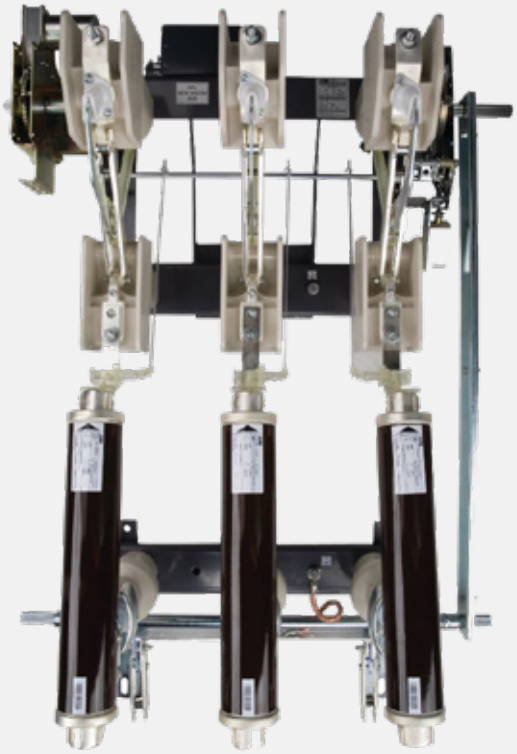
DESCRIPTIVE BULLETIN

VersaRupter® medium voltage indoor switch

4.76–38 kV, 200–1200 A, 25–61 kA



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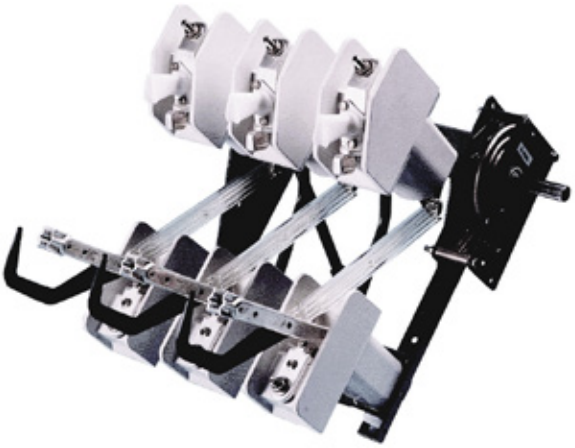
VersaRupter® switch overview
General description



— VersaRupter switch assembled with snap action K-mechanism

The VersaRupter switch is a general purpose, three-pole, loadbreak switch that offers switchgear owners and assemblers the advantages of an advanced interrupting technology and proven, dependable performance in a compact design. The switch is available to switchgear assemblers as a building block for metal-enclosed and padmounted switchgear applications in ratings from 4.76 – 38 kV.

- Puffer arc extinguishing system allows for a high number of operations without excessive wear
- Lack of gravity dependent latches allows for flexible mounting arrangements
- Tight phase spacing without the requirement for interphase barriers on most ratings
- Compact operating mechanisms available in stored energy or snap action varieties
- Compact motor operator provides local or remote control of the VersaRupter switch.

The VersaRupter switch includes a heavy-duty steel frame with stand-off insulators, a unique puffer type arc extinguishing system, and an operating mechanism. The current-carrying components include blade-type interrupters with cast hinges and jaw connectors. Optional accessories and features include operating handles, auxiliary switches, grounding switches, fuse bases, mechanical fuse tripping, motor operator, shunt trip, mechanical door interlocking, and key interlocking.

VersaRupter switch at a glance			
Applications	Metal-enclosed and padmount switchgear for utility distribution, industrial, mining, and commercial installations		
	Voltage	**Loadbreak current**	**Momentary**
	4.76- 15 kV	200, 600, and 1200 A	40 kA momentary / 40 kA fault close
	27 kV	200, 600, and 1200 A	32 kA momentary / 32 kA fault close
	38 kV	600, 800, and 1000 A	25 kA momentary / 25 kA fault close
Ratings	15 kV	600 and 1200 A	61 kA momentary / 61 kA fault close
Standards	IEEE C37.20.4 (2001 and 2013) IEC 60129, 60254, 60265, 60694, 420, 62271-105 For UL and CSA listings see Tables 1A and 1B		
Experience	Over 35 years of product design and field experience with attention to product modernization and development		
Actuators	Manual operation with choice of chain drive, side direct drive, or HE/HM shaft drive Optional motor operation, optional shunt trip with A-mech only Left or right side mounting available with most options		
Options	Grounding switch, fuse base, mechanical fuse tripping, auxiliary switches, key interlocks		
Quality	ISO-9001 Complete IEEE design test reports Switches are tested to a minimum of 1,000 mechanical operations, 100 open/close operations up to 600 A, and 20 open/close operations at 1200 A		

Technical data

VersaRupter® switch technical details

Rated voltage (kV)	Rated maximum voltage (kV)	Rated current (A)	BIL (kV)	60 Hz withstand 1 minute (kV)	Pole spacing (in/mm)	Momentary asymmetrical (kA)	Fault-making asymmetrical (kA)	Peak withstand* (peak kA)	Fault-making* (peak kA)	Short time current symmetrical (kA/sec)
		200								
		600								
4.73	4.76	1200	60	19	5.91/150	40	40	65	65	25/2
		200								
		600								
12-13.8	15	1200	95	36	6.69/170	40	40	65	65	25/2
		600								
13.8	15	1200	95	36	9.25/235	61	61	N/A	N/A	50/2
		200								
		600								
12-16.5	17	1200	110	50	9.25/235	40	40	65	65	25/2
		200								
		600								
23.9-24.9	27	1200	125	60	10.8/275	32	32	65	52	25/2
		600								
		800								
34.5	38	1000	150	80	14.1/360	25	25	65	42	25/2
UL listed										
		200								
		600								
4.73	4.76	1200	60	19	5.9/150	40	40	65	65	25/2
		200								
		600								
13.8	15	1200	95	36	6.69/170	40	40	65	65	25/2
		600								
13.8	15	1200	95	36	9.25/235	61	61	N/A	N/A	50/2
		200								
		600								
12-16.5	17	1200	110	50	9.25/235	40	40	65	65	25/2

*Per IEEE C37.20.4 (2013), momentary asymmetrical values are now peak withstand values, and fault-making asymmetrical values are now fault-making values. Variants with N/A are not retested to peak values.

Maximum torque at closing (ft-lbs)	85 - 89
Maximum torque at opening K-mech (ft-lbs)	89
Maximum torque at opening A-Mech (ft-lbs)	2.2
Operating rotation of shaft (degrees)	130
Arc time (ms)	10 - 20
Opening time (ms)	40 - 60

Weights and dimensions
Drawings

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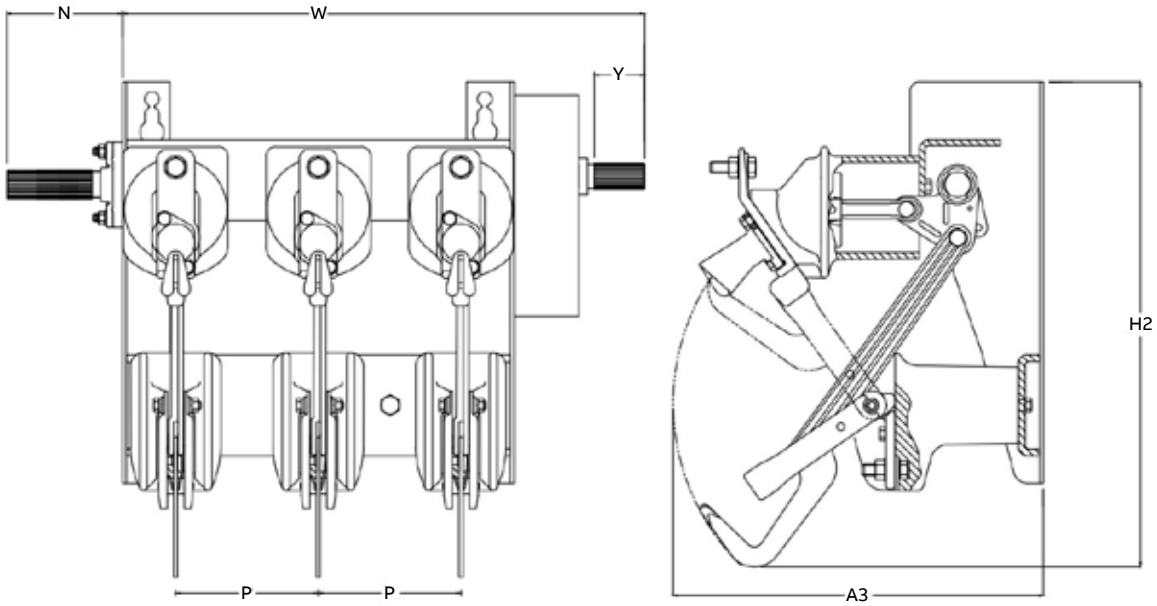
Standard VersaRupter® switch - single hole lug. Reference drawings for dimensions table on page 7.



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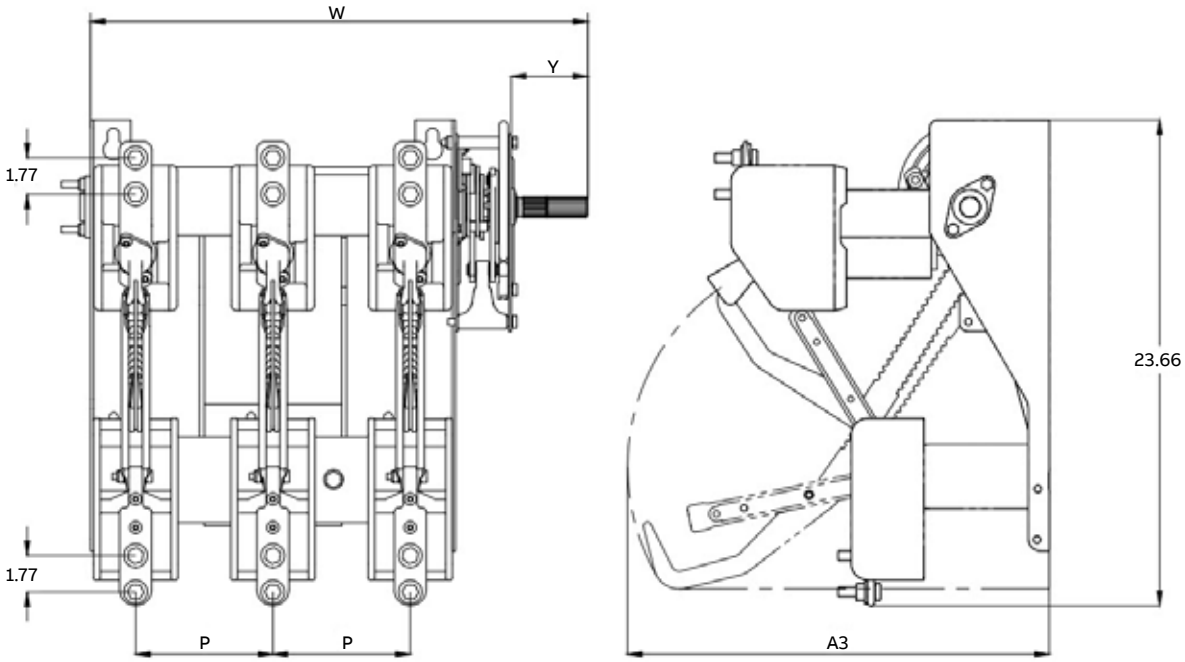
NEMA 2-hole lug



Weights and dimensions table

Dimensions (in)								
Switch max kV / phase spacing			**Width[1] (W)**	**Height (H2)**	**Depth (A3)**	**Optional shaft ext. (N)**	**Weight (lbs.)**	**Ref. drawing**
		K-mechanism	22.68					
	200 A	A-mechanism	22.41					
		K-mechanism	22.68					
	600 A	A-mechanism	22.41					S-20183
4.76 kV		K-mechanism	22.68					
P = 5.91" (150 mm)	1200 A	A-mechanism	22.41	20.08	15.51	4.80	71	S-20214
		K-mechanism	24.25					
	200 A	A-mechanism	23.98					
		K-mechanism	24.25					
	600 A	A-mechanism	23.98					S-20184
15 kV		K-mechanism	24.25					
P = 6.69" (170 mm)	1200 A	A-mechanism	23.98	23.62	20.12	4.80	75	S-20227
		K-mechanism	29.37					
	600 A	A-mechanism	29.10					
15 kV (61 kA)		K-mechanism	29.37					
P = 9.25" (235 mm)	1200 A	A-mechanism	29.10	24.17	21.55	7.32	110	S-20346
		K-mechanism	29.37					
	200 A	A-mechanism	29.10					
		K-mechanism	29.37					
	600 A	A-mechanism	29.10					S-20348
17 kV		K-mechanism	29.37					
P = 9.25" (235 mm)	1200 A	A-mechanism	29.10	23.62	20.12	7.32	93	S-20228
		K-mechanism	32.52					
	200 A	A-mechanism	32.25					
		K-mechanism	32.52					
	600 A	A-mechanism	32.25					S-20347
27 kV		K-mechanism	32.52					
P = 10.8" (275 mm)	1200 A	A-mechanism	32.25	23.62	20.12	7.32	95	S-20229
		K-mechanism	46.61					
	600 A	A-mechanism	46.12					
		K-mechanism	46.61					
	800 A	A-mechanism	46.12					
38 kV		K-mechanism	46.61					
P = 14.1" (360 mm)	1000 A	A-mechanism	46.12	34.25	33.46	10.08	220	NHP 241285

[1]Width for K-mechanism based on standard shaft (K3) where Y dimension = 3.77" excluding 38 kV where Y= 7.39"
Other options are: K2 snap action mechanism where Y = 2.69"
K5 snap action mechanism where Y = 5.26"

[1]Width for A-mechanism based on standard shaft (A3) where Y dimension = 3.50" excluding 38 kV where Y=6.90"
Other options are: A4 stored energy mechanism where Y = 4.80"
A6 stored energy mechanism where Y = 6.90"

Note: See definitions for K and A mechanisms on page 8.

Operating mechanism
Selection guide

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01
Snap action
K-mechanism

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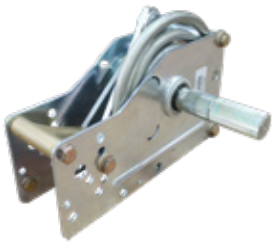
02
Stored energy
A-mechanism



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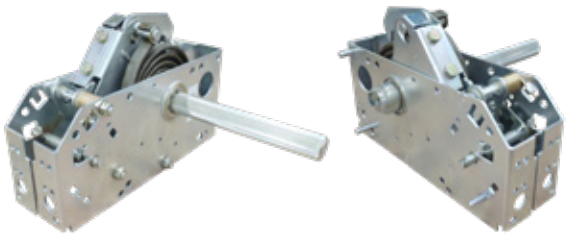

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Snap action K-mechanism
The K-mechanism is a single spring snap action device. The switch opens or closes by charging the spring past dead center using one of the manual operating handles. The K-mechanism may be used with all handle options as well as with type NM motor operators. The K-mechanism cannot be used for shunt trip or fuse trip applications.

- Use the K-mechanism if you need chain drive or side direct drive handles.

Stored energy A-mechanism
The A-mechanism is a dual spring stored energy device that is well suited for remote tripping applications. When shunt tripping or mechanical fuse tripping is specified, the type A-mechanism must be used. In closed operation, the opening spring is charged and latched by an operating handle or by a motor operator. The VersaRupter® switch is then opened by any of the following methods below:

- Movement of the operating handle
- Motor operator
- Electrical signal to a shunt trip device
- Mechanical fuse tripping linkage

Operating features and functions

		Mechanism type			
		Snap action K-mech		Stored energy A-mech	
		40/32/25 kA	61 kA	40/32/25 kA	61 kA
UL recognized and CSA compliant		X	X	X	X
Electrical control options	Remote shunt trip[1]			X	X
	Auxiliary switch	X	X	X	X
	Open fuse auxiliary switch			X	
Operating handles	Side direct drive	X	X		
	HE shaft drive[2]	X	X	X	X
	HM shaft drive	X	X	X	X
	Chain drive	X	X		
Motor operator (optional)	NM motor[3]	X	X	X	X
Interlocks	Mechanical door interlock	X	X	X	X
	Key interlock	X	X	X	X
	Padlock	X	X	X	X
Grounding switch	Type E grounding switch	X		X	
	Mechanical interlock	X		X	
Fuse options	Fuse bases	X		X	
	Mechanical fuse tripping[4]			X	

[1] Shunt trip option provides for operation by local push button or remote signal. Shunt trip requires stored energy type A-mechanism.
[2] The HM drive must be used if manual operation is needed in conjunction with motor operator.
[3] Chain and direct drive handles cannot be used with motor operators.
[4] This feature provides for the switch to open if a fuse operates.

Operating handles
Selection guide

The VersaRupter® switch can be operated with a variety of handles as well as a motor operator. Operators may be mounted in a variety of positions and offer various features. Some operators are not compatible with all mechanisms and features. The chart below provides compatibility guidance.

Selection guide - operators vs. feature compatibility

Handle operator	Location	Use with K-mech	Use with A-mech	Mechanical door interlock	Key interlock	Shunt trip	Motor operator[1]
Chain drive without door interlock	Front mounted with left or right side drive	•			•		
Chain drive with door interlock	Front mounted with left or right side drive	•		•	•		
Direct drive	Shaft mounted with left or right side drive	•			•		
Manual shaft drive type HE[2] without door interlock	Front mounted with right or left side drive	•	•		•	•	
	Manual with NM motor (HM handle)	•	•		•	•	•
Manual shaft drive type HE[2] with door interlock	Front mounted with right or left side drive	•	•	•	•	•	
	Manual with NM motor (HM handle)	•	•	•	•	•	•

Handle options with type K snap action mechanism		
Handle operator	Front mounted chain drive handle without mechanical door interlock	Right side mounting
		Left side mounting
	Front mounted chain drive handle with mechanical door interlock	Right side mounting
		Left side mounting
	(side mounted) Direct drive handle	Right side mounting
		Left side mounting
	(front mounted) HE/HM shaft operator	Right side mounting
		Left side mounting

Direct drive handle

Chain drive Kirk Key right

Handle options with Type A stored energy mechanism		
Handle operator	(front mounted) HE shaft operator	Right side mounting
		Left side mounting
	(front mounted) HM shaft operator (use with NM motor)	Right side mounting
		Left side mounting

HE

HM

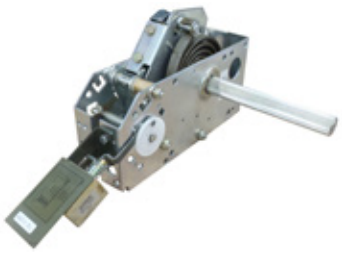
Optional accessories

Electrical control options
The shunt trip option is available for local push button or remote switching applications. The shunt trip can only be installed on a VersaRupter® switch with a stored energy mechanism (A-mechanism). The shunt trip utilizes a solenoid to actuate the A-mechanism trip latch.

The auxiliary switch can be installed on all VersaRupter switches. The auxiliary switch contacts change state when the VersaRupter switch contacts change state.

The compact, lightweight NM motor operator provides for remote electrical opening and closing of the VersaRupter switch. The NM motor operator is installed on the splined shaft of the VersaRupter switch mechanism (either K-mechanism or A-mechanism) or on a left-hand shaft extension.

Optional accessories
The VersaRupter switch can be equipped with a fuse base and/or a grounding switch. Grounding switches are available for connection to the lower terminals of the VersaRupter switch or the VersaRupter switch fuse base. Fuse bases are offered for mounting Type CEF fuses, with or without fuse tripping, on the upper or lower terminals of the VersaRupter switch rated below 1200 A. An optional fuse auxiliary switch is available to indicate an open fuse condition if equipped with fuse tripping.



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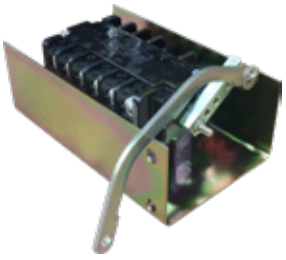

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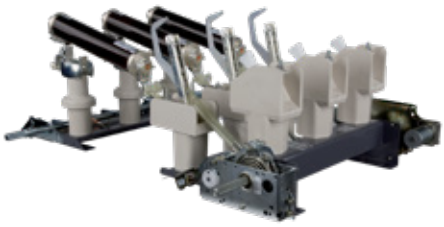

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01 Shunt trip installed
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02 Shunt trip
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03 Aux switch
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04 Type E grounding switch

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05 VersaRupter switch with fuse base, ground switch, motor operator, and shunt trip installed
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06 NM motor operator
—
07 Motor controller

Applications

The main purpose of the VersaRupter® load break switch is to interrupt loads and open circuits under normal current. The VersaRupter switch has been used in the following applications:

- In transformer and motor protection with the use of fuses
- As a visual disconnect in mining applications
- In pad-mounted switch applications
- In various metal enclosed switchgear configurations such as switch over breaker, duplex, and maintenance bus scenarios

Additional information
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