JST POWER EQUIPMENT



TECHNICAL GUIDE

J3Mag™

4.76, 8.25, and 15kV

ANSI / IEEE Vacuum Circuit Breaker

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J3Mag Circuit Breakers – *Introduction*

PRODUCT DESCRIPTION

The J3Mag medium-voltage circuit breakers offer the latest in vacuum interrupter technology, providing superior control and protection of medium-voltage power equipment in utility, industrial, and commercial installations. The J3Mag is a magnetically actuated and latching circuit breaker with a high number of operations due to its simple design, with only three (3) moving parts responsible for safe interruption.



The J3Mag vacuum circuit breaker is designed for installations involving generators, motors, industrial feeder circuits, and utility distribution.

- Suitable for both Indoor and outdoor applications
- Outdoor Non-Walk-In
- E-House Construction Distribution line

Switching and protection for:

- Main – Tie – Main systems
- Main – Main systems
- Generators
- Feeder circuits
- Cap banks
- Transformers
- Motors
- Resistive loads

FEATURES

- Mechanical operations counter
- Close/Open status flags for each pole
- Auxiliary contacts, (9) 52a & (9) 52b
- Automatically engaging secondary disconnect

ADVANTAGES

- Magnetically actuated breaker
- Independent pole actuators
- Having few moving parts eliminates lubrication requirements
- Direct drive of push rods eliminates torque in breaker
- Consistent operating time over life of unit
- Chain driven racking mechanism
- Optional single phas operation to achieve higher relaibility scores

JST QUALITY ASSURANCE

JST Power is an ISO 9001:2015 certified manufacturer that fully complies with IEEE Standard for Metal-Clad Switchgear requirements, Standard C37.20.2-2015 and C37.09. Our company assures the products customers receive conform to all applicable standards and has been fully tested prior to shipment.

JST Power's Quality Assurance teams have a certified APQP4Wind champion who monitors the execution of the different quality controls throughout the various stages of the manufacturing process, ensuing high quality levels through efficient processes. JST complies with NEC and OSHA requirements.

BREAKER COMPARTMENT

J100CLAD™ circuit breaker compartments are designed for operator safety with a viewing window and closed-door. The circuit breaker has self-aligning, fully automatic primary and secondary contacts allowing the operators to keep the front door closed throughout the racking operation. Some of the key components in this compartment are:

- Guide rails
- Ground bus
- Racking mechanism
- CT mounting
- Shutter assembly
- Secondary disconnect, automatic
- Control module\ capacitor
- Primary disconnect, epoxy



Breaker Compartment

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J3Mag Circuit Breakers – *Design*

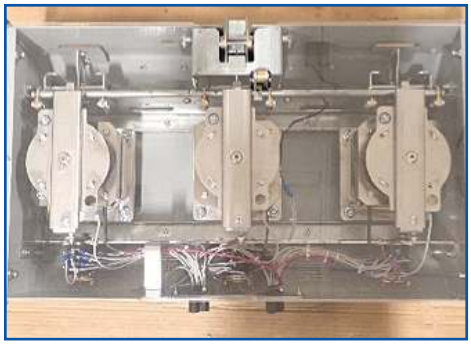
COMPONENTS

Magnetic actuator

J3Mag uses three (3) independent actuators for interrupter operations, one actuator per pole. This design reduces moving parts making the actuator maintenance-free for the lifetime of the product.



Magnetic Actuator



Bottom View of Breaker

STANDARDS

J3Mag circuit breaker has been tested in accordance with

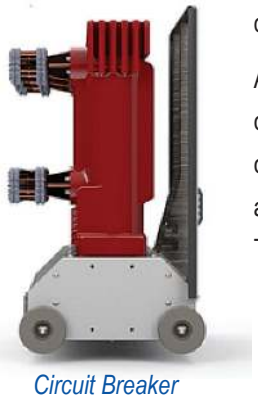
- IEEE Std C37.04-2018
- IEEE Std C37.09-2018

Vacuum Interrupters

The vacuum interrupters (VI's) are embedded in a solid insulating material to protect the VI's from collecting dust or moisture and from bumps due to handling. The solid insulation also improves dielectrics and heat discipation. With the use of an embedded design, the vacuum interrupters are maintenance-free for the life of the VI's.



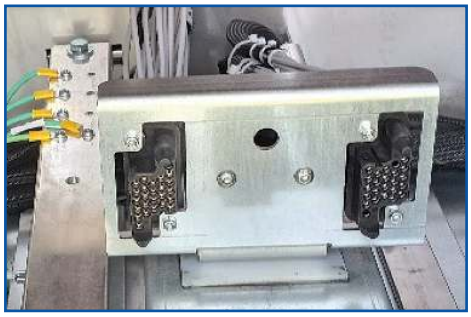
Finger Clusters



Circuit Breaker Side View

Secondary Disconnect System

The system includes a dual (25-pin) self-aligning disconnect for control circuitry as a standard feature. The female plugs resided in the breaker cell, so potentially energized contacts are recessed and are touch safe. Assembly requires no manual connection of secondary contacts.



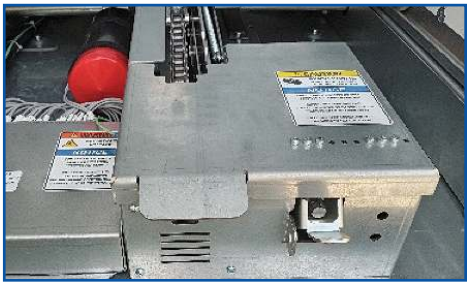
Secondary Disconnect

Racking Mechanism

The breaker racking assembly will be housed within the cell and not on the circuit breaker. With easy access to the assembly this will reduce maintenance costs and down-time. The racking assembly employs a worm-gear mechanism with chain-drive assist to move the circuit breaker to and from three (3) separate positions. The racking procedure can be completed with the front door closed. The assembly includes padlock provisions.

A solid ground bus contact will engage the circuit breaker grounding contact prior to the coupling of the primary and secondary contacts and is continuous during the racking operations. The three racking positions are as follows:

- Connect: Primary and secondary (control) contacts are engaged.
- Test: Primary contact are disengaged. Secondary (control) contacts are engaged for in cell breaker testing.
- Disconnect: Both primary and secondary contacts are disengaged.



Racking Mechanism

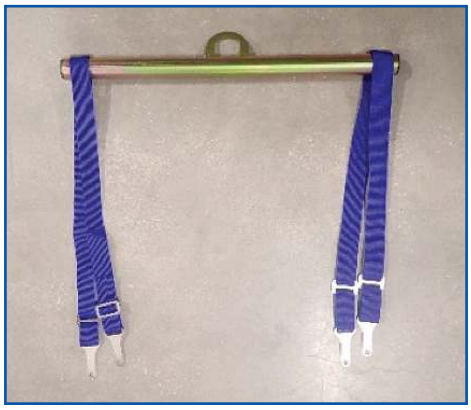
Interlocks

The racking assembly is in full compliance with IEEE standards to assure proper sequence and safe operation. For improved safety, the interlock system prohibits operation of the circuit breaker while in an intermediate position and blocks insertion of an improperly rated circuit breaker.

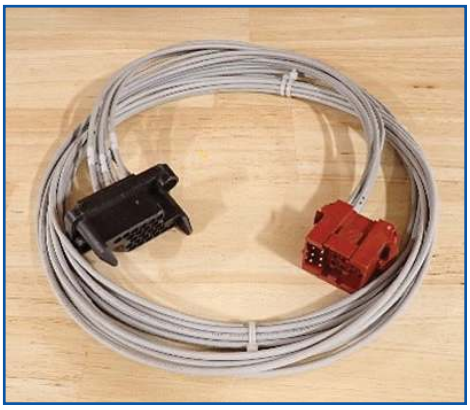
J3Mag Circuit Breakers – *Available Accessories*

The J3Mag product line is available with the following accessories or special tools:

- Breaker accessory kit including PT / CPT racking handle, breaker lift yoke.
- Jumper Cable
- Test Box
- Lift Truck
- Ground & Test Device, 6-pole, manually operated



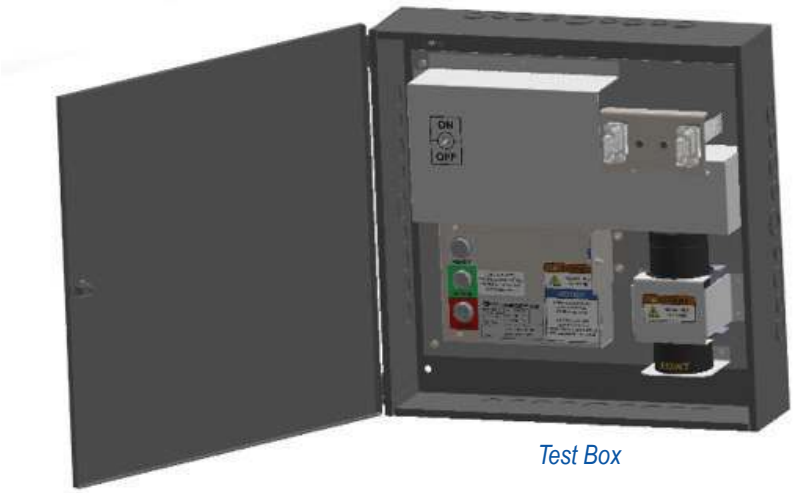
Lift Yoke



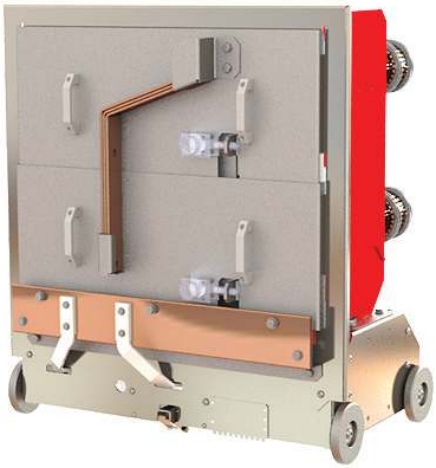
Jumper Cable



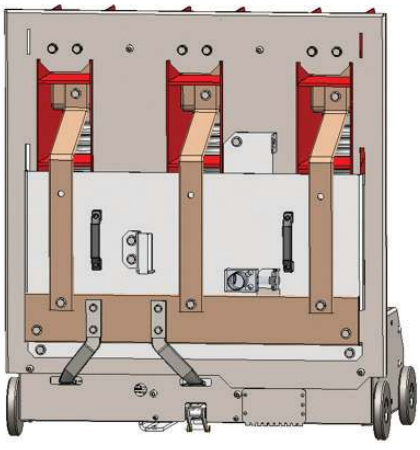
Lift Truck



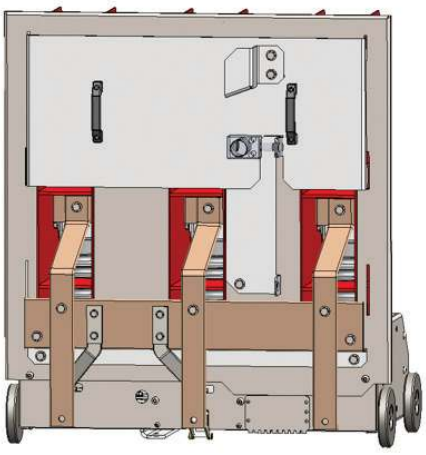
Test Box



Ground and Test Device



Assembled for Upper Terminal Connection



Assembled for Lower Terminal Connection

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J3Mag Circuit Breakers – *Technical Data*

CIRCUIT BREAKER RATINGS

Rated Max Voltage (kV rms)	Nominal Voltages (kV)	Continuous Current (Amps)	Rated Short-Circuit and Short-Time Current (kA rms)	Rated Close and Latch Current (kA Peak)	Rated Power Frequency Withstand (Hi-Pot) (kV rms)	Rating Lightning Impulse Withstand (BIL) (kV Crest)
4.76	2.4, 4.16	1200, 2000, 3000	25	65	19	60
		31.5	82			
		40	104			
		50	130			
8.25	4.8, 6.9, 7.2	1200, 2000, 3000	40	104	36	95
15	6.9, 7.2, 8.4, 12, 12.47, 13.2, 13.8, 14.4	1200, 2000, 3000	25	65	36	95
			31.5	82		
			40	104		
			50	50		

- Rated Voltage Range factor is K = 1.0 for all circuit breakers.
- Maximum Permissible Tripping Time Delay (Y) is 2-seconds for all circuit breakers.
- 50 Hz available upon request

AUXILIARY CONTACT AND TOC SWITCH RATINGS

Rated Voltage	600 VAC, 250 VDC
Switching Capacity	Up to 16A
Dielectric Withstanding Voltage	2500 VRMS
Contact Resistance	Up to 10mΩ (Average 4mΩ)
Insulation Resistance	1000MΩ min. initial
Number of Poles	9(52A) - 9(52B)
Indexing	90°
Contacts	Break Before Make
Terminal Type	Screw
Construction	Closed

BREAKER TIMING

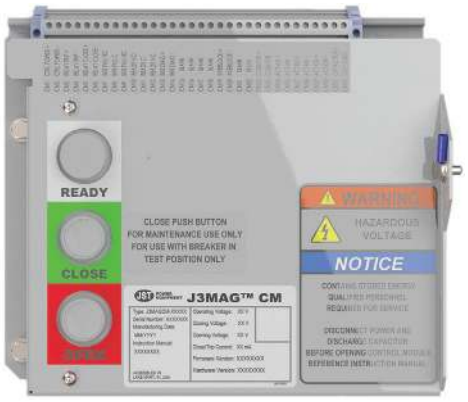
Voltage Class (kV rms)	Continuous Current (Amps)	Interrupt Time (Cycles)	Closing Time (ms)	Opening Time (ms)
4.76, 8.25, 15	1200, 2000, 3000	3 Cycles	39-41	28-30

POWER REQUIREMENTS

	Actuator Driver (Watts)
Standby	7
Capacitor Charging	36
Trip/Close Consumption	2
Reclosing Sequence (open-close-open)	6

CONTROL MODULE RATED VOLTAGES

The Control Module is rated from 48 VDC to 125 VDC and 120 VAC; and 250VDC to 240VAC.



Control Module

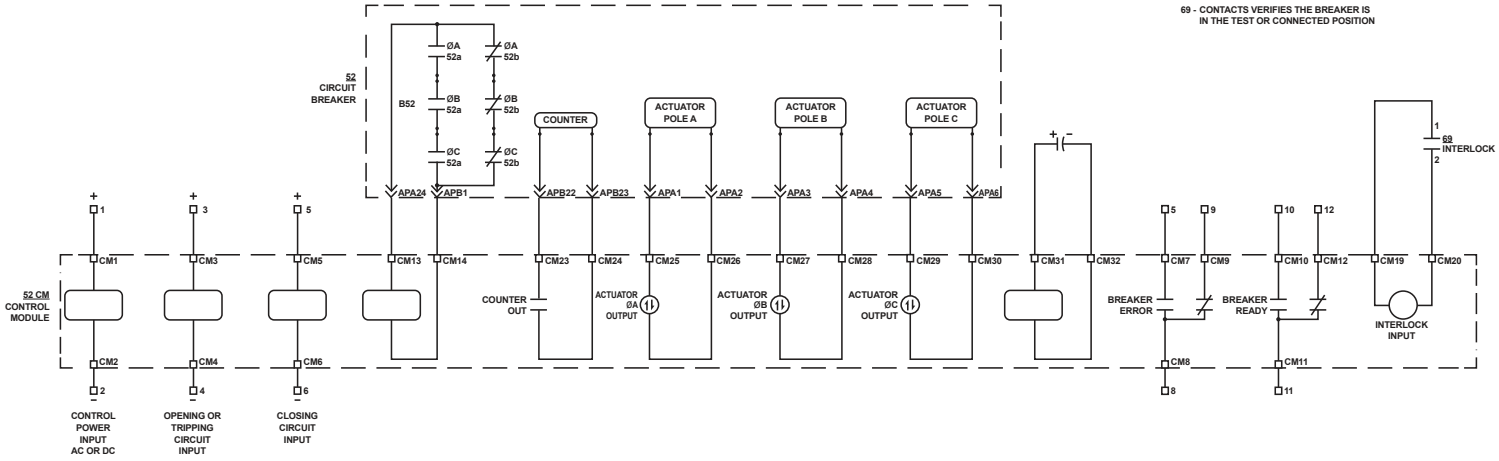


Terminal Block Connections

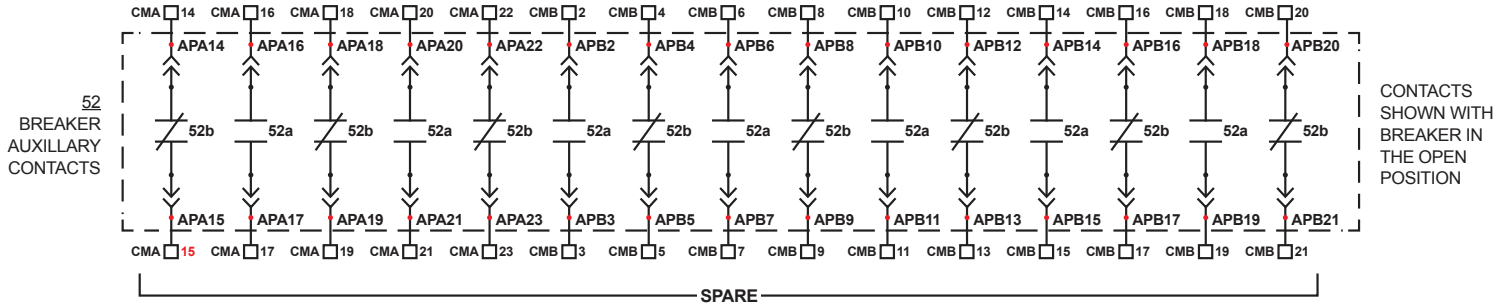
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J3Mag Circuit Breakers – *Schematics*

SAMPLE CONTROL MODULE SCHEMATIC



BREAKER AUXILIARY CONTACTS



CAPACITOR RATINGS
(For Circuit Breaker Magnetic Actuation)

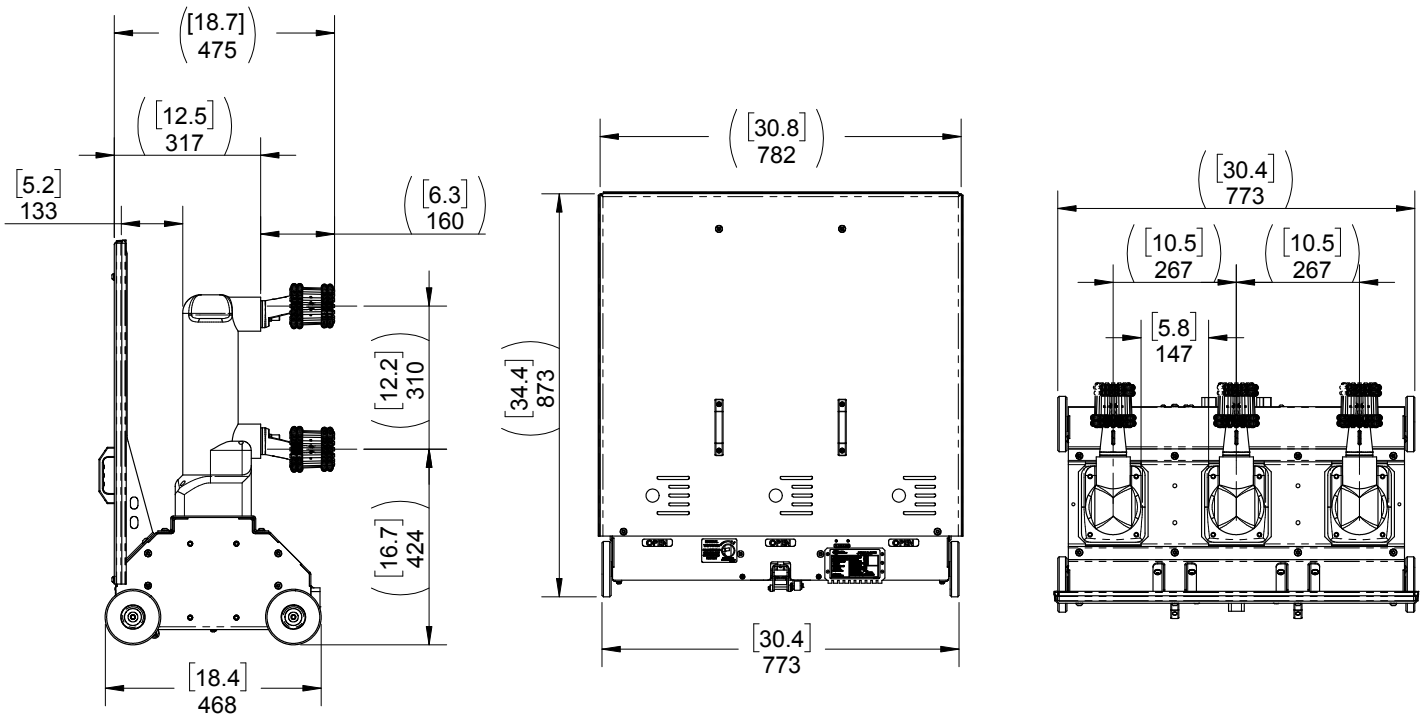
Rated Max Voltage (kV rms)	Continuous Current (Amps)	Interuption (kA Peak)	Capacitor Rating (VDC)
4.76-14	1200	25	250, 16000 µF
		31.5	
	2000-3000	25	250, 30000 µF
		31.5	
	1200-3000	50	250, 30000 µF

BREAKER WEIGHT

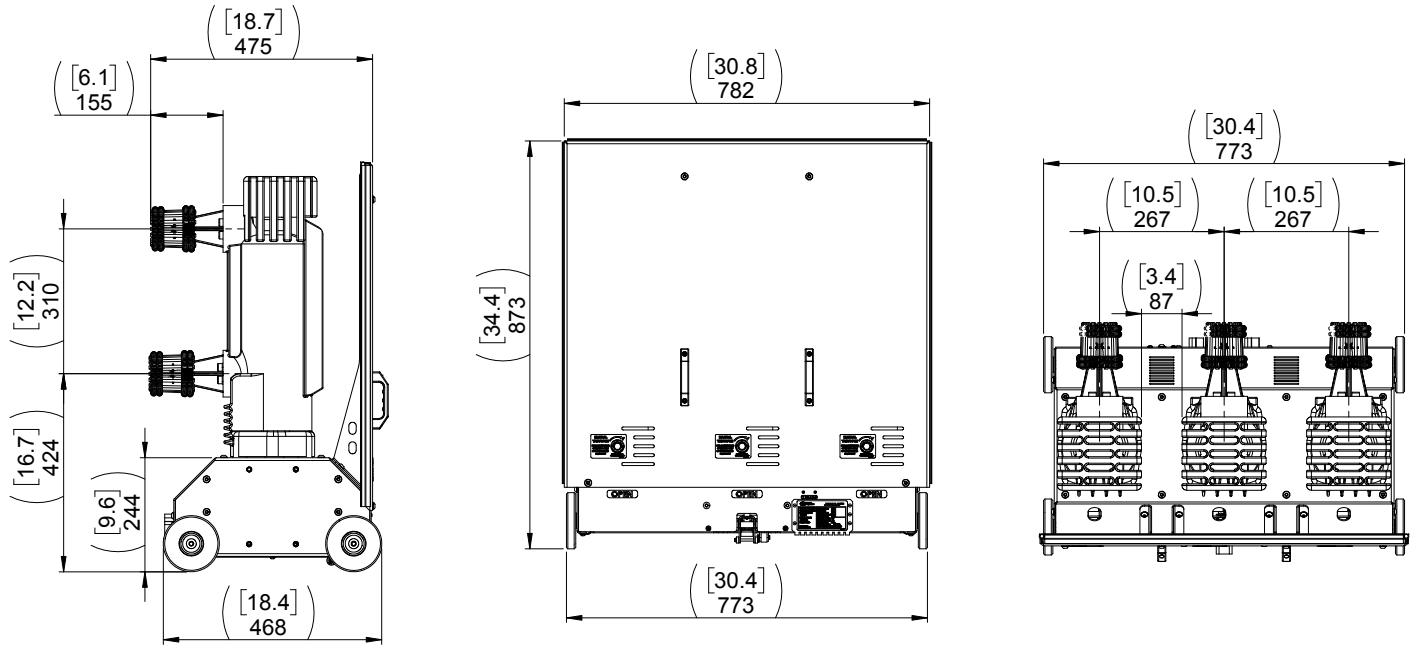
Rated Short-Circuit and Short-Time Current (kA rms)	Continuous Current (Amps)	Approximate Weight (Lbs)	Approximate Weight (Kg)
31.5	1200	321	146
	2000	321	146
	3000	546	248
50	1200	531	241
	2000	546	248
	3000	546	248

J3Mag Circuit Breakers – *Breaker Dimensions*

DIMENSIONS FOR 25 KA AND 31.5KA CIRCUIT BREAKER



DIMENSIONS FOR 40KA AND 50KA BREAKER



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HEADQUARTERS

30 Skyline Drive
Lake Mary, Florida 32746
Phone: 407-632-4050
Fax: 407-982-1153
Sales@jstpower.com
www.jstpower.com

MANUFACTURING FACILITIES



Lake Mary, Florida



Nogales, Mexico



Haikou, Hainan



Wuhan, Hubei



Shanghai



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Yangzhou, Jiangsu