

DISTRIBUTION SOLUTIONS

## ADVAC<sup>®</sup> 38

IEEE medium voltage vacuum circuit breakers  
and PowerCube PB8

40.5 kV–1200 A..3000 A–16 kA..40 kA



---

**The ABB ADVAC® 38 is a medium voltage circuit breaker tested to the latest IEEE standards.**

**ABB's state-of-the-art medium voltage circuit breakers use highly automated manufacturing for the highest quality assurance. ABB's millimeter-precision design reduces maintenance while ensuring reliability and safety for critical applications.**

**The ADVAC 38 series medium voltage breakers are characterized by their compact size, low weight and floor-rolling withdrawable designs that are the premium choice for modern electrical distribution applications.**

---

# Contents

<b>04–06</b>	<b>ADVAC® 38 — its strengths, your benefits</b>
<b>07–12</b>	<b>Description</b>
<b>13–32</b>	<b>Selection and ordering</b>
<b>33–35</b>	<b>Specific product characteristics</b>
<b>36–39</b>	<b>Overall dimensions</b>
<b>40–47</b>	<b>Electric circuit diagrams</b>



---

## ADVAC® 38:

Its strengths, your benefits



**Global  
availability**



**Safety and  
protection**



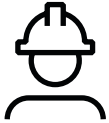
**Reliability in  
extreme conditions**





## Productivity

Maximize your output



### Help keep personnel safe

- ADVAC® 38 is the smallest and lightest 40.5 kV circuit breaker in the industry, helping to increase personnel safety while decreasing transportation costs and storage space
- Roll-on-floor (ROF) caster design offers ease of use
- Remote motorized racking options available



### Save floor space

- Space-saving compact design
- Two-high stacking capability



### Protect assets

Type tested according to:

- C37.09-2018
- C37.54-2002
- C37.55-2020
- C37.20.2-2015 Annex C for partial discharge testing



### Optimize investment

- Optimized design with compact, single-sized compartment for all ratings
- Lowest power consumption accessories for reduced battery bank systems

## Productivity

Maximize your output

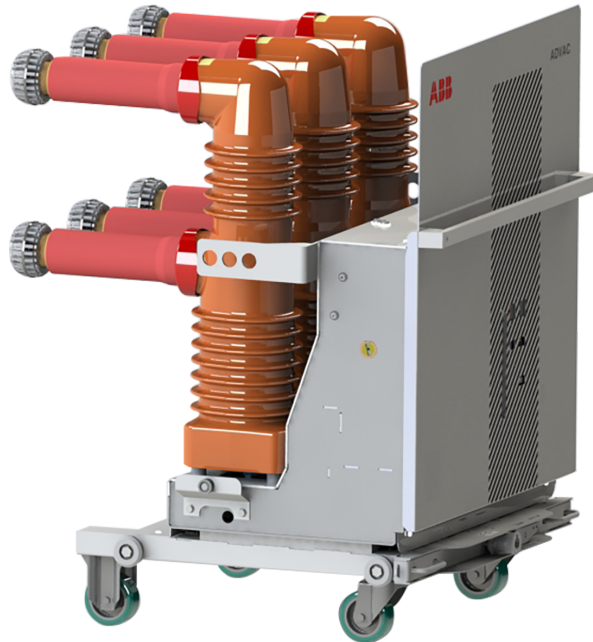


### Reduce maintenance costs

- Class M2 for 10,000 mechanical operations
- Globally proven EL operating mechanism and racking truck are shared for all ADVAC® circuit breakers, requiring no adjustment or measurement
- Reduced vacuum interrupter wear design requires no visible or mechanical measurements



- Maintenance-free embedded pole design helps protect vacuum interrupters from contamination, moisture and damage and helps improve tracking resistance



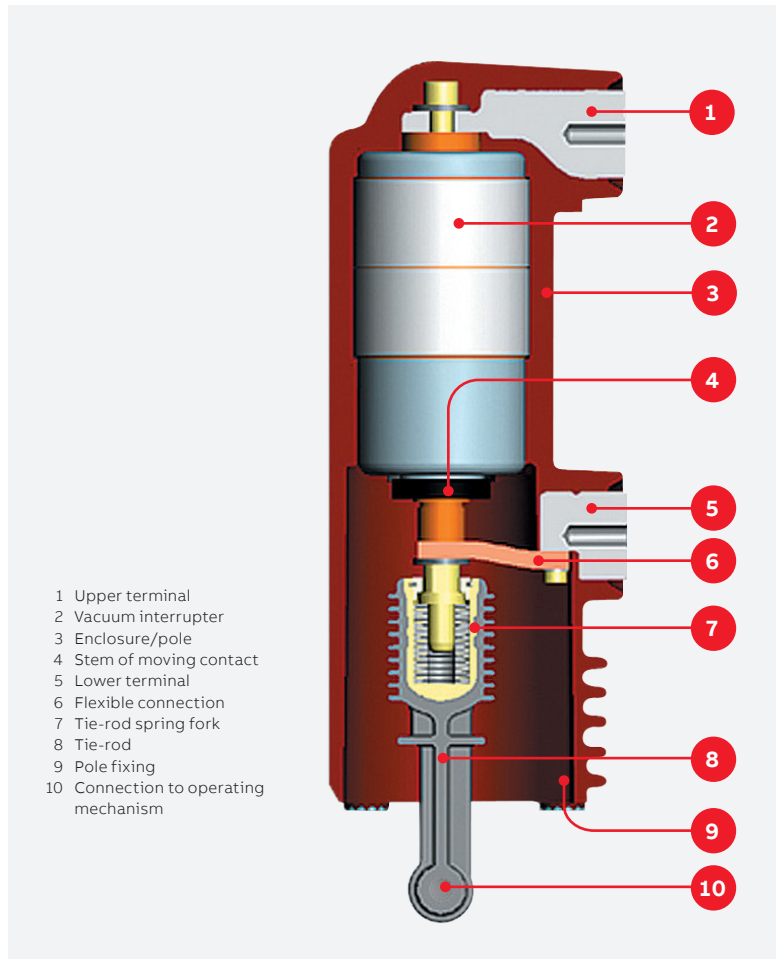
## Description

These new ADVAC® 38 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 38 medium voltage circuit breakers use vacuum interrupters embedded in the poles. This construction technique makes the circuit breaker poles 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 or 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 rapidly restored by the sharp reduction in density of the conveyed load and rapid condensation of 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 versions
- 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



## Description

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 and 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

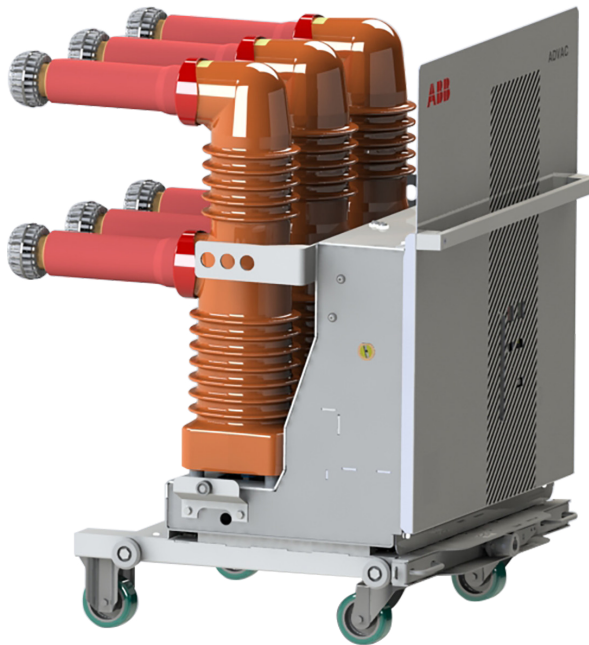
The low speed of the contacts, along with their reduced travel and exposed conductive component, limit the energy required for operation, ensuring extremely low wear on the system. This means that the circuit breaker requires very little maintenance. ADVAC® 38 circuit breakers have mechanical operating 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, easy-to use design and can be customized with a wide range of accessories, which are straightforward and rapidly installed. This simplicity enhances reliability of the apparatus.

### The structure

The operating mechanism and 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.



### Interruption principle of ABB interrupters

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

### 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.

Temperature rises 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 ABB 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.

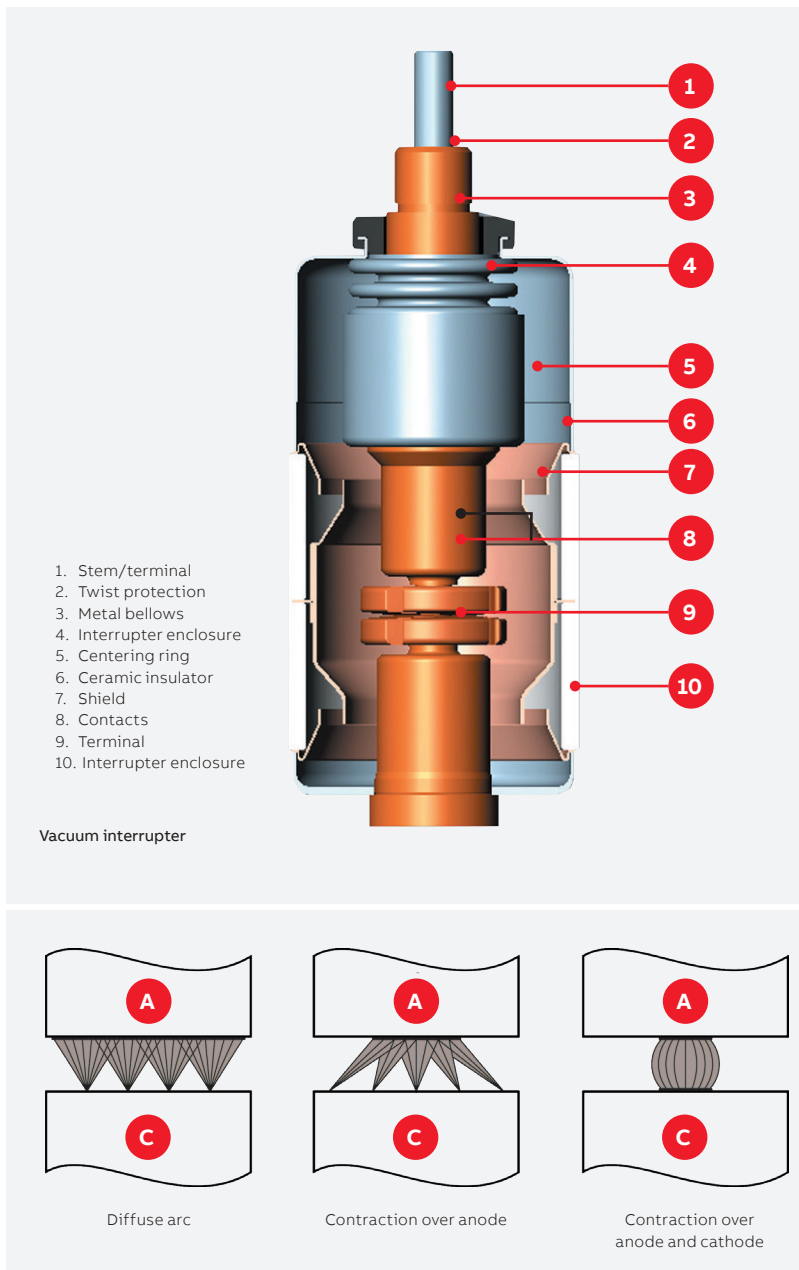


Diagram of transition from diffuse arc to contracted arc in a vacuum interrupter.

## Description

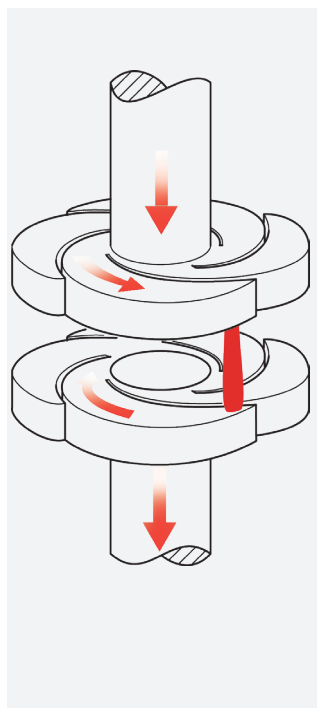
### ABB vacuum interrupter contact spiral shape

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

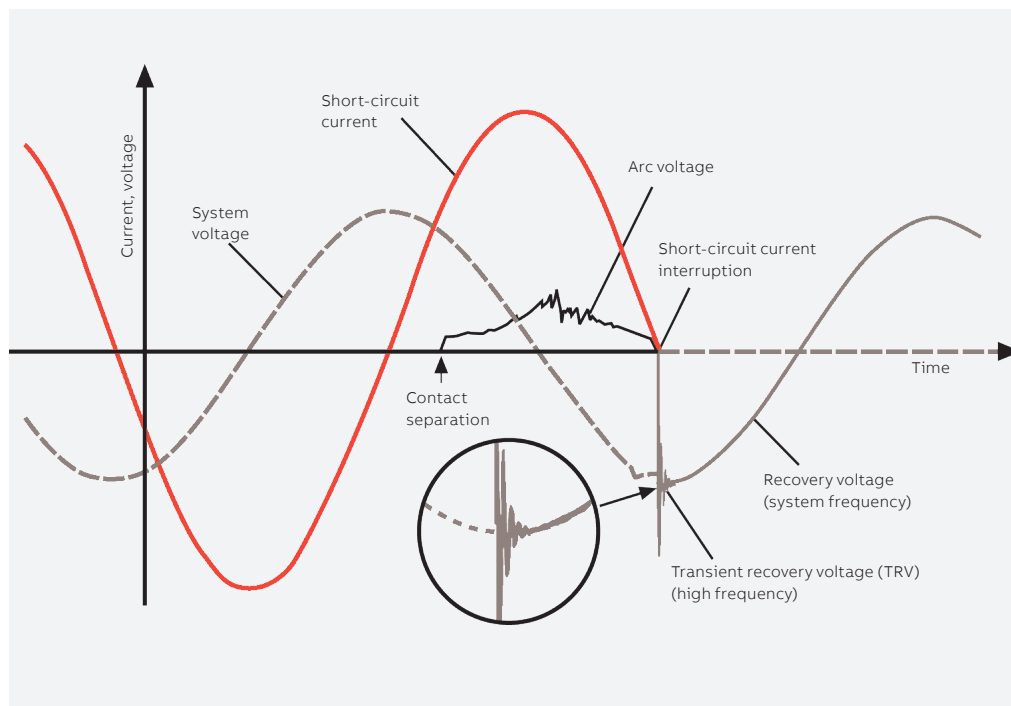
The self-generated electromagnetic force acts tangentially and causes the arc to spin rapidly around the axis of the contacts. This forces the arc to turn and affect a larger area than that of a fixed contracted arc. Besides minimizing the thermal stress to which the contacts are subjected, this ensures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

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 allows maximum dielectric strength to be re-established between the interrupter contacts within just 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.



**Versions available**

ADVAC® 38 circuit breakers are available in fixed and withdrawable versions with front operating mechanism. The withdrawable version is available for the PB8 OEM enclosures.

**Fields of application**

ADVAC 38 circuit breakers are used in power distribution systems for controlling and protecting cables, transformer and distribution substations, motors, transformers and capacitor banks.

**Standards**

ADVAC 38 circuit breakers and PB8 enclosure comply with

- C37.04
- C37.09-2018
- C37.54-2002
- C37.55-2020
- C37.20.2-2015 Annex C for partial discharge testing

ADVAC 38 circuit breakers undergo the tests indicated below, helping ensure the safety and reliability of apparatus in service in every installation.

- Type tests — Temperature rise, tests to verify insulation level (tests with rated lightning impulse withstand voltage and power frequency withstand voltage), peak and short-time withstand current tests, mechanical life, short-circuit current making and breaking capacity.
- Individual production tests — Insulation of the main circuits with voltage at power frequency, auxiliary and operating circuit insulation, measurement of the main circuit resistance, mechanical and electrical operation.

**Safe service**

Thanks to the complete range of mechanical and electrical locks (available on request), ADVAC 38 circuit breakers can be used to create reliable distribution switchgear.

The locking devices are designed to prevent incorrect operation and allow the installations to be inspected in conditions of operator safety. Key locks or padlocks enable the opening and closing and/or racking in and out operations.

The device for racking out with the door closed only allows the circuit breaker to be racked in or out of the switchgear with the door closed. Anti-racking-in locks prevent circuit breakers with different-rated currents from being racked in and also prevent racking in and out operations with the circuit breaker closed.

- Highly reliable operating mechanisms with very few components
- Extremely limited, simple maintenance
- Accessories common to the entire range
- Electrical accessories that can be installed or replaced quickly and easily, thanks to pre-engineered wiring with plug-socket connectors
- Mechanical anti-pumping device supplied as standard equipment
- Built-in closing spring loading lever
- Circuit breaker open key lock
- Protective covering over opening and closing pushbuttons that can be operated only with a special tool
- Padlock device on operating pushbuttons

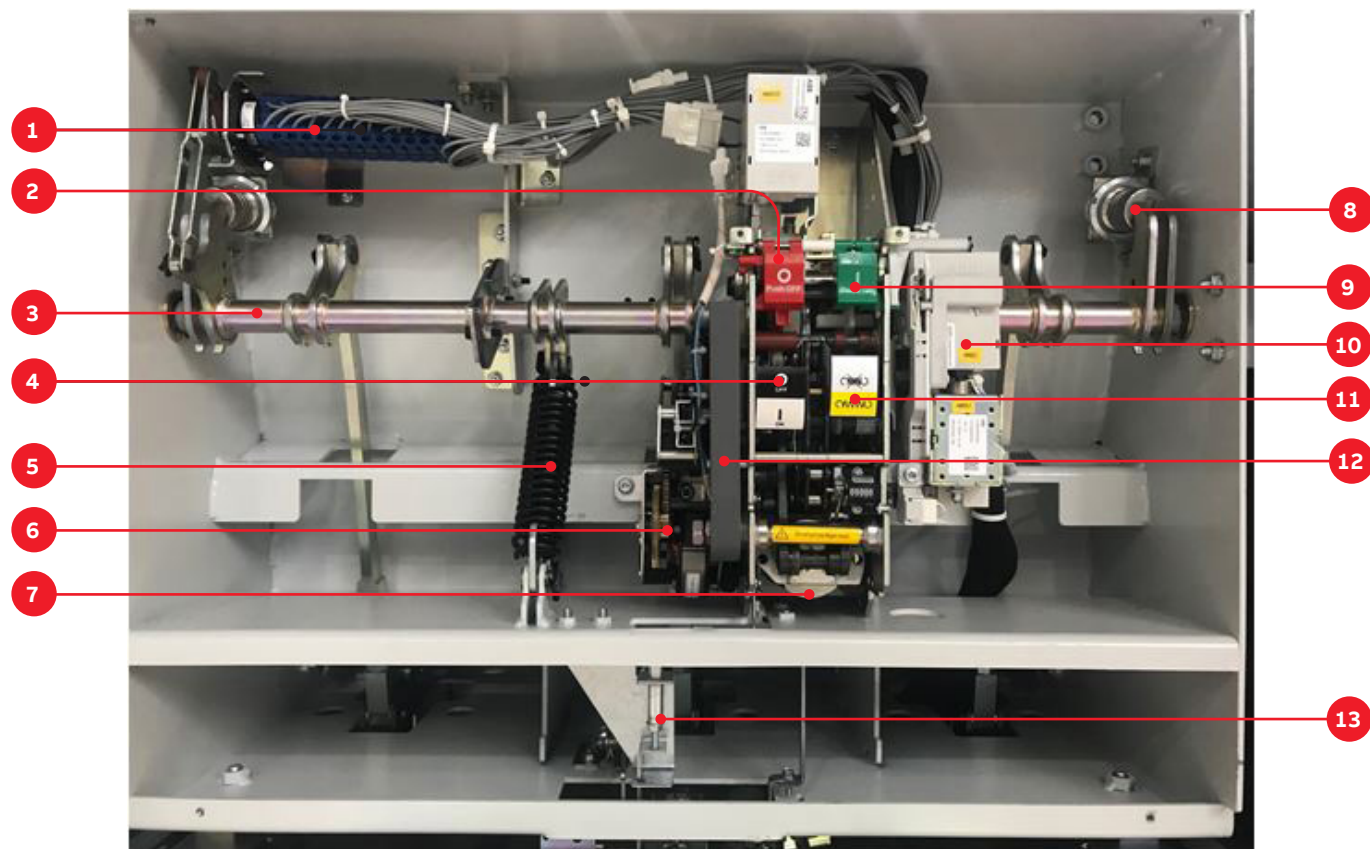
**Accessories**

A complete range of ADVAC 38 circuit breaker accessories is available to meet any installation requirement.

The operating mechanism has a standardized range of accessories and replacement parts that are easy to identify and order. Accessories are installed conveniently from the front of the circuit breaker. Electrical connection is performed with plug-socket connectors.

Use, maintenance and operation of the apparatus are simple and require limited use of resources.

## Description



**Circuit breaker operating mechanism**

1	Auxiliary contacts
2	Open pushbutton
3	Main shaft
4	Breaker status indicator
5	Opening spring
6	Charging motor
7	Charging spring
8	Damper
9	Close pushbutton
10	Smart coil pack, open, close, undervoltage
11	Spring charged indicator
12	Manual charging handle
13	Racking interlocks

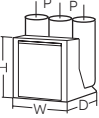
## Selection and ordering

### ADVAC® 38 withdrawable circuit breakers

General characteristics of the ADVAC 38 drawout  
and roll on the floor (ROF) series

Refer to ordering aid document 1VCD500372  
for available ratings and options.



ADVAC® 38 kV							
Rated voltage class	kV						38
Maximum tested voltage $U_r$	kV						40.5
Rated frequency	Hz						50/60
Short-circuit breaking current $I_{sc}$	kA		16				
			25			40	
			31.5				
C2 class capacitive switching	A			1000		1000	
Rated current $I_r$	A	1200	2000	3000 FAC	1200	2000	3000 FAC
Short-time withstand current	kA		16				
			25			40	
			31.5				
Short circuit withstand	s		3			3	
Close and latching capability			42				
			65			104	
			82				
% DC component ( $I_{dc}$ )	%		46			46	
Interrupting time	ms		< 50			< 50	
Closing time	ms		50–80			50–80	
Mechanical endurance class	M2						10,000
Lightning impulse withstand voltage	kV		150			150	
Power frequency withstand voltage $U_d$	kV						80
Overall dimensions		Phase distance	mm/inches				280 / 11.0
		Height	mm/inches				1126 / 44.3
		Width	mm/inches				897 / 35.3
		Depth	mm/inches				906 / 35.7
		Weight of withdrawable ROF version	kg / lb	299 / 661	299 / 661	299 / 661	299 / 661

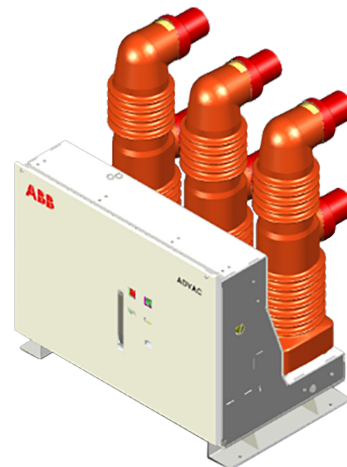


## Selection and ordering

### ADVAC® 38 fixed circuit breakers

General characteristics of the ADVAC 38 fixed mounted series

Refer to ordering aid document 1VCD500372 for available ratings and options.



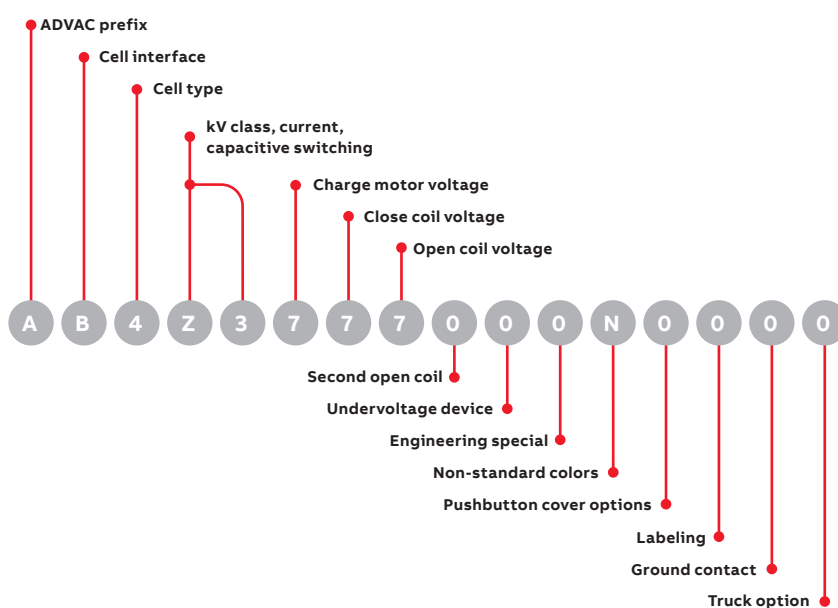
ADVAC® 38 kV									
Rated voltage class	kV								38
Maximum tested voltage $U_r$	kV								40.5
Rated frequency	Hz								50/60
Short-circuit breaking current $I_{sc}$	kA		16					40	
			25						
			31.5						
C2 class capacitive switching	A			1000				1000	
Rated current $I_r$	A	1200	2000	3000 FAC		1200	2000	3000 FAC	
Short-time withstand current	kA		16					40	
			25						
			31.5						
Short circuit withstand	s		3					3	
Close and latching capability			42					104	
			65						
			82						
% DC component ( $I_{dc}$ )	%		46					46	
Interrupting time	ms		< 50					< 50	
Closing time	ms		50–80					50–80	
Mechanical endurance class	M2								10,000
Lightning impulse withstand voltage	kV		190	150		190			150
Power frequency withstand voltage $U_d$	kV				80				
Overall dimensions		Phase distance	mm/inches						280 / 11.0
		Height	mm/inches						884 / 34.8
		Width	mm/inches						796 / 31.3
		Depth	mm/inches						501 / 19.7
		Weight of fixed version	kg / lb	170 / 375	181 / 400		170 / 375		181 / 400

## ADVAC® 38 breaker smart-style numbering

### Ordering of the ADVAC 38

The ADVAC 38 kV breaker product line has a structured, smart-style number ordering system. The complete style number is built up of 16 customer-selected 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 an ADVAC 38, 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, also known as model 4 ADVAC circuit breaker for digit 3.
  - Step 4: Select the system ratings according to the table below for digits 4 and 5.
- Continue to the next page for smart coil description and breaker style number ordering continuation.

ADVAC® 38 style number digits 4–5

Digits 4–5	kV class	Max wave voltage (kV)	Continuous current (A)	Short circuit current (A)	BtB C2 capacitive switching (A)
W1	38		1200	16	
W2			2000	16	
W3			3000 FAC	16	
X1			1200	25	
X2			2000	25	
X3			3000 FAC	25	
Y1			1200	31.5	
Y2			2000	31.5	
Y3			3000 FAC	31.5	
Z1	40.5		1200	40	1000
Z2			2000	40	1000
Z3			3000 FAC	40	1000

# Selection and ordering

## Charging motor smart numbering

Digit	Value	Charge motor voltage
6	A	120 V AC
	B	240 V AC
5	5	24 V DC
	6	48 V DC
7	7	125 V DC
	8	250 V DC

**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..48 V DC, 125 V DC, 250 V DC 120 V AC, 240 V AC
Operating limits	85..110% Un
Power on inrush (Ps)	600 W, 900 W for 40 kA, 3000 A and C2 rated breakers
Rated power (Pn)	200 W, 350 W for 40 kA, 3000 A and C2 rated breakers
Inrush duration	0.2 s
Charging time	6–7 s
Insulation voltage	1500 V AC at 1 min

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

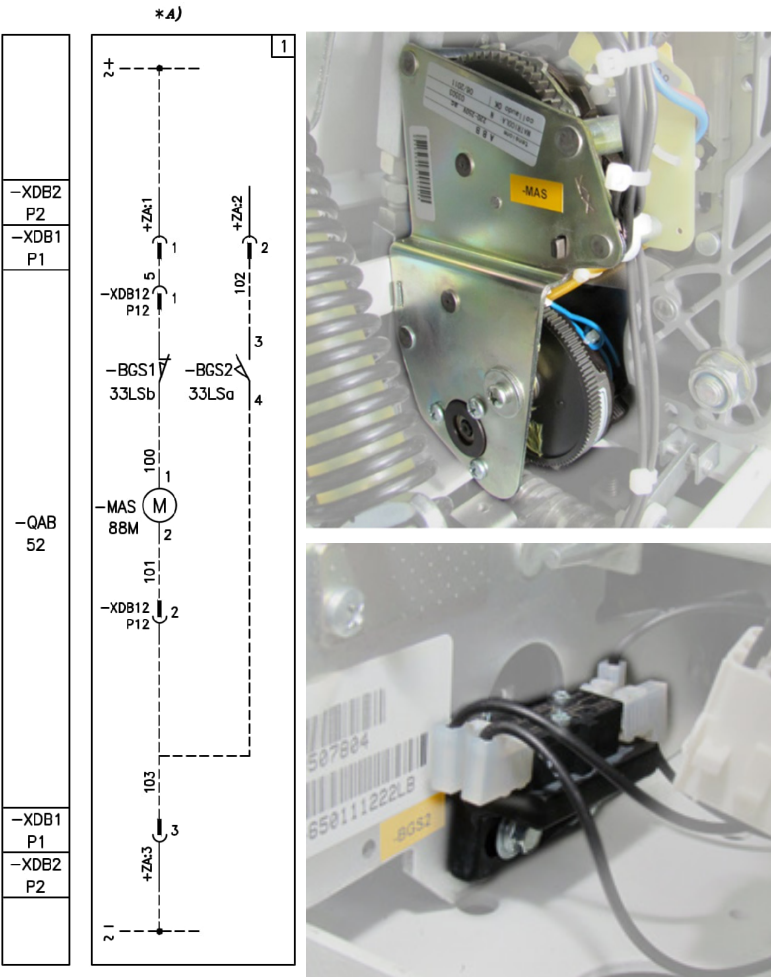
**-BGS2 / -33LSa**  
Breaker charged/discharged is a standard accessory contact for signaling the breaker status. It consists of a microswitch that allows for remote signaling of the state of the circuit breaker operating mechanism's closing spring.

- 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 as the charging motor.

See following page for smart coil accessory description and ordering.

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





Smart coil accessories

ADVAC® smart coils

For accessory digits 7 through 10 of the ADVAC 38 style number, the device employs smart coil switch technology. The smart coil functions in a circuit the same as an older-style coil would, but adds the benefits of monitoring and increased reliability. 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 (~60 V for 125 V system) across the coil during coil supervision. The smart coil’s reduced power consumption (~100 mA at 125 V DC) during supervision makes it suitable for constant 24/7 monitoring with the circuit breaker in the open or closed position. This also leads to a reduced battery bank size when used with backup systems. The smart coil will constantly pulse the current in the coil monitoring circuit each 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, the smart coil has a faster response time than a standard coil because it triggers off a voltage threshold for actuation, whereas standard coils require a large current increase in the circuit to create the necessary magnetic force for activation.



Smart coil pack (item 10 on page 12) consists of the open coil, close coil and undervoltage coil.

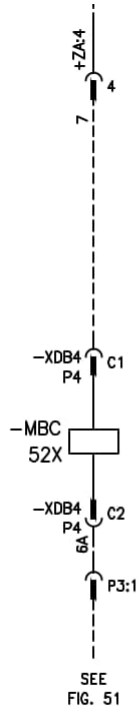
Smart coil main technical characteristics

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

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



# Selection and ordering



## Close coil smart numbering

**Step 6:** Select close coil voltage from table for **digit 7:**  
**-MBC / 52X**

The ADVAC® smart coil closing release allows for the breaker closing command to be transmitted by remote control. This electronic solenoid release is suitable for both instantaneous and permanent duty.

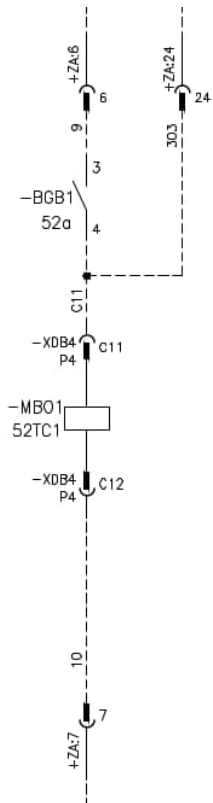
The permanently supplied release provides the electrical anti-pumping function with both electrical opening and reclosing commands maintained.

To guarantee the closing action, the current impulse must last at least 100 ms. If the shunt closing release -MBC and undervoltage release -MBU have the same supply voltage 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 shunt closing release energizing 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	120 V AC
	B	240 V AC
	5	24 V DC
	6	48 V DC
	7	125 V DC
	8	250 V DC





## Open coil smart numbering

**Step 7:** Select open coil voltage from table for **digit 8:**

**-MBO1 / 52TC1**

For the first open coil, the ADVAC® smart opening coil allows for remote control enablement of the apparatus opening command.

This release is suitable for both instantaneous and permanent duty. However, an auxiliary contact (-BGB1) de-energizes the coil after the circuit breaker has opened. A coil monitoring wire is provided for continuous 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).

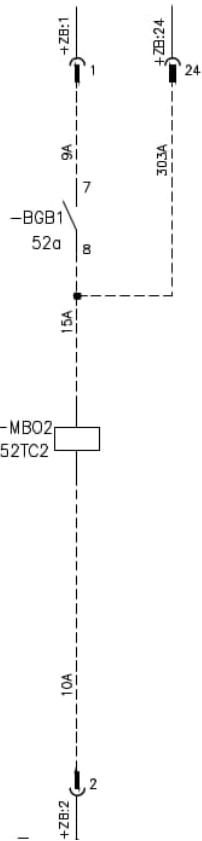
The first open coil is located directly behind the undervoltage coil on the smart coil pack.

Digit	Value	Open coil voltage
8	A	120 V AC
	B	240 V AC
	5	24 V DC
	6	48 V DC
	7	125 V DC
	8	250 V DC





# Selection and ordering



## Accessories

**Step 8:** Select second open coil voltage from table for **digit 9:**  
**-MBO2 / 52TC2**

For the second open coil, the ADVAC® smart opening coil additional release is similar to shunt opening release -MBO1, which allows the opening command of the apparatus to be transmitted by remote control.

It can be powered by the same circuit as the main shunt opening release -MBO1 or by a completely separate circuit.

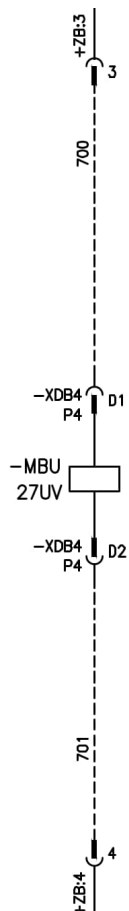
This release is suitable for both instantaneous and permanent duty. However, auxiliary contact -BGB1 de-energizes it after the circuit breaker has opened. A coil monitoring wire is provided for continuous monitoring.

Continuity functionality can be checked with a continuity control device (CCC), opening circuit supervision (TCS) or STU functionality control device (supplied on request). -MBO2 has the same electrical and operating characteristics as release -MBO1 .

Digit	Value	Second open coil voltage
9	A	120 V AC
	B	240 V AC
	5	24 V DC
	6	48 V DC
	7	125 V DC
	8	250 V DC
	X	Not installed







## Accessories

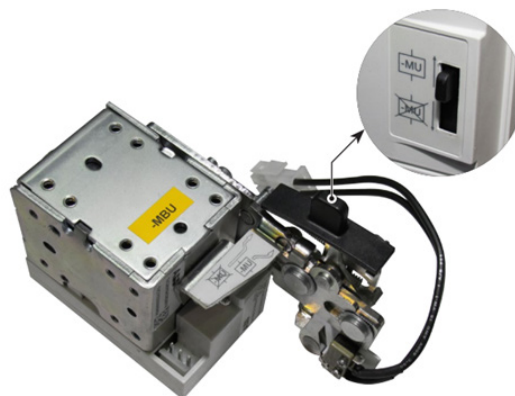
**Step 9:** Select undervoltage coil voltage from table for **digit 10:**

**-MBU/ 27UV**

The ADVAC® smart coil undervoltage release opens the circuit breaker when there is a sensible reduction in 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, the undervoltage release provides locking upon automatic closing/opening in the absence of voltage in the medium voltage main circuit. If the shunt closing release -MBC and the undervoltage release -MBU have the same supply voltage 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 shunt closing release energizing to allow the closing operation to take place.

Digit	Value	Undervoltage device
10	A	120 V AC
	B	240 V AC
	5	24 V DC
	6	48 V DC
	7	125 V DC
	8	250 V DC
	X	Not installed



The undervoltage release mechanical override is a mechanical device that allows the undervoltage release trip to be temporarily excluded.

When the ADVAC 38 circuit breaker is equipped with an undervoltage release, this undervoltage release mechanical override must be used to discharge the breaker prior to removal from the compartment.



# Selection and ordering

## Accessories

**Step 10:** Select 0 for standard or 2 for added early “B” contact option for **digit 11**:

This contact closes momentarily (duration of >30 ms) upon circuit breaker opening controlled remotely by shunt opening release. The indication is not provided when opening is manual and local. In this case, a contact (-BGB11) is activated by the manual pushbutton and cuts off the transient contact closing signal (-BGB4). The transient contact is activated directly from the main operating shaft, thus the indication is provided only on actual opening of the main circuit breaker contacts.

Digit	Value	Engineering special
11	0	Standard ABB labels
	2	Early “B”+ standard ABB labels



(\*) For application at 24 V DC and with currents <2.5 mA, gold contacts are recommended.

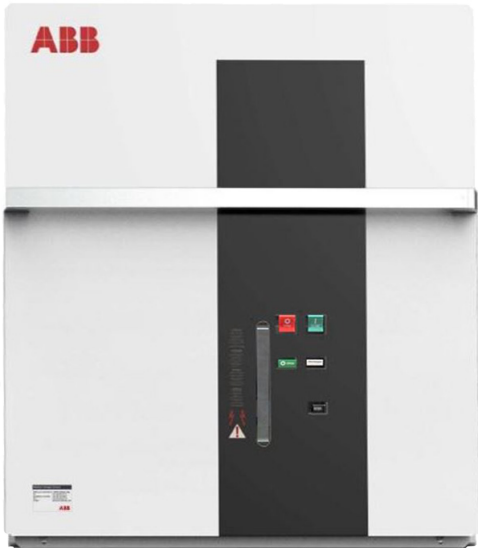
General characteristics	
Insulation voltage to standard VDE 0110, Group C	660 V AC 800 V DC
Rated voltage	24 V ... 660 V
Test voltage	2 kV for 1 min
Maximum rated current	10 A at 50/60 Hz
Breaking capacity	Class 1 (IEC 62271-1)
Number of contacts	5
Groups of contacts	10 / 16 / 20
Contact travel	90°
Actuating force	0.66 Nm
Resistance	<6.5 mΩ
Storage temperature	-30 °C ... +120 °C
Operating temperature	-20 °C ... +70 °C (-30 °C ref. ANSI 37.09)
Contact over temperature	10 K
Mechanical life	30,000 mechanical operations
Protection class	IP20
Cable section	1 mm²

Electrical characteristics (according to IEC 60947)		
Rated current Un	Breaking capacity (10,000 interruptions)	
220 V AC	Cos θ = 0.70	20 A
220 V AC	Cos θ = 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**:

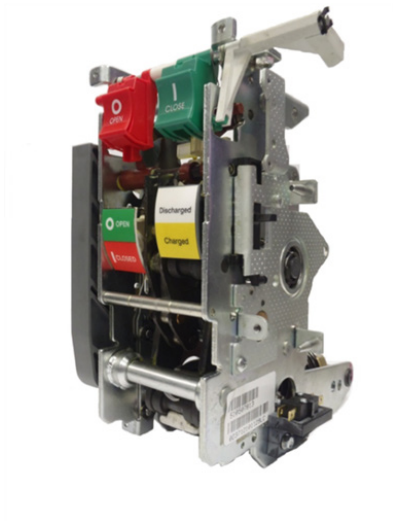


Standard IEEE coloring scheme is option 0.

- 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-standard colors
12	0	N/A
	1	Reverse buttons
	2	Reverse buttons and indicators
	3	Reverse indicators

- 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.”



# 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.

**Step 13:** Specify special labeling requirements for **digit 14:**

- **Option 0** is standard offering with all labels in English.
- **Option S** changes the labeling on the breaker to 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.

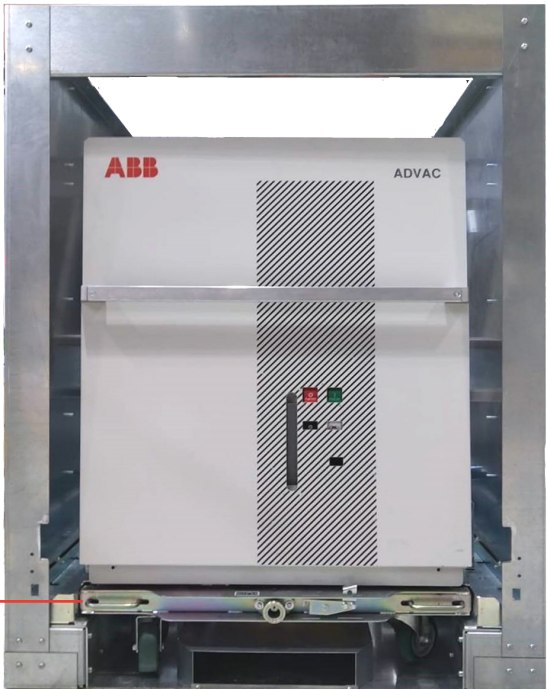
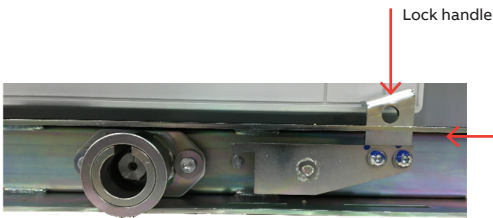
The lock handle is removed for process industry practices (PIP) applications, which require that the breaker can only be racked in with the switchgear door closed. Removal of the handle prevents an operator from manually releasing the truck. The operator must close the switchgear door and use the racking release lever on the outer switchgear door to perform a manual racking. For PIP applications, 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 stainless steel ground shoe offering.

Digit	Value	Pushbutton options
13	0	No pushbutton covers
	1	Close pushbutton cover

Digit	Value	Labels (see note 4)
14	0	English labeling
	S	Spanish labeling

Digit	Value	Ground contact
15	0	Lock handle kit
	G	Copper ground contact



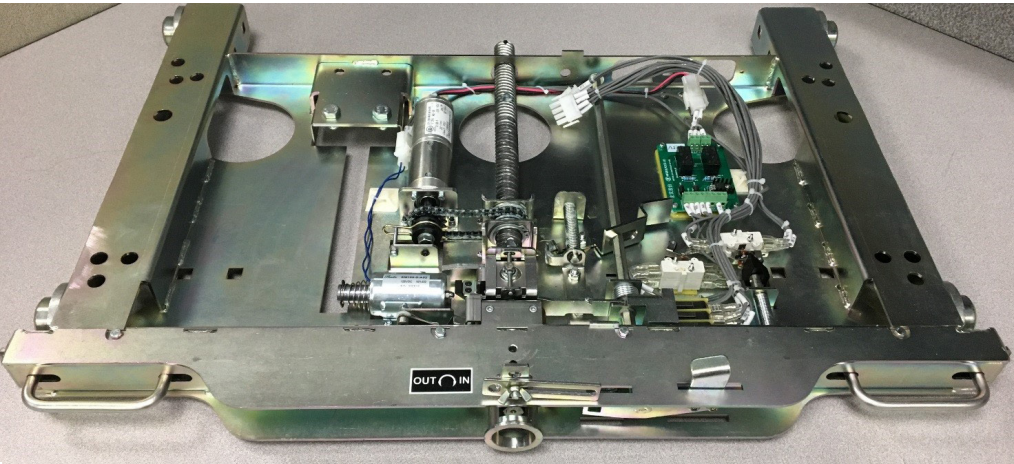
**Step 15:** Select integrated racking mechanism (IRM) truck type or fixed mounted breaker for **digit 16:**

- **Option 0** is the standard drawout manual truck assembly. The manual truck can be used with SmartRack for remote racking.
- **Options 2** through 4 add the ANSI three-position motorized integrated racking mechanism for the voltage selected.
- **Options A through D** add the ANSI three-position motorized integrated racking mechanism for the voltage selected and ABB-recommended dual-pole miniature circuit breaker (S202MK0.5UC) protection for the motorized truck.
- **Option F** should be used with fixed mounted or stationary breakers without truck assemblies.

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



S202M-K0.5UC



Motorized truck assembly



## 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 if a blockage has occurred in the electric racking. 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 overcurrent condition has occurred.

Order code is 1SVR730840R0400 for the CM-SRS.21S, 24–240 V AC/DC, with screw terminals and measuring range of 0.1–1 A.

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



PowerCube PB8 breaker compartment

PowerCube PB8 details

The PB8 circuit breaker compartment employs a three physical racking position design with automatic self-aligning breaker secondary control wiring. Regardless of rating, all compartments are 55 inches high, 42 inches wide and 58 inches deep with V0 cycloaliphatic primary bushings protruding 9.5 inches from the rear. The compartments rated 3000 A ship with an installed floor-mounted fan for forced ventilation.

Optional accessories include: a pre-fabricated TOC switch with wire harness of 8 or 16 contacts; a right- or left-handed hinged door with multi-point latch (MPL); door stop to prevent door from closing while accessing the compartment; and CT mounting kits for 6, 12 or 18 standard 7.25-inch window-sized CTs per compartment.

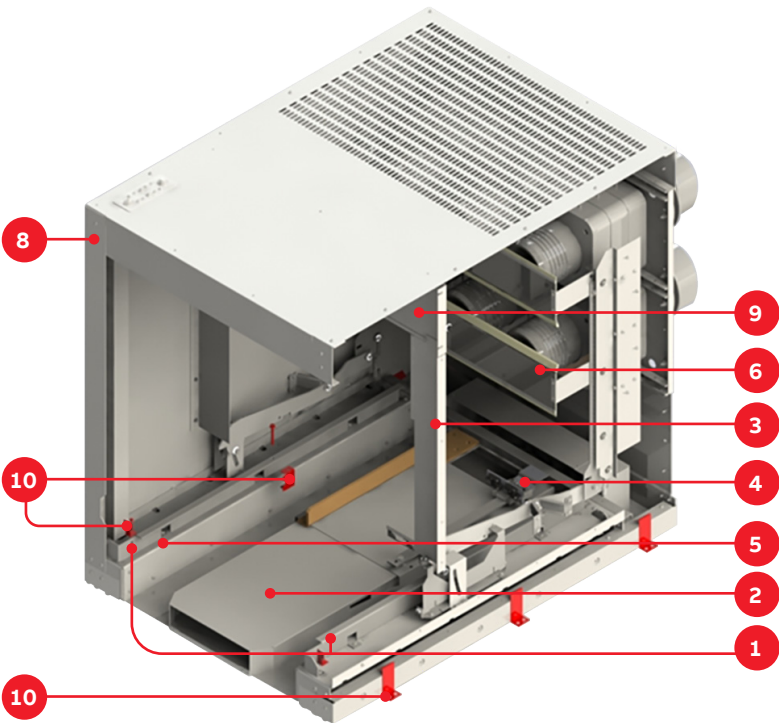
The three physical racking positions in the compartment are:

**1. Disconnect** position disengages the main disconnecting devices and the control contacts on the breaker. They are a safe distance from the stationary part of the device located on the housings.

- 2. Test** position disengages the main disconnecting devices and engages the control contacts. This position allows operation of the circuit breaker for testing.
- 3. Connected** position engages the main and control disconnecting devices on the breaker.

Mechanical interlocks inside the circuit breaker prevent moving the circuit breaker from one position to another unless the device is open. Additionally, interlocks prevent the closing of the breaker in the intermediate racking positions.

When supplied, the truck-operated contacts (TOC) (9) actuate just prior to the breaker reaching the connected position. Use of the -BGT1 pin monitor contact in the integrated racking mechanism is recommended for absolute breaker position indication, because it does not close until the breaker is interlocked into one of the three racking positions — disconnect, test or connect.



1	Module interlock slots
2	Ventilation channel
3	Ground bar
4	Secondary disconnects
5	Wheel rails
6	Shutters
7	Breaker position label
8	Compartment door mounting
9	TOC contact switch mounting
10	Shipping brackets (painted red)

# Selection and ordering

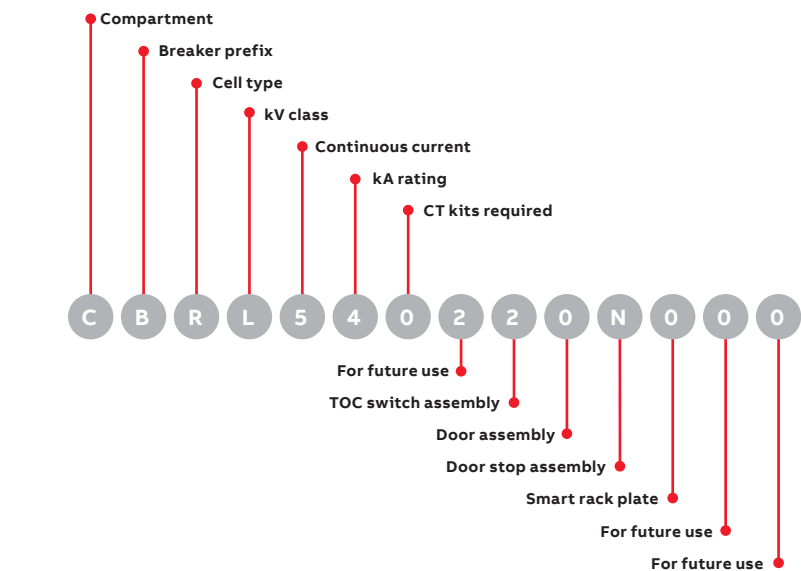
## PowerCube PB8 breaker compartment

### Ordering of the PowerCube PB8

The PB8 breaker compartment product line has a structured, smart-style ordering number system. The complete number is built of 14 customer-

selected digits. Each digit identifies features or functions that can be incorporated into the PB8 compartment. UL recognition is provided as standard for all breaker compartments.

### Sample style number



### How to order a PB8 40.5 kV breaker compartment

Follow the step-by-step instructions below to create the 14-digit number for ordering. The first four digits of the number for the PB8 will be “CBRL” which stands for option codes below:

- 1. Digits 1 and 2 — Specify “CB” for a circuit breaker compartment
- 2. Digit 3 — Select the compartment R = roll on the floor. The same compartment is used for drawout.
- 3. Digit 4 — Select system class L = 38 kV
- 4. Digit 5 — Select maximum continuous current:  
1 = 1200 A  
2 = 2000 A  
3 = 3000 A FAC
- 5. Digit 6 — Select system fault current rating:  
1 = 16 kA  
2 = 25 kA  
3 = 31.5 kA  
4 = 40 kA

Digit	Value	
1	C	Compartment

Digit	Value	
2	B	Breaker

Digit	Value	
3	R	Roll on the floor

Digit	Value	kV rating
4	L	38 kV

Digit	Value	Current rating
5	1	1200 A
	2	2000 A
	3	3000 A

Digit	Value	Short circuit current
6	1	16 kA
	2	25 kA
	3	31.5 kA
	4	40 kA

6. Digit 7 — Select how many CTs will be installed for CT mounting hardware to be added to the compartment. CT mounting kits can be ordered later if value is not currently known.

0 = No kit

1 = 6 CT kit

2 = 12 CT kit

3 = 18 CT kit

7. Digit 8 — Select 2 = None

8. Digit 9 — Select number of TOC switch contacts:

0 = None

1 = 8 contacts

2 = 16 contacts

See specific product characteristics section on TOC switch for switch type and ratings.

9. Digit 10 — Select whether a multipoint latch door assembly should be included:

0 = No door

A = Right-hand door

B = Left-hand door

10. Digit 11 — Select door stop assembly:

Y = Included

N = Not included

10. Digit 12 — Select 0 = Not installed

11. Digit 13 — Select 0 = For future use

12. Digit 14 — Specify 0 = For future use

Digit	Value	CT kits
7	0	None
	1	6 CTs per compartment
	2	12 CTs per compartment
	3	18 CTs per compartment

Digit	Value	Not used
8	2	None

Digit	Value	TOC contacts
9	0	None
	1	8
	2	16

Digit	Value	Door assembly
10	0	None
	A	Right-hand door
	B	Left-hand door

Digit	Value	Door stop assembly
11	Y	Included
	N	None (*)

Digit	Value	Smart rack plate
12	0	None (*)
	1	Installed on door

Digit	Value	Not used
13	0	No value

Digit	Value	Not used
14	0	No value

## Selection and ordering

### Optional accessories

#### Indoor current transformer Type SCP-2, SCD-2

##### Product features

- 600 volt, indoor, 10 kV BIL
- 25–400 Hz
- Primary amperes: 50–6000
- Mechanical rating: 180 x rated current
- Thermal rating: 80 x rated current, 1 second
- Continuous current rating factor:  
Refer to selection guide
- Window size: 7.25 inches

##### Application

The SCP current transformer is used as the source of current for relaying and metering. It is available in three internal window diameter sizes, and dual- and multi-ratio designs are available upon request.

##### Construction features

The ring-type core is insulated and toroidally wound with a fully distributed secondary winding. The protective case, made of impact-resistant polycarbonate, is assembled using self-tapping screws.

#### Secondary terminals

Secondary terminals are 10–32 brass terminal studs with hardware.

##### Curves

Saturation, overcurrent, ratio correction factor and phase-angle curves are available upon request.

##### Test reports

IEEE test reports are stored electronically and can be emailed in various formats at the time of shipment.

##### Standards

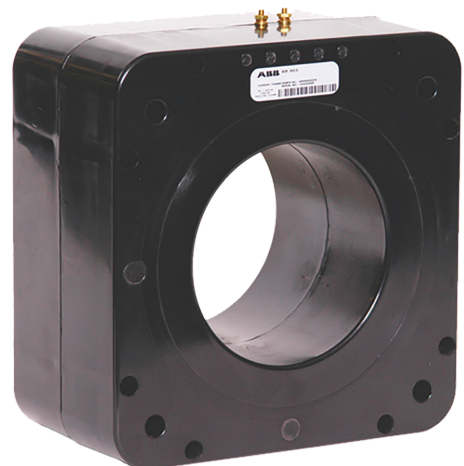
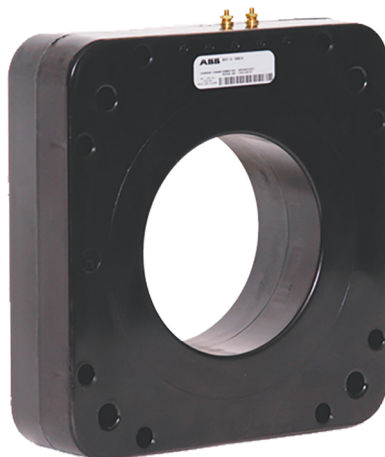
These units meet all applicable IEEE and NEMA standards and can be tested to other standards as requested.

##### UL recognized component

The SCP and SCD are UL recognized components (UL file number E96461).

##### Ordering

See next page for ordering numbers.

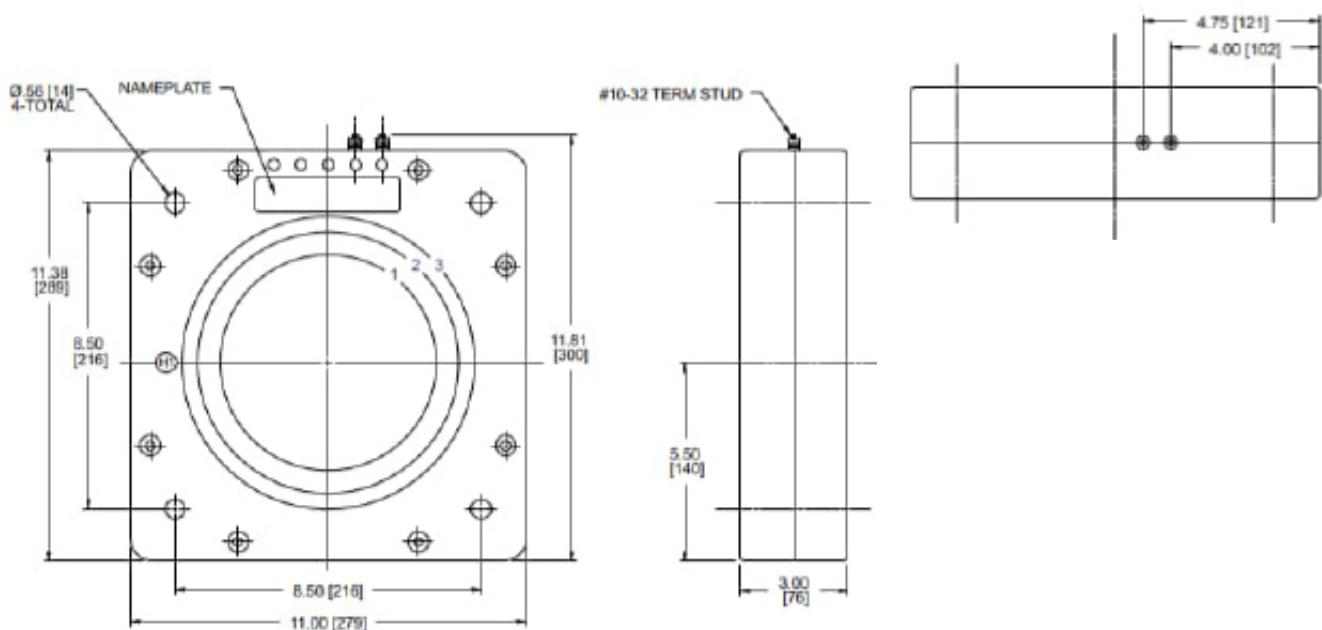




**Type SCP-2 indoor current transformer C200**

Type SCP-2 (7.25 inch window)									
50	2.0	1.5	4.8	-	-	-	-	-	9628A06G01
75	2.0	1.5	2.4	2.4	-	-	-	C10	9628A06G02
100	2.0	1.5	1.2	2.4	-	-	-	C10	9628A06G03
150	2.0	1.5	1.2	1.2	2.4	-	-	C20	9628A06G04
200	2.0	1.5	0.6	0.6	1.2	2.4	2.4	C20	9628A06G05
300	2.0	1.5	0.3	0.3	0.6	1.2	2.4	C50	9628A06G06
400	2.0	1.5	0.3	0.3	0.3	0.6	1.2	C50	9628A06G07
600	2.0	1.5	0.3	0.3	0.3	0.6	0.6	C100	9628A06G08
800	2.0	1.5	0.3	0.3	0.3	0.3	0.3	C100	9628A06G09
1000	1.5	1.0	0.3	0.3	0.3	0.3	0.3	C100	9628A06G10
1200	1.5	1.0	0.3	0.3	0.3	0.3	0.3	C200	9628A06G11
1500	1.5	1.0	0.3	0.3	0.3	0.3	0.3	C200	9628A06G12
2000	1.33	1.0	0.3	0.3	0.3	0.3	0.3	C200	9628A06G13
2500	1.33	1.0	0.3	0.3	0.3	0.3	0.3	C200	9628A06G14
3000	1.33	1.0	0.3	0.3	0.3	0.3	0.3	C200	9628A06G15
4000	1.33	1.0	0.3	0.3	0.3	0.3	0.3	C200	9628A06G16
5000	1.33	1.0	0.3	0.3	0.3	0.3	0.3	C200	9628A06G17

Type	Window size		Approx. weight (lb)
	(in)	(mm)	
SCP-2	7.25	184	30



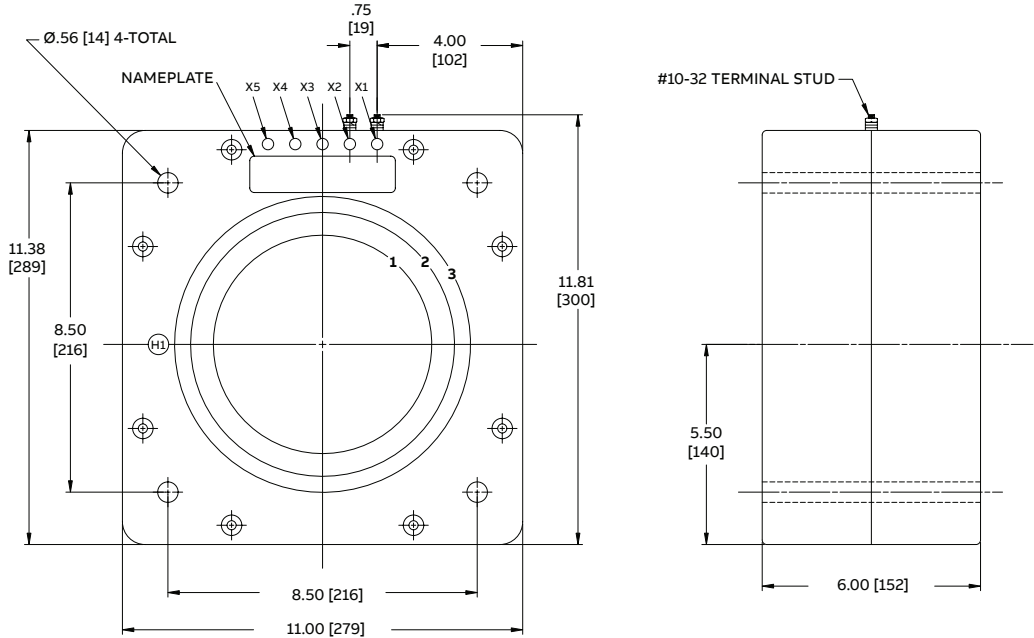


# Selection and ordering

## Type SCD-2 indoor current transformer C400

Type SCD-2 (7.25 inch window)										
200	0.6	0.6	1.2	2.4	C50	180	100	2.0	1.5	7525A46G01
300	0.3	0.3	0.6	1,2	C100	180	100	2.0	1.5	7525A46G02
400	0.3	0.3	0.3	0.6	C100	180	100	2.0	1.5	7525A46G03
600	0.3	0.3	0.3	0.3	C200	180	100	2.0	1.5	7525A46G04
800	0.3	0.3	0.3	0.3	C200	180	100	2.0	1.5	7525A46G05
1000	0.3	0.3	0.3	0.3	C400	180	80	1.5	1.0	7525A46G06
1200	0.3	0.3	0.3	0.3	C400	180	80	1.5	1.0	7525A46G07
1500	0.3	0.3	0.3	0.3	C400	180	80	1.5	1.0	7525A46G08
2000	0.3	0.3	0.3	0.3	C400	180	60	1.33	1.0	7525A46G09
2500	0.3	0.3	0.3	0.3	C400	180	60	1.33	1.0	7525A46G10
3000	0.3	0.3	0.3	0.3	C400	180	60	1.33	1.0	7525A46G11
4000	0.3	0.3	0.3	0,3	C400	180	60	1.33	1.0	7525A46G12
5000	0.3	0.3	0.3	0,3	C400	180	60	1.33	1.0	7525A46G13

Type	Window size		Thickness		Approximate weight (lb)
	(in)	(mm)	(in)	(mm)	
SCD-2	7.25	184	6.0	152	52



## Specific product characteristics



### Vibration resistance

ADVAC® 38 circuit breakers are designed to provide high levels of resistance to stress caused by mechanical vibration.

Many versions comply with the type-approval criteria of the major international shipping registers (DNV, Lloyd's Register and RINA) and the qualification criteria of the International Seismic Standards (IEEE 344, IEEE 323 and IEC 60980). Please contact us if you wish to know which versions have been type-approved by the shipping registers.

### Tropicalization

ADVAC 38 circuit breakers are manufactured in compliance with the most stringent specifications concerning their use in hot-humid-saline climates. All important metal components are treated against corrosive substances in compliance with atmospheric corrosivity class C5 of standard BS EN 12500.

Galvanizing treatment is applied in accordance with ISO 2081 Standards, classification code Fe/Zn 12, thickness 12x10<sup>-6</sup> m, protected by a conversion layer formed mainly by chromates in compliance with ISO 4520 standards.

## Specific product characteristics

### TOC and MOC auxiliary contacts

The PowerCube PB8 compartment may be ordered with an optional eight or 16 truck-operated contacts (TOC). The TOC switch assembly is mounted in the breaker compartment and actuates just before the breaker reaches connected position. For exact breaker position monitoring of non-motorized trucks, use the TOC contact referred to as -BGT1 or pin monitor.

The ADVAC® 38 standard group of mechanism-operated auxiliary contacts (MOC), located in the circuit breaker, actuate directly off the breaker's main operating shaft. Nine closing contacts, "52a," signal that the circuit breaker is open, and eight opening contacts, "52b," signal that the circuit breaker is closed.

All auxiliary contacts are wired through the breaker secondary wiring and are electrically isolated in the disconnect breaker position. Following are the TOC and MOC ratings. All contacts are high speed rotary wiping contacts. Auxiliary contacts conform to the following standards/regulations/directives:

- IEC 62271-100
- IEEE C37.54
- EN 61373 cat. 1 class B / impact and vibration test
- Germanish Loyd regulation / vibrations envisaged by shipping registers
- UL 508
- EN 60947 (DC-21A DC-22A DC-23A AC-21A)
- RoHS directive



#### 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 at 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 °C ref. ANSI 37.09)
Contact over temperature	10 K
Mechanical life	30,000 mechanical operations
Protection class	IP20
Cable section	1 mm²

#### Electrical characteristics (according to IEC 60947)

Rated current Un		Breaking capacity (10,000 interruptions)
220 V AC	Cos θ = 0.70	20 A
220 V AC	Cos θ = 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



#### Anti-pumping device

The EL operating mechanism of VD4 circuit breakers (in all versions) is equipped with a mechanical anti-pumping device that prevents reclosing due to both electrical and mechanical commands.

Should both the closing command and any one of the opening commands (local or remote) be active at the same time, this would result in a continuous succession of opening and closing commands.

The anti-pumping device prevents this situation by ensuring that each closing operation is only followed by an opening operation and that there is no other closing operation after this. To obtain a further closing operation, the closing command must be released and then enabled again.

Furthermore, the anti-pumping device only allows the circuit breaker to be closed if the following conditions are met at the same time:

- Operating mechanism spring fully loaded
- Opening pushbutton and/or shunt opening release (-MBO1/-MBO2) not activated
- Circuit breaker open

#### Environmental protection program

ADVAC® 38 circuit breakers are manufactured in accordance with ISO 14000 standards (guidelines for environmental management). The production processes are implemented in accordance with the environmental protection standards as to the reduction of energy consumption and the production of waste.

All this is achieved thanks to the environmental management system applied in the medium voltage apparatus manufacturing facility. Assessment of the environmental impact during the lifecycle of the product, obtained by reducing the overall energy consumption and use of raw materials to the minimum, is put into effect during the design engineering stage through an accurate choice of materials, processes and packaging.

This is to allow the products and components to be recycled to the utmost degree at the end of their useful life.

#### Spare parts

- Charging motor
- Closing coil
- Open coil
- Second open coil
- Undervoltage release
- Early B transient contact with momentary closing during circuit breaker opening
- Time-lag device for undervoltage release

#### Ordering

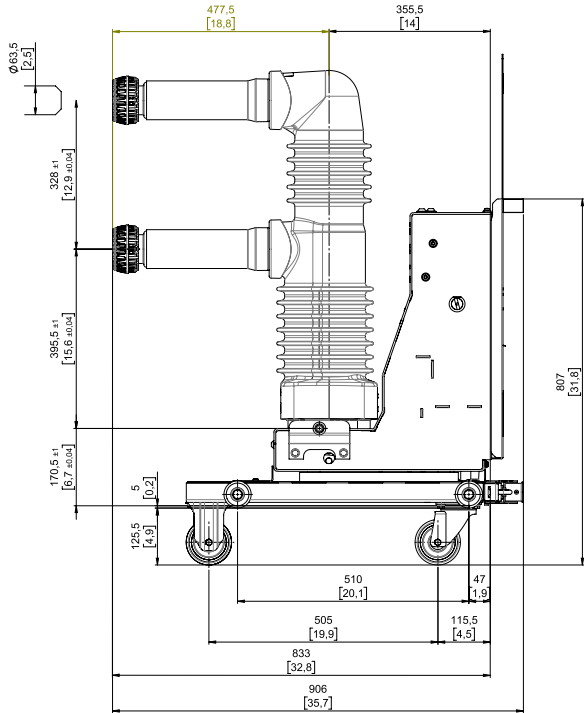
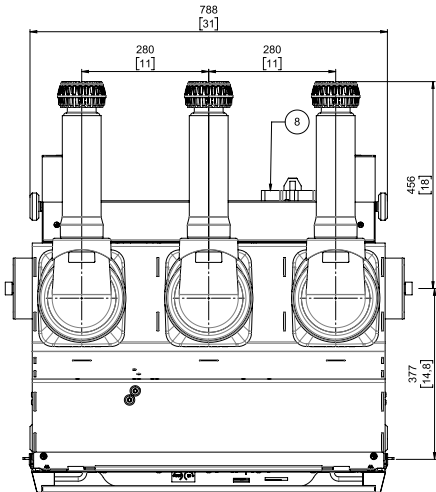
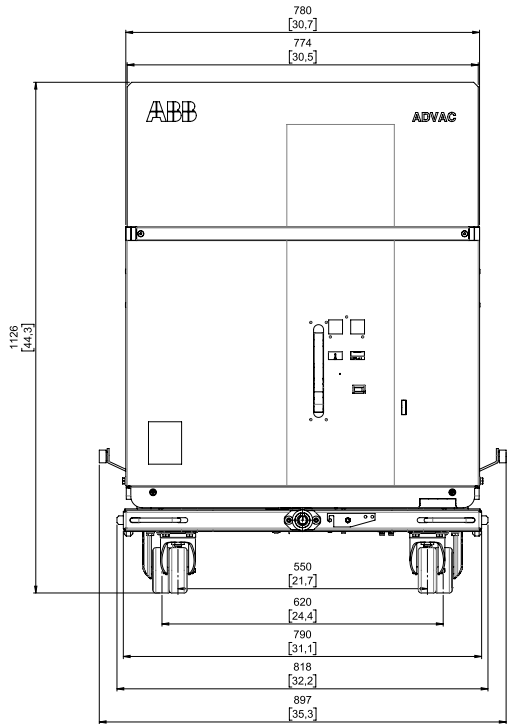
For availability and to order spare parts, please contact our Service department, specifying the circuit breaker serial number.



# Overall dimensions

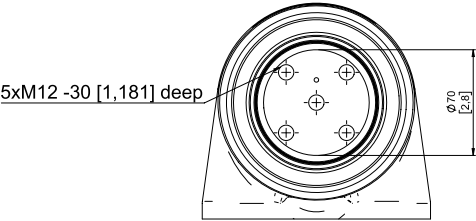
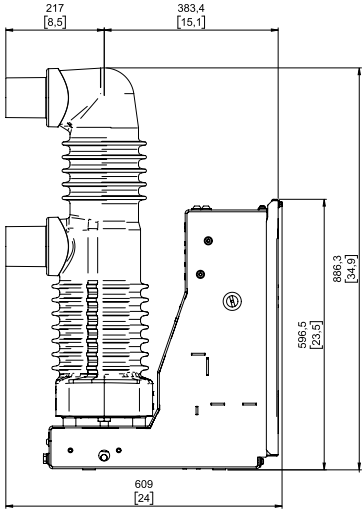
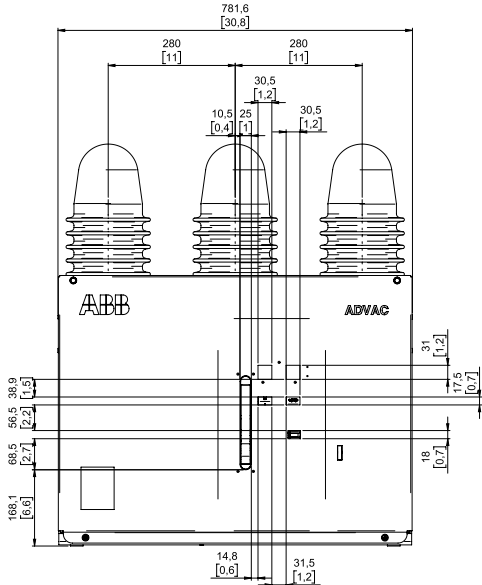
ADVAC® 38 drawout dimensions

Type	ADVAC® 38
BIL	150 kV
Ir	1200 A
	2000 A
	3000 A
Isc	16 kA
	25 kA
	31.5 kA
	40 kA



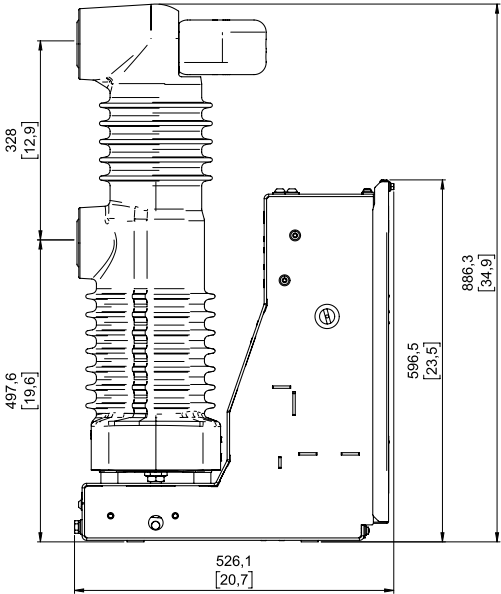
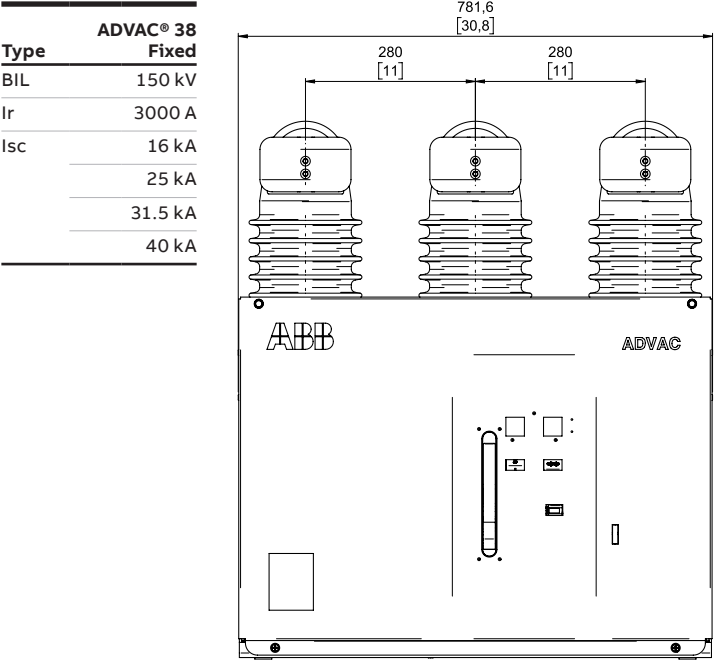
ADVAC® 38 fixed 1200..2000 A dimensions

ADVAC® 38	
Type	Fixed
BIL	190 kV
Ir	1200 A
	2000 A
Isc	16 kA
	25 kA
	31.5 kA
	40 kA

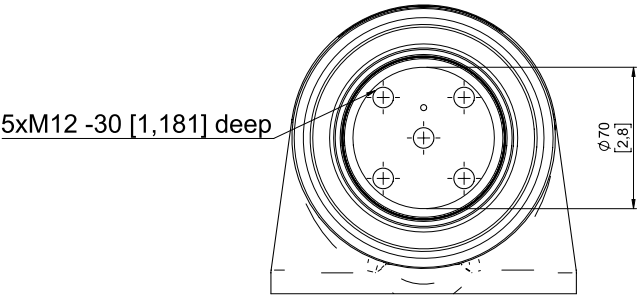


# Overall dimensions

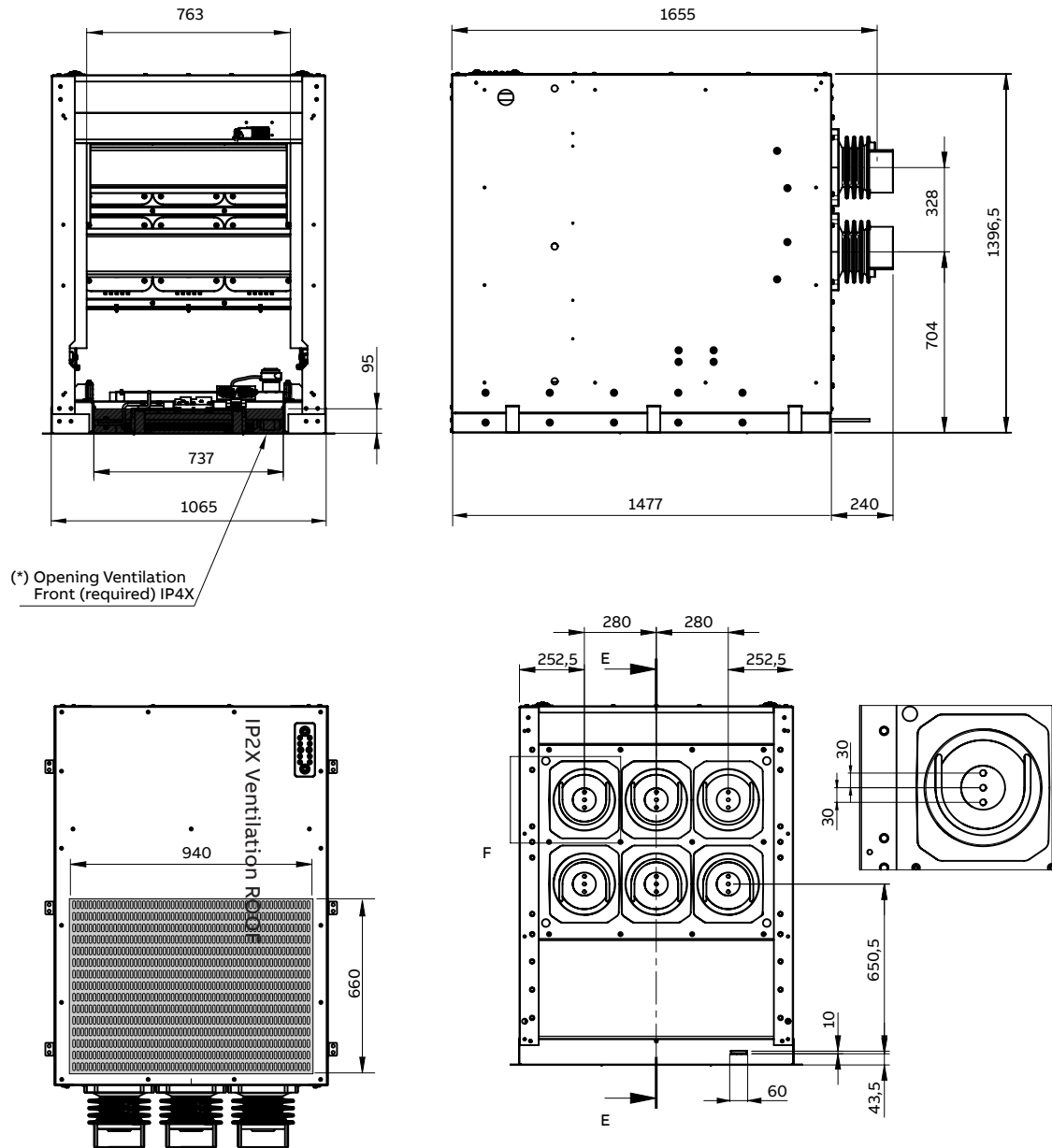
ADVAC® 38 fixed 3000 A dimensions



SAME POLE CONNECTION



## PowerCube PB8 compartment

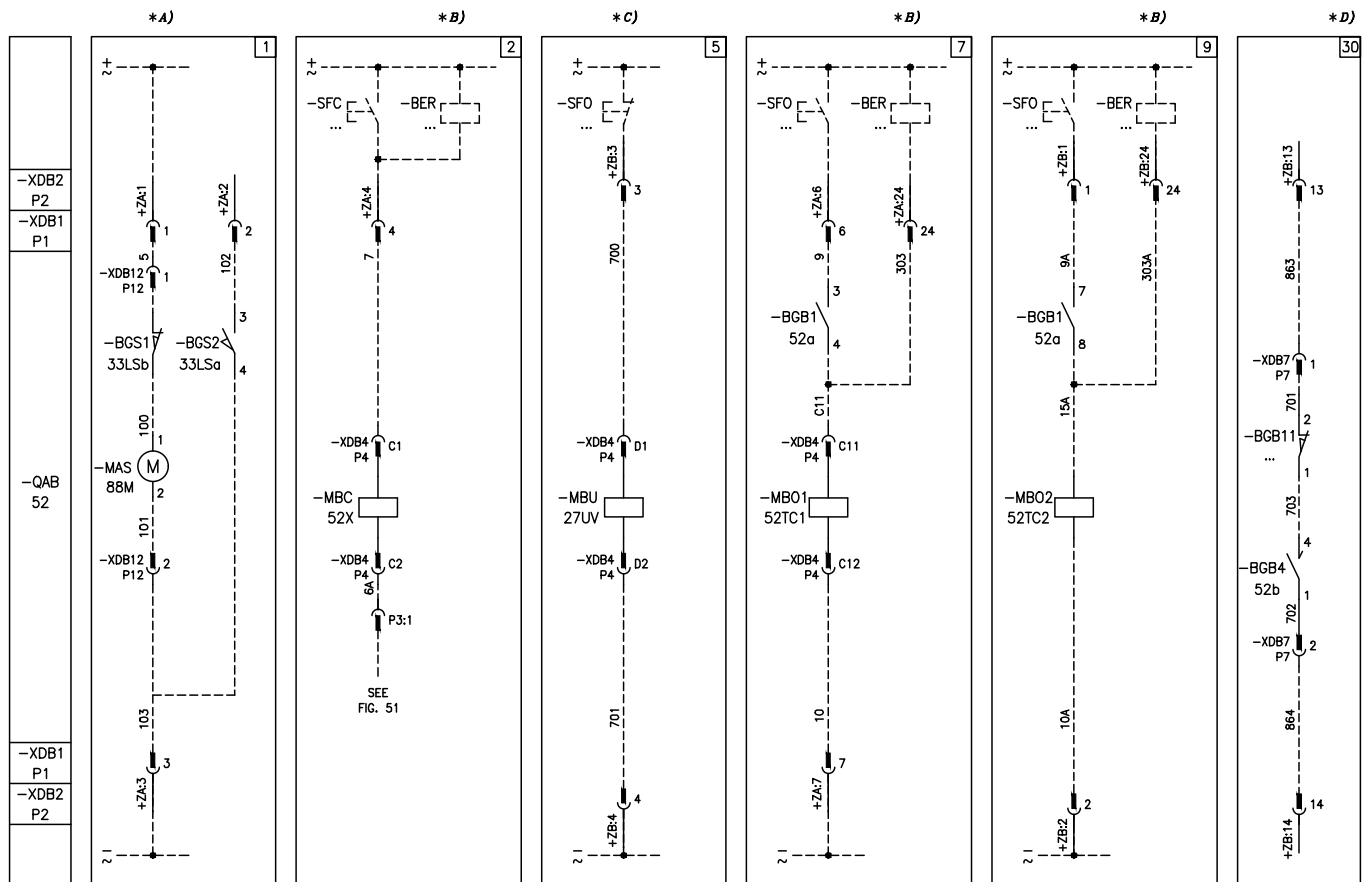


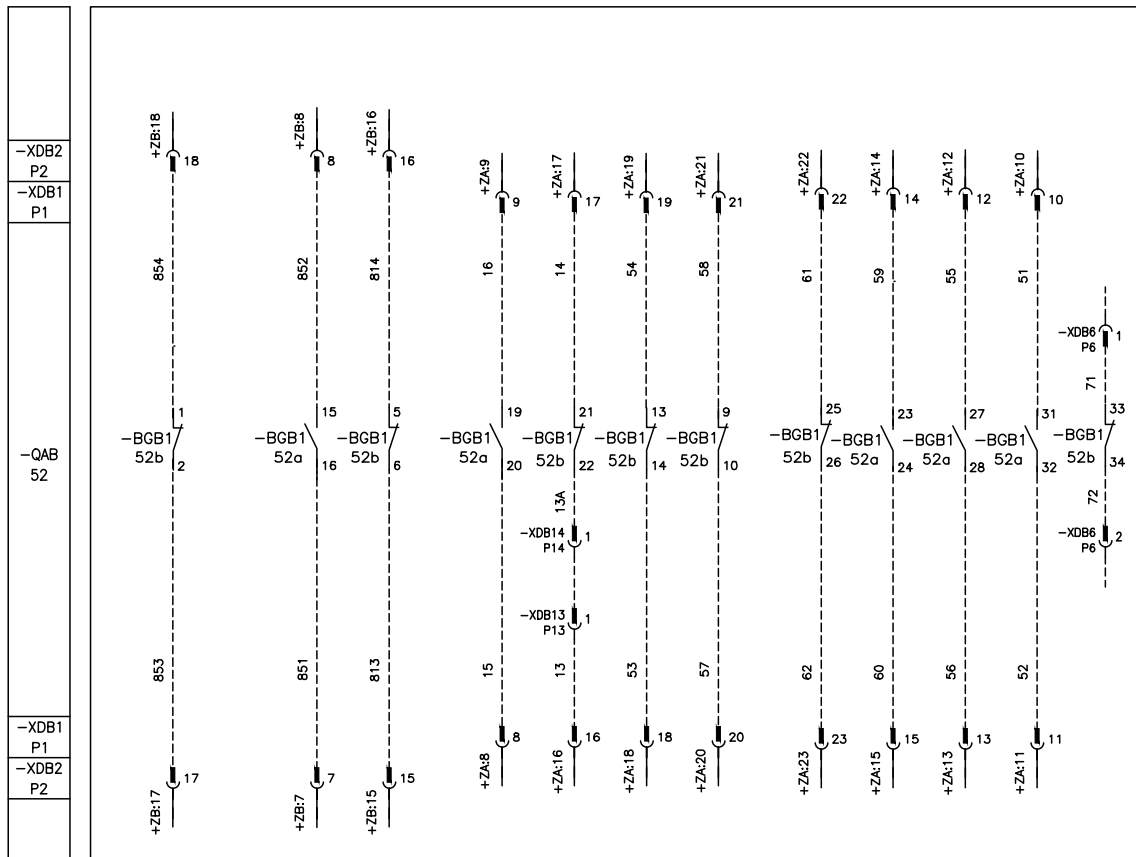
Weight 600–700 kg (1322–1534 lb)

# Electric circuit diagram

Electric circuit diagram of ADVAC® 38 with drawables circuit breakers 1VCD400309

The schematic shows the secondary control wiring scheme for the ADVAC 38 circuit breaker. This wiring includes nine “a” and eight “b” MOC auxiliary contacts. The point-to-point diagram shows the physical connections and wire numbers used in the wiring harness.



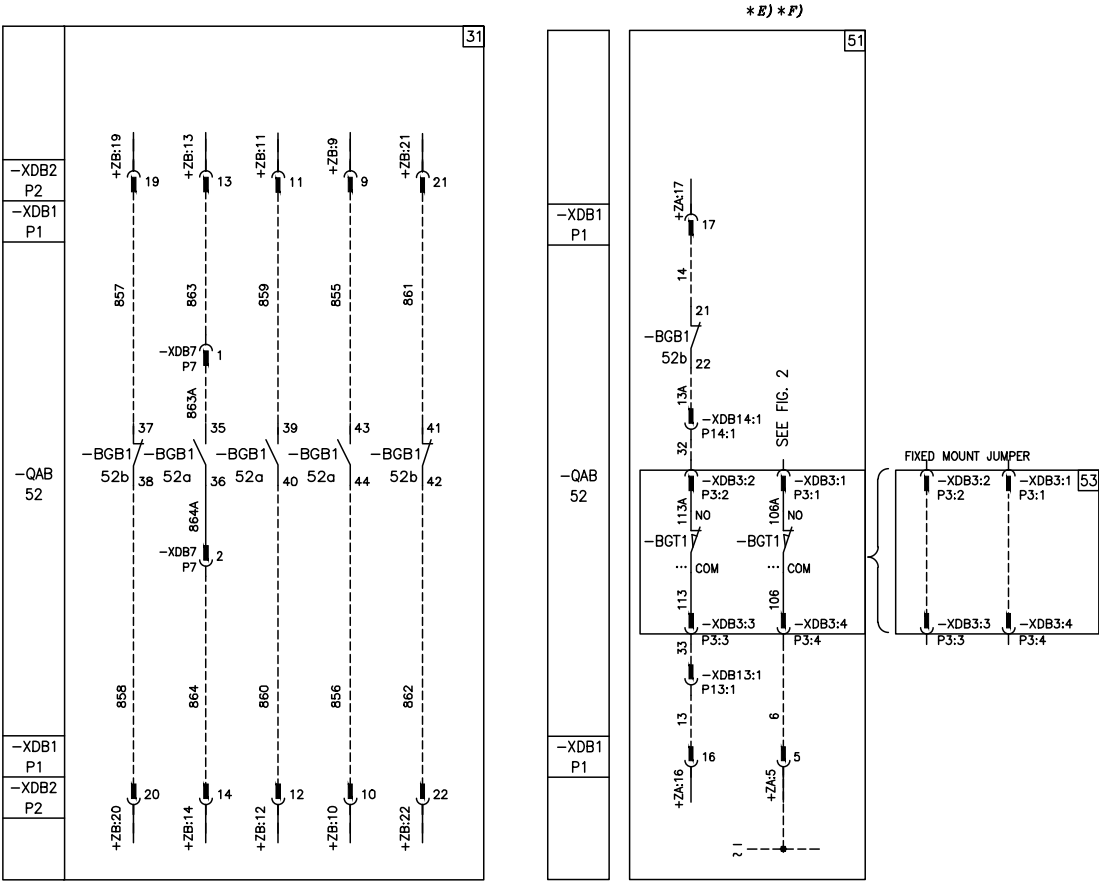






# Electric circuit diagram

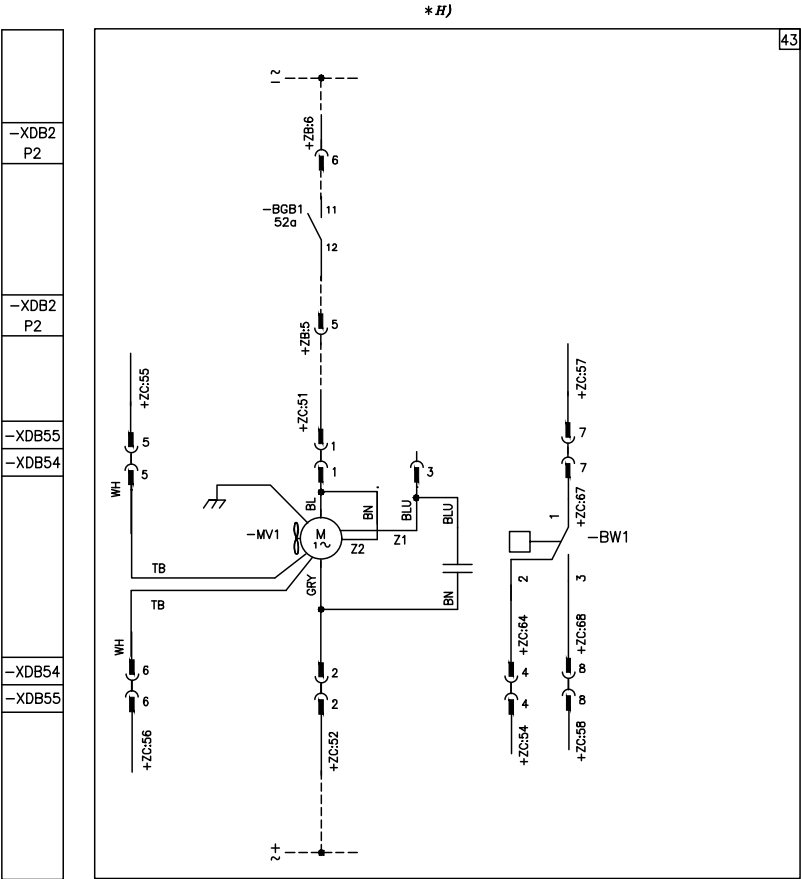
Electric circuit diagram of ADVAC® 38 with drawable circuit breakers 1VCD400309



Electric circuit diagram of PB8 compartment 1VCD400309

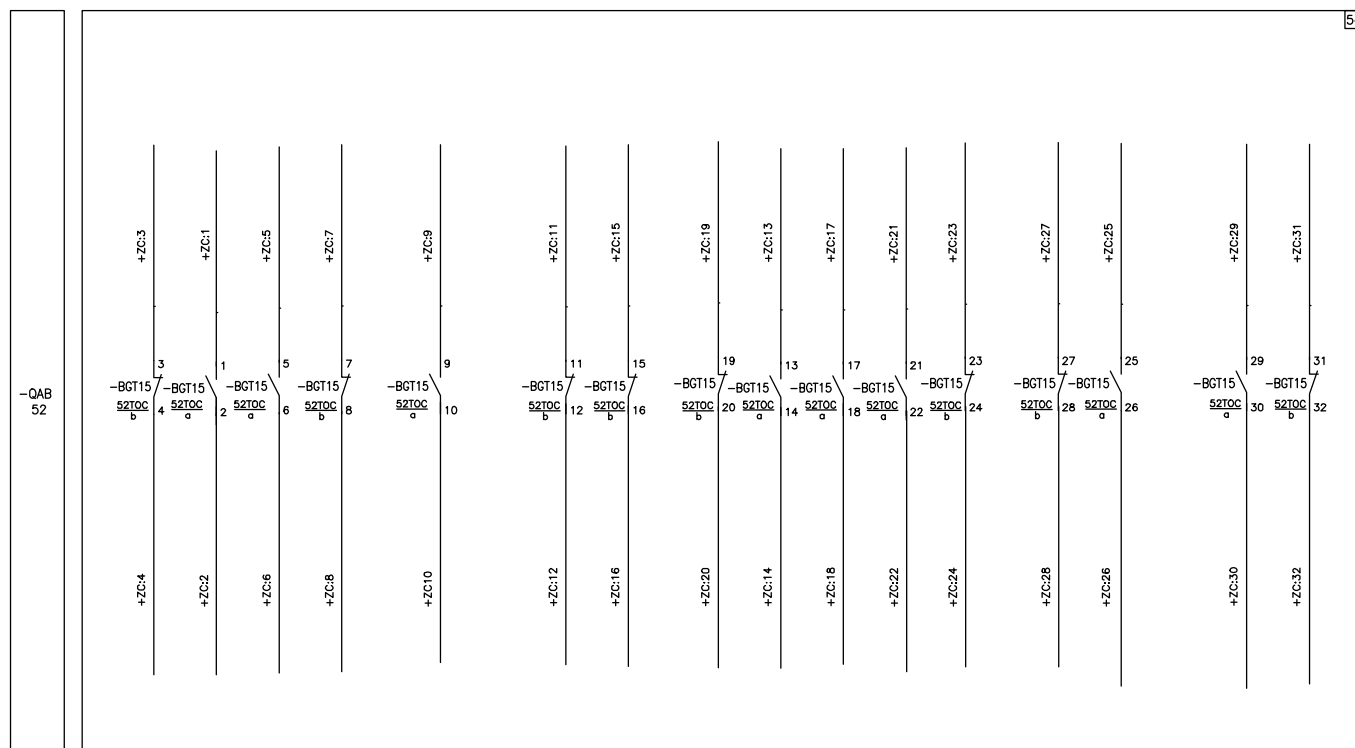
3000 A PB8 compartment wiring diagram

The schematic below shows the additional wiring and cooling fan added to the PB8 when ordered for 3000 A applications. All wiring of the PB8 is routed up through the top front of the compartment for customer integration.



Electric circuit diagram of PB8 compartment 1VCD400309

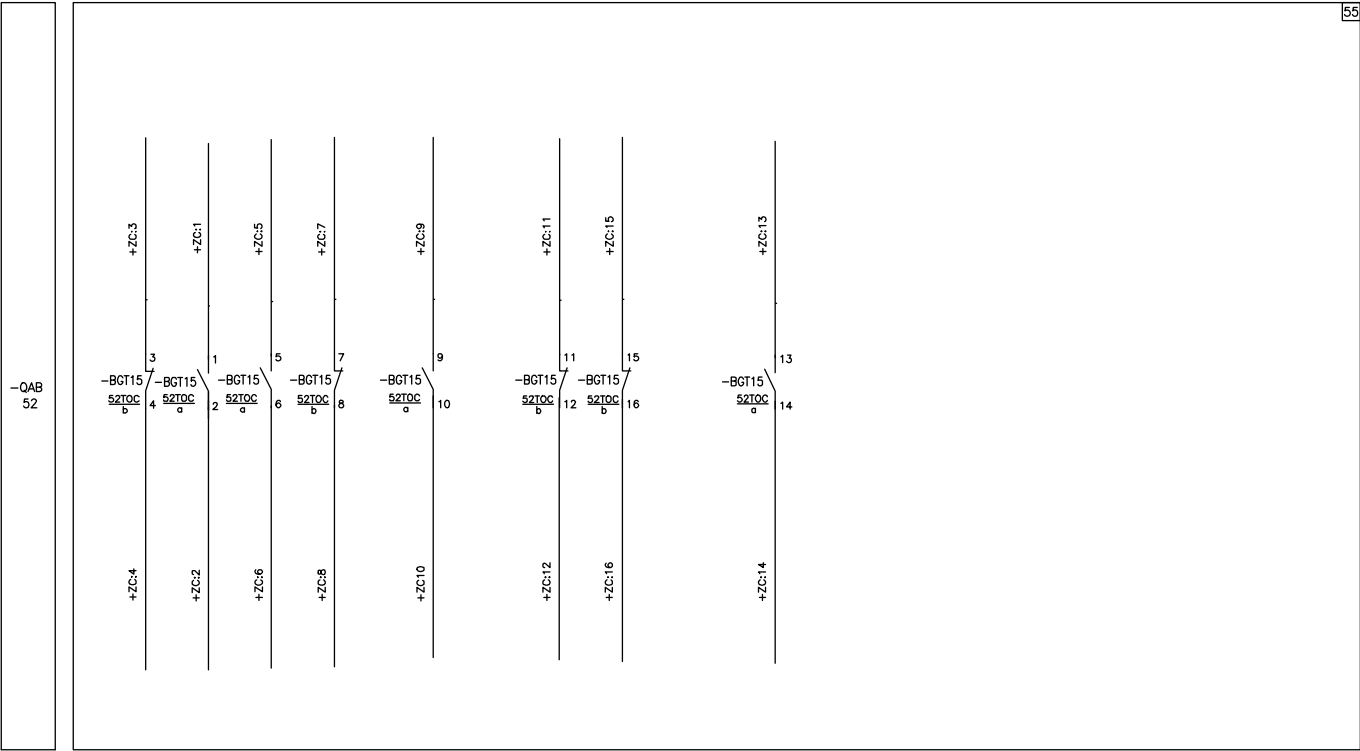
The schematic shows the basic wiring scheme for the ADVAC 38 breaker compartment TOC circuit, which is wired to -QAB 52 pigtail wiring end for customer integration.



Electric circuit diagram of PB8 compartment 1VCD400309

ADVAC® 38 TOC PB8 compartment wiring diagram

The schematic shows the basic wiring scheme for the ADVAC 38 breaker compartment TOC circuit, which is wired to -QAB 52 pigtail wiring end for customer integration.



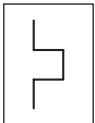

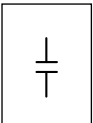
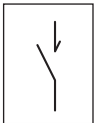
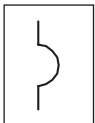
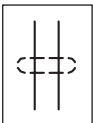
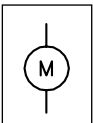
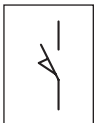
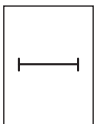
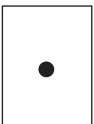
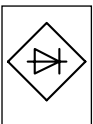
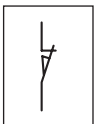
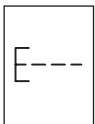
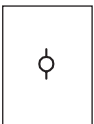
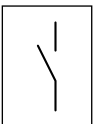
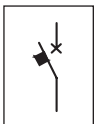
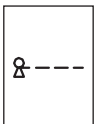
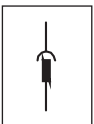
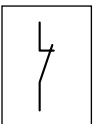
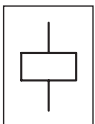

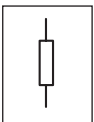
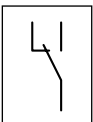
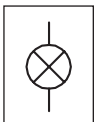
# Electric circuit diagram

## Operating state shown

The diagrams are shown under the following conditions:

- Circuit breaker open and connected (only withdrawable circuit breaker)
- Circuits de-energized
- Closing springs discharged

## Graphical symbols for electric diagrams

	Thermal effect		Exposed conductive part, frame		Capacitor (general symbol)		Passing make contact closing momentarily during release
	Electromagnetic effect		Conductors in shielded cable (e.g., two conductors)		Motor (general symbol)		Closing position contact (limit switch)
	Timing		Connection of conductors		Rectifier with two half-waves (bridge)		Opening position contact (limit switch)
	Pushbutton control		Terminal or clamp		Make contact		Power circuit breaker with automatic opening
	Key control		Socket and plug (female and male)		Break contact		Control coil (general symbol)
	Earth (general symbol)		Resistor (general symbol)		Change-over break before make contact		Lamp (general symbol)

## Reference designations used in electrical diagrams

IEC designation	ANSI designation	Description of circuit element
-BER	...	= Device for the supervision of shunt opening release coil continuity
-BGB1	52a, 52b	= Circuit breaker auxiliary contacts
-BGB4	52b	= Auxiliary passing contact (closing momentarily when circuit breaker opens)
-BGB11	...	= Contact to break the -BGB4 signaling during the manual opening operation
-BGS1	33LSa, 33LSb	= Limit switch of the spring-charging motor
-BGS2	33LSa, 33LSb	= Limit switch signaling closing springs charged or discharged
-FCM2	...	= Miniature breaker with thermomagnetic overcurrent release (ABB S202M-K...UC)
-MAS	BBM	= Motor for the closing charging springs
-MAT	...	= Motor drive for racking circuit breaker in and out of the cell (direct current supply) allocated on the circuit breaker's truck
-MBC	52X	= Shunt closing release
-MBO1	52TC1	= First shunt opening release
-MBO2	52TC2	= Second shunt opening release
-MBU	27UV	= Instantaneous undervoltage release
-PFG	...	= LED signaling circuit breaker in the isolated position
-PFR	...	= LED signaling circuit breaker in the connected position
-PFY	...	= LED signaling circuit breaker in the test position
-PFW	...	= LED signaling circuit breaker in racking
-QAB	52	= Main circuit breaker
-RLE2	...	= Locking magnet on the truck; if de-energized, it mechanically prevents the circuit breaker from racking in and out
-RLE2,1,...,3	...	= Contacts activated from -RLE2
-SFC	...	= Pushbutton or contact for circuit breaker closing
-SFC 3	...	= Pushbutton for circuit breaker rack in
-SFC 4	...	= Pushbutton for circuit breaker rack out
-SFO	...	= Pushbutton or contact for circuit breaker opening
-XDB1, 2	P1, P2	= Connectors for circuit breaker circuits
-XDB12	P12	= Spring-charging motor connector
-XDB4,6,7,8,13,14	P4,P6,P7,P8,P13,P14	= Connectors for accessories
-MV1		= Rear fan
-BW1		= Flow sensor
-XDB54-55		= Fan and sensor connector
-BGT15		= Auxiliary contact for signaling connected - extracted (TOC)
-TB		= Thermal contacts for fan motor overheating



**Additional information**

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB Inc. does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB Inc.





---

**ABB Inc.**

305 Gregson Dr.  
Cary, NC 27511  
+1 800 929 7947 ext. 5  
[customer.service.group@us.abb.com](mailto:customer.service.group@us.abb.com)

**ABB Inc.****Electrification Services**

Florence, South Carolina  
Phone: +1 800 HELP 365 (option 7)

**ABB S.p.A.****ABB SACE Division**

Medium Voltage Products Via Friuli, 4  
I-24044 Dalmine  
Tel: +39 035 6952 111  
Fax: +39 035 6952 874  
E-mail: [info.mv@it.abb.com](mailto:info.mv@it.abb.com)

**[www.abb.com/mediumvoltage](http://www.abb.com/mediumvoltage)**