

DISTRIBUTION SOLUTIONS

AMVAC

ANSI Indoor Vacuum Circuit Breaker

Product catalog



AMVAC indoor medium voltage vacuum circuit breakers with magnetic actuators are tested according to the latest IEEE standards.

AMVAC circuit breakers are the best choice in modern electricity distribution applications to protect and control significant assets, such as transformers, motors, capacitor banks, and cables.

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Benefits



**Protect
your assets**



**Maximize
your output**



**Optimize your
investments**



Help keep personnel safe



- Safety and protection of personnel and equipment with enclosed mechanism housing and embedded pole technology
- Roll-on-floor (ROF) caster design offers ease of use
- Three position remote motorized racking options available
- Increases safety by reducing personnel time in front of switchgear lineups

Protect your assets



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

Optimize investments



- 5-year warranty
- Lowest maintenance requirements
- Highest quality and short lead times thru automated production process
- 75% lower power consumption accessories for reduced battery bank systems
- Global 24hour Service and support
- Breaker + cassette solutions available for a faster engineering design

Maximize your output



- High number of operations between breaker servicing
- Actuator with a single moving part for increased reliability
- The integrated racking mechanism (truck) is designed to 180 ftlbs of torque for increased reliability and reduced maintenance costs

Description



Key benefits

- simple open and close coils, electronic controller, and capacitors for energy storage
- requires minor maintenance of all medium voltage vacuum circuit breakers on the market today
- the Highest number of operations between breaker servicing
- increases safety by reducing personnel time in front of switchgear lineups

Key features

- rated at up to 15 kV, 3000 A, 50 kA, and 27 kV, 2000 A, 25 kA
- low-maintenance magnetic actuator mechanism and electronic controller
- standard five-year warranty
- fixed and withdrawable versions with the front operating mechanism
- stored energy operating mechanism with mechanical anti-pumping device supplied as standard

AMVAC 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	10A C2
		40	10A C2
		50	630A C1
	2000	25	10A C2 Cable Charging
		32	10A C2 Cable Charging
		40	630A C1
		50	630A C1
	3000	25	630A C1
		32	630A C1
		40	630A C1
		50	630A C1
8	1200	40	630A C1
	2000		630A C1
	3000		630A C1
15	1200	25	630A C1
		32	25A C2 Cable Charging
		40	630A C1
		50	630A C1
	2000	25	25A C2 Cable Charging
		32	25A C2 Cable Charging
		40	630A C1
		50	630A C1
	3000	25	630A C1
		32	630A C1
		40	630A C1
		50	630A C1
27	1200	16	400A C1
		25	400A C1
	2000	16	400A C1
		25	400A C1

AMVAC construction features

Magnetic actuator

The bi-stable magnetic latch actuator was introduced in 1997 and is used in various ABB products, including the AMVAC circuit breaker. Due to its simple design, no maintenance on the actuator is necessary for the product's lifetime. The magnetic actuator operates on the principle of shifting magnetic flux and is latched into one of the stable positions by rare-earth magnets, which require no power.



Vacuum interrupters

ABB vacuum interrupters (VIs) are embedded in a solid insulation material to protect the VIs from collecting dust, moisture, and accidental bumps. The solid insulation also improves tracking resistance making ABB circuit breakers one of the lightest available on the market. Because of the embedded design, these vacuum interrupters are maintenance-free for the life of the VI.



Power capacitor

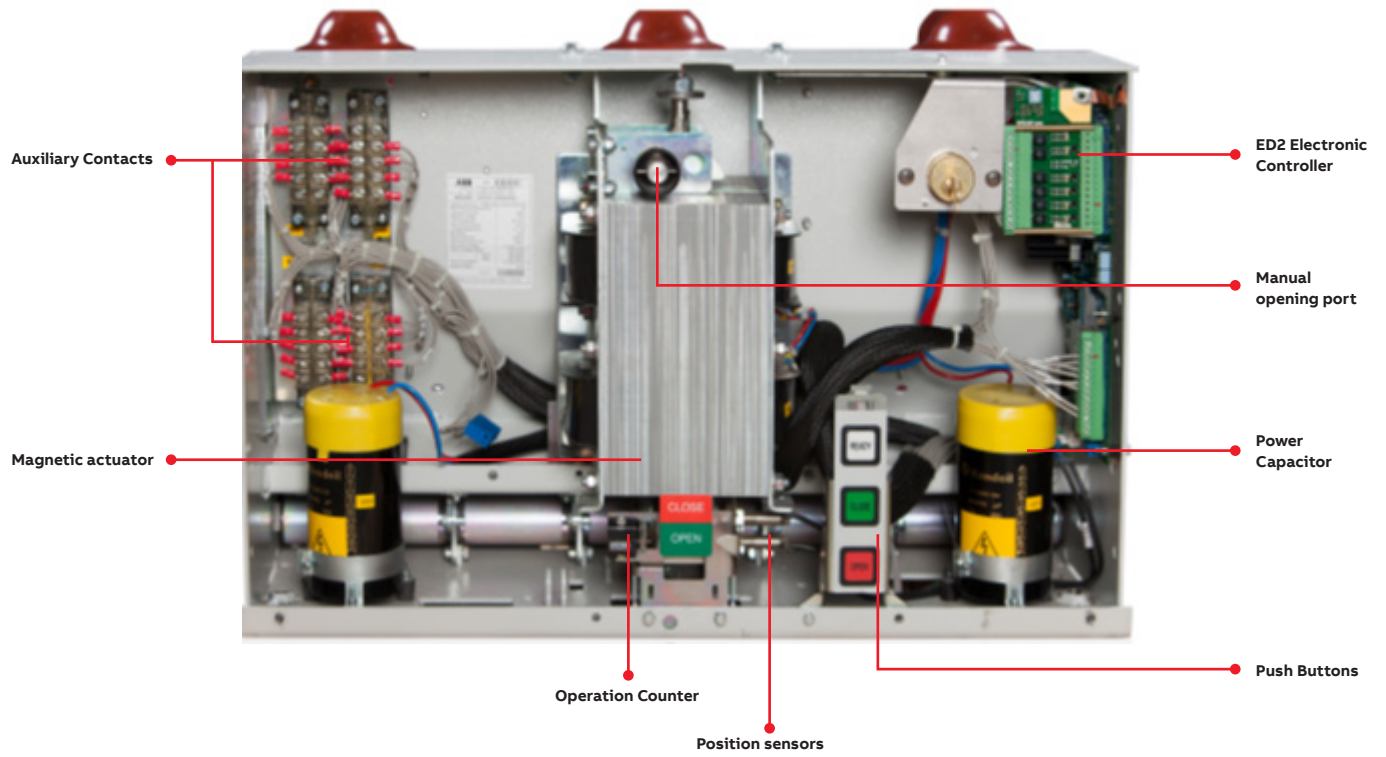
The onboard capacitors of the AMVAC breaker deliver the current needed to create magnetic fields within the mechanism, thereby eliminating current draw and voltage drop from the battery bank for the substation. For more information on the maintenance of the capacitors, please see the AMVAC Installation, Operation, and Maintenance Manual.



Electronic board

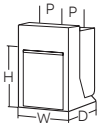
The electronic control board or ED2 controller in the AMVAC breaker provides improved reliability due to its self-monitoring functions and features. These features included onboard coil monitoring, watchdog CPU monitoring, position sensor status, optional under-voltage, and energy failure auto trip. The AMVAC breaker is customizable for any application. The low energy optocoupler inputs allow the ED2 controller to manage the required 45 ms current limited pulse from the storage capacitors to deliver the open and close energy to the operating coils. This precision control of the electronic control board eliminates operating coil failures, which is the number one shortcoming of spring actuated mechanisms.





AMVAC _ Selection and Ordering

Fixed circuit breakers

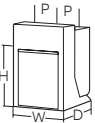
Circuit breaker	AMVAC 05			
Standards	ANSI 37.06 •			
Rated voltage	Ur [kV]	4.76		
Rated insulation voltage	Us [kV]	4.76		
Withstand voltage at 50 Hz	Ud (1 min) [kV]	19		
Impulse withstand voltage	Up [kV]	60		
Rated frequency	fr [Hz]	60		
Rated thermal current (40 °C)	Ir [A]	1200	2000	3000
		25	25	25
		31.5	31.5	31.5
		40	40	40
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	50	50	50
		25	25	25
		31.5	31.5	31.5
		40	40	40
Admissible rated short-time withstand current (2s)	Ik [kA]	50	50	50
		65	65	65
		82	82	82
		104	104	104
Making capacity	Ip [kA]	130	130	130
Operation sequence	[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		3 cycles *	3 cycles **	3 cycles **
Closing time	[ms]	35...60	35...60	35...60
Maximum overall dimensions		H [in]	18.7 ⁽¹⁾ (⁽²⁾)	24.2 ⁽¹⁾ (⁽²⁾)
		W [in]	27.6 ⁽¹⁾ (⁽²⁾)	27.6 ⁽¹⁾ (⁽²⁾)
		D [in]	16.1 ⁽¹⁾ (⁽²⁾)	16.1 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]	275	275
Weight	[lb]	410 ⁽¹⁾	420 ⁽¹⁾	430 ⁽¹⁾
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 5

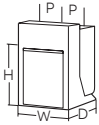
⁽²⁾ For more details, please check the proper standardized dimension table in chapter 5

Circuit breaker		AMVAC 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		3 cycles	3 cycles	3 cycles	
Closing time		[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	23.16	23.16	23.68
		W [in]	27.56	27.56	29.53
		D [in]	15.85	15.85	16.87
		Pole center distance P [mm]	275	275	275
Weight		[lb]	410	420	460
Tropicalization		ANSI 37-20.2			

For more details please check the proper standardized dimension table at chapter 5


AMVAC _ Selection and Ordering

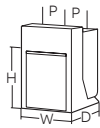
Fixed circuit breakers

Circuit breaker	AMVAC 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
		31.5	31.5	31.5
		40	40	40
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	50	50	50
		25	25	25
		31.5	31.5	31.5
		40	40	40
Admissible rated short-time withstand current (2s)	Ik [kA]	50	50	50
		65	65	65
		82	82	82
		104	104	104
Making capacity	Ip [kA]	130	130	130
Operation sequence	[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		3 cycles	3 cycles	3 cycles
Closing time	[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	18.7 ⁽¹⁾ (²)	24.2 ⁽¹⁾ (²)
		W [in]	27.6 ⁽¹⁾ (²)	27.6 ⁽¹⁾ (²)
		D [in]	16.1 ⁽¹⁾ (²)	16.1 ⁽¹⁾ (²)
		Pole center distance P [mm]	275	275
Weight	[lb]	360 ⁽¹⁾ (²)	410 ⁽¹⁾ (²)	430 ⁽¹⁾ (²)
Tropicalization	ANSI 37-20.2			

(¹) This value may change for the different ratings, please check the proper standardized dimension table in chapter 5

(²) For more details please check the proper standardized dimension table in chapter 5

Circuit breaker		AMVAC 27		
Standards	ANSI 37.06	•		
Rated voltage	Ur [kV]	27		
Rated insulation voltage	Us [kV]	27		
Withstand voltage at 50 Hz	Ud (1 min) [kV]	60		
Impulse withstand voltage	Up [kV]	125		
Rated frequency	fr [Hz]	60		
Rated thermal current (40 °C)	Ir [A]	1200	2000	
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	16	16	
		25	25	
Admissible rated short-time withstand current (2s)	Ik [kA]	16	16	
		25	25	
Making capacity	Ip [kA]	42	42	
		65	65	
Operation sequence	[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		5 cycles	5 cycles	
Closing time	[ms]	35 ... 60	35 ... 60	
Maximum overall dimensions		H [in]	24.7 ⁽¹⁾ (⁽²⁾)	25.5 ⁽¹⁾ (⁽²⁾)
		W [in]	29.5 ⁽¹⁾ (⁽²⁾)	29.5 ⁽¹⁾ (⁽²⁾)
		D [in]	16.9 ⁽¹⁾ (⁽²⁾)	16.9 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]	275	275
Weight	[lb]	410 ⁽¹⁾ (⁽²⁾)	410 ⁽¹⁾ (⁽²⁾)	
Tropicalization	ANSI 37-20.2			

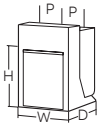


⁽¹⁾ This value may change for the different ratings; please check the proper standardized dimension table in chapter 5

⁽²⁾ For more details, please check the proper standardized dimension table in chapter 5

AMVAC _ Selection and Ordering

Drawout and Floor Rolling (FR) circuit breakers for Advance and SafeGear


Circuit breaker	AMVAC 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
		25	25	25
		31.5	31.5	31.5
		40	40	40
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	50	50	50
		25	25	25
		31.5	31.5	31.5
		40	40	40
Admissible rated short-time withstand current (2s)	Ik [kA]	50	50	50
		65	65	65
		82	82	82
		104	104	104
Making capacity	Ip [kA]	130	130	130
Operation sequence	[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		3 cycles*	3 cycles**	3 cycles**
Closing time	[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	24.7 ⁽¹⁾ (⁽²⁾)	26.2 ⁽¹⁾ (⁽²⁾)
		W [in]	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)
		D [in]	25.9 ⁽¹⁾ (⁽²⁾)	26 ⁽¹⁾ (⁽²⁾)
		Pole center distance P [mm]	275	275
Weight	[lb]	355 ⁽¹⁾	410 ⁽¹⁾	430 ⁽¹⁾
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 5

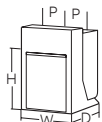
⁽²⁾ For more details, please check the proper standardized dimension table in chapter 5

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		3 cycles	3 cycles	3 cycles
Closing time	[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	25.1 ⁽²⁾	26.2 ⁽²⁾
		W [in]	31 ⁽²⁾	31 ⁽²⁾
		D [in]	25.9 ⁽²⁾	26 ⁽²⁾
		Pole center distance P [mm]	275	275
Weight	[lb]	410	420	460
Tropicalization	ANSI 37-20.2			

⁽²⁾ For more details, please check the proper standardized dimension table in chapter 5


AMVAC _ Selection and Ordering

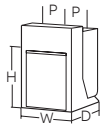
Drawout and Floor Rolling (FR) circuit breakers for Advance and SafeGear

Circuit breaker	AMVAC 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
		31.5	31.5	31.5
		40	40	40
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	50	50	50
		25	25	25
		31.5	31.5	31.5
		40	40	40
Admissible rated short-time withstand current (2s)	Ik [kA]	50	50	50
		65	65	65
		82	82	82
		104	104	104
Making capacity	Ip [kA]	130	130	130
Operation sequence	[O - 0.3 s - CO - 3 min - CO]			
Total breaking time		3 cycles	3 cycles	3 cycles
Closing time	[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	24.7 ⁽¹⁾ (²)	26.2 ⁽¹⁾ (²)
		W [in]	31 ⁽¹⁾ (²)	31 ⁽¹⁾ (²)
		D [in]	25.9 ⁽¹⁾ (²)	26 ⁽¹⁾ (²)
		Pole center distance P [mm]	275	275
Weight	[lb]	360 ⁽¹⁾ (²)	410 ⁽¹⁾ (²)	430 ⁽¹⁾ (²)
Tropicalization	ANSI 37-20.2			

(¹) This value may change for the different ratings. Please check the proper standardized dimension table in chapter 5

(²) For more details, please check the proper standardized dimension table in chapter 5

Circuit breaker		AMVAC 27	
Standards	ANSI 37.06 •		
Rated voltage	Ur [kV]	27	
Rated insulation voltage	Us [kV]	27	
Withstand voltage at 50 Hz	Ud (1 min) [kV]	60	
Impulse withstand voltage	Up [kV]	125	
Rated frequency	fr [Hz]	60	
Rated thermal current (40 °C)	Ir [A]	1200	2000
Rated breaking capacity (rated symmetrical short-circuit current)	Isc [kA]	16	16
		25	25
Admissible rated short-time withstand current (2s)	Ik [kA]	16	16
		25	25
Making capacity	Ip [kA]	42	42
		65	65
Operation sequence	[O - 0.3 s - CO - 3 min - CO]		
Total breaking time	5 cycles		5 cycles
Closing time	[ms]	35 ... 60	35 ... 60
<div></div> Maximum overall dimensions	H [in]	26.8 ⁽¹⁾ (⁽²⁾)	27.4 ⁽¹⁾ (⁽²⁾)
	W [in]	31 ⁽¹⁾ (⁽²⁾)	31 ⁽¹⁾ (⁽²⁾)
	D [in]	25.9 ⁽¹⁾ (⁽²⁾)	26.1 ⁽¹⁾ (⁽²⁾)
	Pole center distance P [mm]	275	275
Weight	[lb]	410 ⁽¹⁾ (⁽²⁾)	410 ⁽¹⁾ (⁽²⁾)
Tropicalization	ANSI 37-20.2		

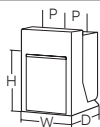


⁽¹⁾ This value may change for the different ratings; please check the proper standardized dimension table in chapter 5

⁽²⁾ For more details, please check the proper standardized dimension table in chapter 5

AMVAC _ Selection and Ordering

Drawout and Floor Rolling (FR) circuit breakers for SafeGear HD

Circuit breaker	AMVAC 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		3 cycles	3 cycles	3 cycles
Closing time	[ms]	35 ... 60	35 ... 60	35 ... 60
Maximum overall dimensions		H [in]	25.9 ⁽¹⁾ (²)	25.9 ⁽¹⁾ (²)
		W [in]	31 ⁽¹⁾ (²)	31 ⁽¹⁾ (²)
		D [in]	30.3 ⁽¹⁾ (²)	30.3 ⁽¹⁾ (²)
		Pole center distance P [mm]	275	275
Weight	[lb]	510	510	510
Tropicalization	ANSI 37-20.2			

(¹) This value may change for the different ratings. Please check the proper standardized dimension table in chapter 5

(²) For more details, please check the proper standardized dimension table in chapter 5

Ordering AID

All ABB AMVAC circuit breakers come with a smart style number, uniquely identifying it in rating, execution, and completion. Below you may find the ordering AID of our AMVAC portfolio.

Model 4 ordering AID

Digit 1, 2, and 3: Circuit breaker, execution, and model

Digit	Value	
1	M	AMVAC prefix
Digit	Value	
2	A	Drawout
	B*	Roll on the floor
	F	Fixed mount
Digit	Value	
3	4	Breaker model 4

The tables below can be used to determine breaker Catalogue number for AMVAC circuit breakers used in Advance, SafeGear, SafeGear HD or OEM applications. Catalogue numbers are 15 characters long with a combination of letters and numbers.

Example: MB4G217000020U0 is a 15kV 2000A 25kA AMVAC with Roll on the Floor wheels, 125Vdc Control Voltage, reversed ANSI color pushbuttons and indicator and UL qualifications.

* Roll on the floor breakers are only to be used with switchgear that is expressly designed for roll on the floor trucks.

Digit	Value		Continuous current	Max wave voltage	Interrupt time cycles	Short time current	Close and latch	Lightning impulse withstand (kV,crest)	Low frequency withstand (HI-POT) (kV,RMS)	Cap switching
				(kV,RMS)		(kA, RMS)	(kA,CREST)	(BIL)		
4&5	A	1	1200A	4.76	3	25	65	60	19	630A C2 15kA peak 2.4kHz
		2	2000A	4.76	3	25	65	60	19	Rated cable charging current 10A
		3	3000A	4.76	5	25	65	60	19	630A C1 19kA peak 2.8kHz
	B	1	1200A	4.76	3	31.5	82	60	19	Rated cable charging current 10A
		2	2000A	4.76	3	31.5	82	60	19	Rated cable charging current 10A
		3	3000A	4.76	5	31.5	82	60	19	630A C1 19kA peak 2.8kHz
	C	1	1200A	4.76	5	40	104	60	19	Rated cable charging current 10A
		2	2000A	4.76	5	40	104	60	19	630A C1 19kA peak 2.8kHz
		3	3000A	4.76	5	40	104	60	19	630A C1 19kA peak 2.8kHz
	D	1	1200A	4.76	5	50	130	60	19	630A C1 19kA peak 2.8kHz
		2	2000A	4.76	5	50	130	60	19	630A C1 19kA peak 2.8kHz
		3	3000A	4.76	5	50	130	60	19	630A C1 19kA peak 2.8kHz
	E	1	1200A	8.25	5	40	104	95	36	630A C1 19kA peak 2.8kHz
		2	2000A	8.25	5	40	104	95	36	630A C1 19kA peak 2.8kHz
		3	3000A	8.25	5	40	104	95	36	630A C1 19kA peak 2.8kHz
	G	1	1200A	15	3	25	65	95	36	630A C2 15kA peak 2.0kHz
		2	2000A	15	3	25	65	95	36	Rated cable charging current 25A
		3	3000A	15	3	25	65	95	36	630A C1 19kA peak 2.8kHz
	H	1	1200A	15	3	31.5	82	95	36	Rated cable charging current 25A
		2	2000A	15	3	31.5	82	95	36	Rated cable charging current 25A
		3	3000A	15	5	31.5	82	95	36	630A C1 19kA peak 2.8kHz
	J	1	1200A	15	5	40	104	95	36	630A C1 19kA peak 2.8kHz
		2	2000A	15	5	40	104	95	36	630A C1 19kA peak 2.8kHz
		3	3000A	15	5	40	104	95	36	630A C1 19kA peak 2.8kHz
	K	1	1200A	15	5	50	130	95	36	630A C1 19kA peak 2.8kHz
		2	2000A	15	5	50	130	95	36	630A C1 19kA peak 2.8kHz
		3	3000A	15	5	50	130	95	36	630A C1 19kA peak 2.8kHz
	L	1	1200A	15	5	50	130	95	36	630A C1 19kA peak 2.8kHz
		2	2000A	15	5	50	130	95	36	630A C1 19kA peak 2.8kHz
		3	3000A	15	5	50	130	95	36	630A C1 19kA peak 2.8kHz
	P	1	1200A	27	5	16	42	125	60	400A C1 20kA peak 4.4kHz
		2	2000A	27	5	16	42	125	60	400A C1 20kA peak 4.4kHz
	Q	1	1200A	27	5	25	65	125	60	400A C1 20kA peak 4.4kHz
		2	2000A	27	5	25	65	125	60	400A C1 20kA peak 4.4kHz

*L1, L2, and L3 are for use only in SafeGear HD switchgear these are the only available circuit breakers for SafeGear HD switchgear.

Ordering AID

Digit	Value	Control scheme
6	0	Wiring 1-plug
	1	Wiring 2-plug
	2	Fixed mount

Digit	Value	Control voltage
7	A	120Vac
	B	240Vac
	5	24Vdc
	6	48Vdc
	7	125Vdc
	8	250Vdc

Digit	Value	Special applications
8	0	Standard

Digit	Value	Future
9	0	N/A

Digit	Value	Undervoltage Trip
10	0	Disable
	A	120Vac
	B	240Vac
	5	24Vdc
	6	48Vdc
	7	125Vdc
	8	250Vdc

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

Digit	Value	Non-standard colors
12	0	Standard
	1	Reverse buttons
	2	Reverse buttons / indicator
	3	Reverse indicator

Digit	Value	Future
13	0	N/A

Digit	Value	Labels (see note 7)
14	0	N/A
	U	UL sticker (see note 8)
	S	Spanish labeling
	T	Spanish labeling + UL sticker

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

Digit	Value	Motorized truck
16	0	Manual truck

Notes:

- 1) For Digit 6: option "0" includes single secondary disconnect plug with 4a and 3b auxiliary contacts. This option is not available on MF4 style breakers. Option "0" is not recommended and is for match-in-line applications only. Customer must provide ABB with original breaker number prior to order acceptance.
- 2) For Digit 7: control voltage must be specified, if not, default option is "7" - 125Vdc
- 4) For Digit 10: for UV trip "enable" feature Digit 6 must be a "1" or "2". The time delay will be set at 5-seconds by the factory as a default. Refer to IB for available UV trip settings and time delays.
- 5) This ordering AID represents all available AMVAC Model 4 circuit breaker configurations and options, no special adders are allowed.
- 6) All AMVAC Model 4 circuit breakers are dual rated for 50Hz & 60Hz. This includes primary and control frequency.
- 7) Each circuit breaker will include a production test report.
- 8) For CSA applications, order circuit breaker with UL qualifications and Digit 12 reverse color kit.
- 9) This drawing is for customer reference and catalogue number encoding only.
- 10) A manual opening handle is provided with every AMVAC circuit breaker order. Per ANSI standard, one opening handle must be in close proximity to the circuit breaker at all times.



Spare parts

AMVAC circuit breakers come with few required spare parts available to order.

- Storage capacitor
- ED2 Controller
- Pushbutton assembly
- Operation Counter
- Auxiliary contacts

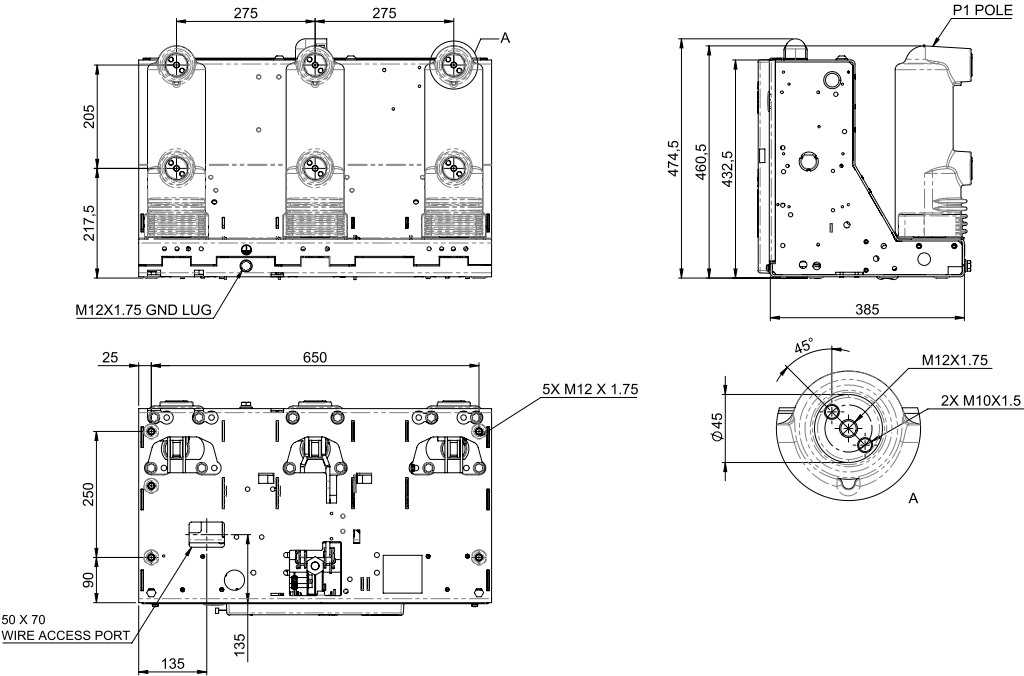
Roll-in replacement breakers and additional accessories are available through your local Service team. Please contact your local Service team for further information on the available kits and spare parts catalog 1VAL050501.

Overall dimensions

AMVAC circuit breakers come in different ratings and executions.
The standardized dimension drawings are reported below, highlighting the model and rating covered.

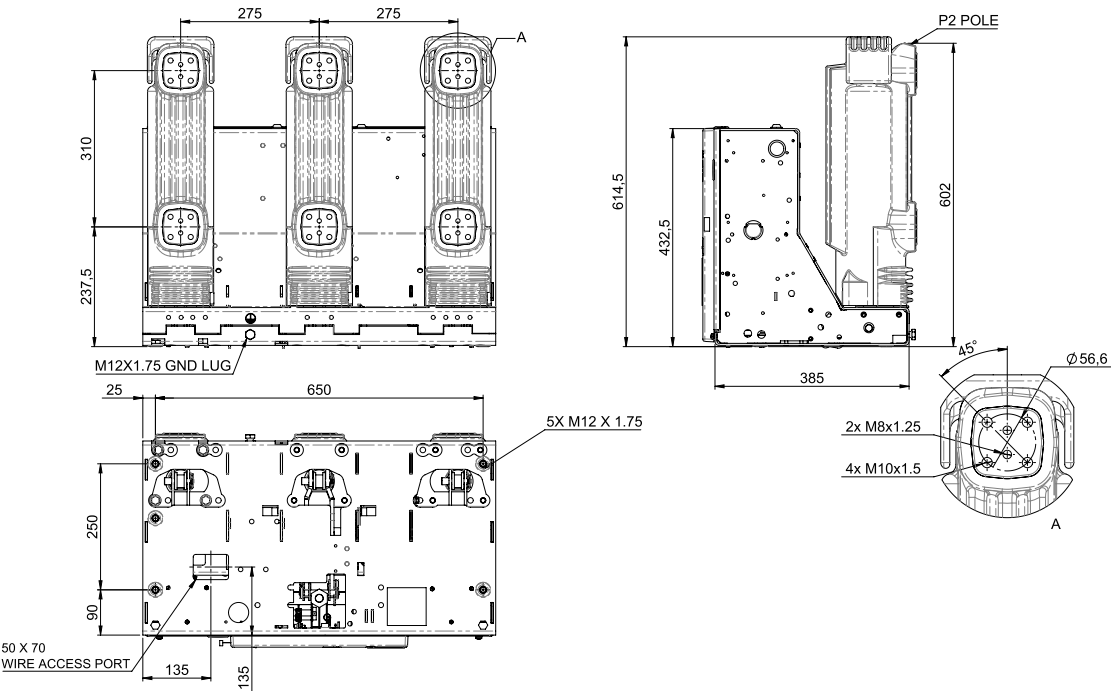
Fixed version

AMVAC		
TN	2RDA042870	
Ur	05	kV
Ur	15	kV
Ir	12	A
Isc	25	kA
Isc	31	kA



Fixed version

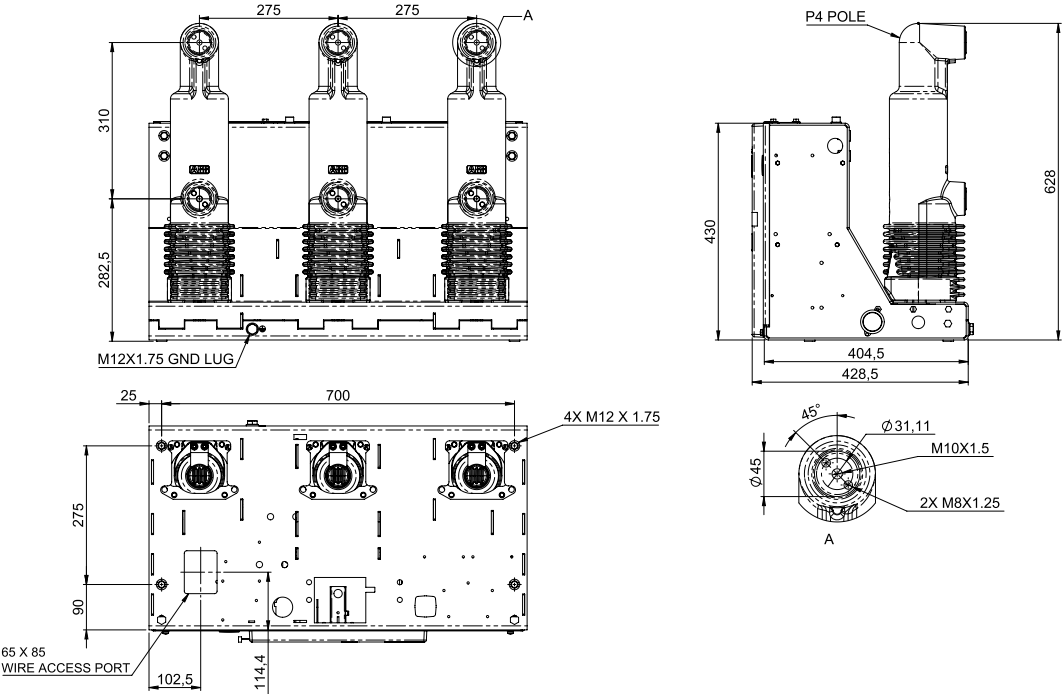
AMVAC		
TN	2RDA042894	
Ur	05	kV
Ur	15	kV
Ir	20	A
Isc	25	kA
Isc	31	kA



Overall dimensions

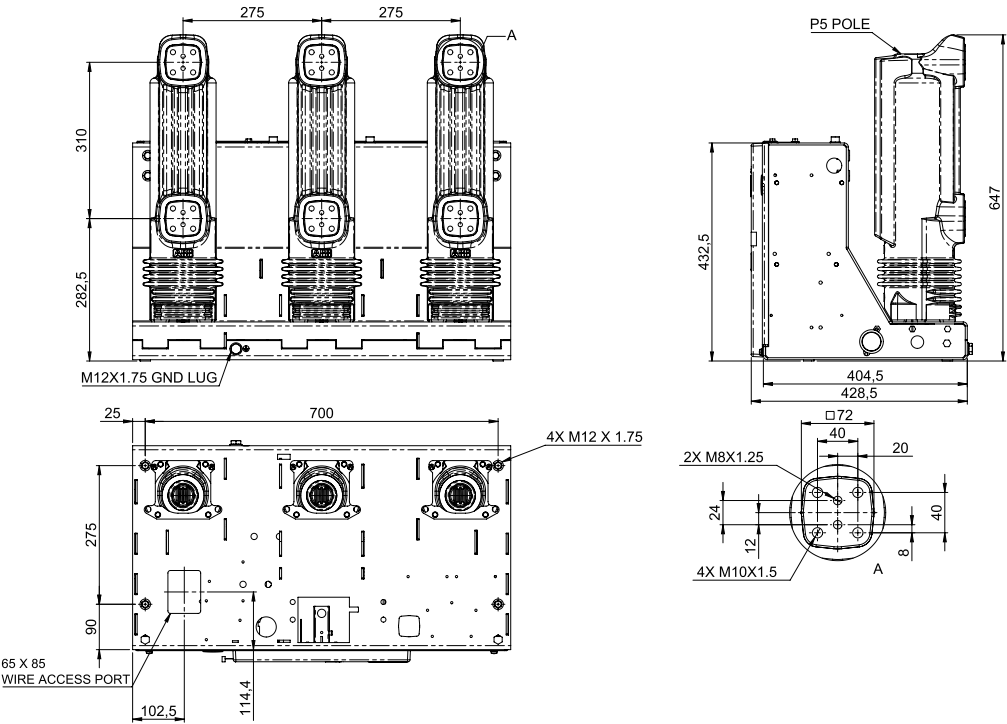
Fixed version

AMVAC		
TN	2RDA043500	
Ur	27	kV
Ir	12	A
Isc	16	kA
	25	kA



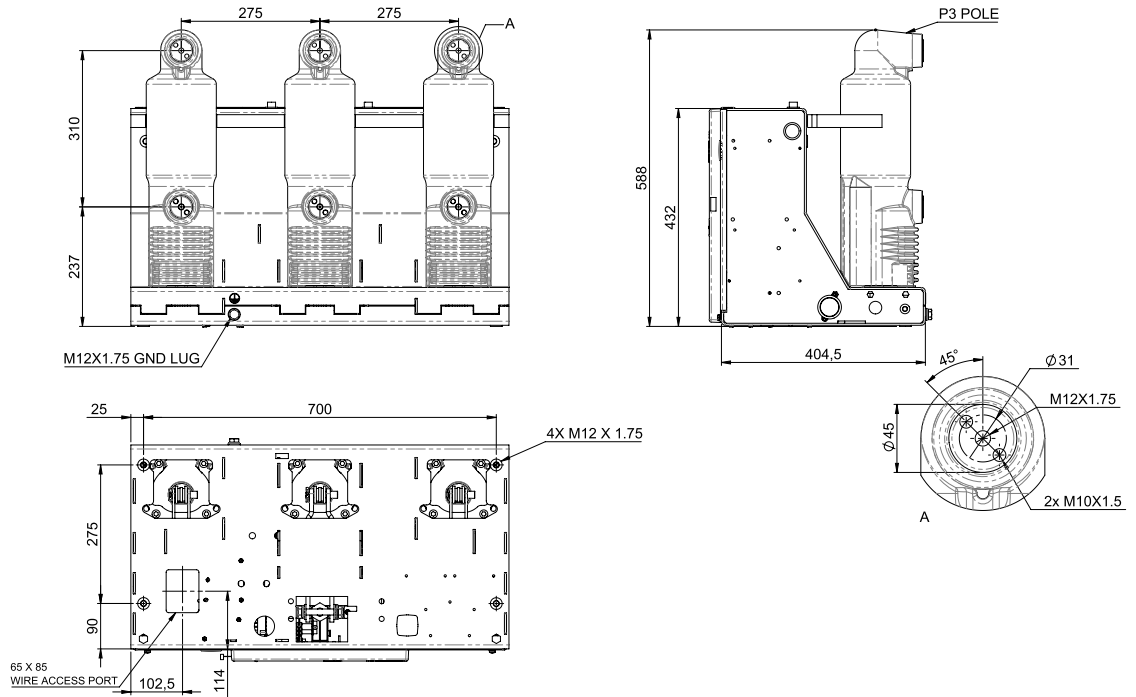
Fixed version

AMVAC		
TN	2RDA043503	
Ur	27	kV
Ir	20	A
Isc	16	kA
	25	kA

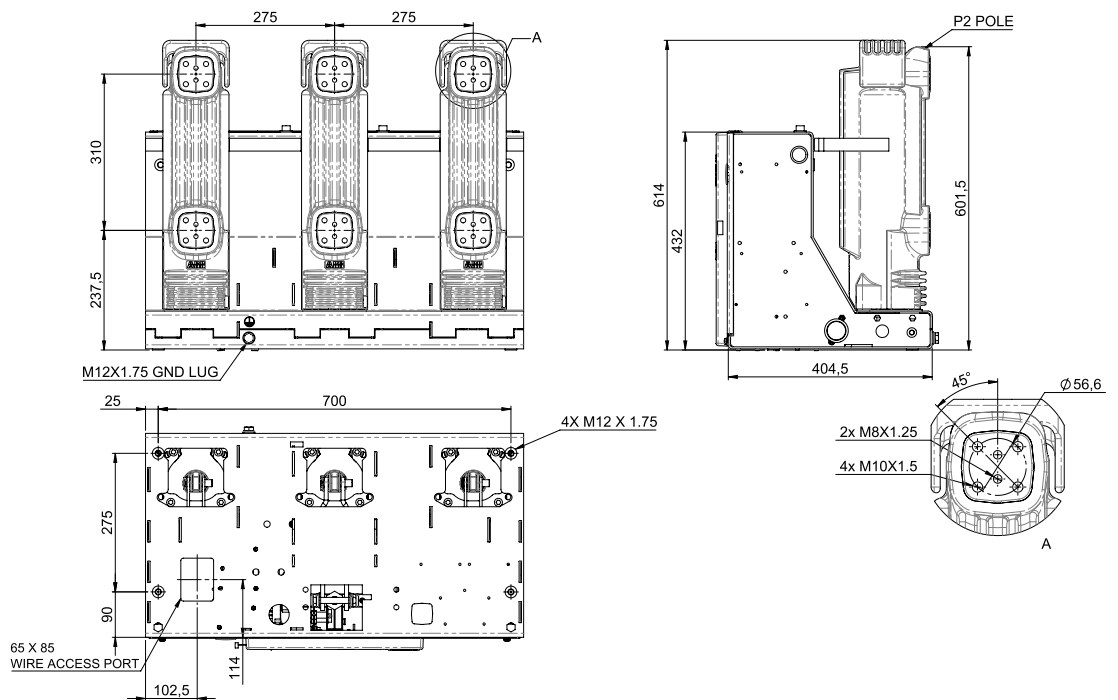


Fixed version**AMVAC**

TN	2RDA042895	
Ur	05	kV
Ir	12	A
Isc	50	kA

**Fixed version****AMVAC**

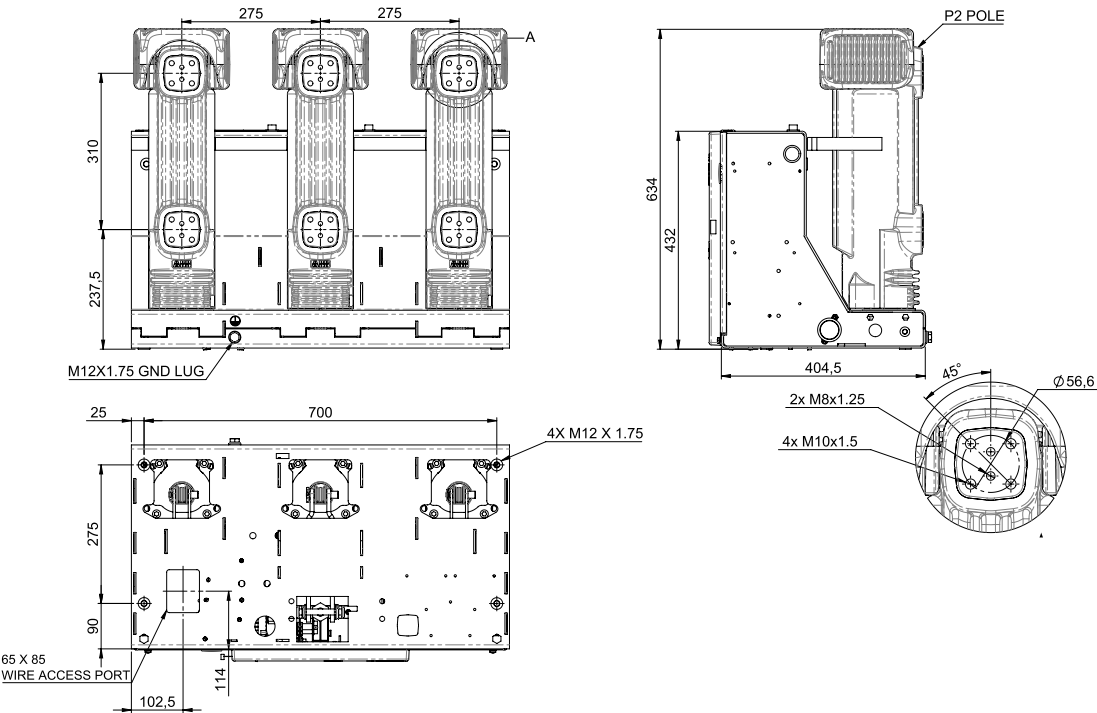
TN	2RDA042896	
Ur	05	kV
Ir	20	A
Isc	50	kA



Overall dimensions

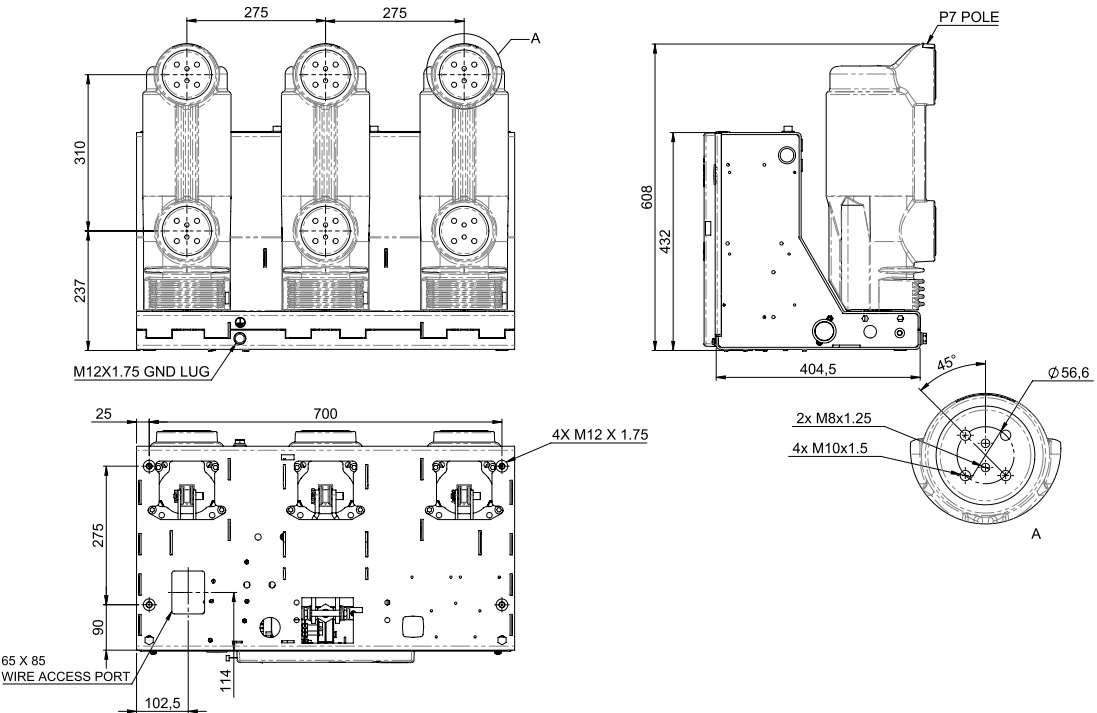
Fixed version

AMVAC		
TN	2RDA042897	
Ur	05	kV
Ir	30	A
Isc	50	kA



Fixed version

AMVAC		
TN	2RDA042911	
Ur	15	kV
Ir	12	A
Isc	50	kA

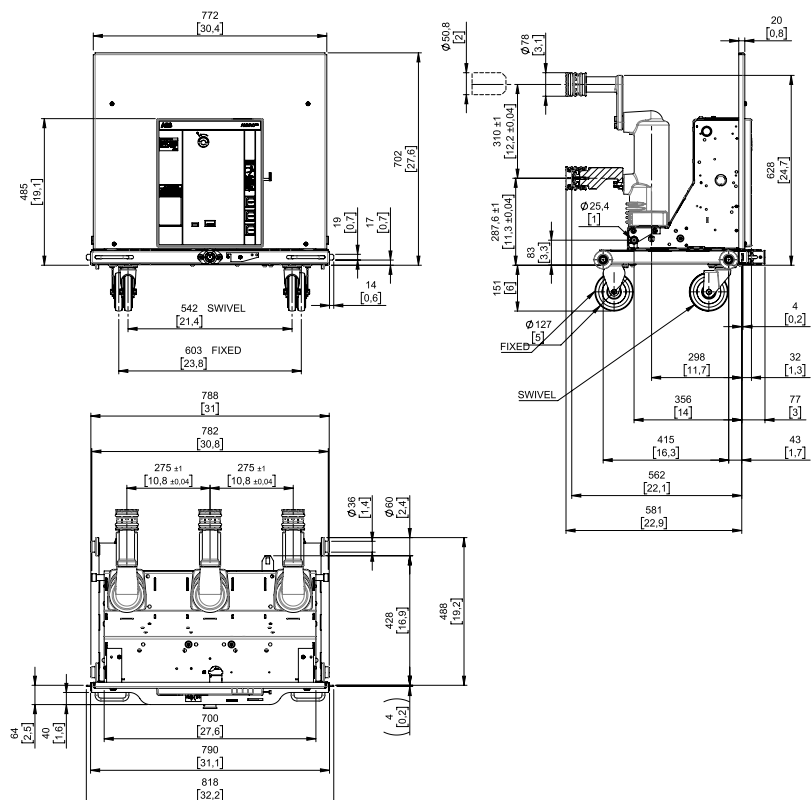


Overall dimensions

Drawout and RoF for Advance / SafeGear

AMVAC

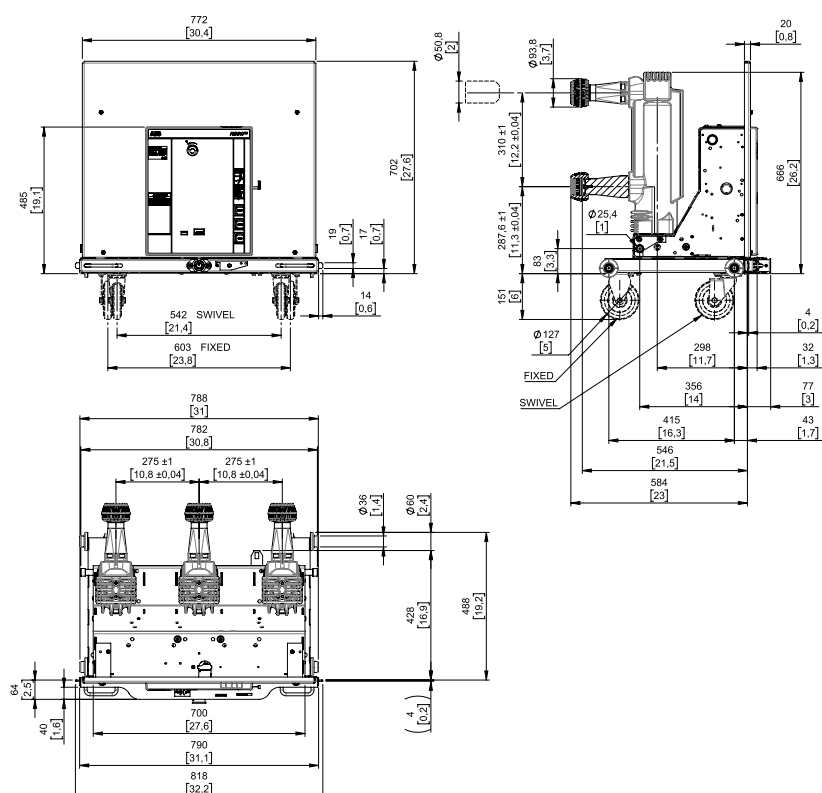
TN	2RGA025898	
Ur	05	kV
	15	kV
Ir	12	A
	20	kA
Isc	25	kA
	31	kA



Drawout and RoF for Advance / SafeGear

AMVAC

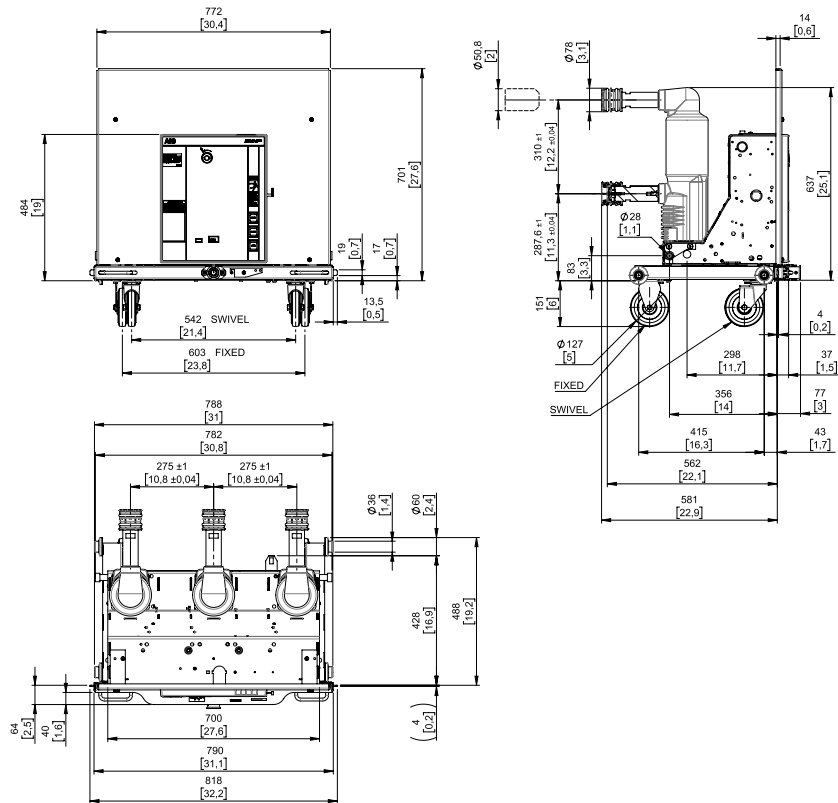
TN	2RGA025976	
Ur	05	kV
	08	kV
	15	kV
Ir	20	A
	20	kA
	25	kA
Isc	31	kA
	40	kA



Drawout and RoF for Advance / SafeGear

AMVAC

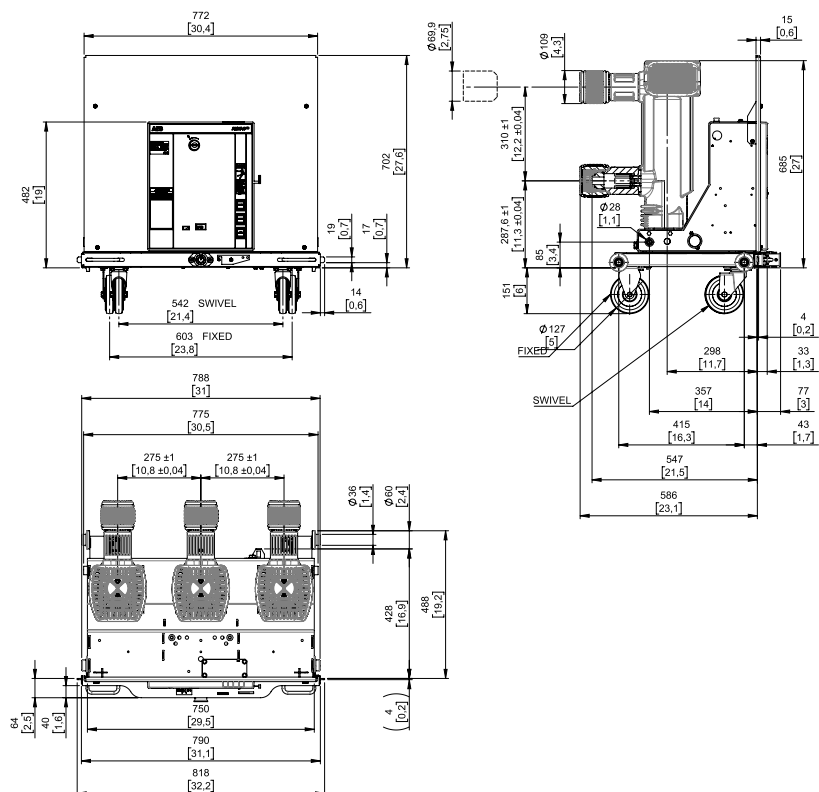
TN	2RGA040129
	05 kV
Ur	08 kV
	15 kV
Ir	12 A
Isc	40 kA



Drawout and RoF for Advance / SafeGear

AMVAC

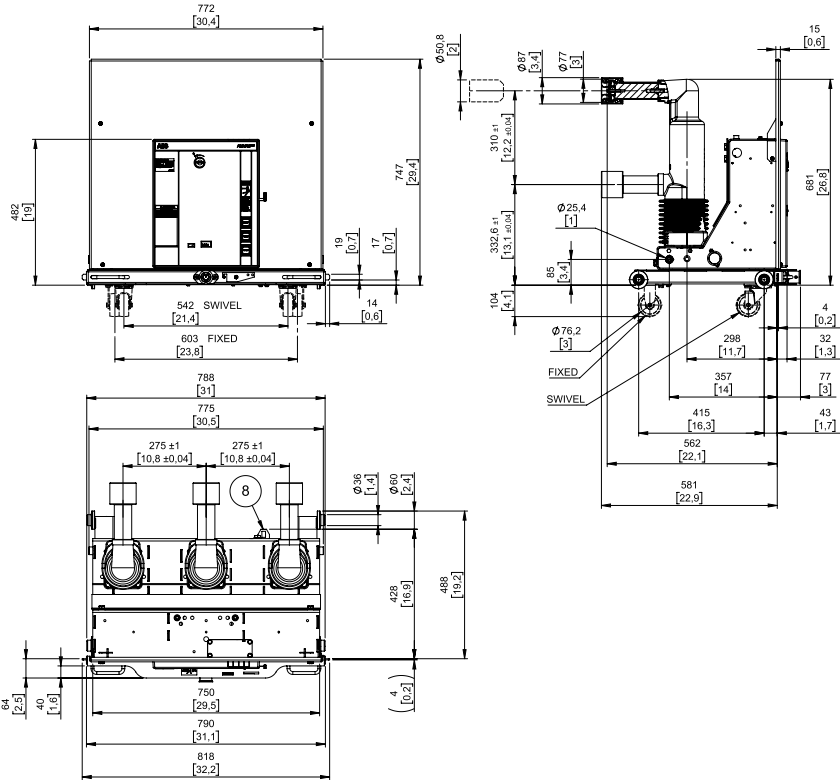
TN	2RGA025987
	05 kV
Ur	08 kV
	15 kV
Ir	30 A
	20 kA
	25 kA
Isc	31 kA
	40 kA



Overall dimensions

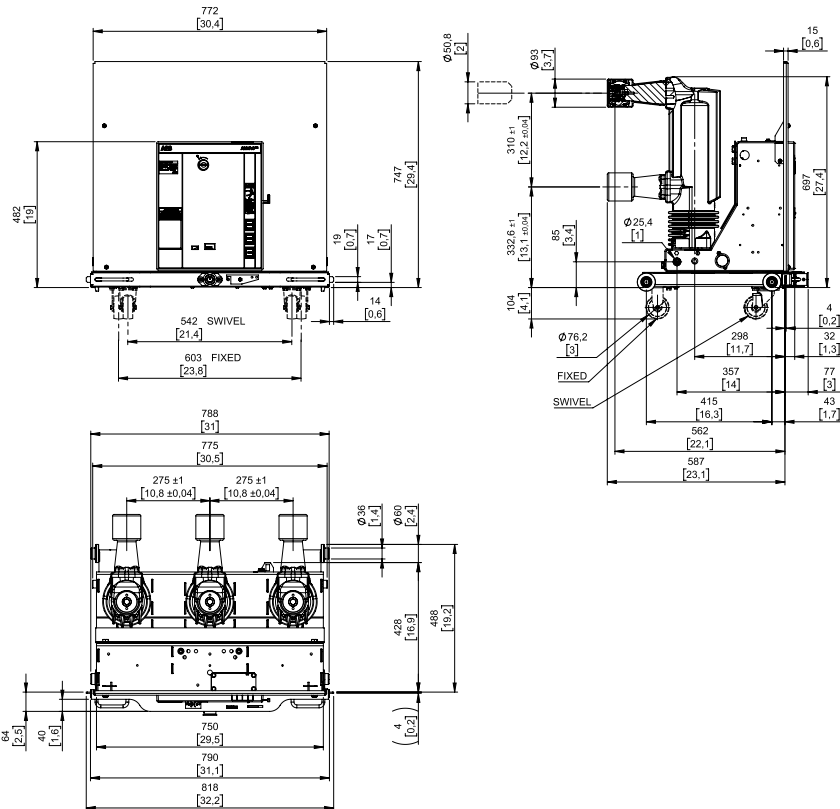
Drawout and RoF
for Advance /
SafeGear

AMVAC		
TN	2RGA025860	
Ur	27	kV
Ir	12	A
Isc	16	kA
	25	kA



Drawout and RoF
for Advance /
SafeGear

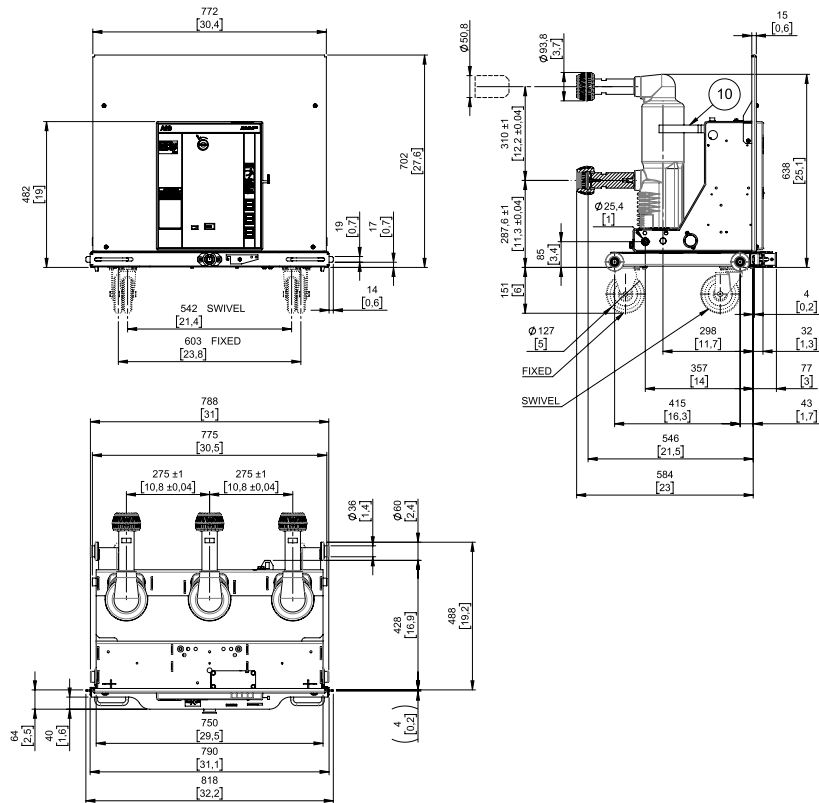
AMVAC		
TN	2RGA025864	
Ur	27	kV
Ir	20	A
Isc	16	kA
	25	kA



Drawout and RoF for Advance / SafeGear

AMVAC

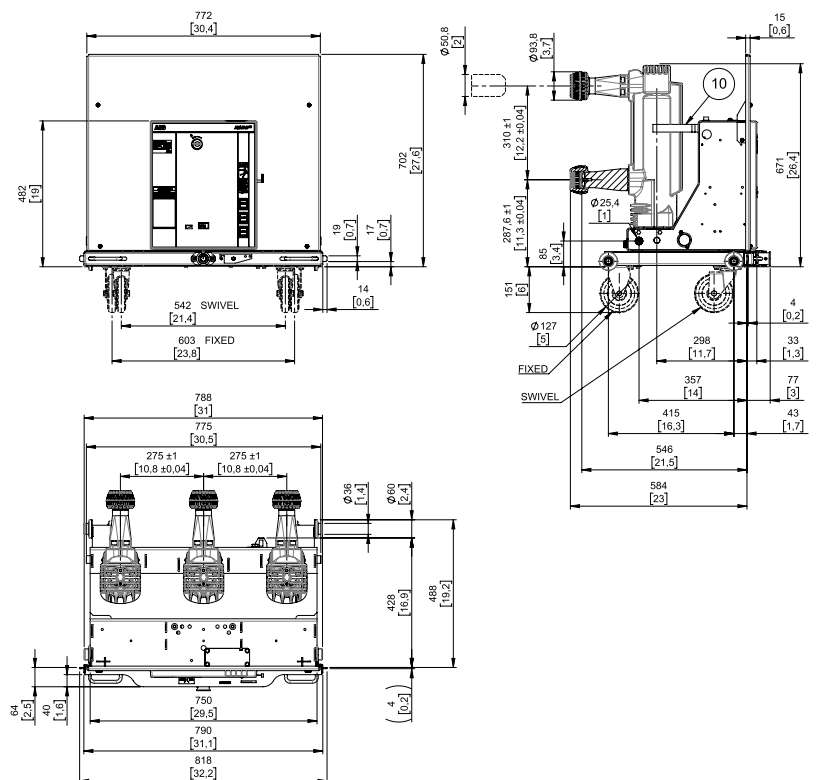
TN	2RGA025973	
Ur	05	kV
Ir	12	A
Isc	50	kA



Drawout and RoF for Advance / SafeGear

AMVAC

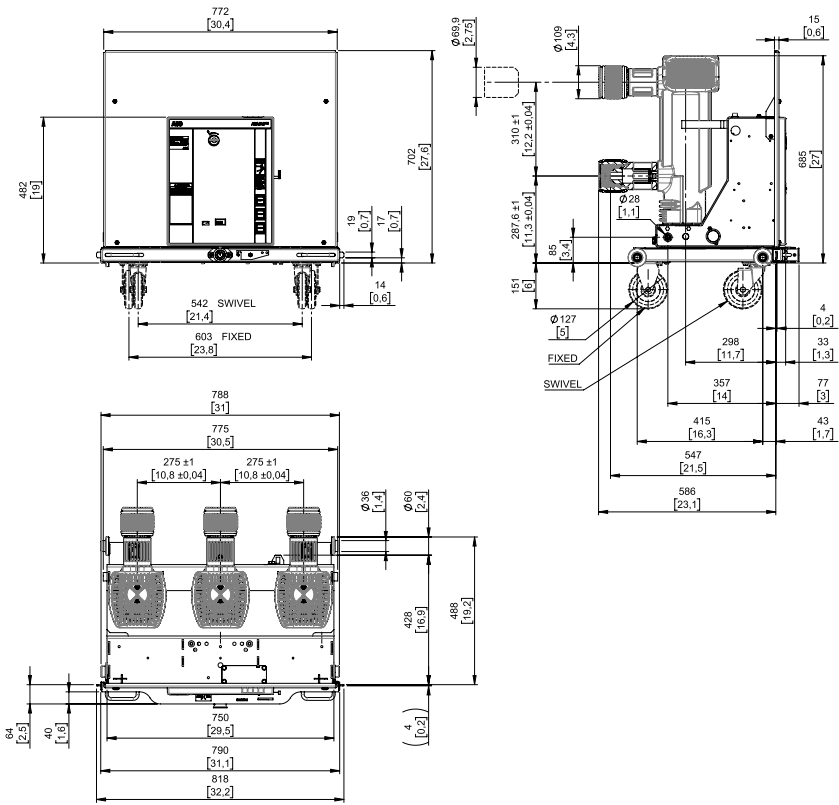
TN	2RGA025977	
Ur	05	kV
Ir	20	A
Isc	50	kA



Overall dimensions

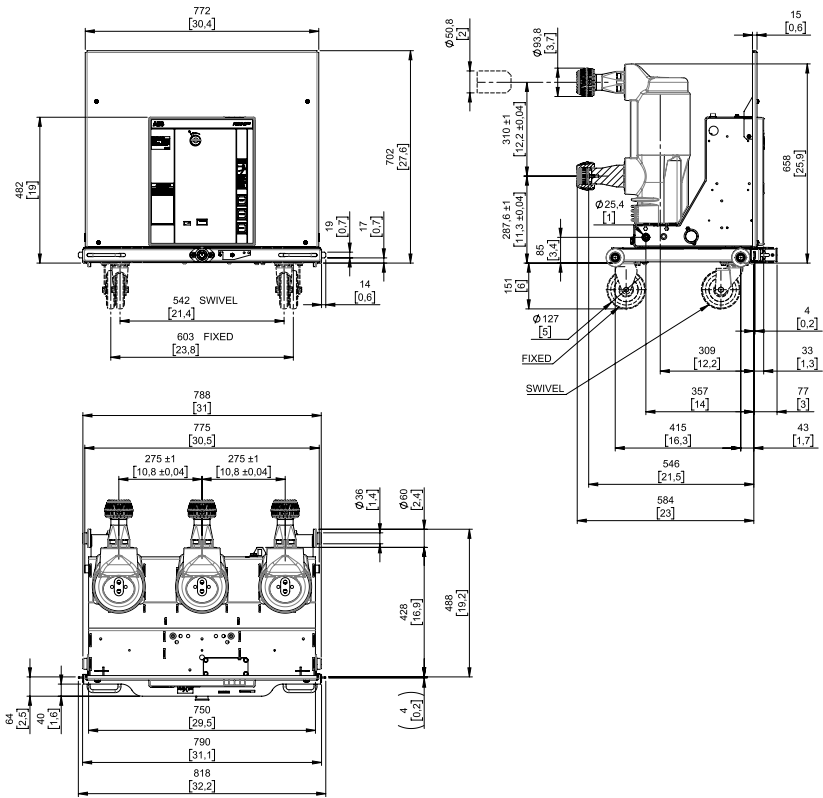
Drawout and RoF for Advance / SafeGear

AMVAC		
TN	2RGA025988	
Ur	05	kV
Ir	30	A
Isc	50	kA



Drawout and RoF for Advance / SafeGear

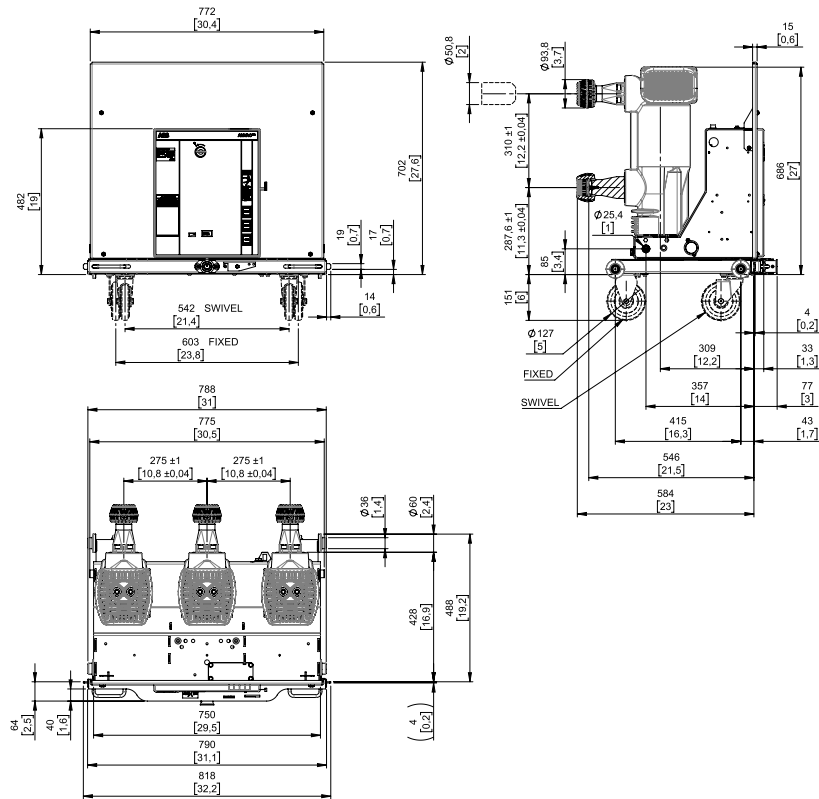
AMVAC		
TN	2RGA025975	
Ur	15	kV
Ir	12	A
Isc	50	kA



Drawout and RoF for Advance / SafeGear

AMVAC

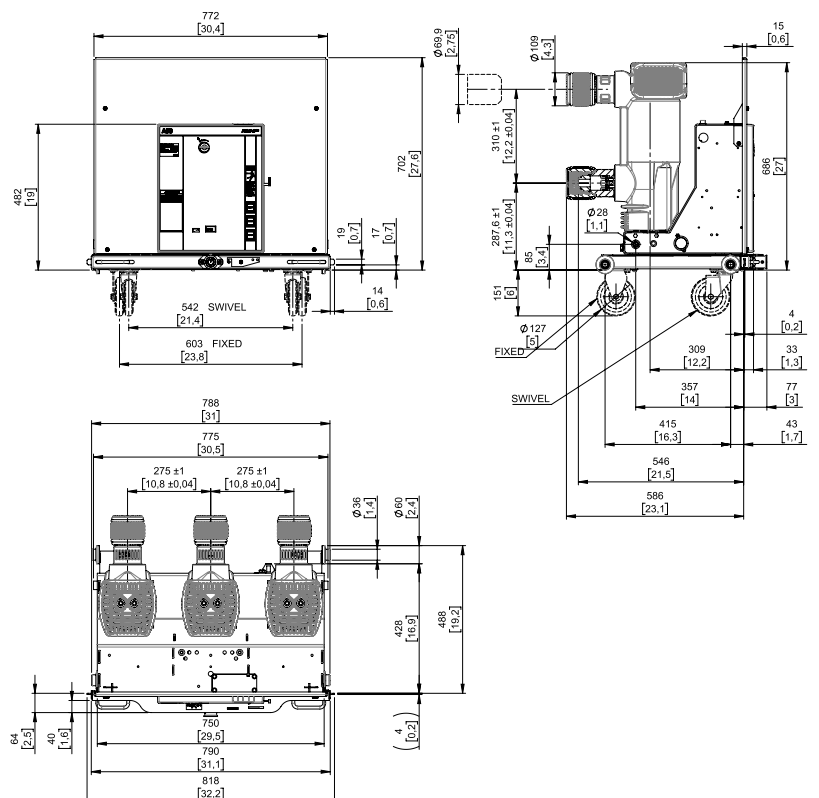
TN	2RGA025979	
Ur	15	kV
Ir	20	A
Isc	50	kA



Drawout and RoF for Advance / SafeGear

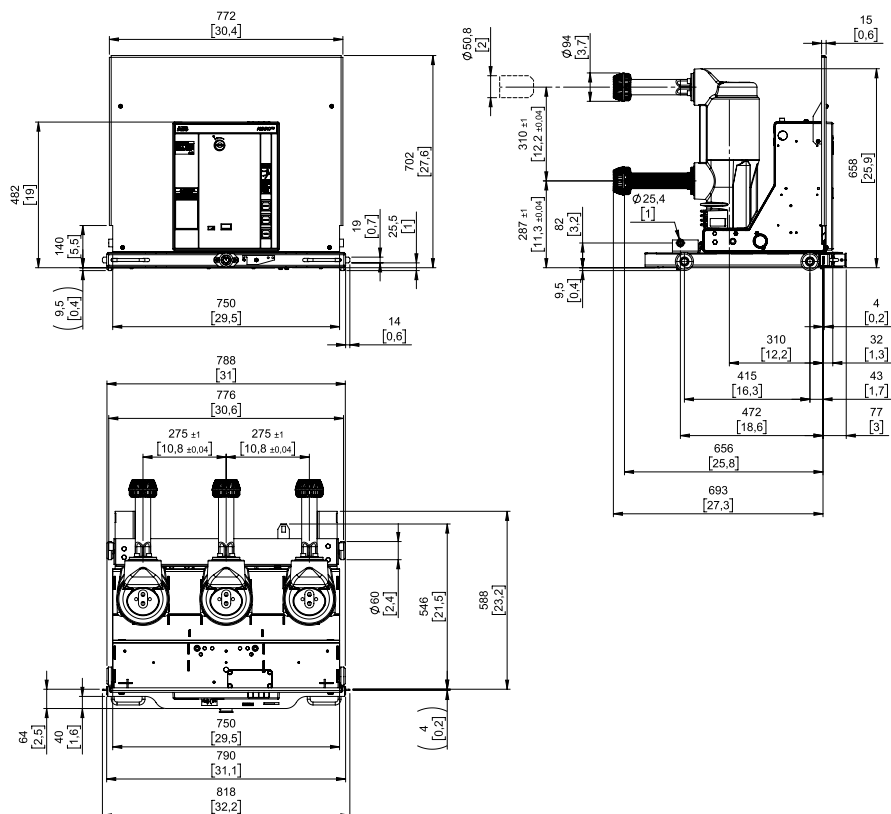
AMVAC

TN	2RGA035980	
Ur	15	kV
Ir	30	A
Isc	50	kA



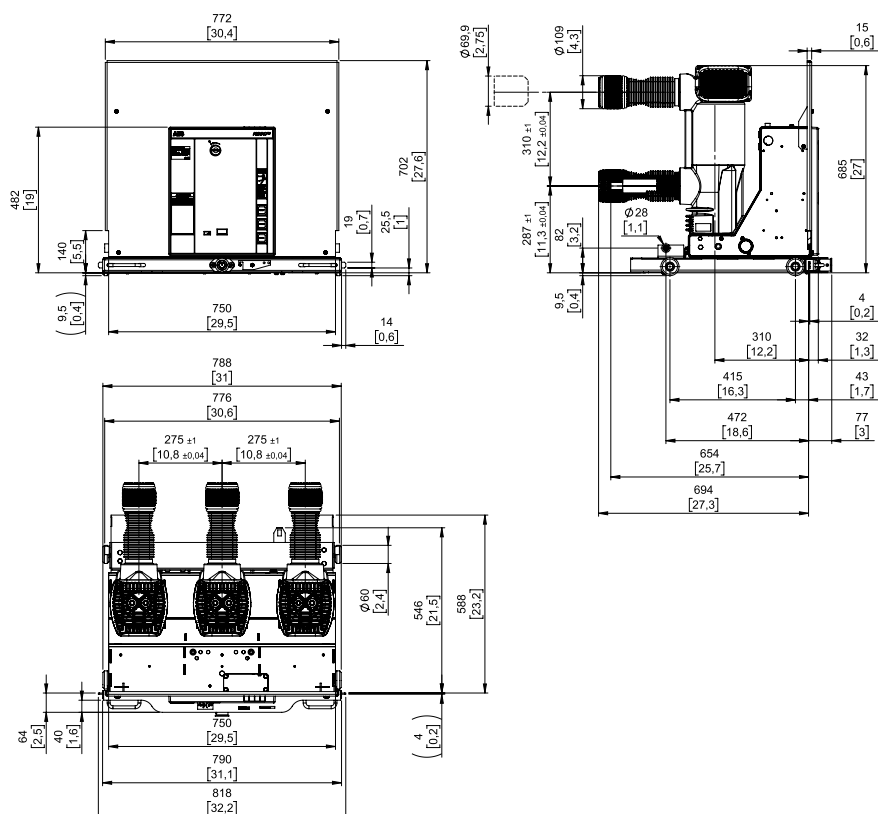
Drawout for SafeGear HD

TN	2RGA026587	
Ur	15	kV
Ir	12	A
	20	A
Isc	50	kA



Drawout for SafeGear HD

TN	2RGA026579	
Ur	15	kV
Ir	30	A
Isc	50	kA



Electrical diagrams

Represented operational state

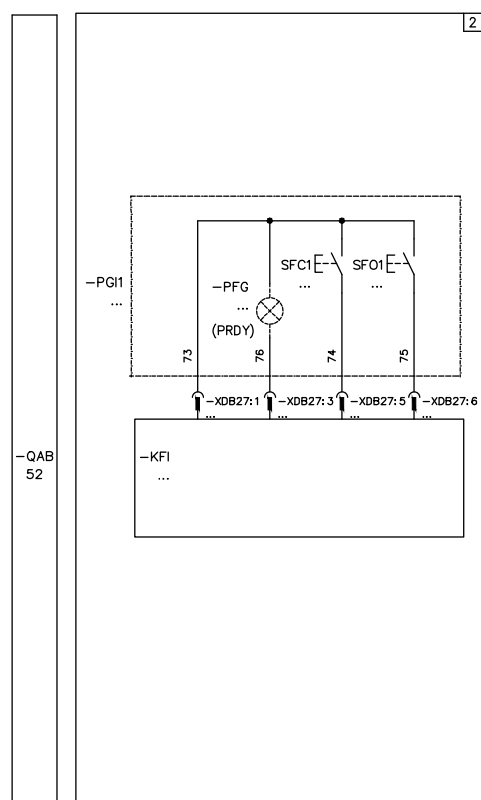
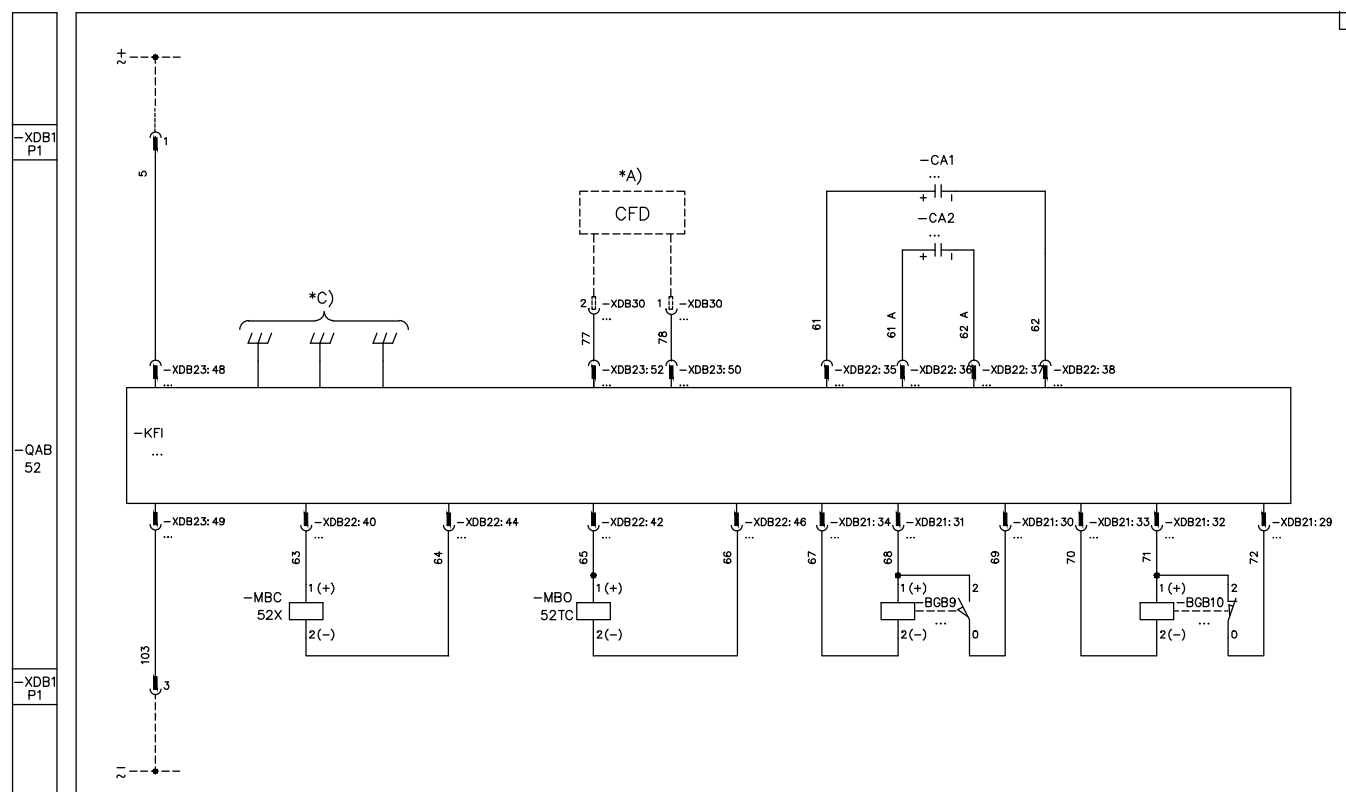
The diagrams indicates the following conditions:

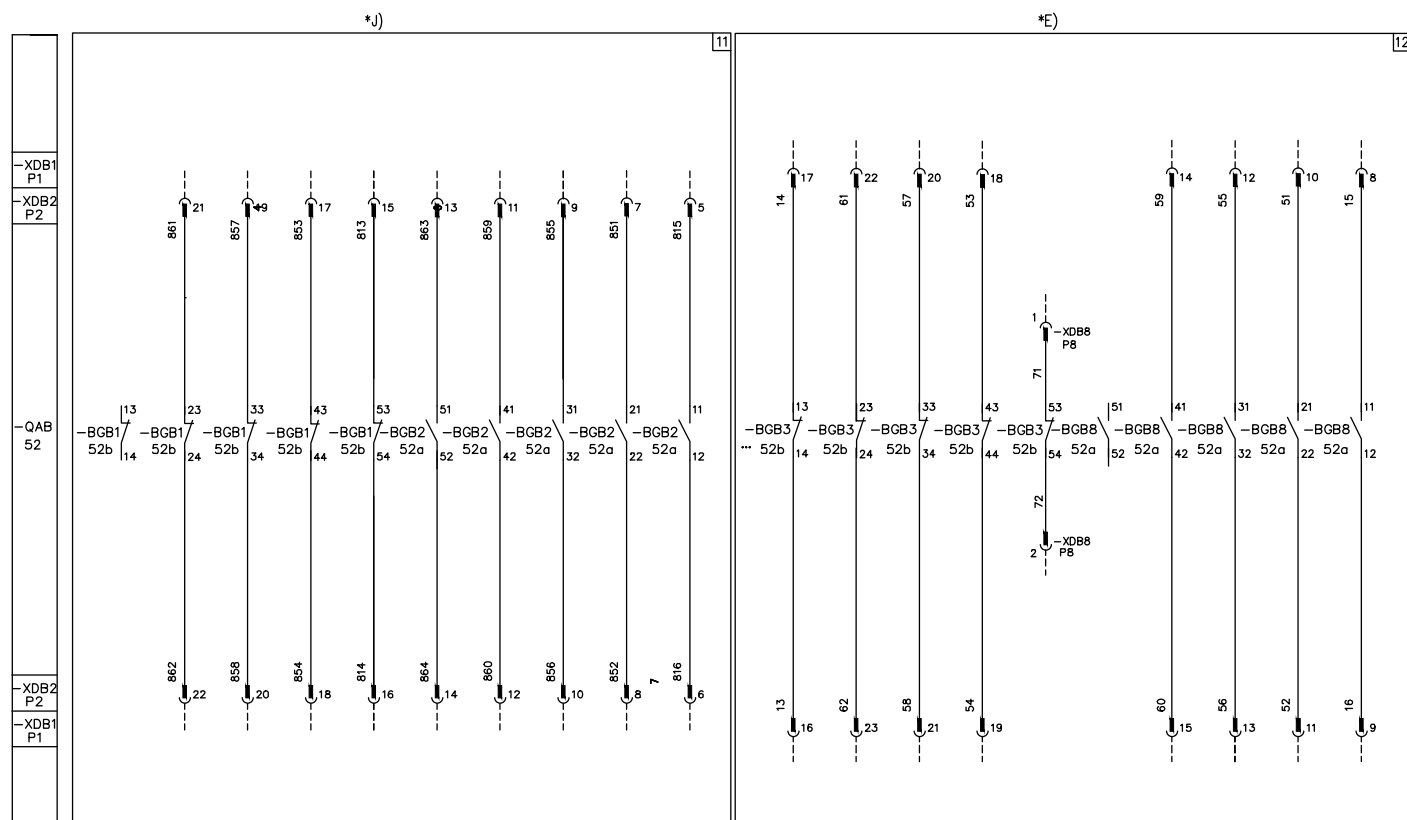
- Circuit breaker off and connected
- De-energized circuits

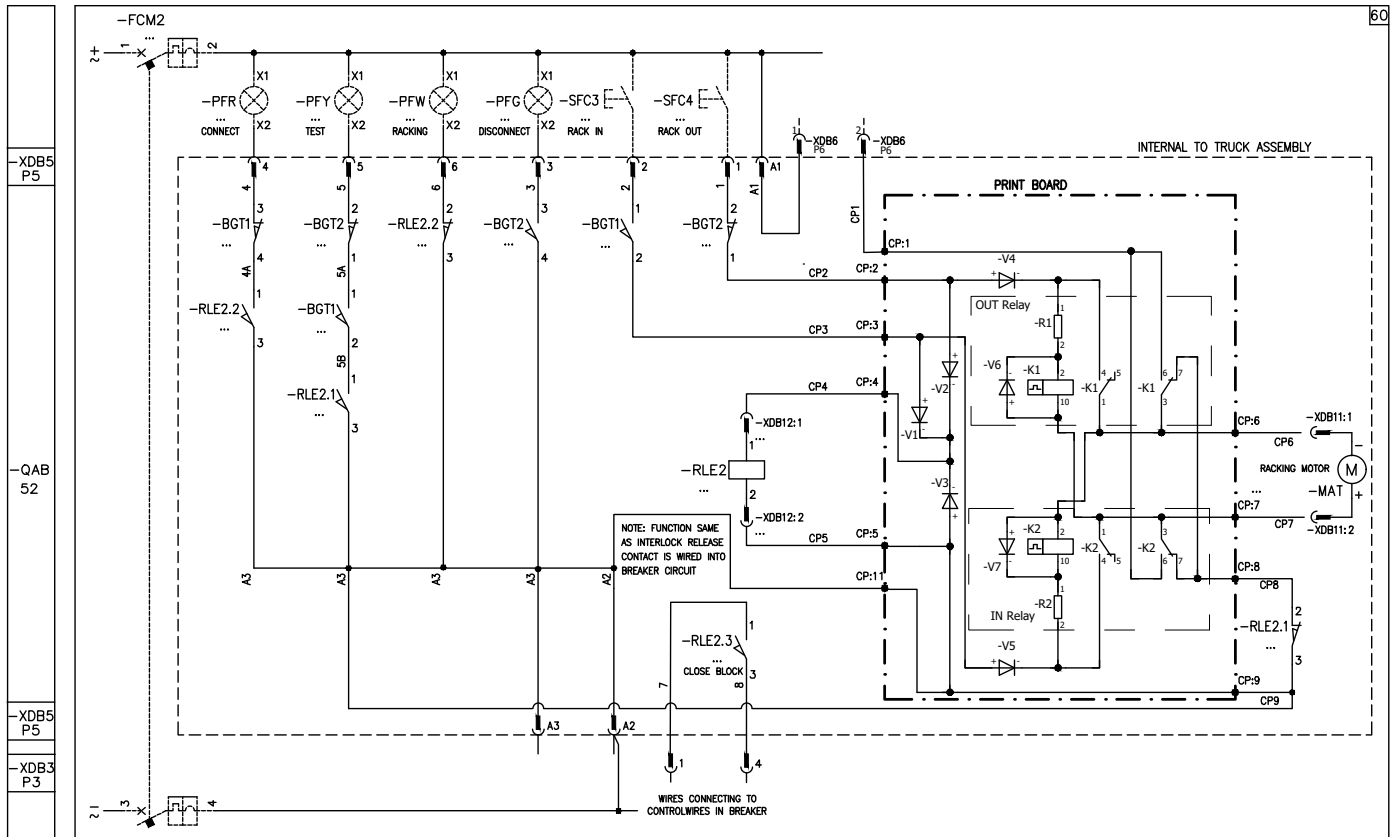
Graphical symbols for electrical diagrams (IEC 60617 standard)

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

AMVAC








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	
-BGB1,2,3,8	52a, 52b	= Circuit breaker auxiliary contacts
-BGB9	...	= Position contact for signalling circuit breaker closed (limit switch with auxiliary supply)
-BGB10	...	= Position contact for signalling circuit breaker open (limit switch with auxiliary supply)
-BGK	...	= Position switches of key locks
-BGT1	...	= Contacts signalling circuit breaker in the connected position
-BGT2	...	= Contacts signalling circuit breaker in the isolated position
-BGT3	...	= Circuit breaker position contact it is open during the travel of the circuit breaker
-CA1, CA2	...	= Capacitors
CFD	...	= Capacitor Fast Discharge (see note A)
-FCM2	...	= Miniature breaker with thermomagnetic o/c release (ABB S202M-K..UC)
-KFI	...	= Control and switching unit
		DR = Signalling contact for unit ready (correct position and capacitor level)
		DN = Signalling contact for unit not ready
		DC1-2 = Signalling contact for circuit breaker closed
		DO1-2 = Signalling contact for circuit breaker open
		DOR = Signalling contact for remote opening command (100ms close)
-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
-MBO	52TC	= Shunt opening release
-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
-PGI1	...	= Humane machine interface with open/close push buttons and ready signalling
		-PFG = Green led lamp for local indication of control and switching unit ready (correct position and capacitor level)
		-SFC1 = Push button for the circuit breaker local closing
		-SF01 = Push button for the circuit breaker local opening
-QAB	52	= Main circuit breaker
-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
-SFC2	...	= Pushbutton or contact for the circuit breaker closing
-SFC3	...	= Pushbutton for the circuit breaker rack in
-SFC4	...	= Pushbutton for the circuit breaker rack out
-SFO2, 3	...	= Pushbutton or contact for the circuit breaker opening
-WGS	...	= Serial bus interface for service operations only (RS232 interface)

Caption		
Desig. IEC	Desig. ANSI	
-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
-XDB4, 6, 7, 8, 13, 14	P4, P6,P7, P8, P13, P14	= Connectors of the accessories
-XDB15	P15	= Internal check connector
-XDB21	P21	= Connectors for position sensors -BS3 and -BS4
-XDB22	P22	= Connector for actuator and capacitor(s)
-XDB23	P23	= Connector for power supply
-XDB24	P24	= Connector for output contacts
-XDB25	P25	= Connector for binary inputs
-XDB27	P27	= Connector for local control panel
-XDB29	P29	= Connector for serial bus interface
-XDB30	P30	= Connector for CFD (Capacitor fast discharge)

Diagram figures description	
Fig. 1	= Basic circuits of circuit breaker and magnetic actuator MABS1
Fig. 2	= Keyboard for local controls
Fig. 3	= Inputs/Outputs for circuit breaker with standard ED2
Fig. 11	= Circuit breaker available auxiliary contacts (Plug 2)
Fig. 12	= Circuit breaker with manual truck available auxiliary contacts (Plug 1)
Fig. 13	= Circuit breaker available auxiliary contacts on the truck (PIN MONITOR)
Fig. 13	= Circuit breaker available auxiliary contacts on the truck (PIN MONITOR)
Fig. 14	= Circuit breaker Key Interlock (KIRK KEY)
Fig. 15	= Jamper to convert into fixed mount (FIXED MOUNT)
Fig. 16	= Circuit breaker with motorized truck available auxiliary contacts (Plug 1)
Fig. 60	= Circuits for the motorization of the Circuit Breaker

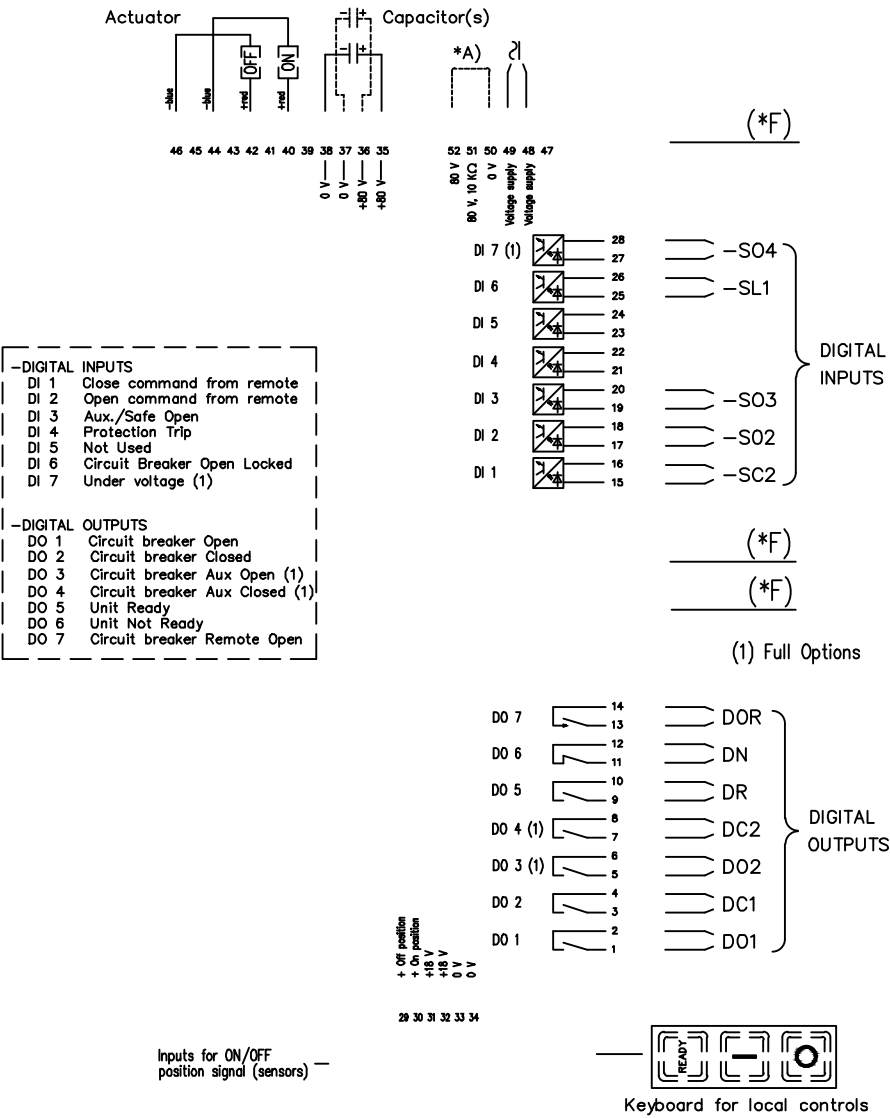
Incompatibility

The combinations of circuits given in the figures below are not possible on the same circuit breaker:

Fig. 13-14-15

Notes	
A)	Connector for CFD (Capacitor fast discharge). WARNING: see instruction manual. Short circuit -XDB23:50 with -XDB23:52 with a Resistor 10 Ohm/50Watt in series to have a fast capacitors discharge.
B)	Serial bus interface for service operations only (RS232 interface).
C)	Fix the ground copper strips under the relevants shock absorber on the unpainted zone.
D)	The circuit breaker is delivered complete with the accessories listed in the order acknowledgement only. To draw up the order examine the apparatus catalogue.
E)	If the "PIN MONITOR" -BGT1 is requested (default), figure 13 is available and the contact -BGB3 {13-14} in figure 12 is not available. If the "PIN MONITOR" -BGT1 is not requested, figure 13 is not available and the contact -BGB3 {13-14} in figure 12 is available and wire 13 is moved from P3:3 to -BGB3:14
F)	Setting DIP switches: see AMVAC instruction manual
G)	If the "FIXED MOUNT" figure 15 is requested or "KIRK KEY" figure 14 is requested then contact -BGT1 (P3:1,P3:4) in figure 3 is not available.
H)	If the "KIRK KEY" figure 14 is requested, the contact DI3 (P2:1,P2:2) in figure 3 is not available. Wire 10A is removed from -XD825:20, and Wire 9A is removed from -XDB24:7
J)	If "1 PLUG WIRING" is requested from CAT# "DIGIT" 6="0", figure 11 is not available.

Electrical diagrams





More product information:

abb.com/mediumvoltage

Your contact center:

abb.com/contactcenters

More service information:

abb.com/service