

DISTRIBUTION SOLUTIONS

ADVAC

ANSI Indoor Vacuum Circuit Breaker

Product catalog



Indoor vacuum circuit breakers, designed explicitly for the IEEE standards.

ADVAC medium voltage circuit breakers are the best choice in modern electricity distribution applications like transformer and distribution substations, for protection and controlling significant assets, such as transformers, motors, capacitor banks, and cables.

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Benefits



**Protect
your assets**



**Maximize
your output**



**Optimize your
investments**



Protect your assets



- Built-in truck interlocks for a compact and robust solution
- Pole-embedded vacuum interrupter for enhanced shock, dust, and humidity resistance

Maximize your output



- Motor assembly removable by a single screw, reducing downtime effort
- Modular Smart Coil assembly used in multiple ABB breakers provides close, open, and undervoltage actuation in one simple assembly
- ABB EL spring mechanism used on various ANSI and IEC breakers to offer up to 20,000 mechanical operations in a compact, modular design that is readily accessible and easily maintained to reduce downtime

Optimize your investments



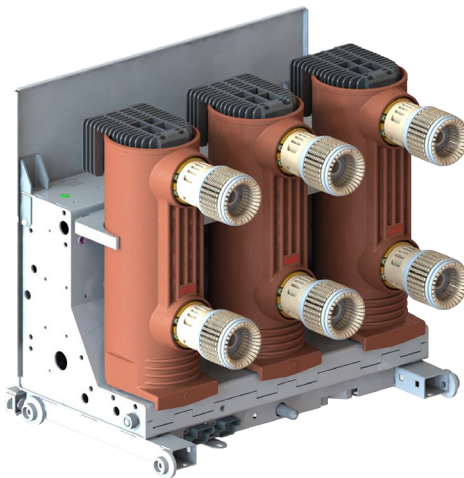
- The racking mechanism (truck) is integrated into the breaker and designed to 180 ft²lb torque rating to provide increased reliability and reduced maintenance costs
- Excellent quality product thanks to high process automation
- Service support
- Breaker + cassette solutions available for a faster engineering design

Description



Key benefit

1. ABB EL spring mechanism used on various ANSI and IEC breakers to provide up to 20,000 mechanical operations in a compact, modular design that is readily accessible and easily maintained to reduce downtime
2. Modular Smart Coil assembly used in multiple ABB breakers provides close, open, and undervoltage actuation in one simple assembly
3. The motor assembly can be replaced by removing a single screw, thereby reducing downtime
4. Vacuum interrupters wholly embedded in a solid insulation material provide superior protection against dust, dirt, and condensation and are less susceptible to failure due to contamination, tracking, or partial discharge



Key features

- 5kV, 8kV, 15 kV, and 38kV heavy duty breaker rated at 1200A, 2000A, 3000A, and 4000A FAC continuous current and 25 kA thru 63 kA interrupting current
- Safety features include a standard built-in mechanical anti-pumping device, KIRK key for fixed variations, padlocking, push-button cover provisions, and closed-door racking
- The racking mechanism (truck) is integrated into the breaker and designed to 180 ft²lb torque rating to provide increased reliability and reduced maintenance costs

ADVAC Circuit Breakers – Capacitive Current Switching ratings

Voltage Class [kV]	Rated Current [A]	Short Circuit Current [kA]	B2B Capacitor Bank Switching Current [A]
5	1200	25	630A C2
		32	25A C2 Cable Charging
		40	25A C2 Cable Charging
		50	1000A C2
		63	1600A C1
	2000	25	25A C2 Cable Charging
		32	25A C2 Cable Charging
		40	1000A C2
		50	1000A C2
		63	1600A C1
	3000	25	1000A C2
		32	1000A C2
		40	1000A C2
		50	1000A C2
		63	1600A C1
8	1200	40	1000A C2
	2000		1000A C2
	3000		1000A C2
15	1200	25	630A C2
		32	25A C2 Cable Charging
		40	1000A C2
		50	1030A C2
		63	1600A C1
	2000	25	25A C2 Cable Charging
		32	25A C2 Cable Charging
		40	1000A C2
		50	1030A C2
		63	1600A C1
	3000	25	1000A C2
		32	1000A C2
		40	1000A C2
		50	1030A C2
		63	1600A C1
38	1200	16	50A C2 Cable Charging
		25	50A C2 Cable Charging
		32	50A C2 Cable Charging
	2000	16	50A C2 Cable Charging
		25	50A C2 Cable Charging
		32	50A C2 Cable Charging

ADVAC Circuit Breakers – Capacitive Current Switching ratings

Description

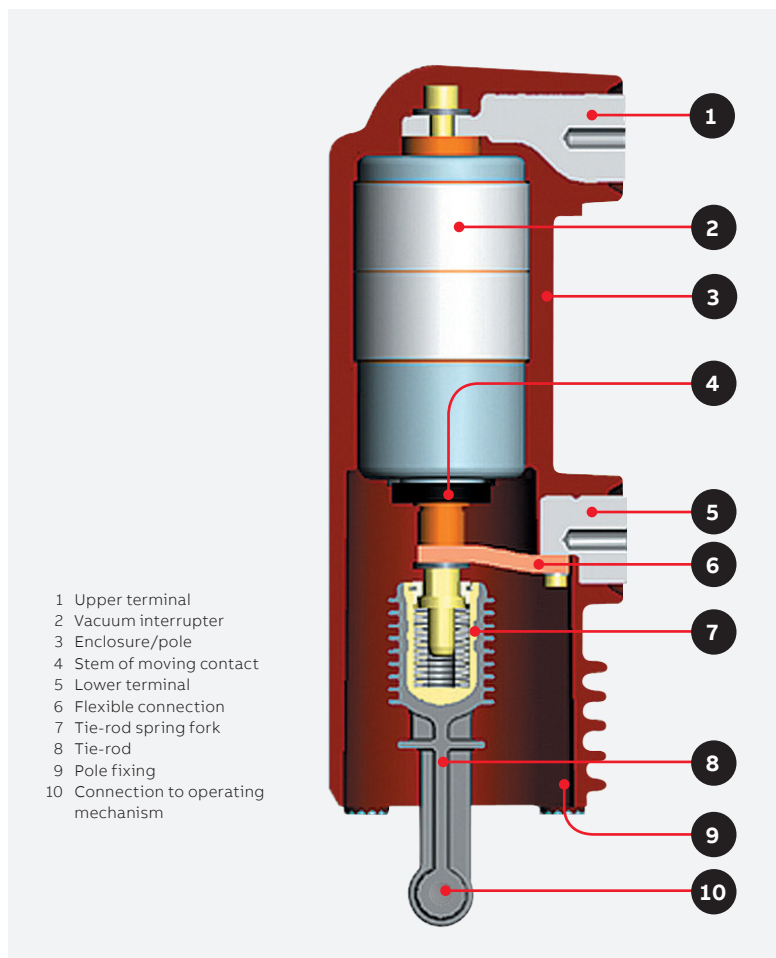
These new ADVAC® circuit breakers exemplify ABB's proven vacuum interrupter engineering and manufacturing technology, as well as the superior design standards employed in the production of circuit breakers.

ADVAC® medium voltage circuit breakers use vacuum interrupters embedded in the poles. This construction technique makes the poles of the circuit breaker particularly sturdy and protects the interrupter from shocks, dust and condensation.

The vacuum interrupter houses the contacts and forms the interruption chamber.

Vacuum current interruption

The vacuum circuit breaker does not require an interrupting and insulating medium. Interrupters do not, in fact, contain ionizable material. The electric arc that generates when the contacts separate is merely formed by melted and vaporized contact material. Supported by the external energy, the electric arc persists until the current annuls near natural zero crossing. In that instant, the dielectric properties are very rapidly restored by the sharp reduction in the density of the conveyed load and rapid condensation of the metallic vapor. Thus the vacuum interrupter recovers insulating capacity and the ability to withstand transient recovery voltage, thereby definitively extinguishing the arc.



Vacuum interrupter embedded in the pole

- Vacuum interruption technique
- Vacuum contacts protected against oxidation and contamination
- Vacuum interrupter embedded in the pole
- Interrupter protected against shocks, dust and condensation
- Operation under different climatic conditions
- Limited switching energy
- Stored energy operating mechanism with anti-pumping device supplied as standard
- Simple customizing with a complete range of accessories
- Fixed and withdrawable version
- Compact dimensions
- Sealed-for-life poles
- Sturdy and reliable
- Limited maintenance
- Circuit breaker racked in and out with door closed
- Incorrect and hazardous operations are prevented thanks to special locks in the operating mechanism and truck
- High environmental compatibility

Since high dielectric strength can be reached in the vacuum, even with minimum distances, circuit breaking is also guaranteed when the contacts separate a few milliseconds before natural current zero crossing. The special shape of the contacts, the material used, as well as the limited duration and low voltage of the arc, guarantee minimum contact wear and long life. In addition, the vacuum also prevents contact oxidation and contamination.

Operating mechanism

The low speed of the contacts, their reduced travel and exposed conductive part, limit the energy required for the operation and therefore guarantee extremely low wear on the system. This means that the circuit breaker only requires very little maintenance.

ADVAC® circuit breakers have mechanical operating mechanisms with stored energy and free trip.

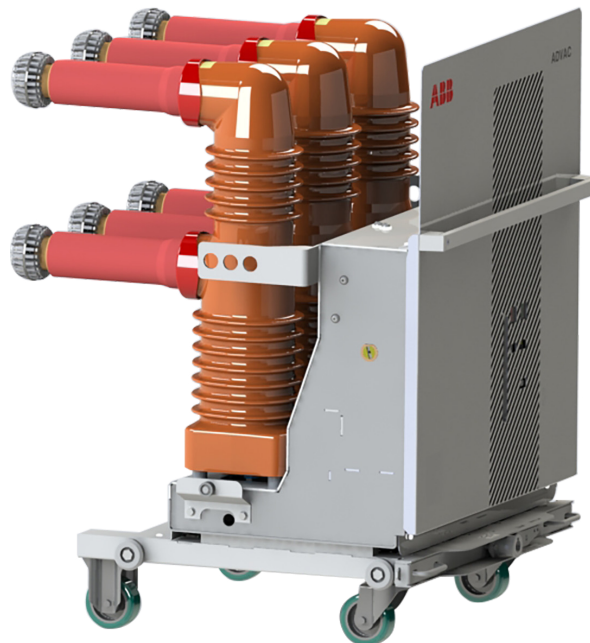
These characteristics allow opening and closing operations to be performed independently of the operator. The operating mechanism is of a simple design, easy to use and can be customized with a wide range of accessories which are straightforward and rapidly installed. This simplicity enhances the reliability of the apparatus.

The structure

The operating mechanism and the poles are fixed to a metal frame which also acts as the support for the fixed version of the circuit breaker.

The compact structure is sturdy and ensures mechanical reliability.

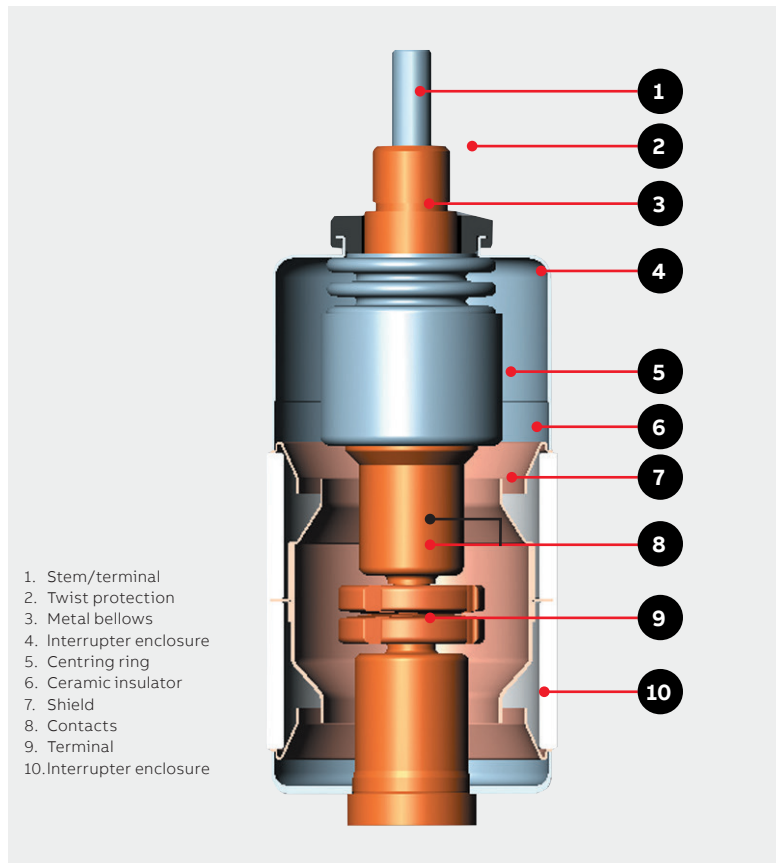
Apart from the isolating contacts and the cord with plug for connecting the auxiliary circuits, the withdrawable version is complete with truck for racking it in and out of the switchgear or enclosure with the door closed.



ADVAC Circuit Breakers – Capacitive Current Switching ratings

Interruption principle of ABB interrupters

In a vacuum interrupter, the electric arc begins the instant in which the contacts separate. It persists until zero current is reached and can be influenced by the magnetic field.



Vacuum interrupter

Vacuum arc – diffuse or contracted

Individual melting points form on the surface of the cathode after the contacts separate. This leads to the formation of metallic vapors which support the arc itself.

The diffuse vacuum arc is characterized by expansion over the contact surface itself and by evenly distributed thermal stress.

At the rated current of the vacuum interrupter, the electric arc is always of the diffuse type. Contact erosion is very limited and the number of current interruptions very high.

As the interrupted current value increases (beyond rated value), the electric arc tends to change from the diffuse to contracted type, owing to the Hall effect.

Starting out from the anode, the arc contracts and tends to concentrate as the current increases.

There is a temperature rise on a level with the affected area and the contact is consequently subjected to thermal stress. To prevent the contacts from overheating and becoming eroded, the arc is made to rotate. By turning, the arc becomes similar to a moving conductor through which current passes.

All vacuum interrupters undergo extensive production voltage conditioning, leakage testing and X-ray inspection for quality assurance prior to installation in the circuit breaker pole assembly.

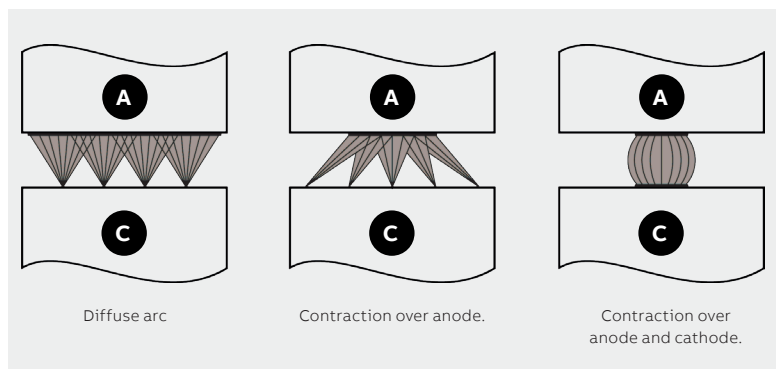


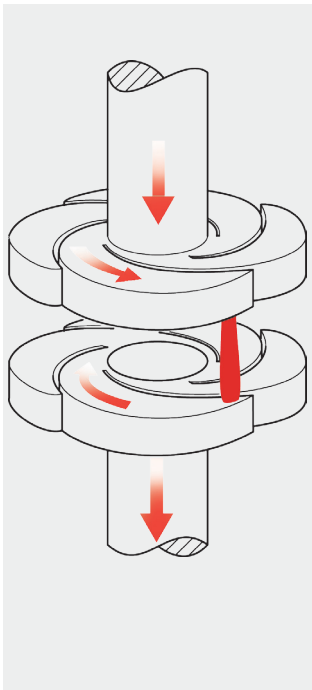
Diagram of transition from diffuse arc to contracted arc in a vacuum interrupter.

The spiral shape of ABB vacuum interrupter contacts

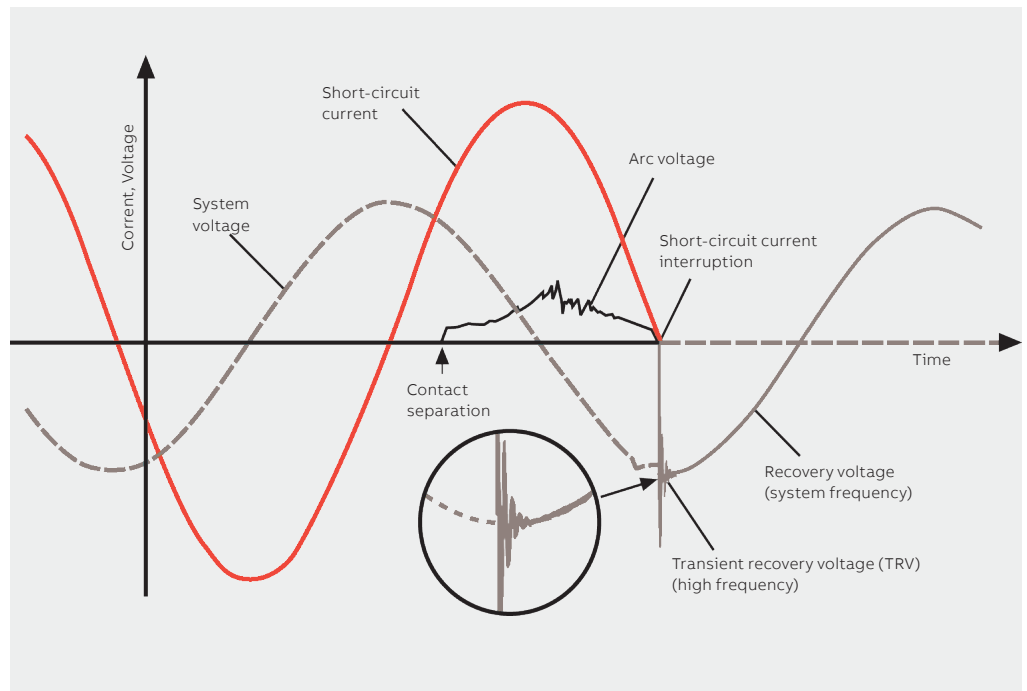
The special spiral shape of the contacts generates a radial magnetic field in all parts of the arc column, concentrated around the circumferences of the contacts.

The electromagnetic force that self-generates, acts tangentially and causes the arc to spin rapidly around the axis of the contacts. This forces the arc to turn and affect a larger area than that of a fixed contracted arc. Besides minimizing the thermal stress to which the contacts are

subjected, all this ensures that these latter are only eroded to a negligible extent and, above all, allows the interruption process to be controlled even with very high short-circuit current values. ABB vacuum interrupters interrupt at natural current zero crossing, thereby preventing the arc from restriking after this has occurred. Rapid reduction in current density at the same time as the zero current instant allow maximum dielectric strength to be re-established between the interrupter contacts within a few microseconds.

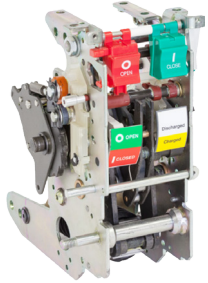


Geometry of radial magnetic field contact with a rotating vacuum arc.



Development of current and voltage trends during a single phase vacuum interruption process.

ADVAC Model 4 Construction Features



EL-mechanism

The EL-mechanism is used in many breakers across ABB's portfolio, thereby reducing required spare parts inventory. By using the EL-mechanism, the ADVAC breaker maintains a lightweight, modular design that is easy to maintain in the case of normal maintenance or repair.

The EL-mechanism also features a mechanical anti-pump device to eliminate reliance on electrical anti-pump devices.

By utilizing a modular design featuring the EL-mechanism, the ADVAC breaker has a quick change trip/close coil and charge motor design that makes repair of these commonly repaired parts easy.

For breaker rebuilds or repairs, the entire EL-mechanism can be removed and replaced in under an hour.

Smart Coils

ADVAC breakers feature smart coils with on-board microprocessors that monitor for coil continuity, over-current and over temperature scenarios and provide a more efficient response than standard coils. Options for a second open coil or under-voltage coil are also available.

Vacuum Interrupters

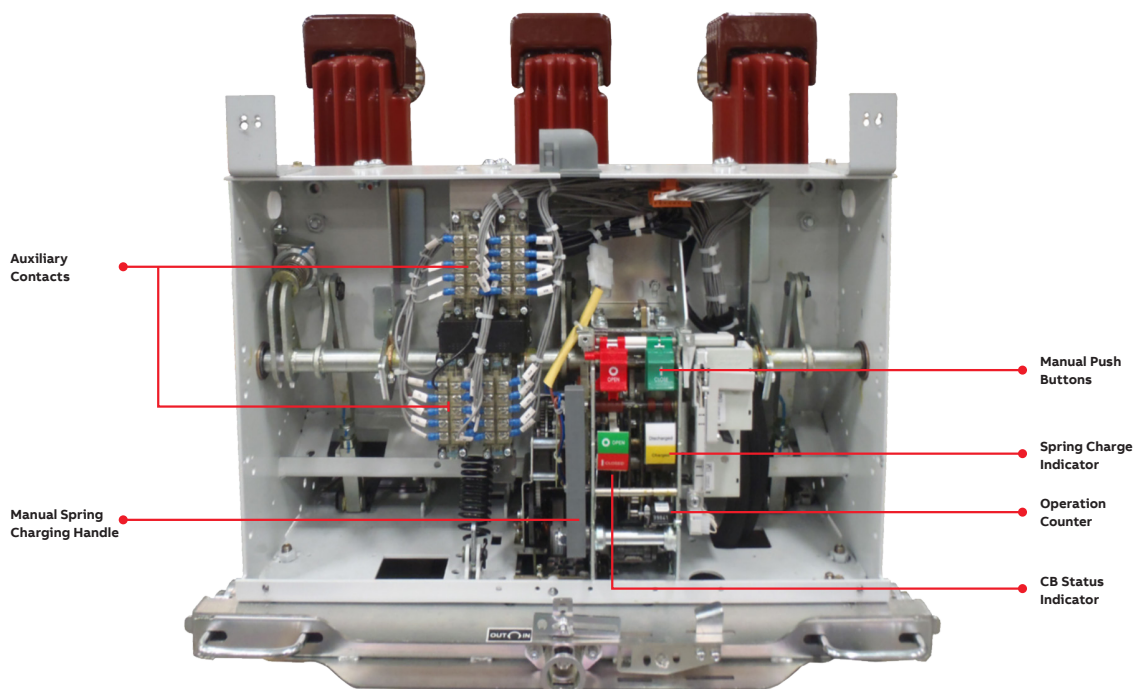
ABB vacuum interrupters (VIs) are embedded in a solid insulation material to protect the VIs from collecting dust or moisture and from accidental bumps. The solid insulation also improves tracking resistance making ABB circuit breakers one of the high-test available in the market.

Because of the embedded design, these vacuum interrupters are maintenance free for the life of the VI.



Breaker Racking Truck

ABB's breaker racking truck for switchgear is integral to the breaker itself in lieu of being inside the switchgear breaker cell. Rated for 180 foot-pounds of torque, the breaker racking truck exceeds the industry standard of 50-60 foot-pounds by a factor of 3 thereby greatly reducing the possibility of an over-torque condition. The breaker racking truck is rated for 1000 rack in-rack out operations, exceeding the ANSI Standard of 500 operations.



ADVAC 63kA Construction Features

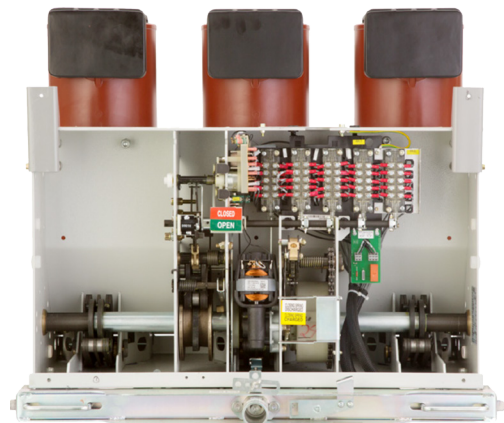
Classic Mechanism

The ADVAC classic mechanism uses a simple, front-accessible, stored-energy operating mechanism designed specifically for use with vacuum technology. This provides the benefits of dependable vacuum interrupters, with advanced contact design and proven reliability, without the complexity of mechanisms and linkages found in previous generation circuit breakers. The unique ADVAC mechanism uses a single toroidal spring mounted on a drive shaft to rotate the shaft in the same direction during opening and closing. The spring can be charged manually via the chain drive and ratchet wheel, or electrically by the spring charging gear motor.



Assembled Poles

ABB assembled poles use an epoxy resin material to surround a vacuum interrupter in lieu of the embedded design of the 50 kA and below ADVAC breakers. The vacuum interrupters and associated assemblies are located inside of the epoxy resin housing.



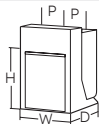
Breaker Racking Truck

ABB's breaker racking truck for switchgear is integral to the breaker itself in lieu of being inside the switchgear breaker cell. Rated for 180 foot-pounds of torque, the breaker racking truck exceeds the industry standard of 50-60 foot-pounds by a factor of 3 thereby greatly reducing the possibility of an over-torque condition. The breaker racking truck is rated for 1000 rack in-rack out operations, exceeding the ANSI Standard of 500 operations.



ADVAC Model 4 _ Selection and Ordering

Fixed circuit breakers

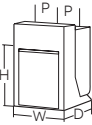
Circuit breaker		ADVAC 05			
Standards		ANSI 37.06 •			
Rated voltage		Ur [kV]	4.76		
Rated insulation voltage		Us [kV]	4.76		
Withstand voltage at 50 Hz		Ud (1 min) [kV]	19		
Impulse withstand voltage		Up [kV]	60		
Rated frequency		fr [Hz]	60		
Rated thermal current (40 °C)		Ir [A]	1200	2000	3000
Rated breaking capacity (rated symmetrical short-circuit current)		Isc [kA]	25	25	25
			31.5	31.5	31.5
			40	40	40
			50	50	50
			25	25	25
Admissible rated short-time withstand current (2s)		Ik [kA]	31.5	31.5	31.5
			40	40	40
			50	50	50
			65	65	65
			82	82	82
Making capacity		Ip [kA]	104	104	104
			130	130	130
			[O - 0.3 s - CO - 3 min - CO]		
Operation sequence					
Total breaking time		cycles	3 cycles *	3 cycles **	3 cycles **
Closing time		[ms]	35 ... 60	35 ... 60	35 ... 60
<div></div> <div>Maximum overall dimensions</div>		H [in]	23.17 ⁽¹⁾ (⁽²⁾)	24.23 ⁽¹⁾ (⁽²⁾)	24.23 ⁽¹⁾ (⁽²⁾)
		W [in]	29.53 ⁽¹⁾ (⁽²⁾)	29.53 ⁽¹⁾ (⁽²⁾)	29.53 ⁽¹⁾ (⁽²⁾)
		D [in]	16.7 ⁽¹⁾ (⁽²⁾)	16.7 ⁽¹⁾ (⁽²⁾)	16.7 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]			
		275			
Weight		[lb]	423 ⁽¹⁾	441 ⁽¹⁾	459 ⁽¹⁾
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

* 40kA and 50kA have a 5 cycles interruption time

** 50KA has a 5 cycles interruption time

⁽¹⁾ This value may change for the different ratings. Please check the proper standardized dimension table in chapter "Overall dimensions"

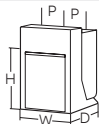
⁽²⁾ For more details, please check the proper standardized dimension table in chapter "Overall dimensions"

Circuit breaker		ADVAC 08			
Standards		ANSI 37.06 •			
Rated voltage		Ur [kV]	8.25		
Rated insulation voltage		Us [kV]	8.25		
Withstand voltage at 50 Hz		Ud (1 min) [kV]	36		
Impulse withstand voltage		Up [kV]	95		
Rated frequency		fr [Hz]	60		
Rated thermal current (40 °C)		Ir [A]	1200	2000	3000
Rated breaking capacity (rated symmetrical short-circuit current)		Isc [kA]	40	40	40
Admissible rated short-time withstand current (2s)		Ik [kA]	40	40	40
Making capacity		Ip [kA]	104	104	104
Operation sequence		[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		cycles	3 cycles	3 cycles	3 cycles
Closing time		[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	23.16 ^(?)	24.23 ^(?)	24.99 ^(?)
		W [in]	27.56 ^(?)	27.56 ^(?)	27.56 ^(?)
		D [in]	16.7 ^(?)	16.7 ^(?)	16.7 ^(?)
		Pole center distance P [mm]	275	275	275
Weight		[lb]	364	399	430
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

^(?) For more details please check the proper standardized dimension table at chapter "Overall dimensions"

ADVAC Model 4 _ Selection and Ordering

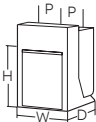
Fixed circuit breakers

Circuit breaker		ADVAC 15			
Standards		ANSI 37.06 •			
Rated voltage		Ur [kV]	15		
Rated insulation voltage		Us [kV]	15		
Withstand voltage at 50 Hz		Ud (1 min) [kV]	36		
Impulse withstand voltage		Up [kV]	95		
Rated frequency		fr [Hz]	60		
Rated thermal current (40 °C)		Ir [A]	1200	2000	3000
			25	25	25
Rated breaking capacity (rated symmetrical short-circuit current)		Isc [kA]	31.5	31.5	31.5
			40	40	40
			50	50	50
Admissible rated short-time withstand current (2s)		Ik [kA]	25	25	25
			31.5	31.5	31.5
			40	40	40
			50	50	50
Making capacity		Ip [kA]	65	65	65
			82	82	82
			104	104	104
			130	130	130
Operation sequence		[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		cycles	3 cycles	3 cycles	3 cycles
Closing time		[ms]	35 ... 60	35 ... 60	35 ... 60
<div></div> <div>Maximum overall dimensions</div>		H [in]	23.92 ⁽¹⁾ (⁽²⁾)	23.92 ⁽¹⁾ (⁽²⁾)	23.92 ⁽¹⁾ (⁽²⁾)
		W [in]	29.52 ⁽¹⁾ (⁽²⁾)	29.52 ⁽¹⁾ (⁽²⁾)	29.52 ⁽¹⁾ (⁽²⁾)
		D [in]	18.06 ⁽¹⁾ (⁽²⁾)	18.06 ⁽¹⁾ (⁽²⁾)	18.06 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]		275	275
Weight		[lb]	300 ⁽¹⁾	304 ⁽¹⁾	319 ⁽¹⁾
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

(⁽¹⁾) This value may change for the different ratings, please check the proper standardized dimension table in chapter "Overall dimensions"

(⁽²⁾) For more details please check the proper standardized dimension table in chapter "Overall dimensions"

Drawout and floor rolling (FR) circuit breakers for Advance and SafeGear

Circuit breaker		ADVAC 05			
Standards	ANSI 37.06 •				
Rated voltage	Ur [kV]	4.76			
Rated insulation voltage	Us [kV]	4.76			
Withstand voltage at 50 Hz	Ud (1 min) [kV]	19			
Impulse withstand voltage	Up [kV]	60			
Rated frequency	fr [Hz]	60			
Rated thermal current (40 °C)	Ir [A]	1200	2000	3000	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	25	25	25	
		31.5	31.5	31.5	
		40	40	40	
		50	50	50	
		25	25	25	
Admissible rated short-time withstand current (2s)	Ik [kA]	31.5	31.5	31.5	
		40	40	40	
		50	50	50	
		65	65	65	
Making capacity	Ip [kA]	82	82	82	
		104	104	104	
		130	130	130	
		[O - 0.3 s - CO - 3 min - CO]			
Operation sequence					
Total breaking time	cycles	3 cycles*	3 cycles**	3 cycles**	
Closing time	[ms]	35 ... 60	35 ... 60	35 ... 60	
Maximum overall dimensions		H [in]	27.6 ⁽¹⁾ (⁽²⁾)	27.6 ⁽¹⁾ (⁽²⁾)	28 ⁽¹⁾ (⁽²⁾)
		W [in]	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)
		D [in]	22.9 ⁽¹⁾ (⁽²⁾)	23 ⁽¹⁾ (⁽²⁾)	23.1 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]	275	275	275
Weight	[lb]	355 ⁽¹⁾	441 ⁽¹⁾	459 ⁽¹⁾	
Operating temperature	[°F]	- 31 ... + 104			
Tropicalization	ANSI 37-20.2				

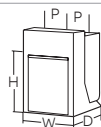
* 40kA and 50kA have a 5 cycles interruption time

** 50KA has a 5 cycles interruption time

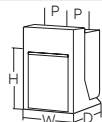
⁽¹⁾ This value may change for the different ratings. Please check the proper standardized dimension table in chapter "Overall dimensions"⁽²⁾ For more details, please check the proper standardized dimension table in chapter "Overall dimensions"

ADVAC Model 4 _ Selection and Ordering

Drawout and floor rolling (FR) circuit breakers for Advance and SafeGear

Circuit breaker		ADVAC 08			
Standards		ANSI 37.06 •			
Rated voltage		Ur [kV]	8.25		
Rated insulation voltage		Us [kV]	8.25		
Withstand voltage at 50 Hz		Ud (1 min) [kV]	36		
Impulse withstand voltage		Up [kV]	95		
Rated frequency		fr [Hz]	60		
Rated thermal current (40 °C)		Ir [A]	1200	2000	3000
Rated breaking capacity (rated symmetrical short-circuit current)		Isc [kA]	40	40	40
Admissible rated short-time withstand current (2s)		Ik [kA]	40	40	40
Making capacity		Ip [kA]	104	104	104
Operation sequence		[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		cycles	3 cycles	3 cycles	3 cycles
Closing time		[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	27.6 ⁽²⁾	27.6 ⁽²⁾	28 ⁽²⁾
		W [in]	31 ⁽²⁾	31 ⁽²⁾	31 ⁽²⁾
		D [in]	22.9 ⁽²⁾	23 ⁽²⁾	23.1 ⁽²⁾
		Pole center distance P [mm]			
		275	275	275	
Weight		[lb]	364	399	430
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

⁽²⁾ For more details please check the proper standardized dimension table in chapter "Overall dimensions"

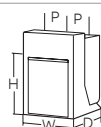
Circuit breaker		ADVAC 15			
Standards		ANSI 37.06 •			
Rated voltage	Ur [kV]	15			
Rated insulation voltage	Us [kV]	15			
Withstand voltage at 50 Hz	Ud (1 min) [kV]	36			
Impulse withstand voltage	Up [kV]	95			
Rated frequency	fr [Hz]	95			
Rated thermal current (40 °C)	Ir [A]	1200	2000	3000	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	25	25	25	
		31.5	31.5	31.5	
		40	40	40	
		50	50	50	
		65	65	65	
Admissible rated short-time withstand current (2s)	Ik [kA]	25	25	25	
		31.5	31.5	31.5	
		40	40	40	
		50	50	50	
		65	65	65	
Making capacity	Ip [kA]	82	82	82	
		104	104	104	
		130	130	130	
		130	130	130	
Operation sequence		[O - 0.3 s - CO - 3 min - CO]			
Total breaking time	cycles	3 cycles	3 cycles	3 cycles	
Closing time	[ms]	35 ... 60	35 ... 60	35 ... 60	
Maximum overall dimensions		H [in]	27.6 ⁽¹⁾ (⁽²⁾)	27.6 ⁽¹⁾ (⁽²⁾)	28 ⁽¹⁾ (⁽²⁾)
		W [in]	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)
		D [in]	22.9 ⁽¹⁾ (⁽²⁾)	23 ⁽¹⁾ (⁽²⁾)	23.1 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]	275	275	275
Weight	[lb]	364 ⁽¹⁾ (⁽²⁾)	399 ⁽¹⁾ (⁽²⁾)	430 ⁽¹⁾ (⁽²⁾)	
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

(⁽¹⁾) This value may change for the different ratings. Please check the proper standardized dimension table in chapter "Overall dimensions"

(⁽²⁾) For more details, please check the proper standardized dimension table in chapter "Overall dimensions"

ADVAC Model 4 _ Selection and Ordering

Drawout and floor rolling (FR) circuit breakers for SafeGear HD

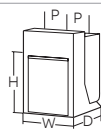
Circuit breaker		ADVAC 15			
Standards		ANSI 37.06 •			
Rated voltage		Ur [kV]	15		
Rated insulation voltage		Us [kV]	15		
Withstand voltage at 50 Hz		Ud (1 min) [kV]	36		
Impulse withstand voltage		Up [kV]	95		
Rated frequency		fr [Hz]	60		
Rated thermal current (40 °C)		Ir [A]	1200	2000	3000
Rated breaking capacity (rated symmetrical short-circuit current)		Isc [kA]	50	50	50
Admissible rated short-time withstand current (2s)		Ik [kA]	50	50	50
Making capacity		Ip [kA]	130	130	130
Operation sequence		[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		cycles	3 cycles	3 cycles	3 cycles
Closing time		[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	27.6 ⁽¹⁾ (⁽²⁾)	27.6 ⁽¹⁾ (⁽²⁾)	27.6 ⁽¹⁾ (⁽²⁾)
		W [in]	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)
		D [in]	27.3 ⁽¹⁾ (⁽²⁾)	27.3 ⁽¹⁾ (⁽²⁾)	27.2 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]			
		275	275	275	
Weight		[lb]	459	459	459
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

(⁽¹⁾) This value may change for the different ratings. Please check the proper standardized dimension table in chapter "Overall dimensions"

(⁽²⁾) For more details, please check the proper standardized dimension table in chapter "Overall dimensions"

ADVAC Model 3 _ Selection and Ordering

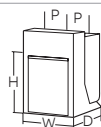
Drawout and RoF circuit breakers for Advance63

Circuit breaker		ADVAC 05			
Standards		ANSI 37.06 •			
Rated voltage		Ur [kV]	4.76		
Rated insulation voltage		Us [kV]	4.76		
Withstand voltage at 50 Hz		Ud (1 min) [kV]	19		
Impulse withstand voltage		Up [kV]	60		
Rated frequency		fr [Hz]	60		
Rated thermal current (40 °C)		Ir [A]	1200	2000	3000
Rated breaking capacity (rated symmetrical short-circuit current)		Isc [kA]	63	63	63
Admissible rated short-time withstand current (2s)		Ik [kA]	63	63	63
Making capacity		Ip [kA]	163.8	163.8	163.8
Operation sequence		[CO - 30 min - CO]			
Total breaking time		cycles	3 cycles	3 cycles	3 cycles
Closing time		[ms]	50 ... 80	50 ... 80	50 ... 80
Maximum overall dimensions		H [in]	27.7 ⁽²⁾	27.7 ⁽²⁾	27.7 ⁽²⁾
		W [in]	31 ⁽²⁾	31 ⁽²⁾	31 ⁽²⁾
		D [in]	22.9 ⁽²⁾	22.9 ⁽²⁾	23.1 ⁽²⁾
		Pole center distance P [mm]	275	275	275
Weight		[lb]	485	485	507
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

⁽²⁾ For more details please check the proper standardized dimension table in chapter "Overall dimensions"

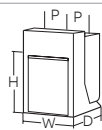
ADVAC Model 3 _ Selection and Ordering

Drawout and RoF circuit breakers for Advance63

Circuit breaker		ADVAC 15			
Standards		ANSI 37.06 •			
Rated voltage		Ur [kV]	15		
Rated insulation voltage		Us [kV]	15		
Withstand voltage at 50 Hz		Ud (1 min) [kV]	36		
Impulse withstand voltage		Up [kV]	95		
Rated frequency		fr [Hz]	60		
Rated thermal current (40 °C)		Ir [A]	1200	2000	3000
Rated breaking capacity (rated symmetrical short-circuit current)		Isc [kA]	63	63	63
Admissible rated short-time withstand current (2s)		Ik [kA]	63	63	63
Making capacity		Ip [kA]	163.8	163.8	163.8
Operation sequence		[CO - 30 min - CO]			
Total breaking time		cycles	3 cycles	3 cycles	3 cycles
Closing time		[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	27.7 ⁽²⁾	27.7 ⁽²⁾	27.7 ⁽²⁾
		W [in]	31 ⁽²⁾	31 ⁽²⁾	31 ⁽²⁾
		D [in]	22.9 ⁽²⁾	22.9 ⁽²⁾	23.1 ⁽²⁾
		Pole center distance P [mm]	275	275	275
Weight		[lb]	485	485	507
Operating temperature		[°F]	- 31 ... + 104		
Tropicalization		ANSI 37-20.2			

⁽²⁾ For more details please check the proper standardized dimension table in chapter "Overall dimensions"

Drawout circuit breakers for SafeGear HD

Circuit breaker		ADVAC 15			
Standards		ANSI 37.06 •			
Rated voltage	Ur [kV]	15			
Rated insulation voltage	Us [kV]	15			
Withstand voltage at 50 Hz	Ud (1 min) [kV]	36			
Impulse withstand voltage	Up [kV]	95			
Rated frequency	fr [Hz]	60			
Rated thermal current (40 °C)	Ir [A]	1200	2000	3000	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	63	63	63	
Admissible rated short-time withstand current (2s)	Ik [kA]	63	63	63	
Making capacity	Ip [kA]	163.8	163.8	163.8	
Operation sequence	[CO - 30 min - CO]				
Total breaking time	cycles	3 cycles	3 cycles	3 cycles	
Closing time	[ms]	50 ... 80	50 ... 80	50 ... 80	
Maximum overall dimensions		H [in]	27.7 ⁽²⁾	27.7 ⁽²⁾	27.7 ⁽²⁾
		W [in]	31 ⁽²⁾	31 ⁽²⁾	31 ⁽²⁾
		D [in]	27.3 ⁽²⁾	27.3 ⁽²⁾	27.3 ⁽²⁾
		Pole center distance P [mm]	275	275	275
Weight	[lb]	507	507	529	
Operating temperature	[°F]	- 31 ... + 104			
Tropicalization	ANSI 37-20.2				

⁽²⁾ For more details please check the proper standardized dimension table in chapter "Overall dimensions"

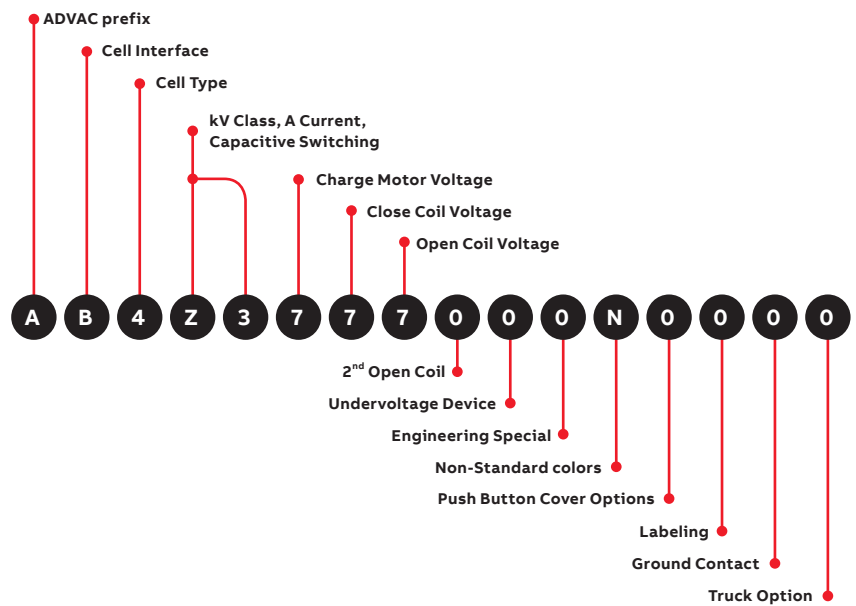
ADVAC Model 3 _ Selection and Ordering

ADVAC® Breaker Smart Style numbering

Ordering of the ADVAC®

The ADVAC® breaker product line has a structured, smart style number ordering system. The complete style number is built up of 16 customer selection digits. Each digit identifies features or functions that can be incorporated into the breaker application. The first five digits of the style number define the basic breaker. The next three digits define electrical control options. The last seven digits are used to define various options.

Sample Style Number



How to create a ADVAC, 16 digit Smart Style ordering number:

- Step 1: Specify "A" for ADVAC circuit breaker for Digit 1:
 - Step 2: Select the breaker type, A = drawout, B = Roll on the floor, F = Fixed or stationary for Digit 2:
 - Step 3: Specify "4" for EL type, model 4 ADVAC circuit breakers or "3" for classic type, model 3 circuit breakers for Digit 3:
 - Step 4: Select the system ratings according to the tables below for Digit 4 and Digit 5.
Table 1 for model 4 and table 2 for model 3:
- Continue to the next page for Smart coil description and breaker style number ordering continuation.

Digit	Value		Continuous current	Max WAVE voltage (kV,rms)	K factor	Interrupt time cycles	Short time current (kA, RMS)	Close and latch (kA, Crest)	Lightning impulse withstand (kV, crest)(BIL)	Low frequency withstand (HI-POT) (kV,RMS)	Cap switching
4&5	A	1	1200A	4.76	1.0	3	25	65	60	19	630A C2, 15kA peak 2.48 kHz
		2	2000A	4.76	1.0	3	25	65	60	19	Rated cable charging current 25A
		3	3000A	4.76	1.0	3	25	65	60	19	1000A C2, 22kA peak @2.4kHz
	B	1	1200A	4.76	1.0	3	31.5	82	60	19	Rated cable charging current 25A
		2	2000A	4.76	1.0	3	31.5	82	60	19	Rated cable charging current 25A
		3	3000A	4.76	1.0	3	31.5	82	60	19	1000A C2, 22kA peak @2.4kHz
	C	1	1200A	4.76	1.0	5	40	104	60	19	Rated cable charging current 25A
		2	2000A	4.76	1.0	3	40	104	60	19	1000A C2, 22kA peak @2.4kHz
		3	3000A	4.76	1.0	3	40	104	60	19	1000A C2, 22kA peak @2.4kHz
	D	1	1200A	4.76	1.0	5	50	130	60	19	1000A C2, 22kA peak @2.4kHz
		2	2000A	4.76	1.0	5	50	130	60	19	1000A C2, 22kA peak @2.4kHz
		3	3000A	4.76	1.0	5	50	130	60	19	1000A C2, 22kA peak @2.4kHz
	E	1	1200A	8.25	1.0	3	40	104	95	36	1000A C2, 22kA peak @2.4kHz
		2	2000A	8.25	1.0	3	40	104	95	36	1000A C2, 22kA peak @2.4kHz
		3	3000A	8.25	1.0	3	40	104	95	36	1000A C2, 22kA peak @2.4kHz
	G	1	1200A	15	1.0	3	25	65	95	36	630A C2 15kA peak 2.4kHz
		2	2000A	15	1.0	3	25	65	95	36	Rated cable charging current 25A
		3	3000A	15	1.0	3	25	65	95	36	1000A C2, 22kA peak @2.4kHz
	H	1	1200A	15	1.0	3	31.5	82	95	36	Rated cable charging current 25A
		2	2000A	15	1.0	3	31.5	82	95	36	Rated cable charging current 25A
		3	3000A	15	1.0	3	31.5	82	95	36	1000A C2, 22kA peak @2.4kHz
	J	1	1200A	15	1.0	3	40	104	95	36	1000A C2, 22kA peak @2.4kHz
		2	2000A	15	1.0	3	40	104	95	36	1000A C2, 22kA peak @2.4kHz
		3	3000A	15	1.0	3	40	104	95	36	1000A C2, 22kA peak @2.4kHz
	K	1	1200A	15	1.0	3	50	130	95	36	1030A C2, 7.2kA peak @625kHz
		2	2000A	15	1.0	3	50	130	95	36	1030A C2, 7.2kA peak @625kHz
		3	3000A	15	1.0	3	50	130	95	36	1030A C2, 7.2kA peak @625kHz
	L (*)	1	1200A	15	1.0	3	50	130	95	36	1000A C1, 19kA peak @2.6kHz
		2	2000A	15	1.0	3	50	130	95	36	1000A C1, 19kA peak @2.6kHz
		3	3000A	15	1.0	3	50	130	95	36	1000A C1, 19kA peak @2.6kHz

(*) L1, I2, and I3 are for use only in safeGear hd switchgear

Digit	Value (4)	Value (5)	Continuous Current Ir [A]	Rated Voltage (max wave voltage Ur) [kV RMS]	Short-time current Ik [kA RMS]	Short-circuit breaking current Ikc [kA RMS]	Switchgear	Power frequency withstand voltage Ud [kV]	Lightning Impulse withstand voltage Up [kV]	Cap switching
	M	1	1200A	15	63	63	SafeGear Hz	36	95	1600A C1
	M	2	2000A	15	63	63		36	95	1600A C1
	M	3	3000A	15	63	63		36	95	1600A C1
	U	1	1200A	4.76	63	63	Advance 63 kA	19	60	1600A C1
	U	2	2000A	4.76	63	63		19	60	1600A C1
	U	3	3000A	4.76	63	63		19	60	1600A C1
	V	1	1200A	15	63	63	Advance 63 kA	36	95	1600A C1
	V	2	2000A	15	63	63		36	95	1600A C1
	V	3	3000A	15	63	63		36	95	1600A C1

ADVAC Model 3 _ Selection and Ordering

Charging Motor Smart numbering

Digit	Value	Charge motor voltage
6	A	120VAC
	B	240VAC
	5	24VDC
	6	48VDC
	7	125VDC
	8	250VDC

Step 5: Select Charging Motor voltage from table for **Digit 6:**

-MAS / 88M

Charging Motor automatically loads the closing springs of the circuit breaker operating mechanism. After circuit breaker closing, the geared motor immediately reloads the closing springs.

Characteristics	
Un	24..48VDC, 125VDC, 250VDC 120VAC, 240VAC
Operating Limits	85..110% Un
Power on Inrush (Ps)	600W, 900W for 40kA, 3000A and C2 rated breakers
Rated Power (Pn)	200W, 350W for 40kA, 3000A and C2 rated breakers
Inrush duration	0.2s
Charging Time	6-7 seconds
Insulation voltage	1500VAC @ 1min

If there is a power loss or during maintenance work, the closing spring can be charged with the manual charging handle built into in the operating mechanism.

-BGS2 / -33Lsa

Breaker charged / discharged is a standard accessory Contact for signaling the breaker status.

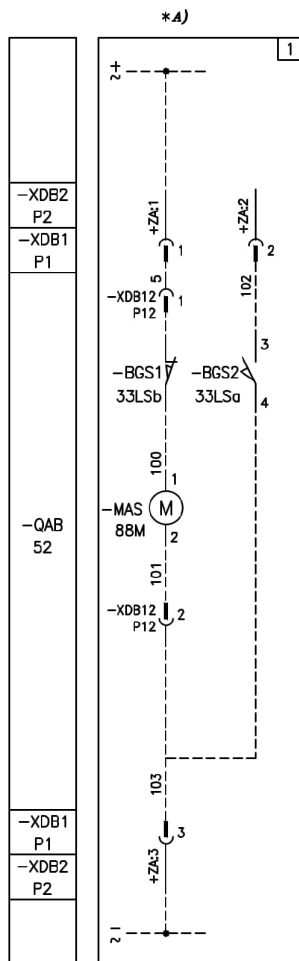
Consists of a microswitch which allows the state of the closing spring of the circuit breaker operating mechanism to be remotely signaled.

The following signals are possible:

- contact open: spring loaded signal
- contact closed: spring discharged signal.

The two signals must be used for circuits with the same power supply voltage. Of the charging motor.

Continue to the next page for Smart coil
accessory description and ordering.



Rated Voltage (a.c.)	250	V
Rated Current	10	A
Thermal capacity	17	A
Short-time withstand current	20	A for 30 sec
Withstand voltage at 50 Hz for 1 minute between live parts and ground	>2000	V
Distance between open contacts	0.5	mm

Smart coil Accessories

ADVAC® Smart coils

For accessory digits 7 thru 10 of the ADVAC® style number, the device employ's smart coil switch technology. The Smart coil will function in a circuit as an older style coil would, except with added benefits for monitoring and increased reliability as opposed to a standard coil. The Smart coil has a high impedance input due to the onboard electronics.

This high impedance gives the device a lower current draw than conventional coils thus having a higher than expected voltage drop (~60V for 125V system) across the coil during coil supervision. The reduced power consumption (~100mA @125VDC) of the Smart coil during supervision make it suitable for constant 24/7 monitoring with the circuit breaker in the open or closed position. This also leads to a reduce battery bank size when used with backup systems. The Smart coil will constantly pulse the current in the coil monitoring circuit every time an internal health check has been completed. Onboard health diagnostics check the coil impedance, temperature and internal circuitry. Should an issue arise the Smart coil will act like an open circuit.

Additionally Smart coil have a faster response time than a standard coil in that it triggers off of a voltage threshold for actuation where standard coils require a large current increase in the circuit to create the necessary magnetic force for activation.



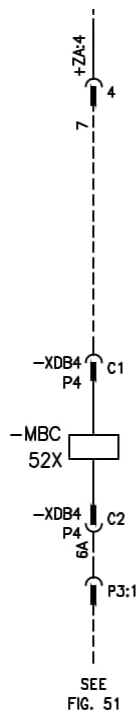
SmartCoil Pack item 10 on page 12, consists of the Open coil, Close Coil, and Undervoltage coil .

Smart coil main technical characteristics are:

	Power supply voltage range	
Power supply voltage	24...48 VDC;	125...250 VDC; 120...240 VAC
Temperature range	-40°C ... +70°C	
Normal operating range Smart Coil	65% .. 120% rated voltage	
Inrush power consumption (¹)	60...100W / VA	
Continuous service power (¹)	1.5W	
Coil monitoring current	100mA	
Insulation Voltage	1500V AC-common mode- 1min	

(¹) Indicative value that may vary based on the ambient temperature, but is independent of power supply voltage

ADVAC Model 3 _ Selection and Ordering



Close Coil Smart numbering

Step 6: Select Close Coil voltage from table for **Digit 7:**

-MBC / 52X

Closing Coil, ADVAC® Smart coil closing release allows closing command of the breaker to be transmitted by remote control. This electronic solenoid release is suitable for both instantaneous and permanent duty.

The permanently supplied release provides the electrical anti-pumping function with both electrical opening and re-closing commands maintained.

To guarantee the closing action, the current impulse must last at least 100 ms. If there is the same supply voltage for shunt closing release -MBC and undervoltage release -MBU and the circuit breaker must close automatically when auxiliary voltage returns, there must be a delay of at least 50ms between undervoltage release energizing and energizing of the shunt closing release to allow the closing operation to take place. Continuity functionality can be checked with a continuity control device (CCC), opening circuit supervision (TCS)(*) or the STU functionality control device (supplied on request).

Digit	Value	Close Coil voltage
7	A	120VAC
	B	240VAC
	5	24VDC
	6	48VDC
	7	125VDC
	8	250VDC



Open Coil Smart numbering

Step 7: Select Open Coil voltage from table for **Digit 8:**

-MBO1 / 52TC1

First Open coil, ADVAC® Smart opening coil allows opening command of apparatus to be enabled by remote control. This release is suitable for both instantaneous and permanent duty. However, an auxiliary contact -BGB1 de-energizes the coil after circuit breaker has opened. A coil monitoring wire is provided for continues monitoring. This release can be controlled by the following devices: coil continuity control (CCC), opening circuit supervision (TCS)(*) or the ABB STU functionality control device (accessory supplied on request). The first open coil is located directly behind the UV coil on the smart coil pack.

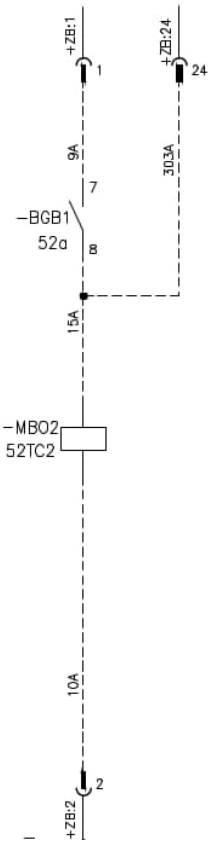
Digit	Value	Open Coil voltage
8	A	120VAC
	B	240VAC
	5	24VDC
	6	48VDC
	7	125VDC
	8	250VDC



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CLAUDIA-JULIA-DANIELLE-MARTINA-Alessandro\\$_
Luca Radaelli\\$\$\$\$_1VCD601690.R0000_r1_noted for
40kA release_march2022\Links

ADVAC Model 3 _ Selection and Ordering

Accessories



Step 8: Select 2nd Open Coil voltage from table for **Digit 9:**
-MBO2 / 52TC2

Second Open coil, ADVAC® Smart Opening Coil additional release similarly to shunt opening release -MBO1, this allows the opening command of the apparatus to be transmitted by remote control. It can be powered by the same circuit as main shunt opening release -MBO1 or by a circuit that is completely separate from release -MBO1. This release is suitable for both instantaneous and permanent duty. However, an auxiliary contact -BGB1 de-energizes it after the circuit breaker has opened. A coil monitoring wire is provided for continues monitoring. Continuity functionality can be checked with a continuity control device (CCC), opening circuit supervision (TCS) or the STU functionality control device (supplied on request). -MBO2 has the same electrical and operating characteristics as release -MBO1 .

Digit	Value	2 nd Open Coil voltage
9	A	120VAC
	B	240VAC
	5	24VDC
	6	48VDC
	7	125VDC
	8	250VDC
	X	Not Installed

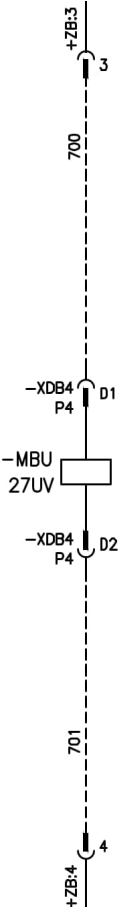


Accessories

Step 9: Select Under Voltage Coil voltage from table for **Digit 10:**
-MBU/ 27UV

Undervoltage release, ADVAC® Smart coil undervoltage release opens the circuit breaker when there is a sensible reduction or lack of the voltage that powers it. The circuit breaker can only close when the release is energized (the closing lock is obtained mechanically). It can be used for remote release (by means of a pushbutton of the normally closed type), for locking on automatic closing/opening in the absence of voltage in the auxiliary circuits. Supplied by means of the secondary output of a voltage transformer, it provides locking upon automatic closing/opening in the absence of voltage in the Medium Voltage main circuit. If there is the same supply voltage for shunt closing release -MBC and undervoltage release -MBU and the circuit breaker must close automatically when auxiliary voltage returns, there must be a delay of at least 50 ms between undervoltage release energizing and energizing of the shunt closing release to allow the closing operation to take place.

Digit	Value	Undervoltage device
10	A	120VAC
	B	240VAC
	5	24VDC
	6	48VDC
	7	125VDC
	8	250VDC
	X	Not Installed



Undervoltage release mechanical override This is a mechanical device which allows the undervoltage release trip to be temporarily excluded. When the ADVAC is fitted with a Undervoltage release , the Undervoltage release mechanical override must be used to discharge the breaker prior to removal form the compartment.

ADVAC Model 3 _ Selection and Ordering

Accessories

Step 10: Select 0 for standard or 2 for added early "B" contact option **Digit 11:**

This contact closes momentarily (duration > 30 ms) upon circuit breaker opening. The transient contact is activated directly from the main operating shaft, thus the indication is provided on an actual opening of the main circuit breaker contacts.

Digit	Value	Engineering special
11	0	Standard ABB labels
	1	No ABB labels
	2	Early "B" + standards ABB labels
	3	Early "B" + no ABB labels
	4	Standard ABB labels + pin Monitor removal

for model 3, only values "0" and "1" are available to select



(*) For application at 24VDC and with currents lower than 2,5mA golden contacts are recommended.

General characteristics	
Insulation voltage to standard VDE 0110, Group C	660 V AC 800 V DC
Rated voltage	24 V ... 660 V
Test voltage	2 kV for 1 min
Maximum rated current	10 A - 50/60 Hz
Breaking capacity	Class 1 (IEC 62271-1)
Number of contacts	5
Groups of contacts	10 / 16 / 20
Contact travel	90°
Actuating force	0.66 Nm
Resistance	<6.5 mΩ
Storage temperature	-30 °C ... +120 °C
Operating temperature	-20 °C ... +70 °C (-30° ref. ANSI 37.09)
Contact overtemperature	10 K
Mechanical life	30.000 mechanical operations
Protection class	IP20
Cable section	1 mm ²

Electrical characteristics (according to IEC 60947)		
Rated current Un		Breaking capacity (10000 interruptions)
220 V AC	Cosφ = 0.70	20 A
220 V AC	Cosφ = 0.45	10 A
24 V DC	1 ms (*)	12 A
	15 ms	9 A
	50 ms	6 A
60 V DC	1 ms	10 A
	15 ms	6 A
	50 ms	4.6 A
110 V DC	1 ms	7 A
	15 ms	4.5 A
	50 ms	3.5 A
220 V DC	1 ms	2 A
	15 ms	1.7 A
	50 ms	1.5 A
250 V DC	1 ms	2 A
	15 ms	1.4 A
	50 ms	1.2 A

Electrical characteristics (according to IEC 62271-100 class 1)	
Rated voltage Un	Breaking capacity
24 V DC 20 ms	18.8 mA
60 V DC 20 ms	7.4 mA
110 V DC 20 ms	4.2 mA
250 V DC 20 ms	1.8 mA

Accessories

Step 11: Select the desired pushbutton and mechanical charged flag Indicator coloring scheme for **Digit 12:**



Standard IEEE coloring scheme is option 0.

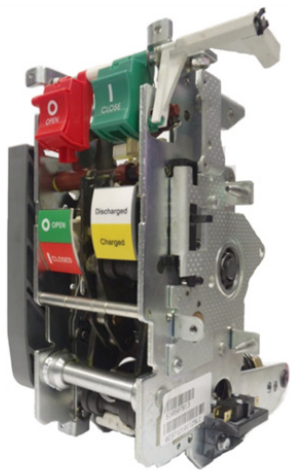
option 0 is as follows:
Open pushbutton—Red background with the word “open” in contrasting letters to indicate that the release opens the circuit breaker.
Close pushbutton— Green background with the word “close” in contrasting letters to indicate that the release closes the circuit breaker.
Breaker Closed indication—Red background with the word “closed” Breaker Open indication Green background with the word “open”

Option 1 reverse buttons is as follows:
Open pushbutton— Green background with the word “close” in contrasting letters to indicate that the release closes the circuit breaker.
Close pushbutton—Red background with the word “open” in contrasting letters to indicate that the release opens the circuit breaker.
Breaker Closed indication—Red background with the word “closed”
Breaker Open indication Green background with the word “open”

Digit	Value	Non Standar Colors
12	0	N/A
	1	Reverse Buttons
	2	Reverse Buttons and Indicator
	3	Reverse Indicator

Option 2 reverse buttons and indicators is as follows:
Open pushbutton— Green background with the word “close” in contrasting letters to indicate that the release closes the circuit breaker.
Close pushbutton—Red background with the word “open” in contrasting letters to indicate that the release opens the circuit breaker.
Breaker Closed indication Green background with the word “open”
Breaker Open indication—Red background with the word “closed”

Option 3 reverse indicators is as follows:
Open pushbutton—Red background with the word “open” in contrasting letters to indicate that the release opens the circuit breaker.
Close pushbutton— Green background with the word “close” in contrasting letters to indicate that the release closes the circuit breaker.
Breaker Closed indication Green background with the word “open”
Breaker Open indication—Red background with the word “closed”



ADVAC Model 3 _ Selection and Ordering

Accessories

Step 12: Select pushbutton cover options for **Digit 13:**

Option 0 is standard offering with no covers over the Open and Close pushbuttons.

Option 1 adds a cover over the Close pushbutton, inhibiting local operators from closing the breaker.

Option 2 adds a cover over both Close and Open pushbuttons, inhibiting local operations of the circuit breakers.

Options 3 adds a key lock to keep the breaker from closing when in open position.

Step 13: Specify special labeling requirements **Digit 14:**

Option 0 is standard offering with all labels in English.

Option S changes the labeling on the breaker into Spanish.

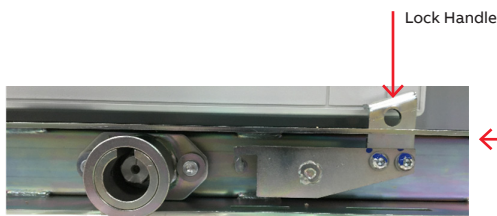
Option U adds the UL sticker on the circuit breaker

Option T adds the UL sticker to the breaker and changes the labeling of the breaker in spanish

Step 14: Select lock handle options for **Digit 15:**

Option 0 is the standard offering with the lock handle installed (also used as the truck interlock release arm). This handle allows padlocking of the breaker truck itself. Additional padlocking will be available outside of the switchgear door. The Lock handle is removed for Process Industry Practices PIP application where it is required that the breaker can only be racked in with the switchgear door closed. Removal of the handle prevents an operator from manually releasing the truck. The operator would have to close the switchgear door and use the racking release level on the outer switchgear door to perform a manual racking.

For PIP application please contact the factory.



Option G adds silver plated copper ground shoes to the breaker truck assembly. The standard ground shoes are stainless steel. All ADVAC breakers are type tested with the standard ground stainless steel shoe offering.

Option 3 is the standard circuit breaker with stainless steel shoe and no lock handle kit.

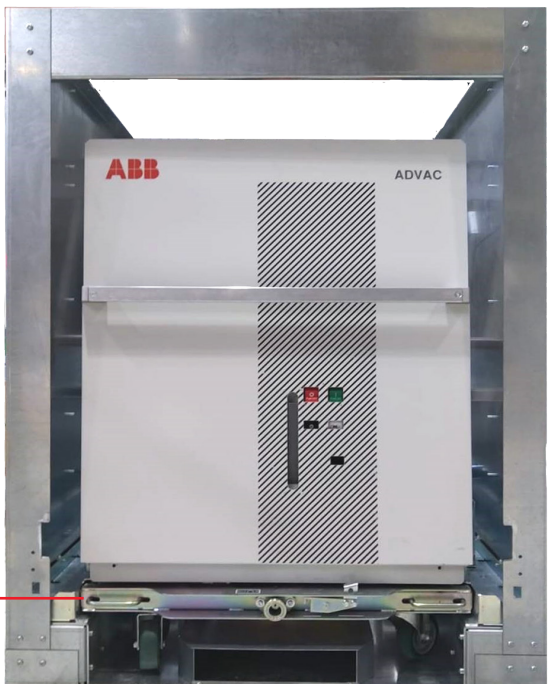
Option 4: Adds silver plated copper ground shoes to the breaker truck assembly. No lock handle kit.

Option 1: is for standard fixed mount circuit breaker.

Option 2: is for fixed mount circuit breaker. It adds a kirk key interlock on closing operation.

Digit	Value	Push button options
13	0	N/A
	1	Close button cover
	2	Close/open button cover
	3	Key lockout - open position

For model 3, only options "0" and "1" are available



Digit	Value	Labels (See note 4)
14	0	N/A
	U	UI sticker (see note 6)
	S	Spanish labeling
	T	Spanish labeling + UL sticker (see note 6)

Digit	Value	Ground contact
15	0	Lock handle kit
	G	Copper ground contact + lock handle kit
	3	None
	4	Copper ground contact
		Fixed mount options
	1	AF4 no kirk key interlock
	2	Af4 kirk key interlock

For options "1" and "2" are not available for model 3

Step 15: Select Integrated Racking Mechanism (IRM) truck type or fixed mounted breaker.

Digit 16:

Option 0 is the standard drawout manual truck assembly. The manual truck can be used with SmartRack for remote racking.

Options 2 thru 4 adds the ANSI three position motorized integrated racking mechanism of the appropriate voltage selected.

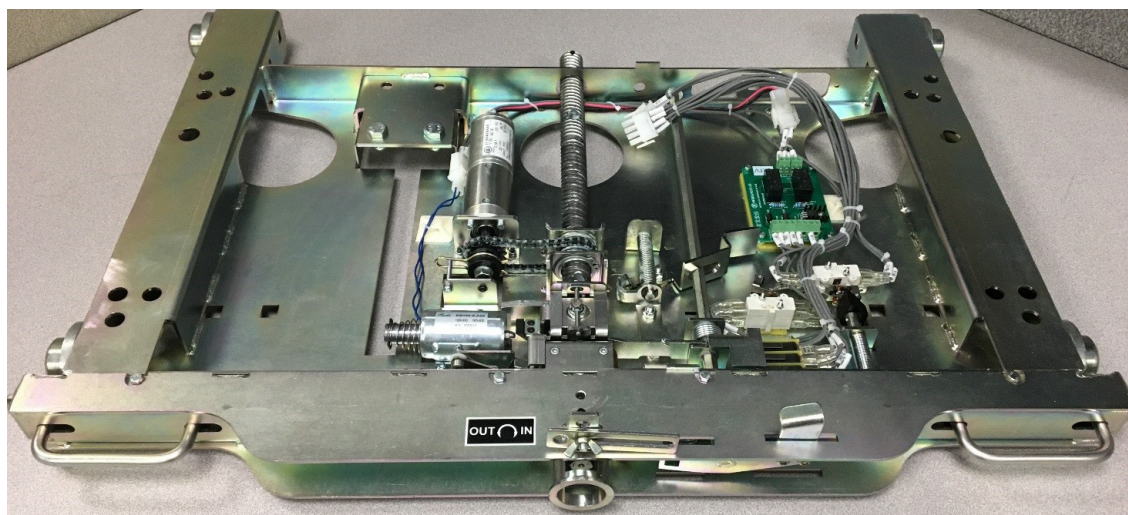
Options A thru D adds the ANSI three position motorized integrated racking mechanism of the appropriate voltage selected and the ABB recommend dual pole miniature circuit breaker protection for the motorized truck S202MK0.5UC.

Option F should be selected for fixed mounted or stationary breakers without truck assemblies

Digit	Value	Motorized truck
16	0	Manual truck
	2	48VDC
	3	125VDC
	4	220VDC
	B	48VDC with protection
	C	125VDC with protection
	D	220VDC with protection
	F	No Truk (free standing execution only)



S202M-K0.5UC



Motorized Truck assembly

ADVAC Model 3 _ Selection and Ordering

Optional accessories

Motor truck current monitoring

The CM-SRS.2 is an electronic current monitoring relay that can be used to monitor the motorized truck. Monitoring the single-phase overcurrent from the truck assembly will provide indication that a blockage in the electric racking has occurred. When set appropriately for an overcurrent during racking the CMSRS. 2 will cut power to the IRM motorized assembly to stop racking and provide a dry contact indication that the OC condition occurred.

Order code 1SVR730840R0400 for the CMSRS. 21S, 24-240 VAC/DC , Screw terminals, measuring range of 0.1-1 A.

<https://new.abb.com/products/1SVR730840R0400/cm-srs-21s>





Spare parts

ADVAC circuit breakers come with a variety of accessories available to order, for example:

- Opening release, coil switch, smart coil 3 cycles, smart coil 5 cycles
- Closing release
- Under-voltage release
- Spring charging motor
- Transient contact
- Operation counter

Many more accessories and replacements are available through your local Service team. Make sure to contact them for further information on the available kits and check the spare parts catalog 1VAL050501.

Contact your local Service team for further information.

Compartments

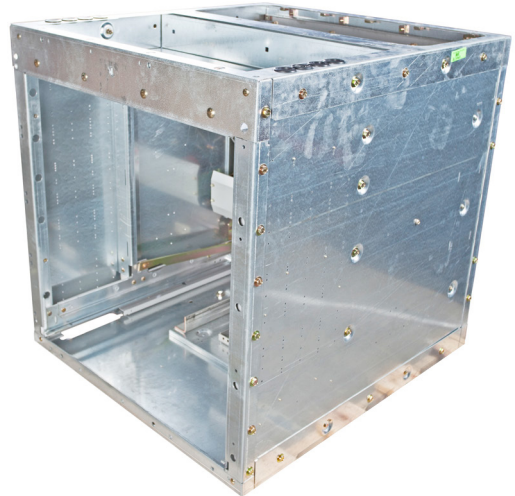
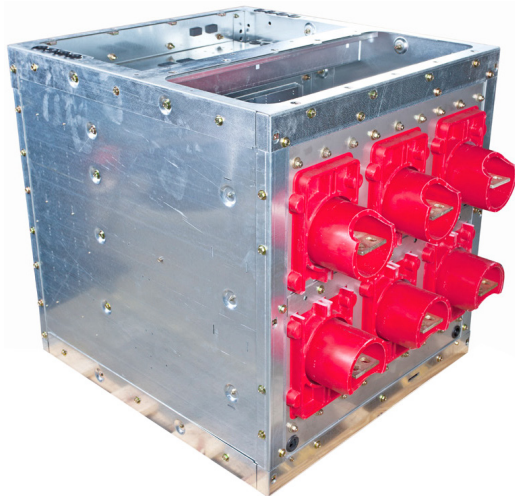
Breaker compartments, 5-27 kV/25-50 kA

Circuit breaker compartments are 38-inches high with a choice of glass-polyester or porcelain primary bushings. Compartments have the same overall size regardless of rating, but compartments rated at 2000 A and 3000 A have a raised floor with a vent system.

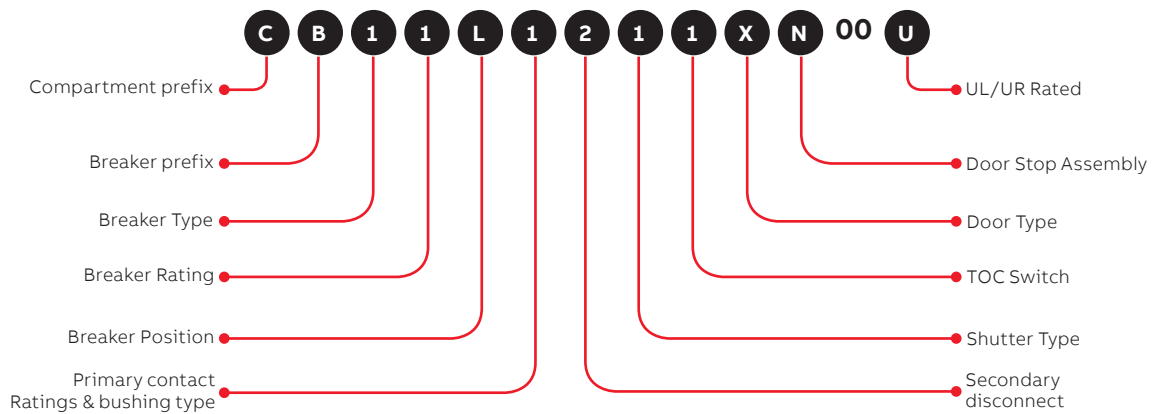
Optional accessories include a pre-fabricated TOC switch wire harness with 8 or 16 contacts and hinged door options consisting of panel screws, multi-point latch (MPL), and outdoor non-walk-in (ODNWI). Panel screws secure the door using numerous bolts, which screw into nuts, within the frame of the compartment. The MPL option utilizes a single latch handle to secure the door to the frame of the compartment. The ODNWI selection provides extended hinges to clear an outdoor enclosure and t-handles to secure the door to the compartment frame.

These door options are available as a complete assembly or as a kit with all hardware (hinges, latches, etc.) provided but the door panel is not included. All door assemblies and kits are supplied with a SmartRack™ adapter plate. A door stop is also optional to prevent the door from closing while accessing the desired compartment, except for ODNWI doors where it is supplied as standard.

UL recognition is provided as a standard for all breaker compartments. The 14-digit smart style number will ease in the selection of the various options that can be incorporated into the breaker compartment.



Sample style number



Style number reference

The breaker compartment product line has a structured, smart style number ordering system. The complete style number is built up of 14 customer selection digits. Each digit identifies features or functions that can be incorporated into the compartment.

How to order

Select the required option codes to fill in the smart style number. The total list price is computed by adding the individual list prices for each of the selections.

- Step 1: Specify "C B" to select the breaker compartment (digits 1 & 2) from Table 6.1.
- Step 2: Select the breaker type (digit 3) from Table 6.2.
- Step 3: Select the system rating (digit 4) for the breaker from Table 6.3.
- Step 4: Select the breaker position in the frame (digit 5) from Table 6.4.
- Step 5: Select the primary contact rating and bushing type (digit 6) from Table 6.5.
- Step 6: Select secondary disconnect (digit 7) from Table 6.6.
- Step 7: Select shutter type (digit 8) from Table 6.7.
- Step 8: Select TOC switch preference (digit 9) from Table 6.8.
- Step 9: Select door assembly preference (digit 10) from Table 6.9.
- Step 10: Select door stop assembly preference (digit 11) from Table 6.10.
- Step 11: Specify "0 0" for (digits 12 & 13) from Table 6.11.
- Step 12: Specify "U" for UL recognition (digit 14) from Table 6.12.

Compartments

Breaker compartments, 5-27 kV/25-50 kA

Table 6.1 Compartment prefix

Digit	Description	Selection
1-2	Prefix	C B

Table 6.2 Breaker type

Digit	Description	Selection
3	Standard drawout	1
	Direct rollout onto the floor	R

Note: 27 kV is only available in standard drawout. Must select option 1 for 27 kV applications

Table 6.3 Breaker kV rating

Digit	Description	Selection
4	5-15 kV, 50 kA max	1
	27 kV, 25 kA max	2

Table 6.4 Breaker compartment position

Digit	Description	Selection
5	Upper	U
	Lower	L

Note: Must select Lower/L for Roll on the Floor applications

Table 6.5 Primary contact ratings and bushing types

Digit		Description	Selection
6	Polyester glass	1200A	1
		2000A	2
	Porcelain	1200A	3
		2000A	4
		3000A	5
		1200A (27 kV)*	6
		2000A (27 kV)*	7

Note: Must purchase CT mounting kit from breaker and switchgear accessories section if utilizing bushing mounted CTs in 27kV application

Table 6.6 Secondary disconnect

Digit	Description	Selection
7	Single disconnect (4a & 4b aux contacts)	1
	Dual disconnect (9a & 8b aux contacts)	2

Note: Selection of secondary disconnects must match breaker

Table 6.7 Shutter type

Digit	Description	Selection
8	Grounded metal	1
	Lexan	2

Note: Must select lexan for 27 kV

Table 6.8 TOC switch

Digit	Description	Selection
9	None	0
	8 contacts	1
	16 contacts	2

Table 6.9 Door Assembly

Digit	Description	Selection
10	None	X
	Panel screws assembly	A
	MPL assembly	B
	ODNWI assembly	C
	Panel screws kit	D
	MPL kit	E
	ODNWI kit	F

Note: All door assemblies and kits are supplied with SmartRack™ adapter plate

Table 6.10 Door stop assembly

Digit	Description	Selection
11	Included	Y
	Not included	N

Note: Must select Y for ODNWI door selections

Table 6.11

Digit	Description	Selection
12-13	-	0 0

Table 6.12 Certification

Digit	Description	Selection
14	UL recognition	U

Notes

1. Breaker interference plates are not supplied with breaker compartments. They must be ordered separately from Table F.
2. Refer to Configuration Options 1-4 for recommended stacking arrangements.
3. Breaker compartments are compatible with ABB type SAB bushing mounted current transformers (CTs) with Mylar inserts. Refer to Optional Components for CT mounting kits. Refer to appropriate breaker compartment drawings and separate CT catalog to determine proper CT window size and ordering information. Contact the ABB Pinetops facility for ordering and pricing information on instrument transformers.
4. Must purchase CT mounting kit from breaker and switchgear accessories section if utilizing bushing mounted CTs in 27kV application.

Breaker compartment order worksheet

C	B										0	0	U
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Digit Tables								Table Value			List Price		
Step 1: Specify "C B" to select the breaker compartment (digits 1 & 2) from Table 6.1													
Step 2: Select the breaker type (digit 3) from Table 6.2													
Step 3: Select the system rating (digit 4) for the breaker compartment from Table 6.3													
Step 4: Select the breaker compartment position (digit 5) from Table 6.4													
Step 5: Select the primary contact rating and bushing type (digit 6) from Table 6.5													
Step 6: Select secondary disconnect (digit 7) from Table 6.6													
Step 7: Select shutter type (digit 8) from Table 6.7													
Step 8: Select TOC switch option (digit 9) from Table 6.8													
Step 9: Select door assembly option (digit 10) from Table 6.9													
Step 10: Select door stop assembly option (digit 11) from Table 6.10													
Step 11: Specify "0 0" for (digits 12 & 13) from Table 6.11													
Step 12: Specify "U" for UL certification (digit 14) from Table 6.12													
Step 13: Total list price (USD) and apply multiplier to calculate net price								Total list price (USD)					
Enter complete smart style number to top of page								Enter multiplier					
								Calculate net price					

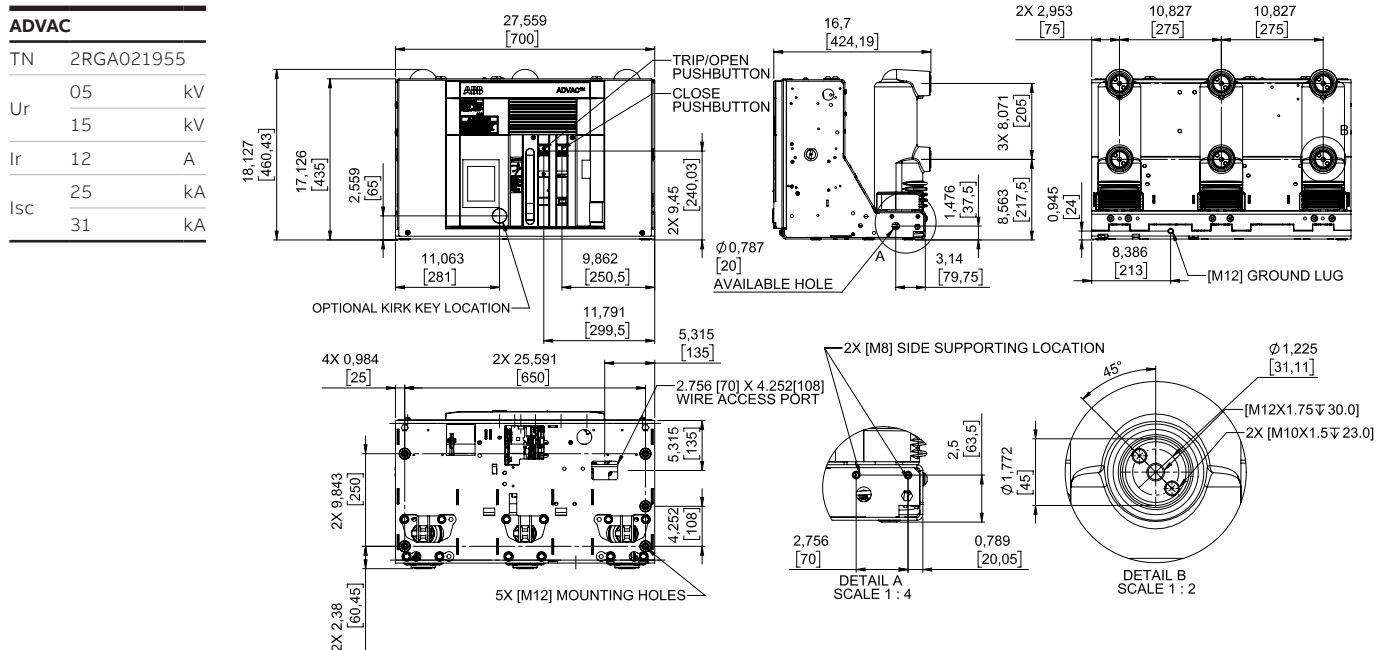
Overall Dimensions

Model 4

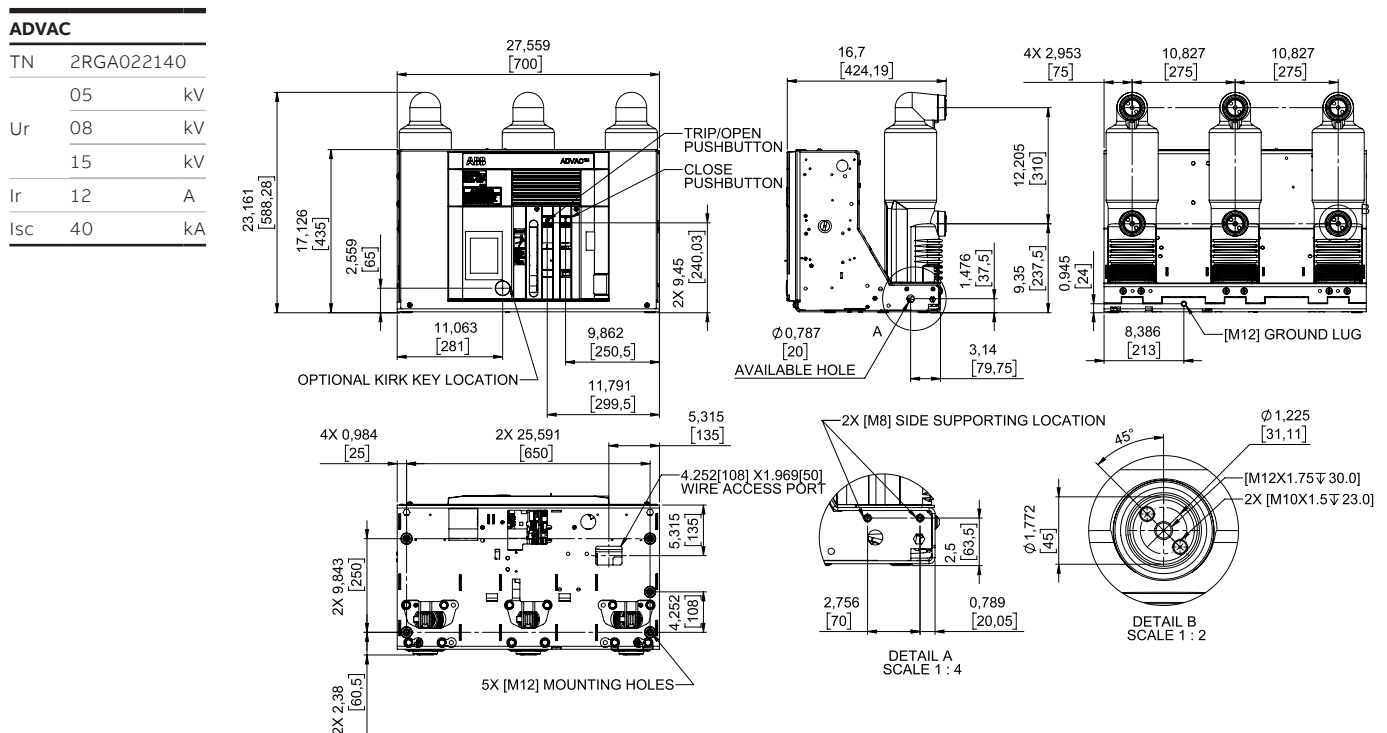
ADVAC circuit breakers come in different ratings and executions.

The standardized dimension drawings are reported below, highlighting the model and rating covered.

Fixed version



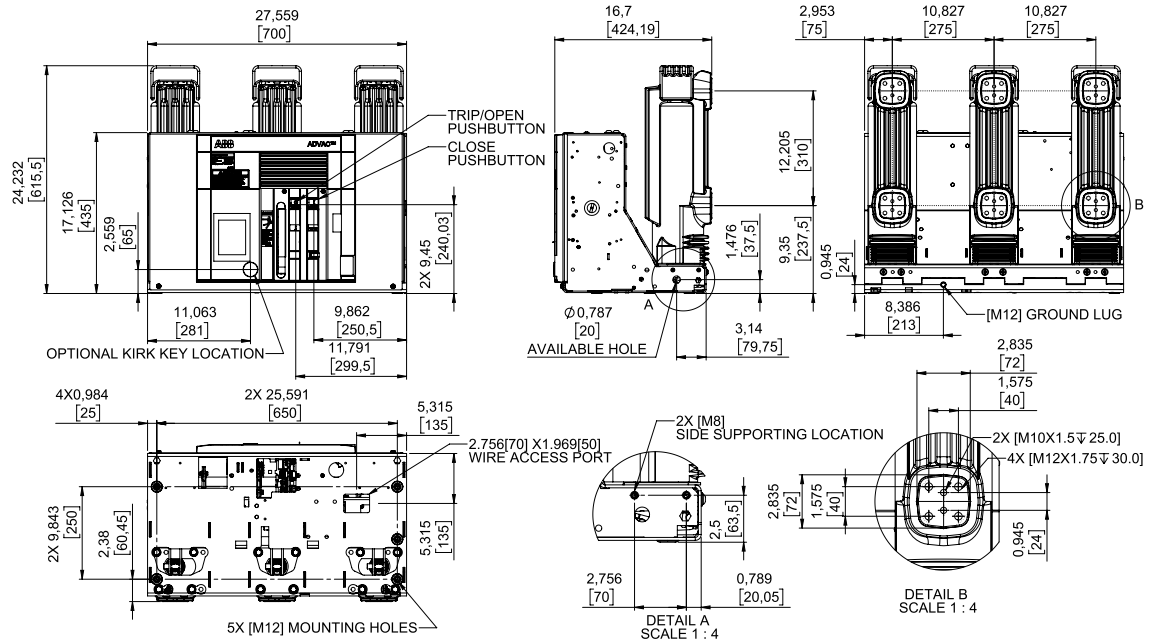
Fixed version



Model 4

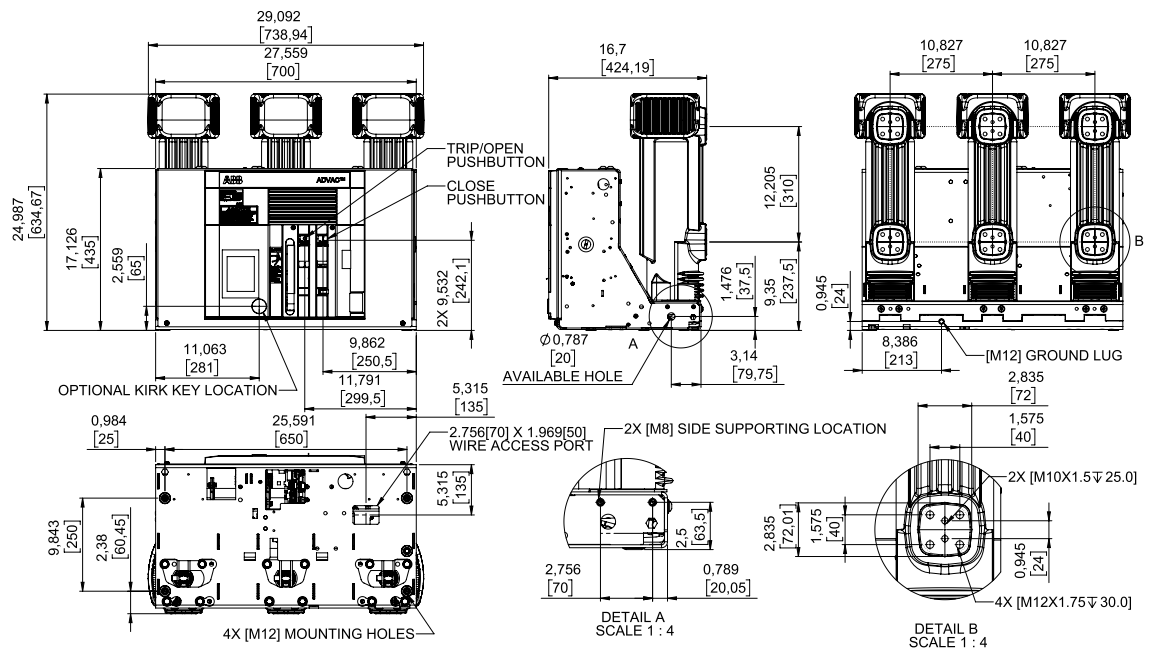
Fixed version

ADVAC		
TN	2RGA022237	
	05	kV
Ur	08	kV
	15	kV
Ir	20	A
	25	kA
Isc	31	kA
	40	kA



Fixed version

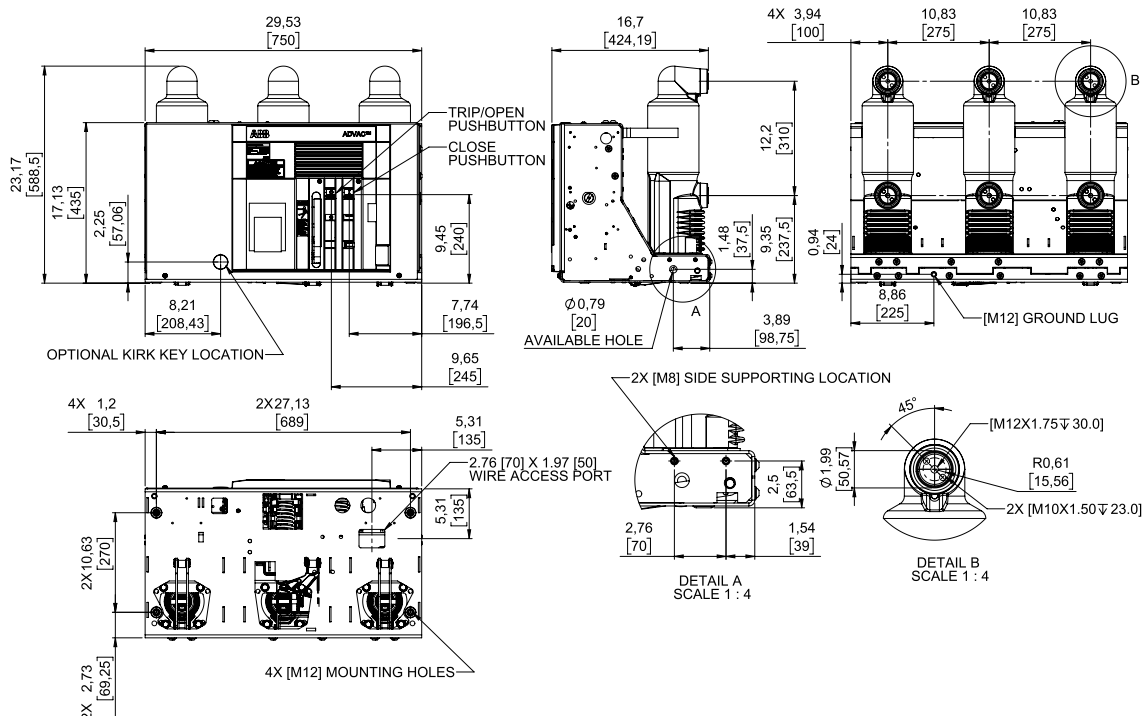
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TN	2RGA022249	
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Ur	08	kV
	15	kV
Ir	30	A
	25	kA
Isc	31	kA
	40	kA



Overall Dimensions

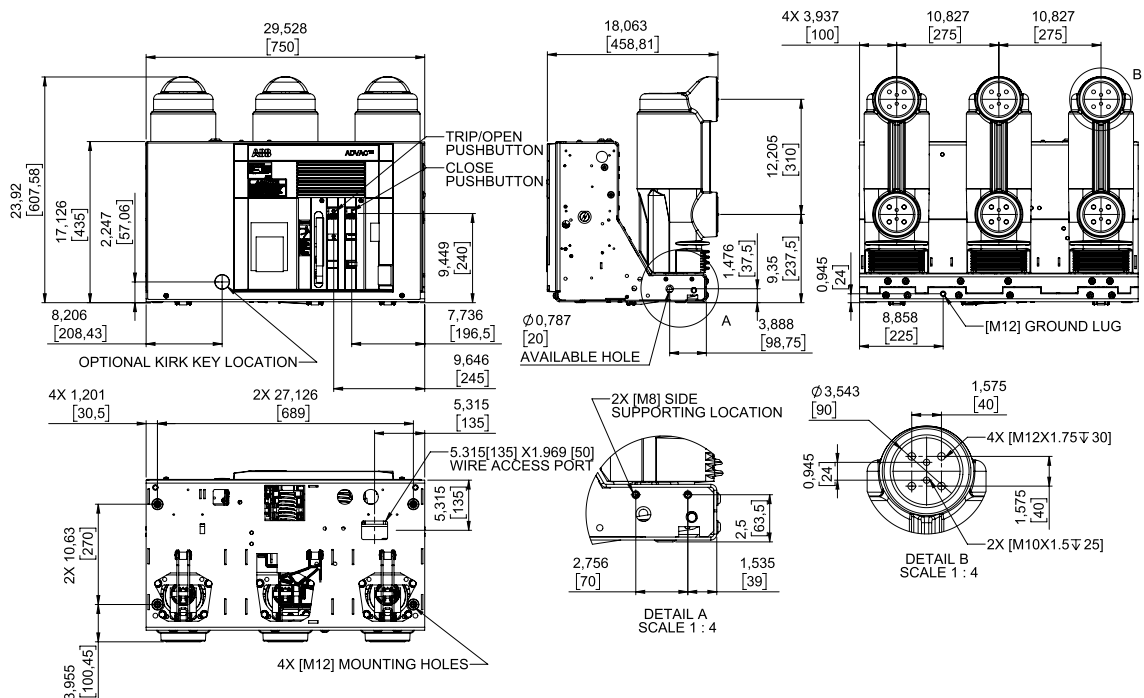
Fixed version

ADVAC			
TN	2RGA022378		
Ur	05	kV	
Ir	12	A	
Isc	50	kA	



Fixed version

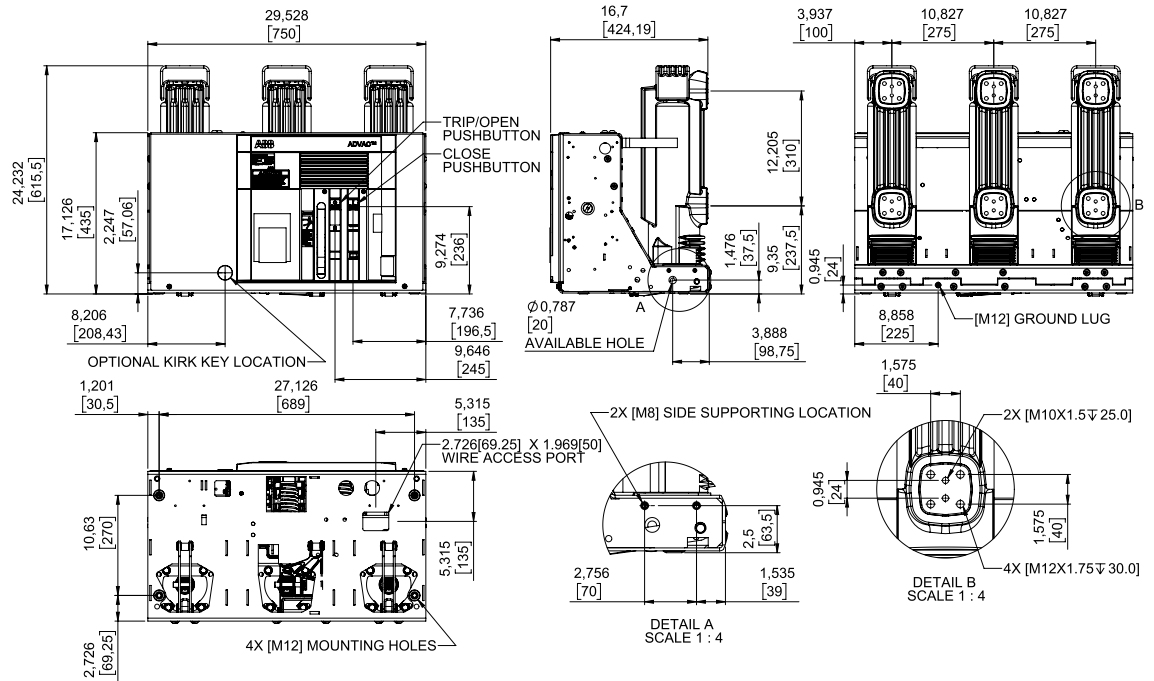
ADVAC			
TN	2RGA022397		
Ur	05	kV	
	15	kV	
	12	A	
Ir	20	A	
	30	A	
Isc	50	kA	



Model 4

Fixed version

ADVAC		
TN	2RGA024665	
Ur	05	kV
Ir	20	A
	30	A
Isc	50	kA

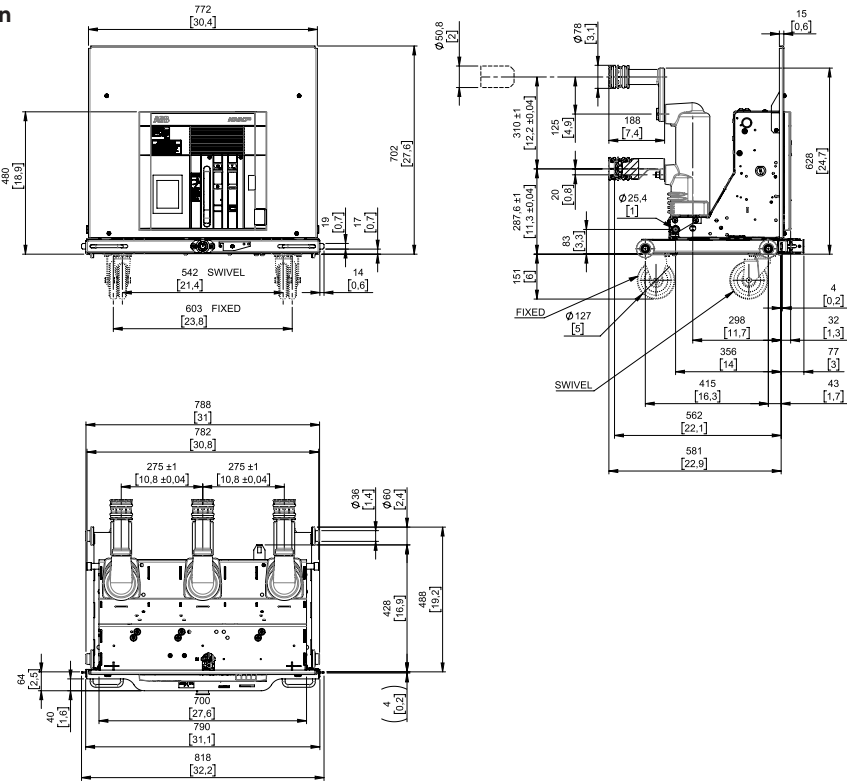


Overall Dimensions

Drawout and RoF for ADVAC /SafeGear

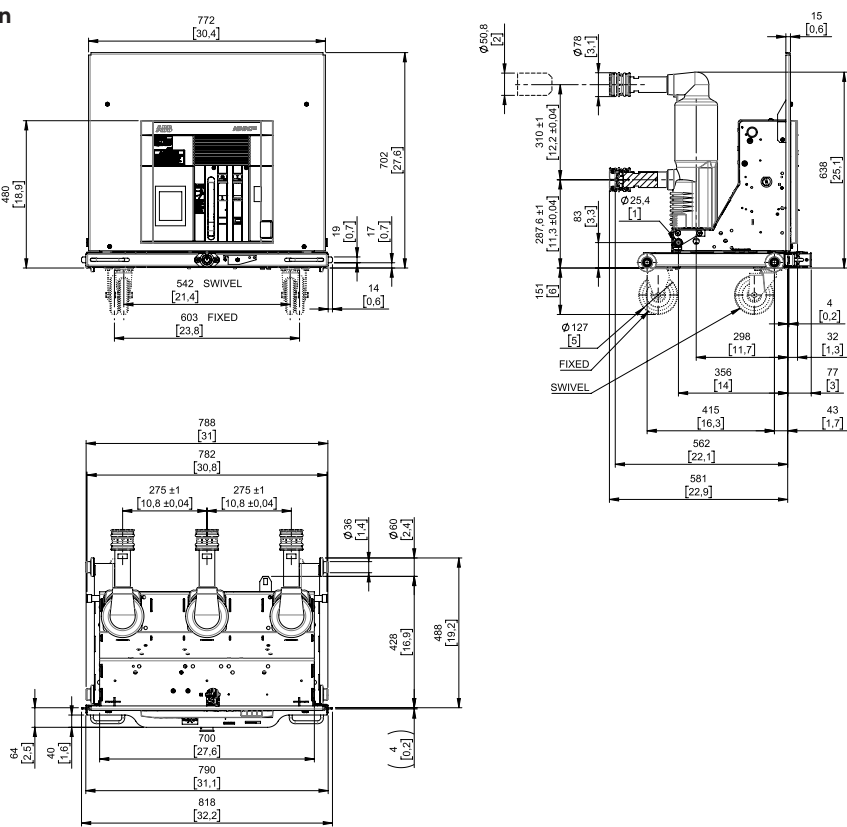
Drawout/ROF version

ADVAC		
TN	2RGA025581	
Ur	05	kV
Ur	15	kV
Ir	12	A
Isc	25	kA
Isc	31	kA



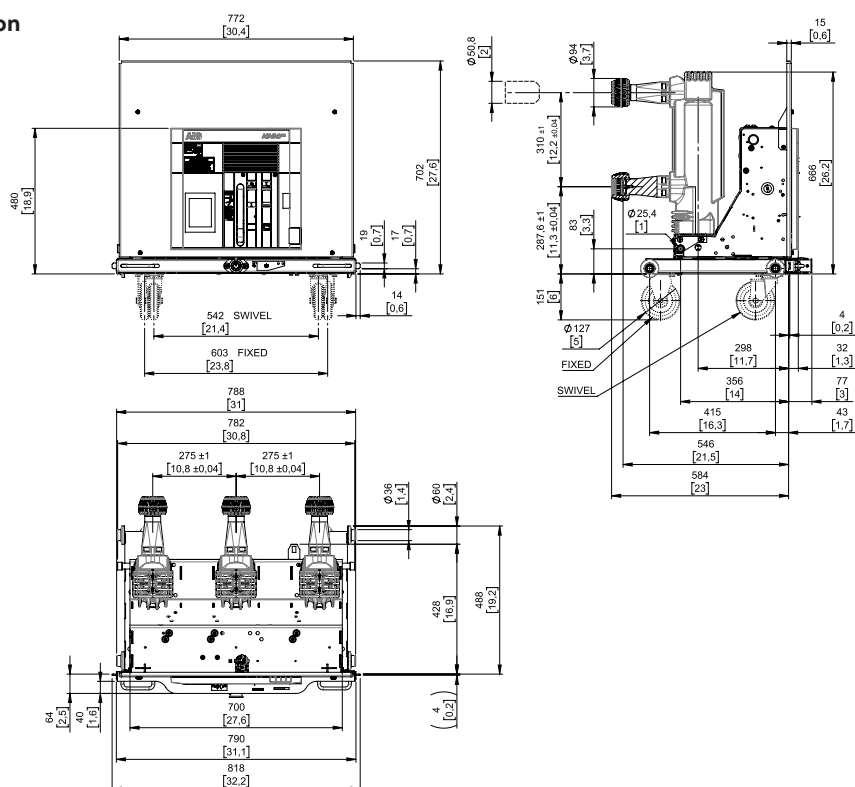
Drawout/ROF version

ADVAC		
TN	2RGA025582	
Ur	05	kV
Ur	08	kV
Ur	15	kV
Ir	12	A
Isc	40	kA



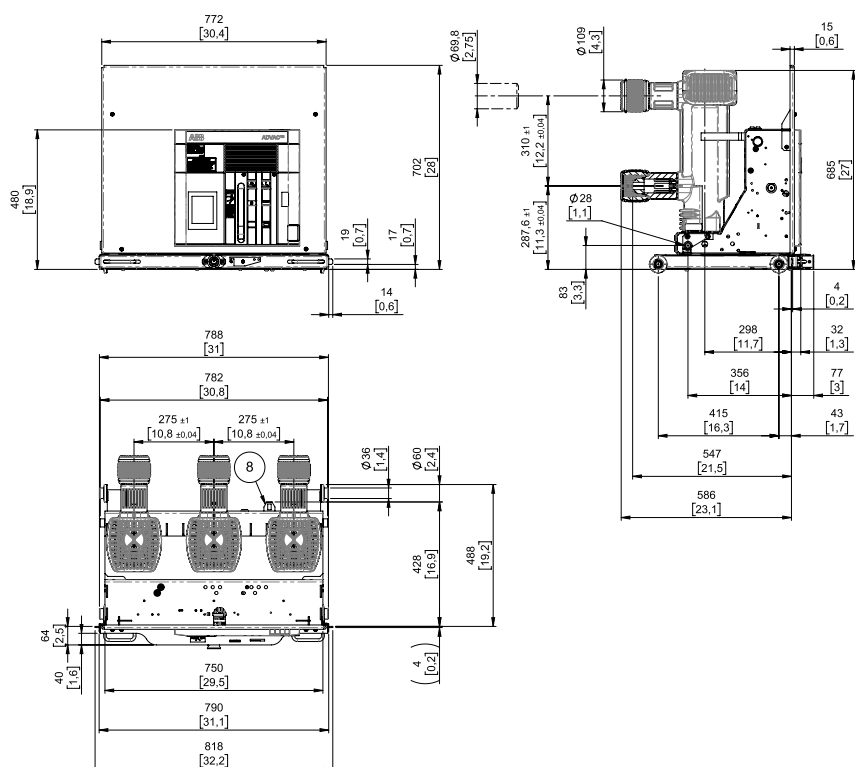
Drawout/ROF version

ADVAC		
TN	2RGA025586	
Ur	05	kV
	08	kV
	15	kV
Ir	20	A
	25	kA
Isc	31	kA
	40	kA



ADVAC

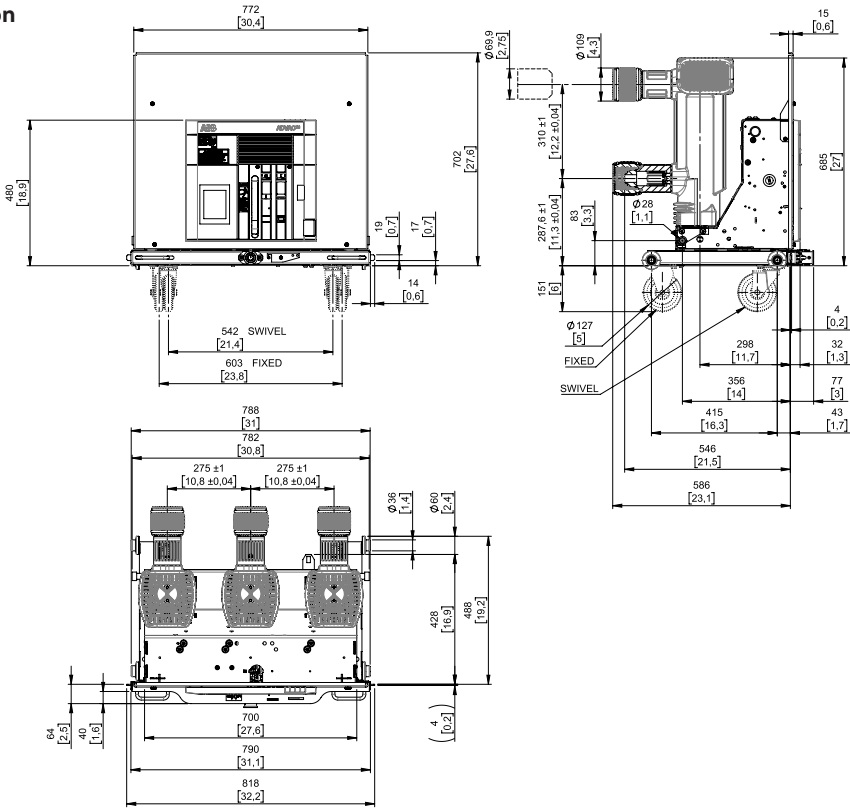
TN	2RGA000819	
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	15	kV
Ir	30	A
Isc	25	kA
	31	kA
	40	kA



Overall Dimensions

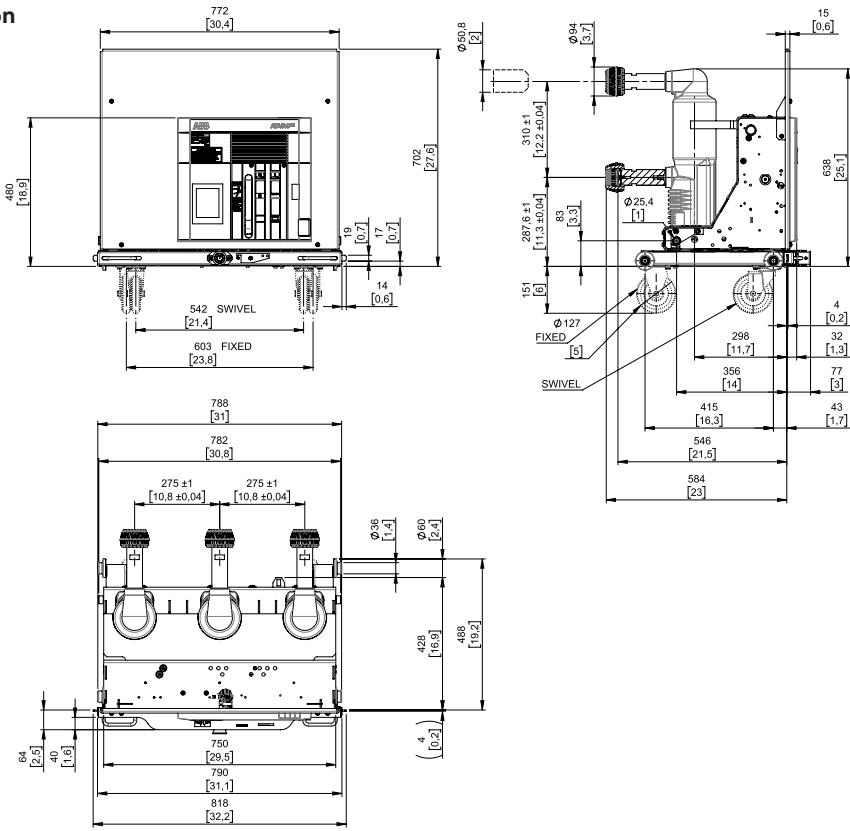
Drawout/ROF version

ADVAC		
TN	2RGA025596	
Ur	15	kV
Ir	30	A
Isc	40	kA



Drawout/ROF version

ADVAC		
TN	2RGA025583	
Ur	05	kV
Ir	12	A
Isc	50	kA

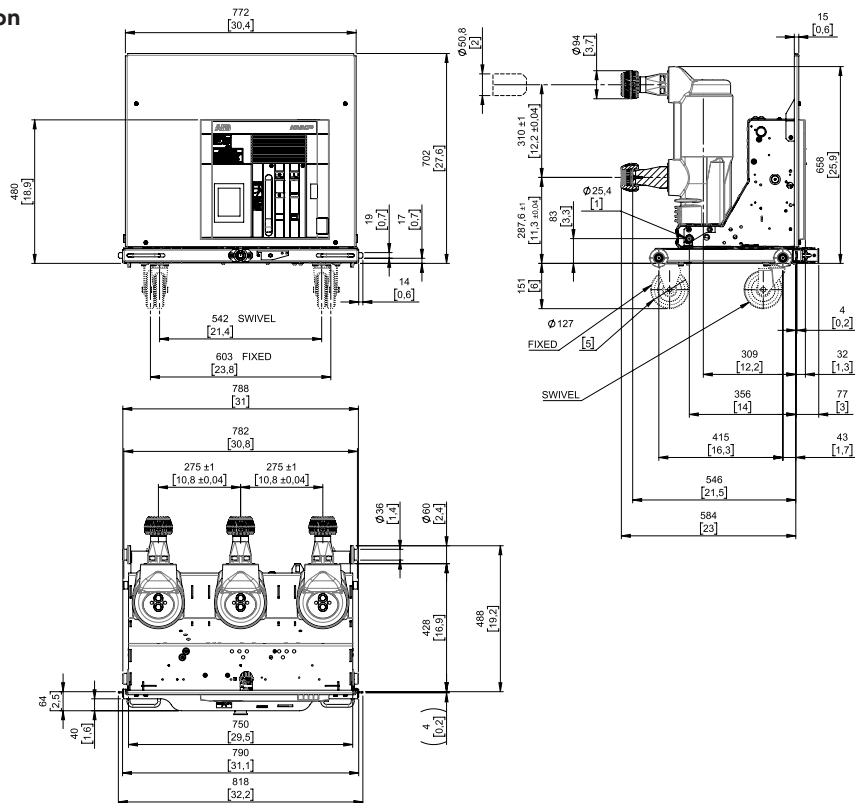


Drawout and RoF for ADVAC /SafeGear

Drawout/ROF version

ADVAC

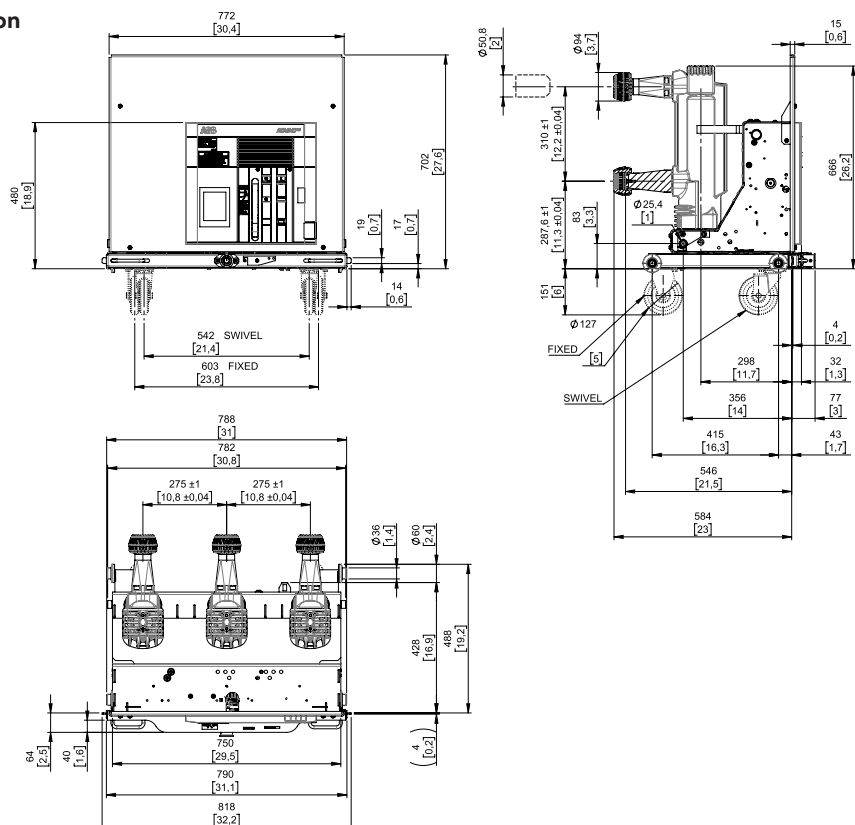
TN	2RGA025601	
Ur	15	kV
Ir	12	A
Isc	50	kA



Drawout/ROF version

ADVAC

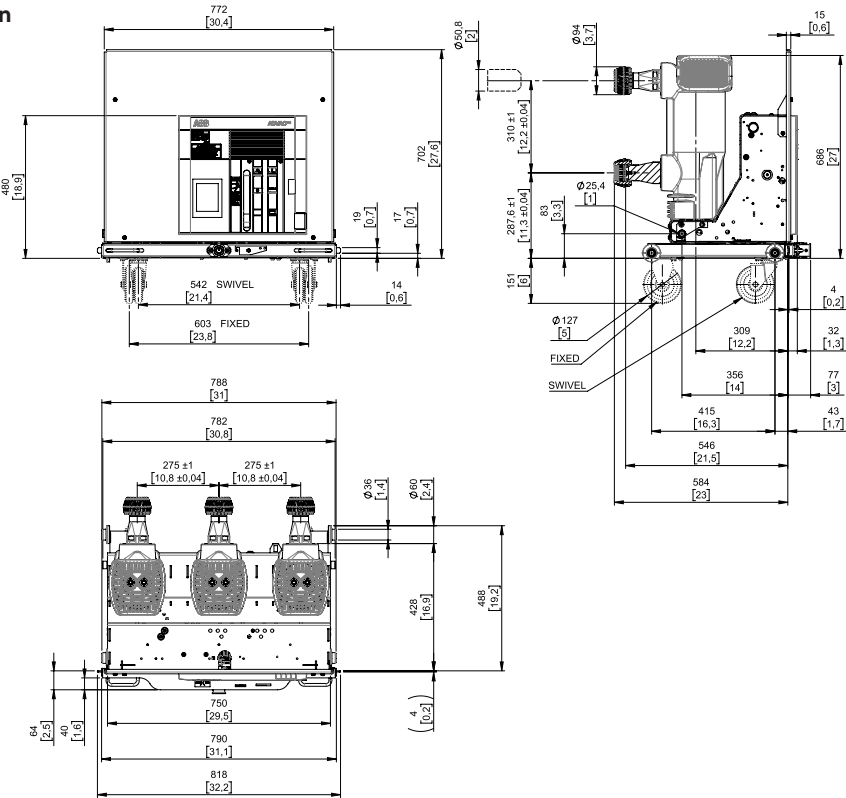
TN	2RGA025594	
Ur	05	kV
Ir	20	A
Isc	50	kA



Overall Dimensions

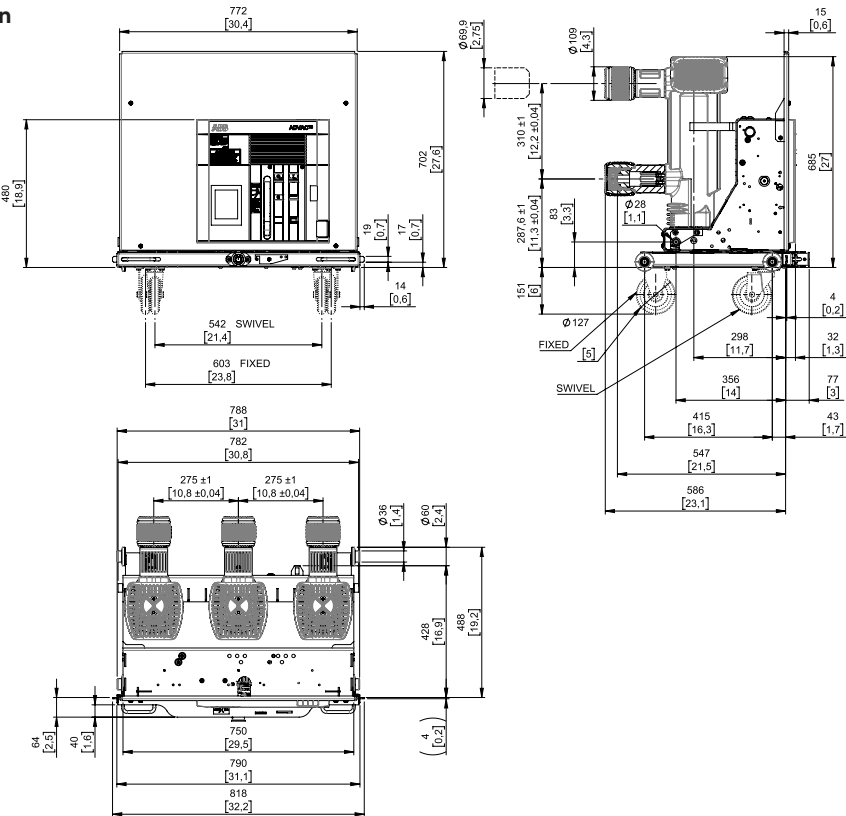
Drawout/ROF version

ADVAC		
TN	2RGA025600	
Ur	15	kV
Ir	20	A
Isc	50	kA



Drawout/ROF version

ADVAC		
TN	2RGA025599	
Ur	05	kV
Ir	30	A
Isc	50	kA

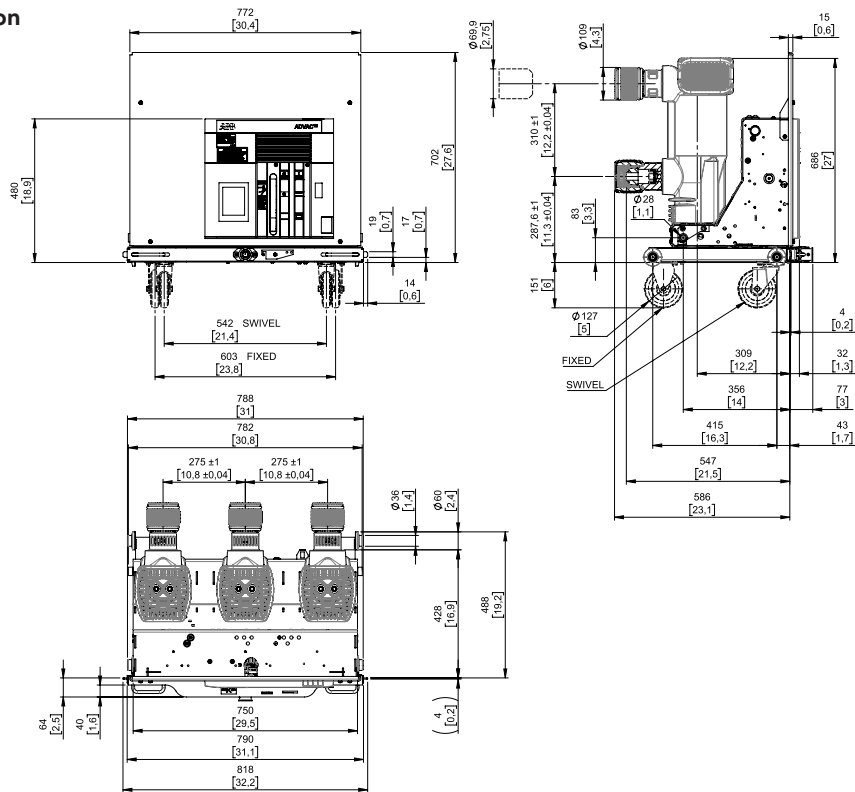


Drawout and RoF for ADVAC /SafeGear

Drawout/ROF version

ADVAC

TN	2RGA025602	
Ur	15	kV
Ir	30	A
Isc	50	kA

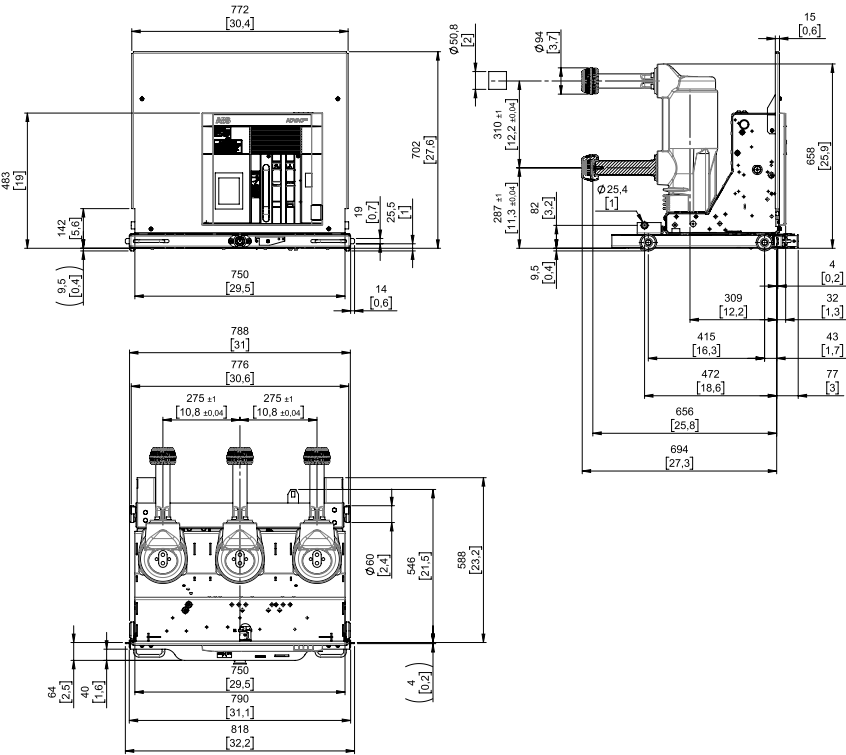


Overall Dimensions

Drawout for Safegear HD

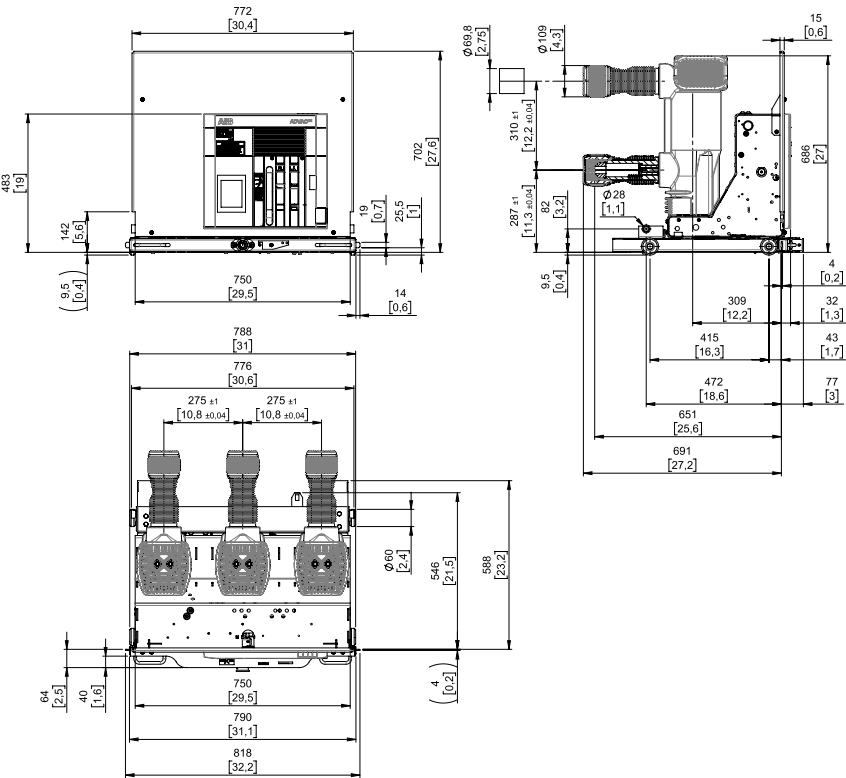
Drawout version

ADVAC		
TN	2RGA026561	
Ur	15	kV
Ir	12	A
	20	A
Isc	50	kA



Drawout version

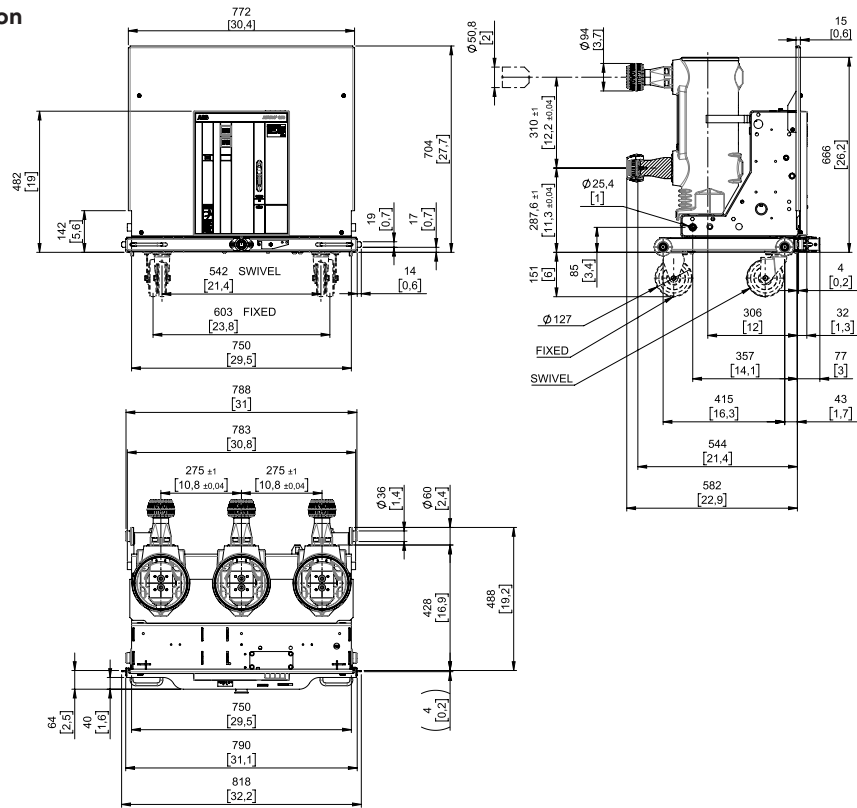
ADVAC		
TN	2RGA026560	
Ur	15	kV
Ir	30	A
Isc	50	kA



Model 3

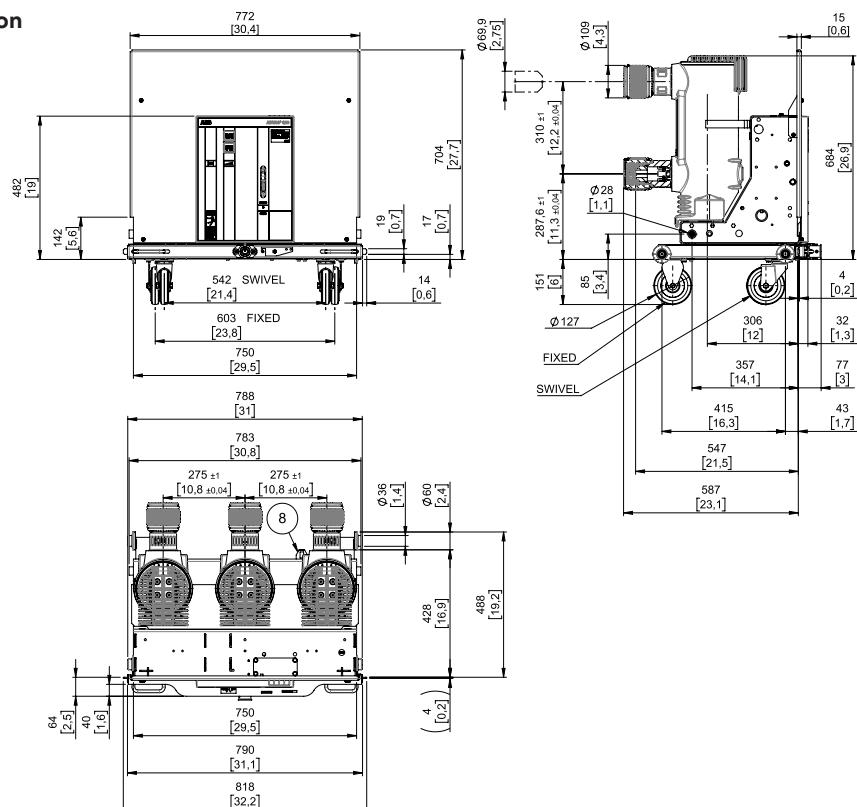
Drawout/ROF version

ADVAC		
TN	2RGA032068	
Ur	05	kV
	15	kV
Ir	12	A
	20	A
	30	A
Isc	63	kA



Drawout/ROF version

ADVAC		
TN	2RGA032070	
Ur	05	kV
	15	kV
Ir	30	A
	63	kA

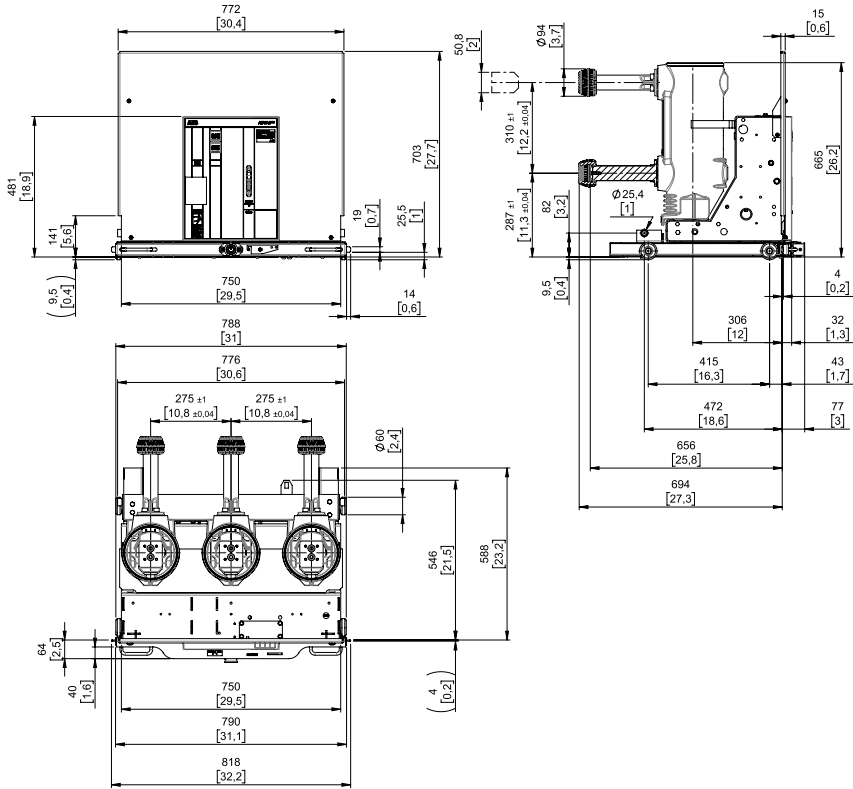


Overall Dimensions

Drawout for SafeGear HD

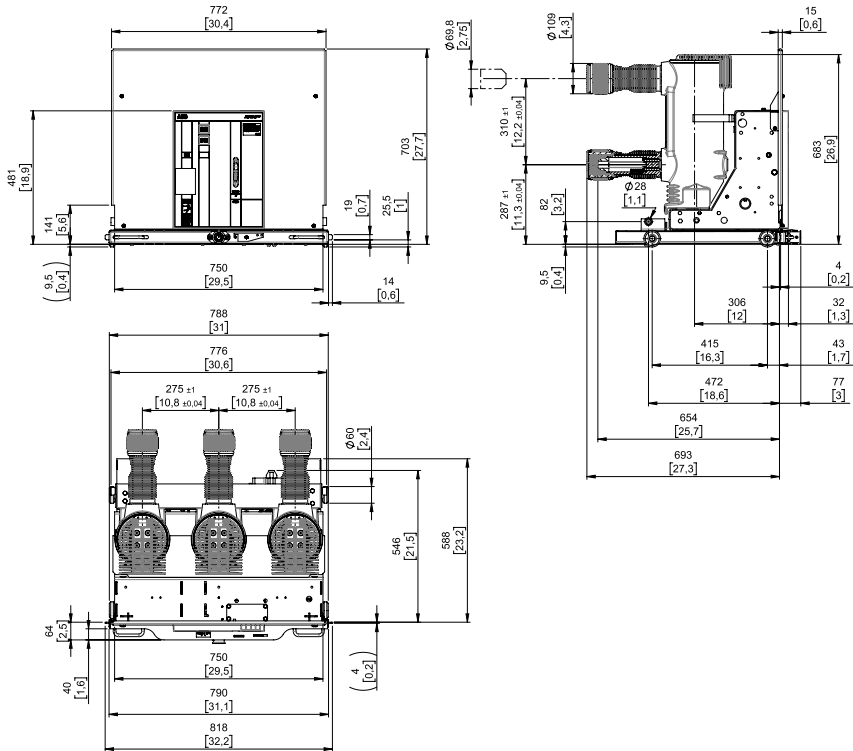
Drawout version

ADVAC		
TN	2RGA017340	
Ur	15	kV
Ir	12	A
	20	A
Isc	63	kA



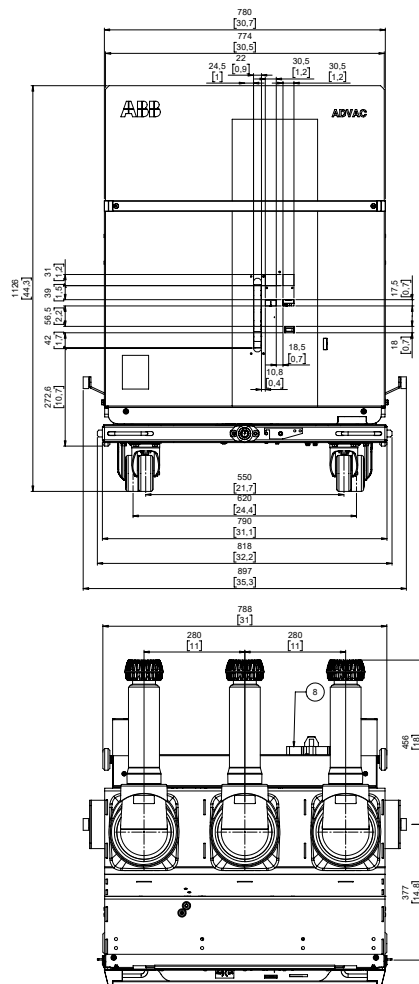
Drawout version

ADVAC		
TN	2RGA016987	
Ur	15	kV
Ir	30	A
Isc	63	kA



Drawout/ROF version

ADVAC		
TN	2RDA038664	
Ur	38	kV
I _r	12	A
	20	A
I _{sc}	16	kA
	25	kA
	32	kA



Electrical diagrams

Represented operational state

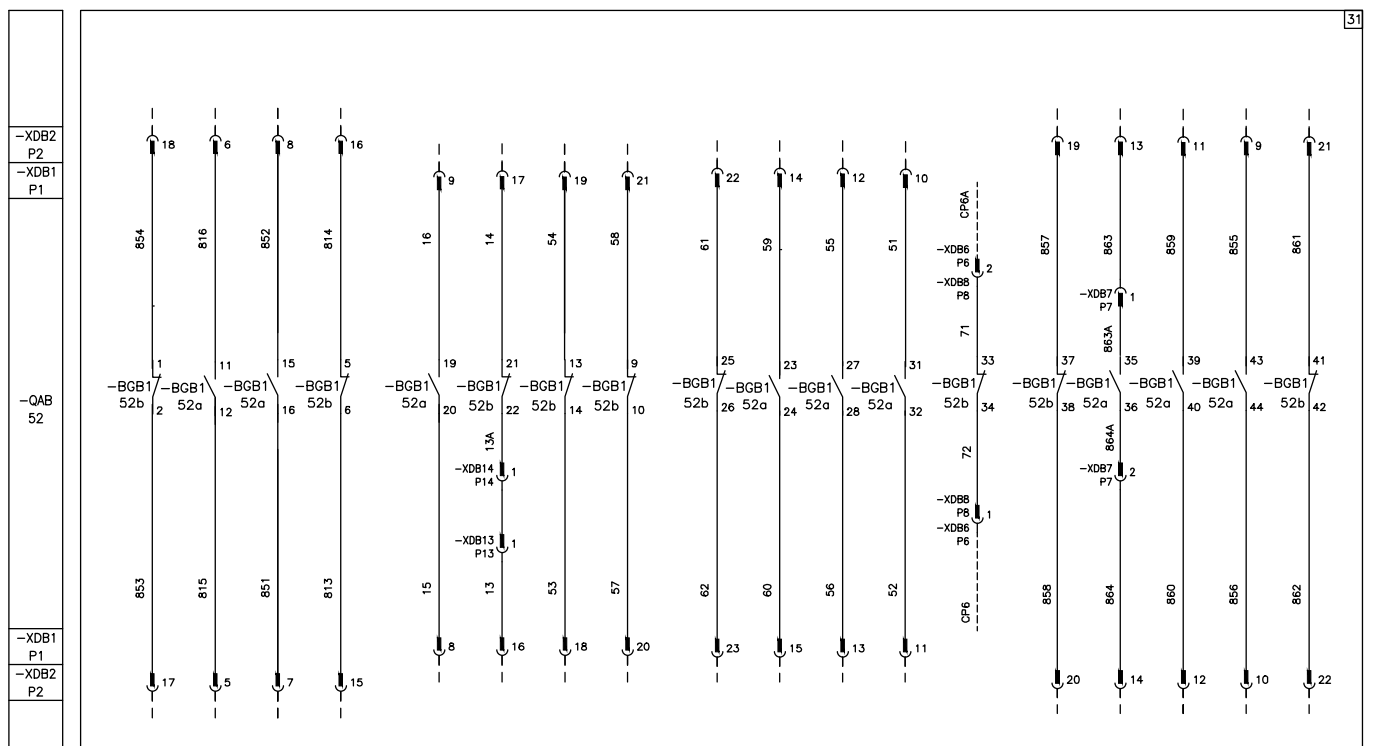
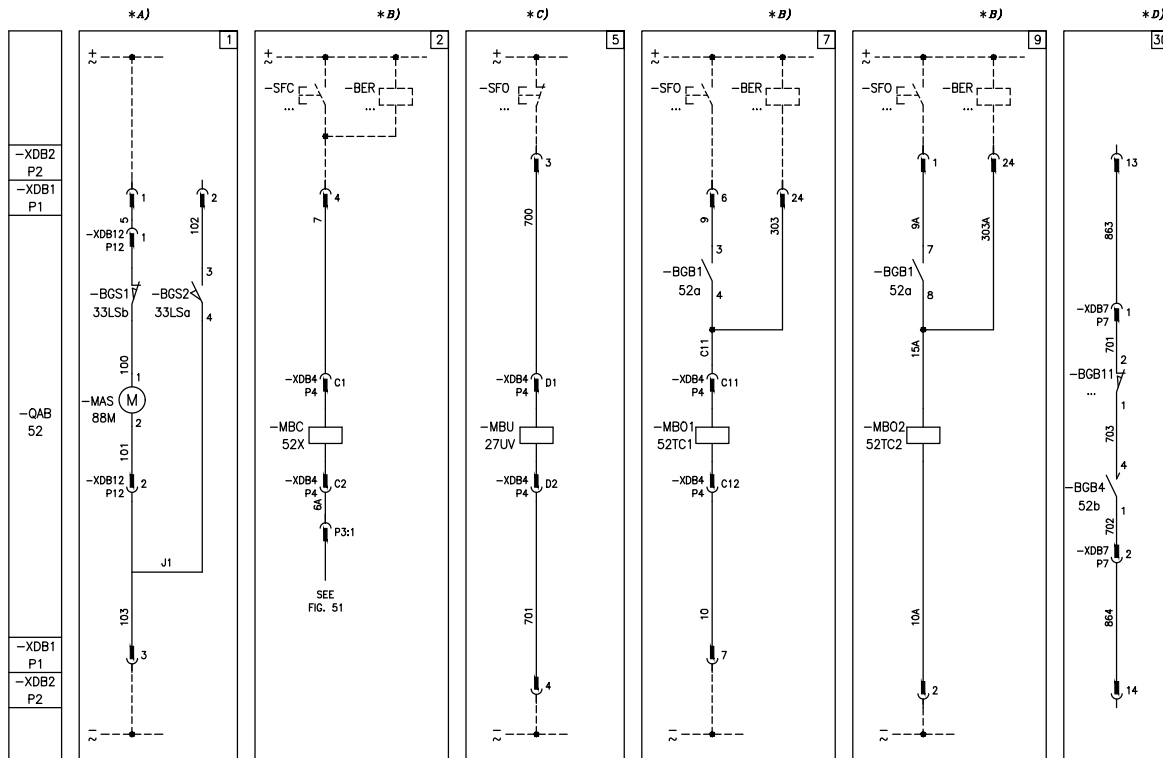
The diagrams indicates the following conditions:

- Circuit breaker off and connected
- De-energized circuits
- Discharged closing springs

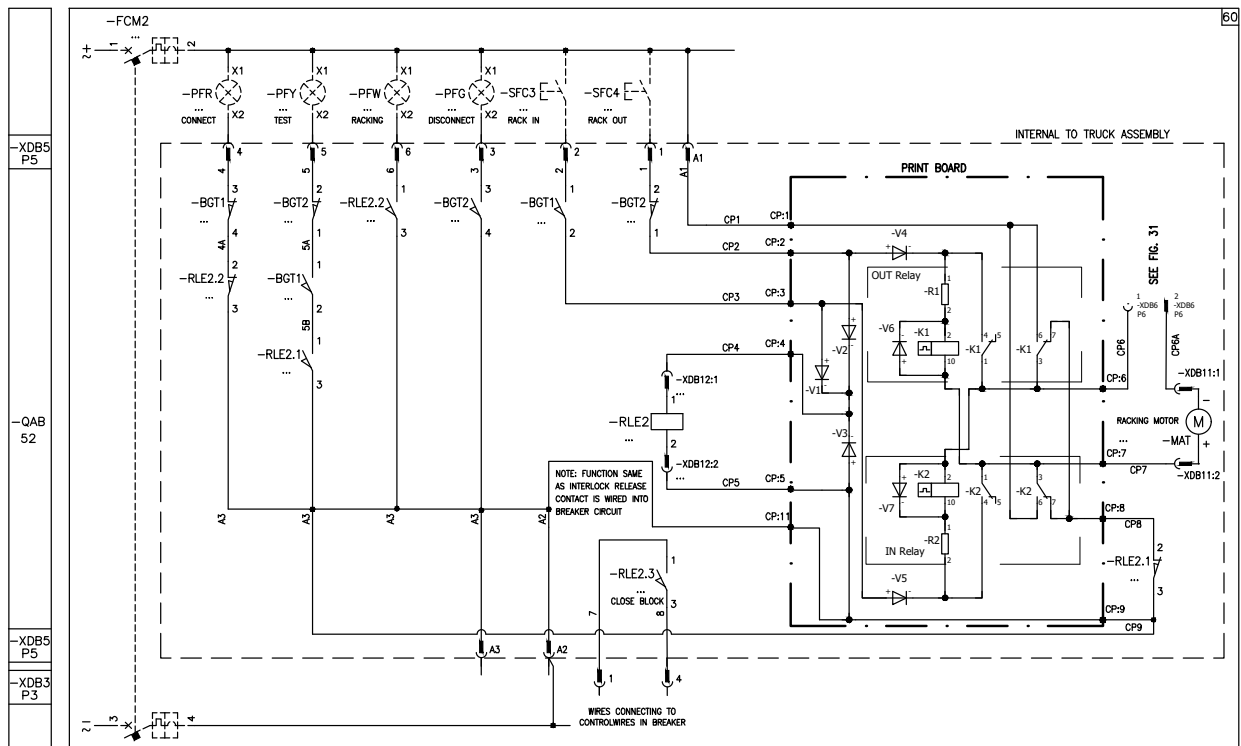
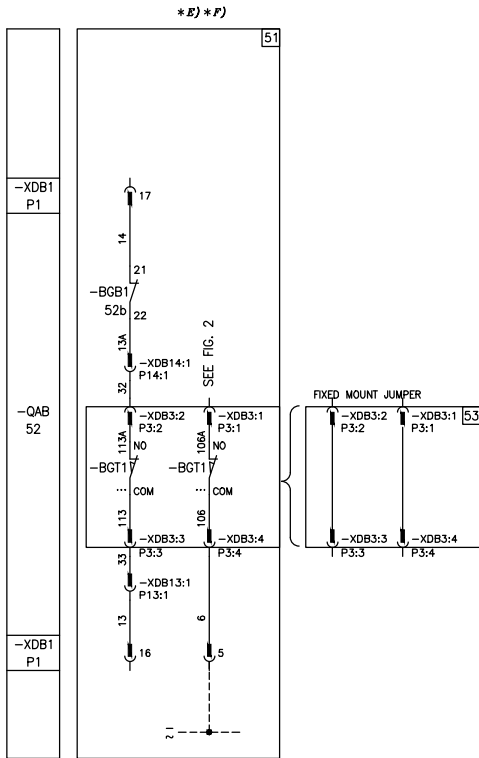
Graphical symbols for electrical diagrams (IEC 60617 standard)

	Thermal effect		Frame, chassis		Capacitor (general symbol)		Passing make contact closing momentarily when its operating device is released
	Electromagnetic effect		Conductors in a screened cable two conductors shown		Motor (general symbol)		Position switch (limit switch), make contact
	Delay		Connection of conductors		Rectifier in full wave (bridge) connection		Position switch (limit switch), break contact
	Operated by pushing		Terminal		Make contact		Circuit breaker with automatic release
	Operated by key		Plug and socket (Male and female)		Break contact		Operating device (general symbol)
	Earth, ground (general symbol)		Resistor (general symbol)		Change-over break before make contact		Lamp (general symbol)
							Miniature breaker with thermomagnetic o/c release

ADVAC Model 4



Electrical diagrams



Reference designation of objects in electrical documents

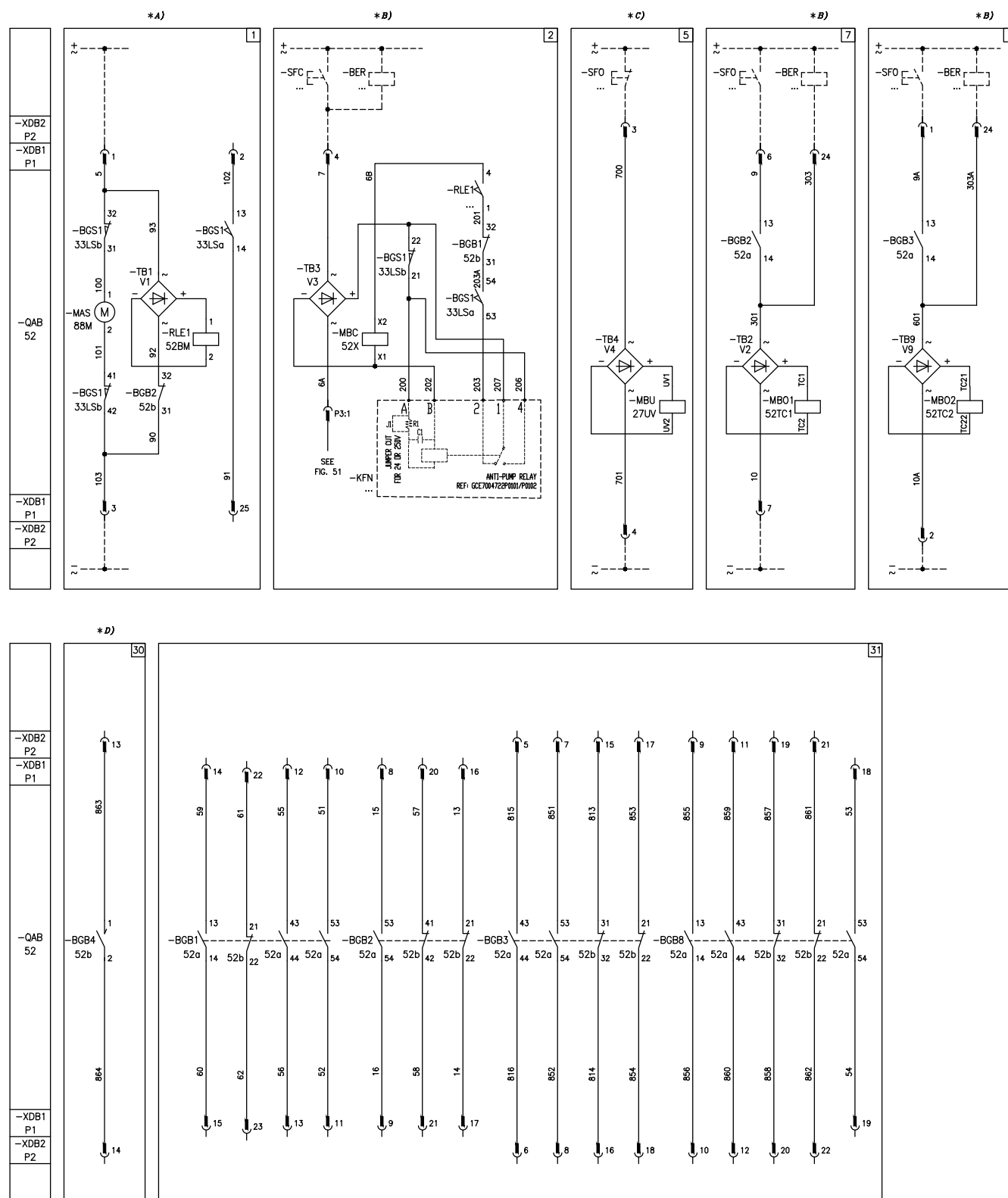
(In compliance with standard IEC 81346-2 and ABB technical standard 2NBA000001) / ANSI

Caption		
		= Reference number of diagram figure.
*		= See note indicated by the letter.
Desig. IEC	Desig. ANSI	
-BER	...	= Device for the supervision of shunt opening release coil continuity (see note B)
-BGB1,2,3,8	52a, 52b	= Circuit breaker auxiliary contacts
-BGB4	52b	= Auxiliary passing contact (closing momentarily when circuit breaker opens)
-BGS1	33LSa, 33LSb	= Limit switch of the springs charging motor
-BGS2	33LSa, 33LSb	= Limit switch signalling closing springs charged or discharged
-BGT1	...	= Contacts signalling circuit breaker in the connected position
-BGT2	...	= Contacts signalling circuit breaker in the isolated position
-FCM2	...	= Miniature breaker with thermomagnetic o/c release (ABB S202M-K •• UC)
-MAS	88M	= Motor for the closing charging springs (see note A)
-MAT	...	= Motor drive for racking in and out the circuit breaker of the cell (direct current supply)
-MBC	52X	= Shunt closing release
-MBO1	52TC1	= First shunt opening release (see note B)
-MBO2	52TC2	= Second shunt opening release (see note B)
-MBU	27UV	= Instantaneous undervoltage release (see note C)
-PFG	...	= Led signalling circuit breaker in the isolated position
-PFR	...	= Led signalling circuit breaker in the connected position
-PFY	...	= Led signalling circuit breaker in the test position
-PFW	...	= Led signalling circuit breaker in racking
-QAB	52	= Main circuit breaker
-RLE1	...	= Close Blocking Magnet. Mechanically blocks closing when not energized.
-RLE2	...	= Locking magnet on the truck. If de-energized it prevents the circuit breaker racking-in and racking-out mechanically
-RLE2.1, ...,3	...	= Contacts activated from -RLE2
-SFC	...	= Pushbutton or contact for the circuit breaker closing
-SFC3	...	= Pushbutton for the circuit breaker rack in
-SFC4	...	= Pushbutton for the circuit breaker rack out
-SFO	...	= Pushbutton or contact for the circuit breaker opening
-TB1,2,3,4,9	V1,2,3,4,9	= Diode Bridges
-XDB1, 2	P1, P2	= Connectors for the circuit breaker circuits
-XDB3	P3	= Connector of truck position contact
-XDB5	P5	= Truck motorization connector
-XDB11	P11	= Truck gear-motor connector
-XDB12	P12	= Truck locking magnet connector
-XDB6,8	P6,P8	= Connectors of the accessories

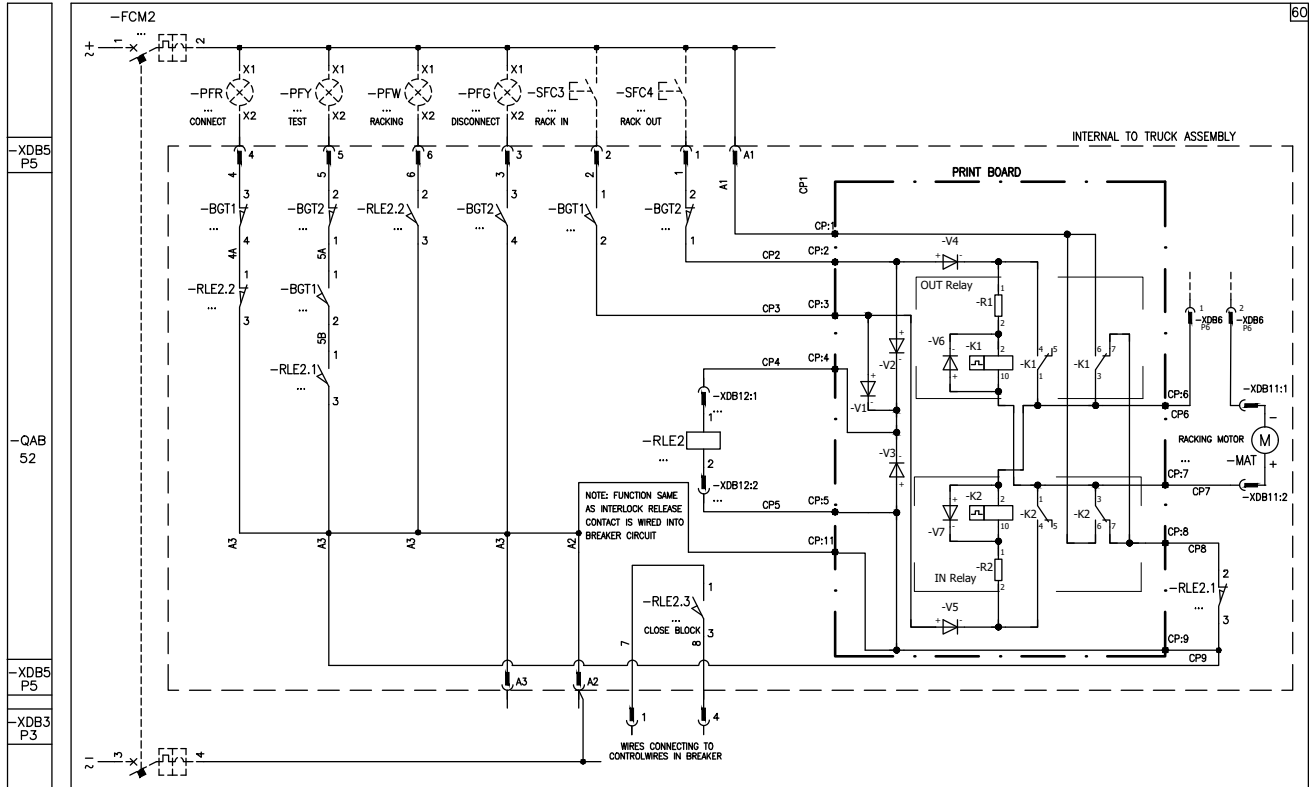
Electrical diagrams

Diagram figures description			Notes
Fig. 1	=	Springs charging-motor circuit (see note A)	1) The circuit breaker is delivered complete with the accessories listed in the order acknowledgement only. To draw up the order examine the apparatus catalogue.
Fig. 2	=	Shunt closing release (antipumping is achieved mechanically)	A) Check the power supply available on the auxiliary circuit to verify if it is adequate to start several closing spring-charging motors simultaneously. To prevent excessive consumption the closing springs must be charged manually before energizing the auxiliary circuit.
Fig. 5	=	Instantaneous undervoltage release (see note C)	B) The circuit for the supervision of shunt opening release coil continuity shall be used for this function only. It is possible to use the SOR Test Unit device to check the coil continuity.
Fig. 7	=	First shunt opening release circuit with possibility of permanent supervision of coil continuity (see note B)	C) The undervoltage release is available in the version suitable for circuit breaker supply side feeding or for feeding from an independent source. Circuit breaker may be closed only if the undervoltage release is energized (lock on closing is achieved mechanically).
Fig. 9	=	Second shunt opening release circuit with possibility of permanent supervision of coil continuity (see note B)	In case of the same voltage supply for closing and undervoltage releases and if it is required for the circuit breaker to automatically close when the auxiliary voltage supply restores, then it is necessary to delay the energization of the closing release by 50 ms after the undervoltage release acceptance.
Fig. 30	=	Passing auxiliary make contact closing momentarily when circuit breaker opens (-MB01, -MB02, -MBU operation)	D) Figure 30 "EARLY B" is optional according to DIGIT 11 of the CAT #.
Fig. 31	=	Circuit breaker with motorized truck available auxiliary contacts	If figure 30 is requested, -BGB8 (41-42) of figure 31 is not available.
Fig. 32	=	Circuit breaker with manual truck available auxiliary contacts	E) -BGT1, P3(1-4) in figure 51 is obligatory and connects to figure 2 for the close circuit.
Fig. 51	=	Circuit breaker available auxiliary contacts on the truck (PIN MONITOR)	F) -BGT1, P3(2-3) in figure 51 changes according to DIGIT 11 of the CAT #.
Fig. 53	=	Jumper to convert into fixed mount (FIXED MOUNT)	If the "PIN MONITOR" -BGT1 is requested (default), the contact -BGT1, P3(2-3) in figure is available and the contact -BGB1(21-22) in figure 31 is not available.
Fig. 60	=	Circuits for the motorization of the truck of the circuit breaker	If the "PIN MONITOR" -BGT1 is not requested, the contact -BGT1, P3 (2-3) in figure 51 is not available and the contact -BGB1(21-22) in figure 31 is available, move wire 13 from P3-3 to -BGB2(22).

ADVAC 63kA (Model 3)







Electrical diagrams

Reference designation of objects in electrical documents

(In compliance with standard IEC 81346-2 and ABB technical standard 2NBA000001) / ANSI

Caption		
	=	Reference number of diagram figure.
*	=	See note indicated by the letter.
Desig. IEC	Desig. ANSI	
-BER	...	= Device for the supervision of shunt opening release coil continuity (see note B)
-BGB1,2,3,8	52a, 52b	= Circuit breaker auxiliary contacts
-BGB4	52b	= Auxiliary passing contact (closing momentarily when circuit breaker opens)
-BGS1	33LSa, 33LSb	= Limit switch of the springs charging motor
-BGS2	33LSa, 33LSb	= Limit switch signalling springs charged or discharged
-BGT1	...	= Contacts signalling circuit breaker in the connected position
-BGT2	...	= Contacts signalling circuit breaker in the isolated position
-FCM2	...	= Miniature breaker with thermomagnetic o/c release (ABB S202M-K •• UC)
-MAS	88M	= Motor for the closing charging springs (see note A)
-MAT	...	= Motor drive for racking in and out the circuit breaker of the cell (direct current supply) allocated on the circuit breaker's truck
-MBC	52X	= Shunt closing release
-MBO1	52TC1	= First shunt opening release (see note B)
-MBO2	52TC2	= Second shunt opening release (see note B)
-MBU	27UV	= Instantaneous undervoltage release (see note C)
-PFG	...	= Led signalling circuit breaker in the isolated position
-PFR	...	= Led signalling circuit breaker in the connected position
-PFY	...	= Led signalling circuit breaker in the test position
-PFW	...	= Led signalling circuit breaker in racking
-QAB	52	= Main circuit breaker
-RLE1	...	= Close blocking magnet. Mechanically blocks closing when not energized.
-RLE2	...	= Locking magnet on the truck. If de-energized it prevents the circuit breaker racking-in and racking-out mechanically
-RLE2.1, ...,3	...	= Contacts activated from -RLE2
-SFC	...	= Pushbutton or contact for the circuit breaker closing
-SFC3	...	= Pushbutton for the circuit breaker rack in
-SFC4	...	= Pushbutton for the circuit breaker rack out
-SFO	...	= Pushbutton or contact for the circuit breaker opening
-TB1,2,3,4,9	V1,2,3,4,9	= Diode bridges
-XDB1, 2	P1, P2	= Connectors for the circuit breaker circuits
-XDB3	P3	= Connector of truck position contact
-XDB5	P5	= Truck motorization connector
-XDB11	P11	= Truck gear-motor connector
-XDB12	P12	= Truck locking magnet connector
-XDB6,8 =	P6, P8	= Connectors of the accessories

Diagram figures description		Notes
Fig. 1	= Springs charging-motor circuit (see note A)	1) The circuit breaker is delivered complete with the accessories listed in the order acknowledgement only. To draw up the order examine the apparatus catalogue.
Fig. 2	= Shunt closing release (antipumping is achieved mechanically)	A) Check the power supply available on the auxiliary circuit to verify if it is adequate to start several closing spring-charging motors simultaneously. To prevent excessive consumption the closing springs must be charged manually before energizing the auxiliary circuit.
Fig. 5	= Instantaneous undervoltage release (see note C)	B) The circuit for the supervision of shunt opening release coil continuity shall be used for this function only. It is possible to use the SOR Test Unit device to check the coil continuity.
Fig. 7	= First shunt opening release circuit with possibility of permanent supervision of coil continuity (see note B)	C) The undervoltage release is available in the version suitable for circuit breaker supply side feeding or for feeding from an independent source. Circuit breaker may be closed only if the undervoltage release is energized (lock on closing is achieved mechanically). In case of the same voltage supply for closing and undervoltage releases and if it is required for the circuit breaker to automatically close when the auxiliary voltage supply restores, then it is necessary to delay the energization of the closing release by 50 ms after the undervoltage release acceptance.
Fig. 9	= Second shunt opening release circuit with possibility of permanent supervision of coil continuity (see note B)	D) Figure 30 "EARLY B" is optional according to DIGIT 11 of the CAT #. If figure 30 is requested, -BGB8 (41-42) of figure 31 is not available.
Fig. 30	= Passing auxiliary make contact closing momentarily when circuit breaker opens (-MB01, -MB02, -MBU operation)	E) -BGT1, P3(1-4) in figure 51 is obligatory and connects to figure 2 for the close circuit.
Fig. 31	= Circuit breaker available auxiliary contacts	F) -BGT1, P3(2-3) in figure 51 changes according to DIGIT 11 of the CAT #. If the "PIN MONITOR" -BGT1 is requested (default), the contact -BGT1, P3(2-3) in figure is available and the contact -BGB1(21-22) in figure 31 is not available. If the "PIN MONITOR" -BGT1 is not requested, the contact -BGT1, P3 (2-3) in figure 51 is not available and the contact -BGB1(21-22) in figure 31 is available, move wire 13 from P3-3 to -BGB2(22).
Fig. 32	= Circuit breaker with motorized truck available auxiliary contacts	
Fig. 51	= Circuit breaker available auxiliary contacts on the truck (PIN MONITOR)	
Fig. 53	= Jumper to convert into fixed mount (FIXED MOUNT)	
Fig. 60	= Circuits for the motorization of the truck of the circuit breaker	



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