



3AH3 Vacuum Circuit-Breakers

Medium-Voltage Equipment
Selection and Ordering Data

Catalog HG 11.03 · 2010

Answers for energy.

SIEMENS



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3AH3 Vacuum Circuit-Breakers

Medium-Voltage Equipment Catalog HG 11.03 · 2010

Invalid: Catalog HG 11.03 · 2008

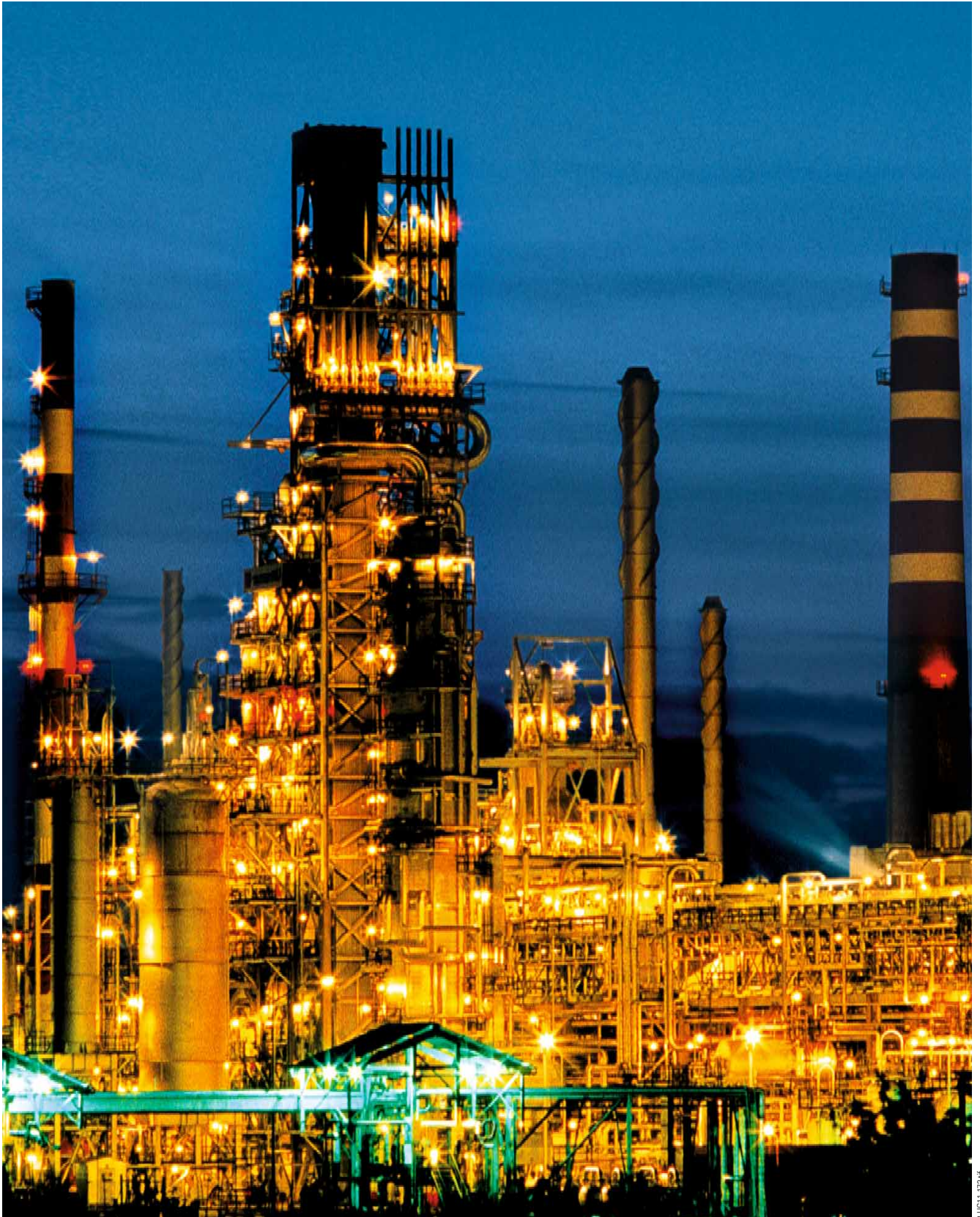
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RH611-1731f



Industrial application: Refinery

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3AH3 vacuum circuit-breaker from 7.2 kV to 36 kV – The Powerful

1

Circuit-breakers must make and break all currents within the scope of their ratings: From small inductive and capacitive load currents up to high short-circuit currents,

controlling all fault conditions in the power system at the same time.

3AH3 – maintenance-free for high switching capacities



The 3AH3 vacuum circuit-breaker is maintenance-free throughout its entire service life. It is extremely powerful and controls up to 10,000 operating cycles. This circuit-breaker is used for high load currents up to 6300 A and high short-circuit currents up to 72 kA. It covers the common medium-voltage range from 7.2 kV to 36 kV.



Due to its high capacity, the circuit-breaker is especially suitable for generator operation and industrial applications. The high-current and generator circuit-breakers 3AH37 and 3AH38 meet the requirements of IEEE Std C37.013.

The vacuum circuit-breaker consists of the pole assemblies (1) and the operating mechanism box (2). The pole assemblies are fixed to the operating mechanism box via post insulators (3). The switching movement is transferred by means of operating rods (4) and levers.

Switching medium

The vacuum switching technology, proven and fully developed for more than 30 years, serves as arc-quenching principle by using vacuum interrupters.

Pole assemblies

The pole assemblies consist of the vacuum interrupters (6) and the interrupter supports. The vacuum interrupters are air-insulated and freely accessible. This makes it possible to clean the insulating parts easily in adverse ambient conditions. The vacuum interrupter is mounted rigidly to the upper interrupter support (5). The lower part of the interrupter is guided in the lower interrupter support (7), allowing axial movement. The braces absorb the external forces resulting from switching operations and the contact pressure.

Operating mechanism box

The whole operating mechanism with releases, auxiliary switches, indicators and actuating devices is accommodated in the operating mechanism box. The extent of the secondary equipment depends on the case of application and offers a multiple variety of options in order to meet almost every requirement.

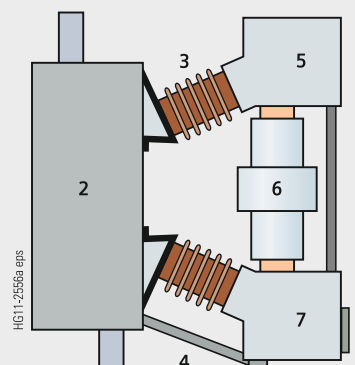
Operating mechanism

The operating mechanism is a stored-energy mechanism. The closing spring is charged either electrically or manually. It latches tight at the end of the charging process and serves as an energy store. The force is transmitted from the operating mechanism to the pole assemblies via operating rods.

To close the breaker, the closing spring can be unlatched either mechanically by means of the local "ON" pushbutton or electrically by remote control. The closing spring charges the opening or contact pressure springs as the breaker closes. The now discharged closing spring will be charged again automatically by the mechanism motor or manually. Then the operating sequence OPEN-CLOSE-OPEN is stored in the springs. The charging state of the closing spring can be checked electrically by means of a position switch.

Trip-free mechanism

3AH3 vacuum circuit-breakers have a trip-free mechanism according to IEC 62271-100. In the event of an opening command being given after a closing operation has been initiated, the moving contacts return to the open position and remain there even if the closing command is sustained. This means that the contacts of the vacuum circuit-breakers are momentarily in the closed position, which is permissible according to IEC 62271-100.



Circuit-breaker structure

- 1 Pole assembly
- 2 Operating mechanism box
- 3 Post insulator
- 4 Operating rod
- 5 Upper interrupter support
- 6 Vacuum interrupter
- 7 Lower interrupter support



Front view



Open operating mechanism box

Releases

A release is a device which transfers electrical commands from an external source, such as a control room, to the latching mechanism of the vacuum circuit-breaker so that it can be opened or closed. Apart from the closing solenoid, the maximum possible equipment is one shunt release and two other releases. For release combinations, refer to page 17.

- The closing solenoid unlatches the charged closing spring of the vacuum circuit-breaker, closing it by electrical means. It is suitable for DC or AC voltage.
- Shunt releases are used for automatic tripping of vacuum circuit-breakers by suitable protection relays and for deliberate tripping by electrical means. They are intended for connection to an external power supply (DC or AC voltage) but, in special cases, may also be connected to a voltage transformer for manual operation.
- Current-transformer operated releases comprise a stored-energy mechanism, an unlatching mechanism and an electromagnetic system. They are used when there is no external source of auxiliary power (e.g. a battery). Tripping is effected by means of a protection relay (e.g. overcurrent-time protection) acting on the current-transformer operated release. When the tripping current is exceeded (= 90 % of the rated normal current of the c.t.-operated release), the latch of the energy store, and thus opening of the circuit-breaker, is released.
- Undervoltage releases comprise a stored-energy mechanism, an unlatching mechanism and an electromagnetic system which is permanently connected to the secondary or auxiliary voltage while the vacuum circuit-breaker is closed. If the voltage falls below a predetermined value, unlatching of the release is enabled and the circuit-breaker is opened via the stored-energy mechanism. The deliberate tripping of the undervoltage release generally takes place via an NC contact in the tripping circuit or via an NO contact by short-circuiting the magnet coil. With this type of tripping, the short-circuit current is limited by the built-in resistors. Undervoltage releases can also be connected to voltage transformers. When the operating voltage drops to impermissibly low levels, the circuit-breaker is tripped automatically.

For delayed tripping, the undervoltage release can be combined with energy stores.

Closing

In the standard version, 3AH3 vacuum circuit-breakers can be remote-closed electrically. They can also be closed locally by mechanical unlatching of the closing spring via pushbutton.

Instead of this "manual mechanical closing", "manual electrical closing" is also available. In this version, the closing circuit of the circuit-breaker is controlled electrically by a pushbutton instead of the mechanical button. In this way, switchgear-related interlocks can also be considered for local operation in order to prevent involuntary closing.

If constant CLOSE and OPEN commands are present at the circuit-breaker at the same time, the circuit-breaker will return to the open position after closing. It remains in this position until a new CLOSE command is given. In this manner, continuous closing and opening (= "pumping") is prevented.

Circuit-breaker tripping signal

The NO contact makes brief contact while the vacuum circuit-breaker is opening, and this is often used to operate a hazard-warning system which, however, is only allowed to respond to automatic tripping of the circuit-breaker. Therefore, the signal from the NO contact must be interrupted when the circuit-breaker is being opened intentionally. This is accomplished under local control with the cut-out switch that is connected in series with the NO contact.

Interlocking

Electrical interlocking

The circuit-breakers can be integrated in electromagnetic feeder or switchgear interlocks. In case of electrical interlocking, the disconnecter or its operating mechanism is equipped with a magnetic lock-out mechanism. This mechanism is controlled by an auxiliary contact of the circuit-breaker, so that the disconnecter can only be operated when the circuit-breaker is open. On the other hand, the circuit-breaker is also controlled by the disconnecter or its operating mechanism, so that it can only be closed when the disconnecter is in an end position. For this purpose, manual electrical closing must be provided in the circuit-breaker operating mechanism (see "Closing").

Mechanical interlocking

To interlock circuit-breaker trucks, withdrawable parts or disconnectors according to the switch position, the circuit-breakers can be equipped with a mechanical interlocking. A sensor at the switchgear checks the position of the circuit-breaker and prevents the open circuit-breaker in a reliable way from being closed mechanically and electrically.

Standards

3AH3 circuit-breakers conform to the following standards:

- IEC 62271-100 (former IEC 60056)
- IEC 62271-1 (former IEC 60694)
- VDE 0671 (former VDE 0670)
- IEEE Std C37.013 (only generator circuit-breaker)

All 3AH3 vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100.

Maintenance-free design

The 3AH3 vacuum circuit-breakers are maintenance-free:

- Under normal ambient conditions according to IEC 62271-1 (former IEC 60694)
- Up to 10,000 operating cycles,
 - no relubrication, no readjustment required
 - and within their tolerances, the characteristics are independent of the switching rate or of standing times without switching operations.

Ambient conditions

The vacuum circuit-breakers are designed for the normal operating conditions defined in IEC 62271-100.

Condensation can occasionally occur under the ambient conditions shown opposite. 3AH3 vacuum circuit-breakers are suitable for use in the following climatic classes according to IEC 60721, Part 3-3:

Climatic ambient conditions:	Class 3K4 ¹⁾
Biological ambient conditions:	Class 3B1
Mechanical ambient conditions:	Class 3M2
Chemically-active substances:	Class 3C2 ²⁾
Mechanically-active substances:	Class 3S2 ³⁾

1) Low temperature limit: – 5 °C

2) Without icing and wind-driven precipitation

3) Restriction: Clean insulation parts

Current carrying capacity

The rated normal currents specified in the opposite diagram have been defined according to IEC 62271-100 for an ambient air temperature of + 40 °C and apply to open switchgear. For enclosed switchgear the data of the switchgear manufacturer applies. At ambient air temperatures below + 40 °C, higher normal currents can be carried (see diagram):

Characteristics curve 1 = Rated normal current 1250 A
 Characteristics curve 2 = Rated normal current 2000 A
 Characteristics curve 3 = Rated normal current 2500 A
 Characteristics curve 4 = Rated normal current 3150 A
 Characteristics curve 5 = Rated normal current 4000 A
 Characteristics curve 6 = Rated normal current 5000 A
 Characteristics curve 7 = Rated normal current 6300 A

Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to low air density. According to IEC 62271-1, the values of the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified in the chapter "Technical Data" apply to a site altitude of 1000 m above sea level. For an altitude above 1000 m, the insulation level must be corrected according to the opposite diagram.

The characteristic shown applies to both rated withstand voltages.

To select the devices, the following applies:

$$U \geq U_0 \times K_a$$

U Rated withstand voltage under reference atmosphere

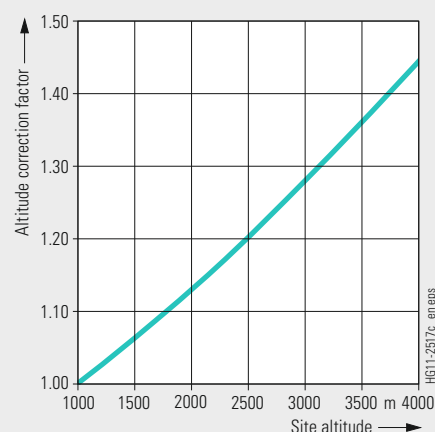
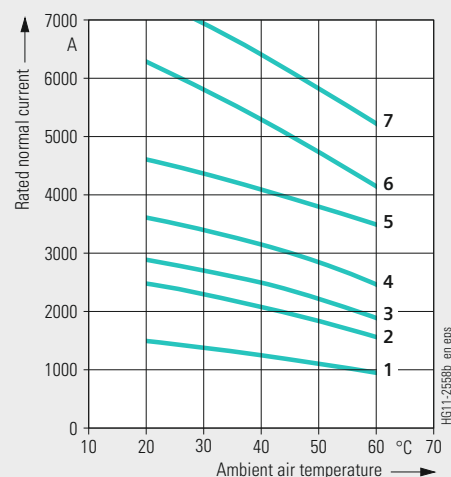
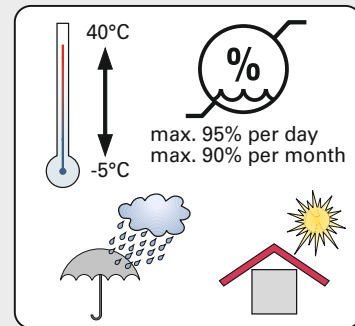
U_0 Rated withstand voltage requested for the place of installation

K_a Altitude correction factor according to the opposite diagram

Example

For a requested rated lightning impulse withstand voltage of 75 kV at an altitude of 2500 m, an insulation level of 90 kV under reference atmosphere is required as a minimum:

$$90 \text{ kV} \geq 75 \text{ kV} \times 1.2$$



Product range overview

Rated voltage kV	Rated short-circuit breaking current kA	Rated normal current (A)														
		1250			2000	2500			3150			4000		5000	6300	
		Pole-centre distance (mm)														
		210	275	350	350	210	275	350	210	275	350	275	300	350	300	300
7.2	50	■				■			■			■				
	63		■				■			■		■				
12	50	■				■			■			■				
	63		■				■			■		■				
15	50	■				■			■			■				
	63		■				■			■		■				
17.5	50	■				■			■	▲		■▲			▲	▲
	63		■				■			■▲		■▲			▲	▲
	72									▲		▲			▲	▲
24	40						■									
	50									■	▲		■	▲	▲ 2)	▲ 2)
	63										▲			▲	▲ 2)	▲ 2)
	72										▲			▲	▲ 2)	▲ 2)
36	31.5			■	■			■			■			■		
	40							■			■			■		
40.5 ¹⁾	31.5			■	■			■			■			■		
	40							■			■			■		

1) As 36 kV circuit-breaker with supplement Y09

2) Pole-centre distance 350 mm

■ 3AH3

▲ 3AH37/3AH38 high-current and generator circuit-breakers (according to IEEE Std C37.013)

Basic equipment

Features	Minimum equipment	Alternative equipment	Remarks
Operating mechanism	Electrical operating mechanism (hand crank not included in the scope of supply)	Manual operating mechanism (hand crank included in the scope of supply)	Hand crank available as accessory
Closing	Closing solenoid and manual mechanical closing	Manual electrical closing	–
1 st release	Shunt release	None	–
2 nd release	Without	Shunt release, undervoltage release, c.t.-operated release	Max. 3 releases can be combined (for possible combinations, refer to page 17)
3 rd release	Without	Shunt release, undervoltage release, c.t.-operated release	Max. 3 releases can be combined (for possible combinations, refer to page 17)
Varistor circuit	Installed for ≥ 60 V DC	None	For limiting switching overvoltages due to inductive loads
Auxiliary switch	6 NO + 6 NC	12 NO + 12 NC	–
Plug connector	24-pole terminal strip	24-pole plug, 64-pole plug	–
Anti-pumping	Available	None	–
Circuit-breaker tripping signal	Available	None	–
Operating cycle counter	Available	None	–
"Spring charged" signal and indication	Available	None	–
Interlocking	Without	Mechanical interlocking	–



3AH3 vacuum circuit-breaker (4000 A)



3AH37 generator circuit-breaker

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The 3AH3 vacuum circuit-breakers consist of a primary and a secondary part. The relevant data make up the 16-digit order number. The primary part covers the main electrical data of the circuit-breaker poles. The secondary part covers the auxiliary devices which are necessary for operating and controlling the vacuum circuit-breaker.

Individual equipment versions, marked with 9 or Z in the 9th to 16th position, are explained more in detail by a 3-digit order code. Several order codes can be added to the order number in succession and in any sequence.

In case of special versions, “-Z” is added to the order number and a descriptive order code follows. If several special versions are required, the suffix “-Z” is listed only once. If a requested special version is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** after consultation. The agreement hereto is made directly between your responsible sales partner and the order processing department in the Switchgear Factory Berlin.

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		a: alphabetical n: numerical																Order codes							
Position:		1	2	3	4	5	6	7	—	8	9	10	11	12	—	13	14	15	16						
Order No.:		3	A	H	3	n	n	n	—	n	a	a	n	n	—	n	a	a	n	—	★	■	■	■	
1 st position	Superior group Switching devices																								
2 nd position	Main group Circuit-breaker																								
3 rd position	Subgroup Circuit-breaker type series																								
4 th to 8 th position	Basic equipment Design and ratings primary part																								
9 th to 16 th position	Secondary part Secondary equipment Operating mechanism, releases, operating voltages and further auxiliary equipment																								
Order codes Group of 3 after the Order No. Format: a n a																									
Special versions (★) Initiated with “-Z” Group of 3 after the Order No. Format: a n n																									

In order to simplify the selection of the correct order number for the requested circuit-breaker type, you will find a configuration example on each page of the chapter "Equipment Selection". For the selection of the secondary part, always the last example of the primary part was taken over and continued, so that at the end of the equipment selection (page 24) a completely configured circuit-breaker results as an example.

On the foldout page we offer a configuring aid.
Here you can fill in the order number you have determined for your circuit-breaker.

Order codes:

3 A H 3 1 1 7 - 7 ■ ■ ■ ■ - ■ ■ ■ ■



50/60 Hz

[illegible]

50/60 Hz

[illegible]

1) Higher rated normal currents on request

3AH3 vacuum circuit-breaker

Rated voltage $U_r = 12 \text{ kV}$, 50/60 Hz

Rated lightning impulse withstand voltage $U_n = 75 \text{ kV}$

Rated short-circuit breaking current $I_{sc} = 50 \text{ kA}$

Pole-centre distance = 210 mm

Rated normal current $I_r = 1250 \text{ A}$

Example for Order No.:

Order codes:

Equipment Selection

Selection of basic types, circuit-breakers

3AH3 Vacuum Circuit-Breakers



15 kV

50/60 Hz

15 kV							Position:																Order codes		
50/60 Hz							Order No.:																		
Rated voltage	Rated lightning impulse withstand voltage	Rated short-duration power-frequency withstand voltage	Rated short-circuit breaking current at 36 % DC component	Rated short-circuit making current (at 50/60 Hz)	Pole-centre distance	Rated normal current																			
U_r	U_p	U_d	I_{sc}	I_{ma}		I_r																			
kV	kV	kV	kA	kA	mm	A																			
15	95	36	50	125/130	210	1250	3	A	H	3	1	6	7	-	2										
						2500	3	A	H	3	1	6	7	-	6										
						3150	3	A	H	3	1	6	7	-	7										
					275	4000 ¹⁾	3	A	H	3	1	7	7	-	8										
			63	160/164	275	1250	3	A	H	3	1	7	8	-	2										
						2500	3	A	H	3	1	7	8	-	6										
						3150	3	A	H	3	1	7	8	-	7										
						4000 ¹⁾	3	A	H	3	1	7	8	-	8										

Special version (available for all 15 kV circuit-breakers)
 $U_d = 42$ kV

- Z E 1 3

17.5 kV

50/60 Hz

U_r	U_p	U_d	I_{sc}	I_{ma}		I_r																			
kV	kV	kV	kA	kA	mm	A																			
17.5	95	38	50	125/130	210	1250		3	A	H	3	2	1	7	-	2									
						2500		3	A	H	3	2	1	7	-	6									
						3150		3	A	H	3	2	1	7	-	7									
					275	4000 ¹⁾		3	A	H	3	2	2	7	-	8									
			63	160/164	275	1250		3	A	H	3	2	2	8	-	2									
						2500		3	A	H	3	2	2	8	-	6									
						3150		3	A	H	3	2	2	8	-	7									
						4000 ¹⁾		3	A	H	3	2	2	8	-	8									

Special version (available for all 17.5 kV circuit-breakers)
 $U_d = 42$ kV

- Z E 1 3

1) Higher rated normal currents on request

Configuration example

3AH3 vacuum circuit-breaker

Rated voltage $U_r = 17.5$ kV, 50/60 Hz

Rated lightning impulse withstand voltage $U_p = 95$ kV

Rated short-circuit breaking current $I_{sc} = 63$ kA

Pole-centre distance = 275 mm

Rated normal current $I_r = 4000$ A

Example for Order No.:

Order codes:

3	A	H	3	2	2	8	-	8	■	■	■	■	-	■	■	■	■								



50/60 Hz

[illegible]

50/60 Hz

[illegible]

$U_p = 185 \text{ kV}$	(only possible together)		-	Z	E	1	4
and $U_d = 85 \text{ kV}$					+ E	1	5
$U_p = 195 \text{ kV}$	(only possible together)		-	Z	E	2	4
and $U_d = 95 \text{ kV}$					+ E	2	5
$U_r = 40.5 \text{ kV}$	(only possible together)		-	Z	Y	0	9
$U_p = 195 \text{ kV}$					+ E	2	4
$U_d = 95 \text{ kV}$					+ E	2	5

Configuration example

Rated normal current $I_r = 2500 \text{ A}$

Order codes:

3 A H 3 3 0 6 - 6

Equipment Selection

Selection of basic types, high-current and generator circuit-breakers

3AH3 Vacuum Circuit-Breakers



17.5 kV

50/60 Hz/generator circuit-breaker acc. to IEEE Std C37.013

Rated voltage	Rated lightning impulse withstand voltage	Rated short-duration power-frequency withstand voltage	Rated short-circuit breaking current at 36 % DC component	Rated short-circuit making current (at 50/60 Hz)	Pole-centre distance	Rated normal current																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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24 kV

50/60 Hz/generator circuit-breaker acc. to IEEE Std C37.013

U_r kV	U_p kV	U_d kV	I_{sc} kA	I_{ma} kA	mm	I_r A																								
24	125	50	50	137	350	3150		3	A	H	3	7	2	2	-	2														
						4000		3	A	H	3	7	2	2	-	3														
						5000		3	A	H	3	7	2	2	-	4														
						6300 ¹⁾		3	A	H	3	7	2	2	-	5														
		63		173	350	3150		3	A	H	3	7	2	3	-	2														
						4000		3	A	H	3	7	2	3	-	3														
						5000		3	A	H	3	7	2	3	-	4														
						6300 ¹⁾		3	A	H	3	7	2	3	-	5														
		72		198	350	3150		3	A	H	3	7	2	4	-	2														
						4000		3	A	H	3	7	2	4	-	3														
						5000		3	A	H	3	7	2	4	-	4														
						6300 ¹⁾		3	A	H	3	7	2	4	-	5														

1) Higher rated normal currents on request

Configuration example

3AH3 vacuum circuit-breaker

Rated voltage $U_r = 24$ kV, 50/60 Hz

Rated lightning impulse withstand voltage $U_p = 125$ kV

Rated short-circuit breaking current $I_{sc} = 72$ kA

Pole-centre distance = 350 mm

Rated normal current $I_r = 6300$ A

Example for Order No.:

Order codes:

3	A	H	3	7	2	4	-	5																						



9th position

Release combination

position								Position:																Order codes						
Release combination								Order No.:																						
Closing solenoid	1 st shunt release	2 nd shunt release	Undervoltage release	C.t.-operated release 0.5 A	C.t.-operated release 1.0 A	C.t.-operated release with tripping pulse ≥ 0.1 Ws (10 Ω)	C.t.-operated release with tripping pulse ≥ 0.1 Ws (20 Ω)	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16					
■	■							3	A	H	3	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
■	■	■															See page 18													
■	■	■															See page 19													
■	■	■															See page 20													
■	■																													
■	■																See page 21													
■	■																See page 22													
■	■																See page 23													
■	■																See page 23													
■	■																See page 24													

- 1) With 3rd shunt release, voltage according to 13th position
2) Version with two c.t.-operated releases 0.5 A

Configuration example

3AH3 vacuum circuit-breaker

($U_r = 36$ kV, 50/60 Hz, $U_p = 170$ kV, $I_{sc} = 40$ kA, $I_r = 2500$ A, pole-centre distance = 350 mm)

Closing solenoid, 1st shunt release, undervoltage release and c.t.-operated release with a rated normal current of 1 A

Example for Order No.:

Order codes:

3 A H 3

3 0 6 - 6

S

- Z A 4 6

3 A H 3 3 0 6 - 6 S ■ ■ ■ - ■ ■ ■ - Z

A 4 6



10th position

Operating voltage of the closing solenoid

		Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes		
Order No.:			3	A	H	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Standard voltages													See page 19	See page 20	See page 21	See page 22	See page 23	See page 23	See page 24		
Special voltages																					
Mechanical closing at the circuit-breaker																					
24 V DC												B									
48 V DC												C									
60 V DC												D									
110 V DC												E									
220 V DC												F									
100 V AC 50/60 Hz ¹⁾												H									
110 V AC 50/60 Hz ¹⁾												J									
230 V AC 50/60 Hz ¹⁾												K									
	30 V DC											Z		With order code					K	1	A
	32 V DC											Z		With order code					K	1	B
	120 V DC											Z		With order code					K	1	C
	125 V DC											Z		With order code					K	1	D
	127 V DC											Z		With order code					K	1	E
	240 V DC											Z		With order code					K	1	F
	120 V AC 50/60 Hz ¹⁾											Z		With order code					K	1	K
	125 V AC 50/60 Hz ¹⁾											Z		With order code					K	1	L
	240 V AC 50/60 Hz ¹⁾											Z		With order code					K	1	M
Manual electrical closing at the circuit-breaker																					
24 V DC												M									
48 V DC												N									
60 V DC												P									
110 V DC												Q									
220 V DC												R									
100 V AC 50/60 Hz ¹⁾												T									
110 V AC 50/60 Hz ¹⁾												U									
230 V AC 50/60 Hz ¹⁾												V									
	30 V DC											Z		With order code					K	2	A
	32 V DC											Z		With order code					K	2	B
	120 V DC											Z		With order code					K	2	C
	125 V DC											Z		With order code					K	2	D
	127 V DC											Z		With order code					K	2	E
	240 V DC											Z		With order code					K	2	F
	120 V AC 50/60 Hz ¹⁾											Z		With order code					K	2	K
	125 V AC 50/60 Hz ¹⁾											Z		With order code					K	2	L
	240 V AC 50/60 Hz ¹⁾											Z		With order code					K	2	M

1) The AC frequency 50 or 60 Hz is selected at the 16th position of the order number together with the language (see page 23)

Configuration example

3AH3 vacuum circuit-breaker
($U_r = 36$ kV, 50/60 Hz, $U_p = 170$ kV, $I_{sc} = 40$ kA, $I_r = 2500$ A, pole-centre distance = 350 mm)
Manual electrical closing at the circuit-breaker, operating voltage of the closing solenoid 32 V DC

Example for Order No.: 3 A H 3 3 0 6 - 6 S Z ■ ■ - ■ ■ ■ - Z
Order codes: A 4 6 + K 2 B

**11th position****Operating voltage of the 1st shunt release**

		Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes		
		Order No.:	3	A	H	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Standard voltages	Special voltages													See page 20	See page 21	See page 22	See page 23	See page 23	See page 24		
24 V DC													1								
48 V DC													2								
60 V DC													3								
110 V DC													4								
220 V DC													5								
100 V AC	50/60 Hz ¹⁾												6								
110 V AC	50/60 Hz ¹⁾												7								
230 V AC	50/60 Hz ¹⁾												8								
	30 V DC												9	With order code					L 1 A		
	32 V DC												9	With order code					L 1 B		
	120 V DC												9	With order code					L 1 C		
	125 V DC												9	With order code					L 1 D		
	127 V DC												9	With order code					L 1 E		
	240 V DC												9	With order code					L 1 F		
	120 V AC	50/60 Hz ¹⁾											9	With order code					L 1 K		
	125 V AC	50/60 Hz ¹⁾											9	With order code					L 1 L		
	240 V AC	50/60 Hz ¹⁾											9	With order code					L 1 M		

1) The AC frequency 50 or 60 Hz is selected at the 16th position of the order number together with the language (see page 23)

Configuration example

3AH3 vacuum circuit-breaker

 $(U_t = 36 \text{ kV}, 50/60 \text{ Hz}, U_p = 170 \text{ kV}, I_{sc} = 40 \text{ kA}, I_t = 2500 \text{ A},$
 pole-centre distance = 350 mm)
Operating voltage of the 1st shunt release 48 V DC

3 A H 3

3 0 6 - 6 S Z

2

Example for Order No.:

Order codes:

 3 A H 3 3 0 6 - 6 S Z 2 ■ - ■ ■ ■ - Z
 A 4 6 + K 2 B

Operating voltage of the 2nd release

Shunt release, undervoltage release or c.t.-operated release

[illegible]

1) The AC frequency 50 or 60 Hz is selected at the 16th position of the order number together with the language (see page 23)

3AH3 vacuum circuit-breaker

($U_r = 36$ kV, 50/60 Hz, $U_p = 170$ kV, $I_{sc} = 40$ kA, $I_r = 2500$ A, pole-centre distance = 350 mm)

2nd release as undervoltage release with operating voltage 32 V DC

Example for Order No.:

Order codes:



14 th position		Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes		
Operating voltage of the operating mechanism		Order No.:	3	A	H	3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Standard voltages	Special voltages																See page 23	See page 23	See page 24		
Manual operating mechanism (hand crank included in the scope of supply)																	A				
24 V DC																	B				
48 V DC																	C				
60 V DC																	D				
110 V DC																	E				
220 V DC																	F				
100 V AC	50/60 Hz ¹⁾																H				
110 V AC	50/60 Hz ¹⁾																J				
230 V AC	50/60 Hz ¹⁾																K				
	30 V DC																Z	With order code	P 1	A	
	32 V DC																Z	With order code	P 1	B	
	120 V DC																Z	With order code	P 1	C	
	125 V DC																Z	With order code	P 1	D	
	127 V DC																Z	With order code	P 1	E	
	240 V DC																Z	With order code	P 1	F	
	120 V AC	50/60 Hz ¹⁾															Z	With order code	P 1	K	
	125 V AC	50/60 Hz ¹⁾															Z	With order code	P 1	L	
	240 V AC	50/60 Hz ¹⁾															Z	With order code	P 1	M	

1) The AC frequency 50 or 60 Hz is selected at the 16th position of the order number together with the language (see page 23)

Configuration example

3AH3 vacuum circuit-breaker

($U_t = 36$ kV, 50/60 Hz, $U_p = 170$ kV, $I_{sc} = 40$ kA, $I_t = 2500$ A, pole-centre distance = 350 mm)

Operating voltage of the operating mechanism 230 V AC, 50 Hz

3 A H 3

3 0 6 - 6 S Z 2 9 - 0

K

Example for Order No.:

3 A H 3 3 0 6 - 6 S Z 2 9 - 0 K ■ ■ - Z
Order codes: A 4 6 + K 2 B + M 1 B



15th position

Auxiliary switch, secondary connection, interlocking

Position:

Order No.:

[illegible]

- 1) Depending on the equipment, some connections of the 64-pole plug connector remain free. These can be connected to free auxiliary switch contacts by the customer. Prefabricated wires are available as accessories.
- 2) Auxiliary switch contacts are not wired to the plug/terminal strip and must therefore be connected directly.

16th position

AC frequency of operating voltages

Languages of operating instructions and rating plate

Language selection				Frequency selection																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Configuration example

3AH3 vacuum circuit-breaker

 $(U_r = 36 \text{ kV}, 50/60 \text{ Hz}, U_D = 170 \text{ kV}, I_{sc} = 40 \text{ kA}, I_r = 2500 \text{ A},$

pole-centre distance = 350 mm)

Auxiliary switch 6 NO + 6 NC, 64-pole plug and with mechanical interlocking

Auxiliary switch contacts and pins of the plug connector gold-plated

Frequency 50 Hz or DC, operating instructions and rating plate in English

Example for Order No.:

Order codes:

[illegible]

Equipment Selection

Selection of additional equipment



Additional equipment

Additional equipment	Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16			Order codes		
	Order No.:	3	A	H	3	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
Options																								
Wiring cables, halogen-free and flame-retardant																				–	Z	A	1	0
Condensation protection, heating for 230 V AC, 50 W																				–	Z	A	3	0
Silicone-free design																				–	Z	A	3	1
Vacuum circuit-breaker for horizontal installation																				–	Z	A	7	0
Additional rating plate, loose delivery																				–	Z	B	0	0
Primary conductor bars silver-plated for external connections and internal interconnection on both sides (standard for 4000 A circuit-breakers and type 3AH381)																				–	Z	D	1	0
Routine test certificate enclosed																				–	Z	F	2	0
Rated operating sequence O - 0.3 s - CO - 15 s - CO (only possible up to 31.5 kA)																				–	Z	F	2	8
Hand crank (also for motor operating mechanism) for manual charging of the closing spring																				–	Z	F	3	0
Circuit-breaker can also be used for 4500 A (applicable to circuit-breaker types 3AH3077-8, 3AH3078-8, 3AH3127-8, 3AH3128-8, 3AH3177-8, 3AH3178-8, 3AH3227-8, 3AH3228-8, 3AH3818-8, 3AH3819-8)																				–	Z	Y	0	4
Further, non-listed special versions (only after consultation with the order processing department at the Switchgear Factory Berlin). Information additionally in clear text.																				–	Z	Y	9	9

Configuration example

3AH3 vacuum circuit-breaker

Rated voltage $U_r = 36 \text{ kV (50/60 Hz)}$

Rated lightning impulse withstand voltage $U_p = 170 \text{ kV}$

Rated short-circuit breaking current $I_{sc} = 40 \text{ kA}$

Pole-centre distance = 350 mm

Rated normal current $I_r = 2500 \text{ A}$

Closing solenoid, 1st shunt release, undervoltage release and c.t.-operated release with a rated normal current of 1 A

Manual electrical closing at the circuit-breaker, operating voltage of the closing solenoid 32 V DC

Operating voltage of the 1st release 48 V DC

2nd release as undervoltage release with operating voltage 32 V DC

3rd release as c.t.-operated release

Operating voltage of the operating mechanism 230 V AC, 50 Hz

Auxiliary switch 6 NO + 6 NC, 64-pole plug and with mechanical interlocking

Auxiliary switch contacts and pins of the plug connector gold-plated

Frequency 50 Hz or DC, operating instructions and rating plate in English

Routine test certificate enclosed

3 A H 3

3 0 6 - 6

S

Z

2

9

-

0

K

B

2

-

Z

F

2

0

0

Example for Order No.:

Order codes:

3 A H 3 3 0 6 - 6 S Z 2 9 - 0 K B 2 - Z
A 4 6 + K 2 B + M 1 B + A 2 0 + F 2 0



On request, we will be pleased to send you an overview of accessories and spare parts, as well as the spare pole assemblies available. Please consider the following information for your purchase order.

Remark for orders

The order numbers in the spare part overview are applicable to vacuum circuit-breakers of current manufacture. When mounting parts or spare parts are being ordered for an existing vacuum circuit-breaker, always quote the type designation, serial number and the year of manufacture of the circuit-breaker to be sure to get the correct delivery.

Retrofitting

When releases/solenoids are retrofitted, the order numbers of the mounting parts must also be specified. For other additional equipment, the required mounting parts are included in the delivery.

Spare pole assemblies

As spare parts, the vacuum interrupters are always supplied as a complete pole including post insulator.

To select the correct spare pole assemblies, please specify the type designation, serial number and year of manufacture of the circuit-breaker. All data is given on the rating plate.

Vacuum pole assemblies and other spare parts must only be replaced by instructed personnel.

Accessories for the plug connector

Included in the scope of supply of the basic equipment for 3AH3 vacuum circuit-breakers:

For 24-pole plug connector

- Lower part of plug
- Crimp sockets according to number of contacts
- Upper part of plug with screwed contacts (no crimp sockets required)

For 64-pole plug connector

- Lower part of plug
- Upper part of plug
- Crimp sockets according to number of contacts

Data on the rating plate

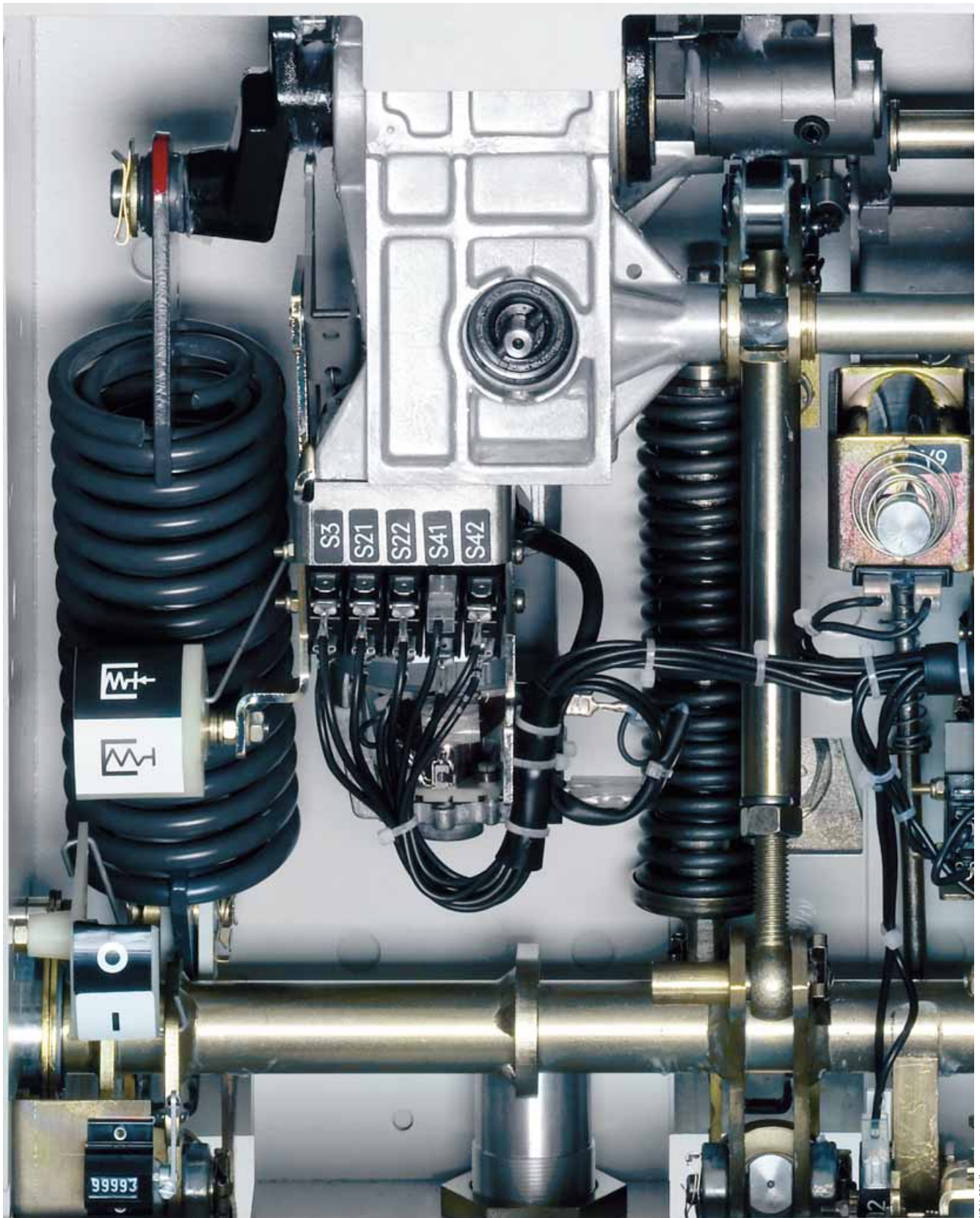
	
SIEMENS	
Type 3AH3306-6	
No. S 3AH3/00007234	Year of manuf. 2010
U_i 36,0 kV 50/60 Hz	I_n 2500 A
I_{sc} 40,0 kA	t_k 3 s
U_d/U_p 70/170 kV	m 180 kg
Rated operating sequence: O - 3 min - CO - 3 min - CO	
Category to IEC 62271-100: E2, M2, C2	
MADE IN GERMANY	

Note:

For any query regarding spare parts, subsequent deliveries, etc. the following three details are necessary:

- Type designation
- Serial No.
- Year of manufacture

Designation	Remarks	Order No.
Hand crank		3AX15 30-2B
Wire bundle	With 10 wires for connection of auxiliary switch to	
	– 64-pole plug connector	3AX11 34-2D
	– 24-pole plug connector	3AX11 34-2B
	– 24-pole terminal strip	3AX11 34-2C
Accessories for plug connector	(for wire cross-section 1.5 mm ²)	
	Crimp pins for lower part of plug 24-pole	3AX11 34-3A
	64-pole	3AX11 34-4B
	Crimp sockets for upper part of plug 64-pole	3AX11 34-4C
	Crimping pliers	3AX11 34-4D
	Disassembly tool	3AX11 34-4G



PHG11-2051f



Vacuum interrupter



Post insulator and upper interrupter support

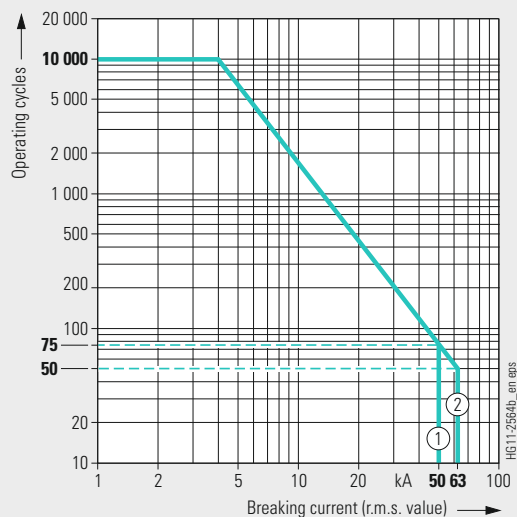
Contents	Page
Technical Data	27
Electrical data, dimensions and weights:	
Voltage level 7.2 kV	28
Voltage level 12 kV	28
Voltage level 15 kV	30
Voltage level 17.5 kV	32
Voltage level 24 kV	34
Voltage level 36 kV	36
Electrical data, dimensions and weights of high-current and generator circuit-breakers according to IEEE C37.013:	
Voltage level 17.5 kV	38
Voltage level 24 kV	40
Circuit diagrams	42
Operating times	44
Short-circuit protection of motors	44
Consumption data of releases	44

Order No.	7.2 kV 50/60 Hz		Rated normal current		Pole-centre distance		Rated operating sequence: O - 3 min - CO - 3 min - CO O - 0.3 s - CO - 3 min - CO O - 0.3 s - CO - 15 s - CO			Rated duration of short-circuit		Rated short-circuit breaking current		DC component in % of the rated short-circuit breaking current		Asymmetrical breaking current		Rated short-circuit making current (at 50/60 Hz)		Rated lightning impulse withstand voltage		Rated short-duration power-frequency withstand voltage		Voltage drop ΔU between connections (according to IEC 62271-1 at DC 100 A)		Minimum creepage distance, interrupter		Minimum creepage distance, phase-to-earth		Minimum clearance, phase-to-phase		Minimum clearance, phase-to-earth		Weights		Detailed dimension drawing (can be ordered)		Operating cycle diagram no. (see page 29)		Catalog dimension drawing no. (see page 29)	
	I_r									t_k		I_{sc}				I_{ma}		U_p		U_d																					
	A	mm								s	kA	%	kA	kA	kV	kV	mV	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg													
3AH3 057-2 ...	1250	210	■	Δ	Δ	3	50	36	56.1	125/130	60	20	1.8	160	230	80	130	180	S_325 00415	1	1																				
3AH3 057-6 ...	2500	210	■	Δ	Δ	3	50	36	56.1	125/130	60	20	1.8	160	230	80	130	180	S_325 00417	1	1																				
3AH3 057-7 ...	3150	210	■	Δ	Δ	3	50	36	56.1	125/130	60	20	1.8	160	230	80	130	180	S_325 00001	1	1																				
3AH3 077-8 ...	4000	275	■	Δ	Δ	3	50	36	56.1	125/130	60	20	1.4	160	170	71	130	308	S_325 00004	1	3																				
3AH3 078-2 ...	1250	275	■	Δ	Δ	3	63	36	70.7	160/164	60	20	1.8	160	170	71	130	196	S_325 00003	2	2																				
3AH3 078-6 ...	2500	275	■	Δ	Δ	3	63	36	70.7	160/164	60	20	1.8	160	170	71	130	196	S_325 00003	2	2																				
3AH3 078-7 ...	3150	275	■	Δ	Δ	3	63	36	70.7	160/164	60	20	1.8	160	170	71	130	196	S_325 00003	2	2																				
3AH3 078-8 ...	4000	275	■	Δ	Δ	3	63	36	70.7	160/164	60	20	1.4	160	170	71	130	308	S_325 00004	2	3																				

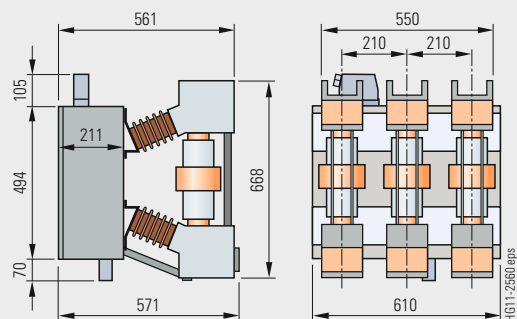
	12 kV 50/60 Hz		I_r				t_k	I_{sc}			I_{ma}	U_p	U_d																											
	A	mm				s	kA	%	kA	kA	kV	kV	mV	mm	mm	mm	mm	mm	mm	kg																				
3AH3 117-2 ...	1250	210	■	Δ	Δ	3	50	36	56.1	125/130	75	28	1.8	160	230	80	130	180	S_325 00415	1	1																			
3AH3 117-6 ...	2500	210	■	Δ	Δ	3	50	36	56.1	125/130	75	28	1.8	160	230	80	130	180	S_325 00417	1	1																			
3AH3 117-7 ...	3150	210	■	Δ	Δ	3	50	36	56.1	125/130	75	28	1.8	160	230	80	130	180	S_325 00001	1	1																			
3AH3 127-8 ...	4000	275	■	Δ	Δ	3	50	36	56.1	125/130	75	28	1.4	160	170	71	130	308	S_325 00004	1	3																			
3AH3 128-2 ...	1250	275	■	Δ	Δ	3	63	36	70.7	160/164	75	28	1.8	160	170	71	130	196	S_325 00003	2	2																			
3AH3 128-6 ...	2500	275	■	Δ	Δ	3	63	36	70.7	160/164	75	28	1.8	160	170	71	130	196	S_325 00003	2	2																			
3AH3 128-7 ...	3150	275	■	Δ	Δ	3	63	36	70.7	160/164	75	28	1.8	160	170	71	130	196	S_325 00003	2	2																			
3AH3 128-8 ...	4000	275	■	Δ	Δ	3	63	36	70.7	160/164	75	28	1.4	160	170	71	130	308	S_325 00004	2	3																			

■ Standard information on the rating plate

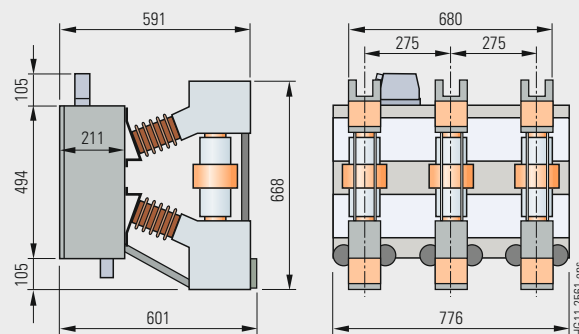
△ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagram for 7.2 kV and 12 kV


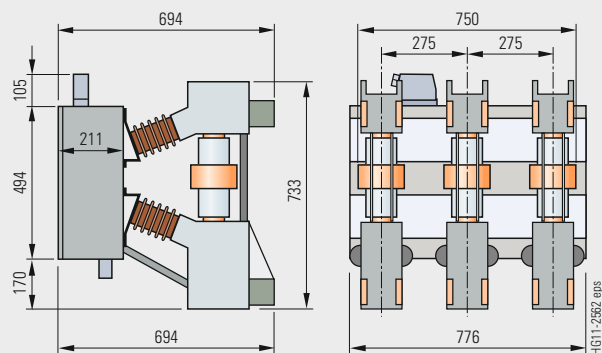
The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience data. The number of operating cycles that can actually be reached can be different depending on the respective application.

Dimension drawings for 7.2 kV and 12 kV


Dimension drawing 1



Dimension drawing 2

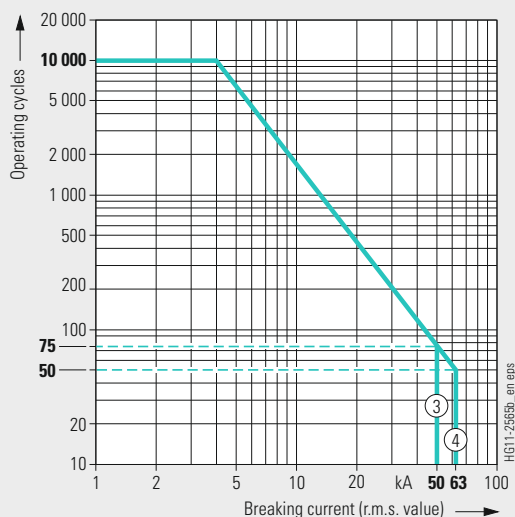


Dimension drawing 3

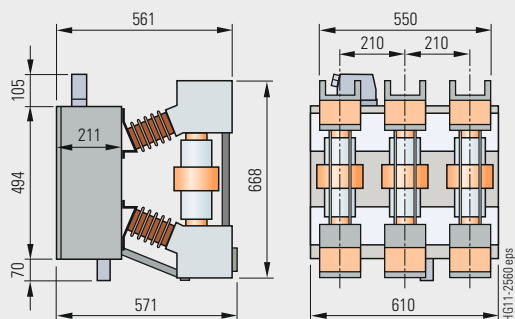
[illegible]

■ Standard information on the rating plate

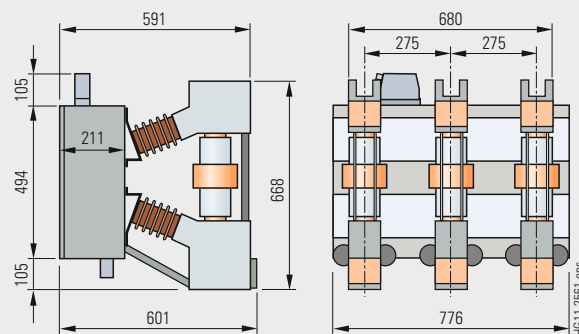
Δ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagram for 15 kV


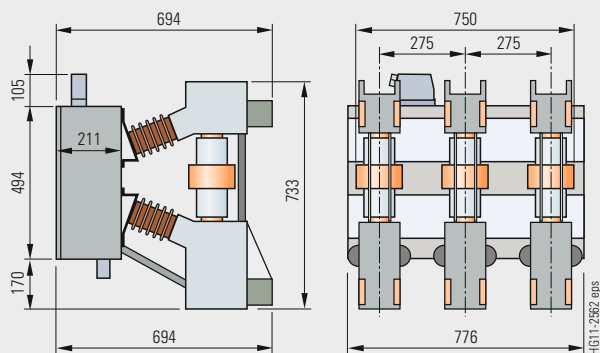
The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience data. The number of operating cycles that can actually be reached can be different depending on the respective application.

Dimension drawings for 15 kV


Dimension drawing 4



Dimension drawing 5



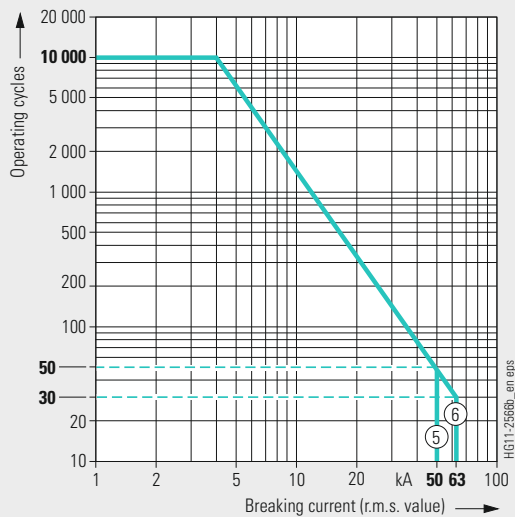
Dimension drawing 6

Order No.	17.5 kV 50/60 Hz																																					
	Rated normal current	Pole-centre distance	Rated operating sequence: O - 3 min - CO - 3 min - CO O - 0.3 s - CO - 3 min - CO O - 0.3 s - CO - 15 s - CO				Rated duration of short-circuit		Rated short-circuit breaking current		DC component in % of the rated short-circuit breaking current		Asymmetrical breaking current		Rated short-circuit making current (at 50/60 Hz)		Rated lightning impulse withstand voltage		Rated short-duration power-frequency withstand voltage		Voltage drop ΔU between connections (according to IEC 62271-1 at DC 100 A)		Minimum creepage distance, interrupter		Minimum creepage distance, phase-to-earth		Minimum clearance, phase-to-phase		Minimum clearance, phase-to-earth		Weights		Detailed dimension drawing (can be ordered)		Operating cycle diagram no. (see page 33)		Catalog dimension drawing no. (see page 33)	
	I_r A	mm				t_k s	I_{sc} kA	%	kA	I_{ma} kA	U_p kV	U_d kV	mV	mm	mm	mm	mm	kg																				
3AH3 217-2 ...	1250	210				3	50	36	56.1	125/ 130	95	38	1.8	160	230	110	130	184	S_325 00416	5	4																	
3AH3 217-6 ...	2500	210				3	50	36	56.1	125/ 130	95	38	1.8	160	230	110	130	184	S_325 00418	5	4																	
3AH3 217-7 ...	3150	210				3	50	36	56.1	125/ 130	95	38	1.8	160	230	110	130	184	S_325 00002	5	4																	
3AH3 227-8 ...	4000	275				3	50	36	56.1	125/ 130	95	38	1.4	160	170	135	130	310	S_325 00006	5	6																	
3AH3 228-2 ...	1250	275				3	63	36	70.7	160/ 163.8	95	38	1.8	160	170	145	130	198	S_325 00005	6	5																	
3AH3 228-6 ...	2500	275				3	63	36	70.7	160/ 163.8	95	38	1.8	160	170	145	130	198	S_325 00005	6	5																	
3AH3 228-7 ...	3150	275				3	63	36	70.7	160/ 163.8	95	38	1.8	160	170	145	130	198	S_325 00005	6	5																	
3AH3 228-8 ...	4000	275				3	63	36	70.7	160/ 163.8	95	38	1.4	160	170	135	130	310	S_325 00006	6	6																	

■ Standard information on the rating plate

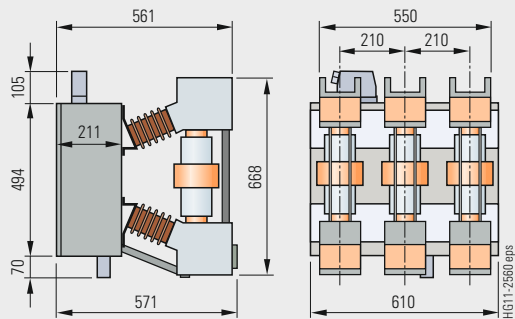
△ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagram for 17.5 kV

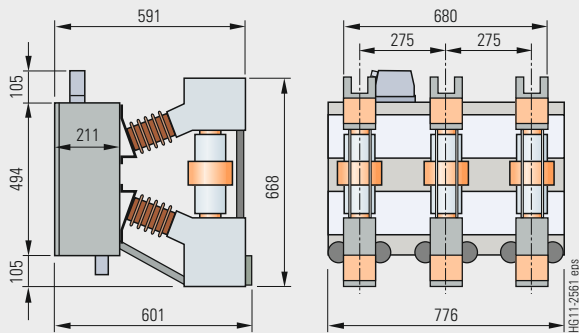


The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience data. The number of operating cycles that can actually be reached can be different depending on the respective application.

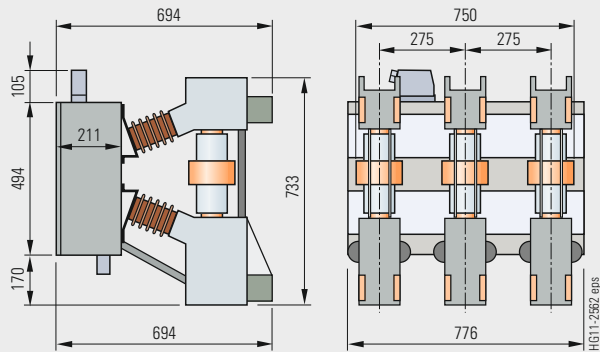
Dimension drawings for 17.5 kV



Dimension drawing 4



Dimension drawing 5



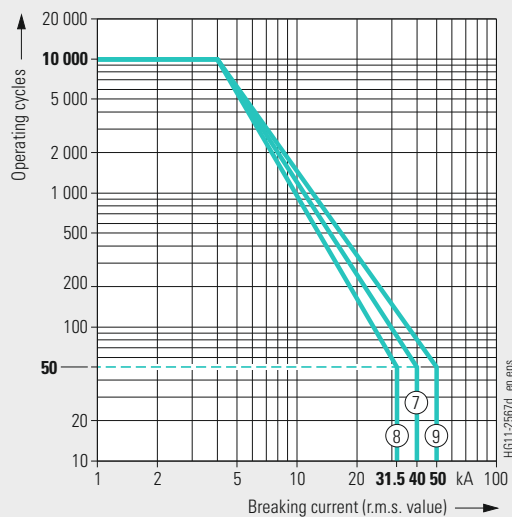
Dimension drawing 6

[illegible]

- Standard information on the rating plate

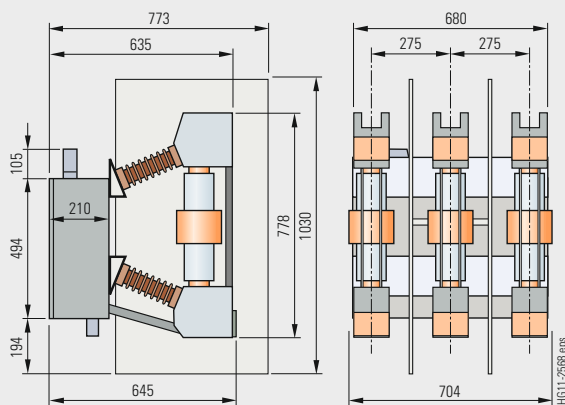
△ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagram for 24 kV

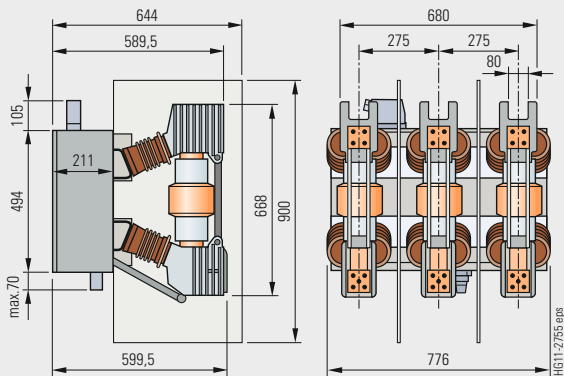


The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience data. The number of operating cycles that can actually be reached can be different depending on the respective application.

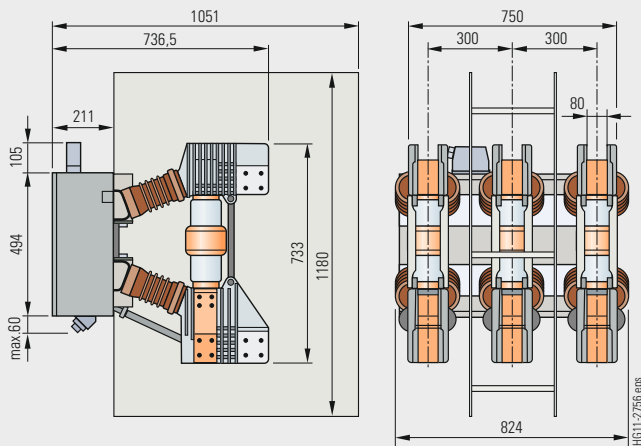
Dimension drawings for 24 kV



Dimension drawing 7



Dimension drawing 8

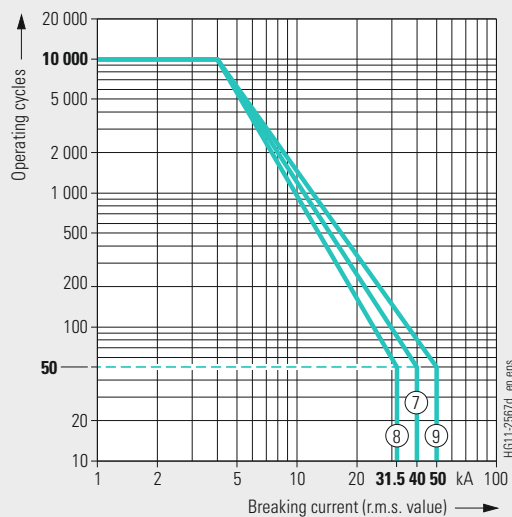


Dimension drawing 9

Order No.	36 kV 50/60 Hz																																								
	Rated normal current	Pole-centre distance	Rated operating sequence: O - 3 min - CO - 3 min - CO O - 0.3 s - CO - 3 min - CO O - 0.3 s - CO - 15 s - CO					Rated duration of short-circuit			Rated short-circuit breaking current			DC component in % of the rated short-circuit breaking current		Asymmetrical breaking current		Rated short-circuit making current (at 50/60 Hz)		Rated lightning impulse withstand voltage		Rated short-duration power-frequency withstand voltage		Voltage drop ΔU between connections (according to IEC 62271-1 at DC 100 A)		Minimum creepage distance, interrupter		Minimum creepage distance, phase-to-earth		Minimum clearance, phase-to-phase		Minimum clearance, phase-to-earth		Weights		Detailed dimension drawing (can be ordered)		Operating cycle diagram no. (see page 37)		Catalog dimension drawing no. (see page 37)	
	I_r A	mm					t_k s	I_{sc} kA	%	kA	I_{ma} kA	U_p kV	U_d kV	mV	mm	mm	mm	mm	mm	mm	kg																				
3AH3 305-2 ...	1250	350	□	■	○		3	31.5	36	35.4	80/82	170	70	2.3	360	330	314	260	170		S_325 00008	8	10																		
3AH3 305-4 ...	2000	350	□	■	○		3	31.5	36	35.4	80/82	170	70	2.3	360	330	314	260	175		S_325 00008	8	10																		
3AH3 305-6 ...	2500	350	□	■	○		3	31.5	36	35.4	80/82	170	70	2.3	360	330	314	260	175		S_325 00009	8	11																		
3AH3 305-7 ...	3150	350	□	■	○		3	31.5	36	35.4	80/82	170	70	1.9	366	430	309	270	350		S_325 00059	8	12																		
3AH3 305-8...	4000	350	□	■	○		3	31.5	36	35.4	80/82	170	70	1.9	366	430	309	270	350		S_325 00058	8	12																		
3AH3 306-6 ...	2500	350	■	△	△		3	40	36	44.9	100/104	170	70	2.0	360	330	314	260	175		S_325 00009	7	11																		
3AH3 306-7...	3150	350	■	△	△		3	40	36	44.9	100/104	170	70	1.9	366	430	309	270	350		S_325 00059	7	12																		
3AH3 306-8...	4000	350	■	△	△		3	40	36	44.9	100/104	170	70	1.9	366	430	309	270	350		S_325 00058	7	12																		

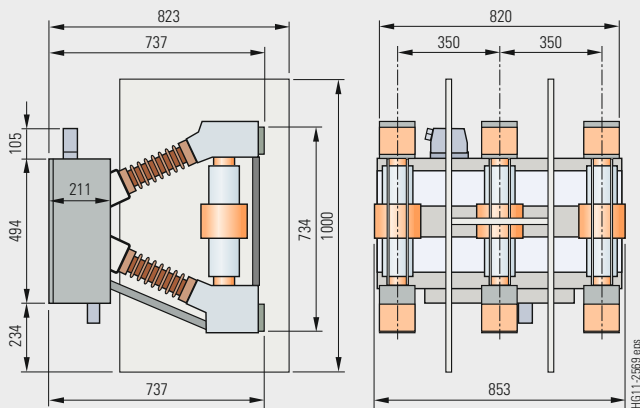
- Standard information on the rating plate
- Possible with order number suffix Z and order code F27
- Possible with order number suffix Z and order code F28
- △ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagram for 36 kV

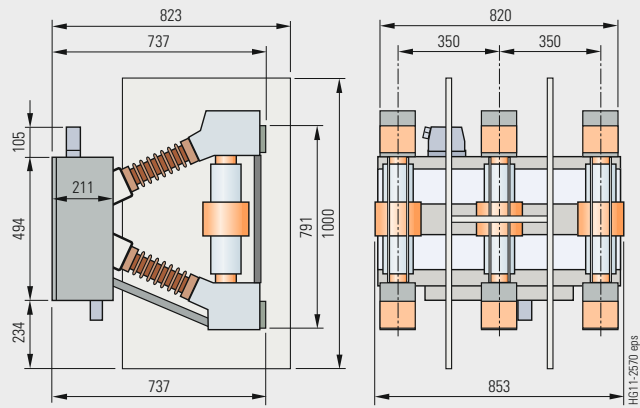


The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience data. The number of operating cycles that can actually be reached can be different depending on the respective application.

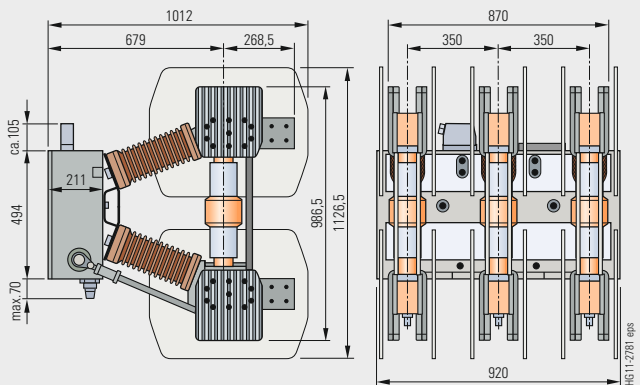
Dimension drawings for 36 kV



Dimension drawing 10



Dimension drawing 11



Dimension drawing 12

Technical Data

Electrical data, dimensions and weights
of high-current and generator circuit-breakers

3AH3 Vacuum Circuit-Breakers

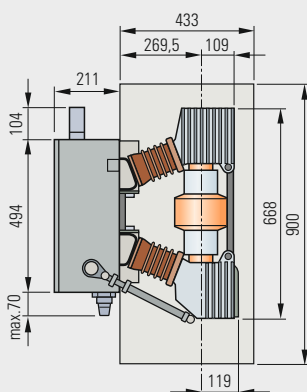
High-current and generator circuit-breakers according to IEEE C37.013 Order No.	17.5 kV 50/60 Hz		Rated normal current		Pole-centre distance		Rated operating sequence: O - 3 min - CO - 3 min - CO		O - 30 min - CO		Rated duration of short-circuit		Rated short-circuit breaking current		DC component in % of the rated short-circuit breaking current		Asymmetrical breaking current		Rated short-circuit making current (at 50/60 Hz)		Rated lightning impulse withstand voltage		Rated short-duration power-frequency withstand voltage		Voltage drop ΔU between connections (according to IEC 62271-1 at DC 100 A)		Minimum creepage distance, interrupter		Minimum creepage distance, phase-to-earth		Minimum clearance, phase-to-phase		Minimum clearance, phase-to-earth		Weights		Detailed dimension drawing (can be ordered)		Catalog dimension drawing no. (see page 39)	
	I_r																																							
	A	mm				s	kA	%	kA	kA	kV	kV	mV	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3AH3 712-4 ...	5000	300	□	■	3	50	75	73	137	110	50	1.4	160	230	230	230	470	S_325 00587	14																					
3AH3 712-5 ...	6300	300	□	■	3	50	75	73	137	110	50	1.4	160	230	230	230	500	S_325 00587	14																					
3AH3 713-4 ...	5000	300	□	■	3	63	65	86	173	110	50	1.4	160	230	230	230	470	S_325 00588	15																					
3AH3 713-5 ...	6300	300	□	■	3	63	65	86	173	110	50	1.4	160	230	230	230	500	S_325 00588	15																					
3AH3 714-4 ...	5000	300	□	■	3	72	65	96	198	110	50	1.4	160	230	230	230	470	S_325 00589	15																					
3AH3 714-5 ...	6300	300	□	■	3	72	65	96	198	110	50	1.4	160	230	230	230	500	S_325 00589	15																					
3AH3 817-7 ...	3150	275	□	■	3	50	75	73	137	110	50	1.4	160	170	145	130	230	S_325 00592	13																					
3AH3 817-8 ...	4000	275	□	■	3	50	75	73	137	110	50	1.4	160	170	135	130	320	S_325 00593	14																					
3AH3 818-7 ...	3150	275	□	■	3	63	65	86	173	110	50	1.4	160	170	145	130	230	S_325 00019	16																					
3AH3 818-8 ...	4000	275	□	■	3	63	65	86	173	110	50	1.4	160	170	135	130	320	S_325 00030	14																					
3AH3 819-7 ...	3150	275	□	■	3	72	65	96	198	110	50	1.4	160	170	145	130	250	S_325 00019	16																					
3AH3 819-8 ...	4000	275	□	■	3	72	65	96	198	110	50	1.4	160	170	135	130	320	S_325 00030	14																					

■ Standard information on the rating plate

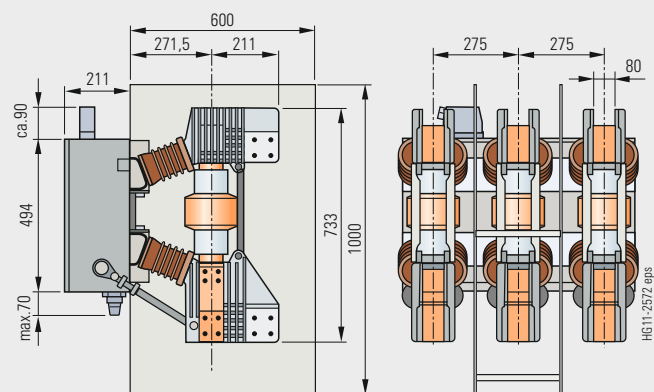
□ Possible with order number suffix Z and order code F27

Number of operating cycles

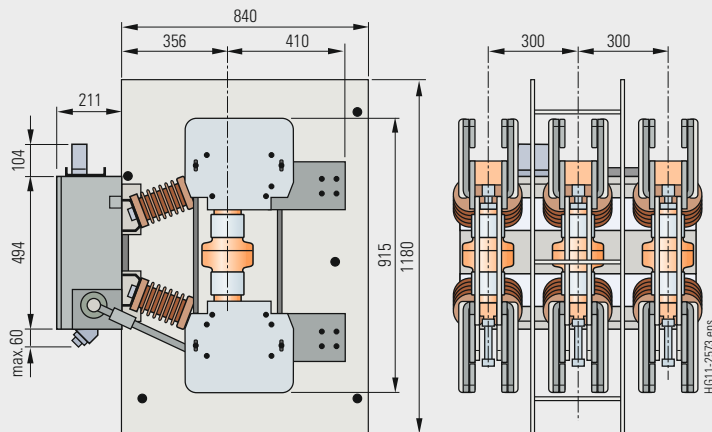
The maximum permissible number of mechanical operating cycles is 10,000. Short-circuit breaking operations have been tested and proved under various conditions according to IEEE C37.013. As regards the electrical endurance, values ranging beyond this depend on the specific case of application.

Dimension drawings for high-current and generator circuit-breakers 17.5 kV

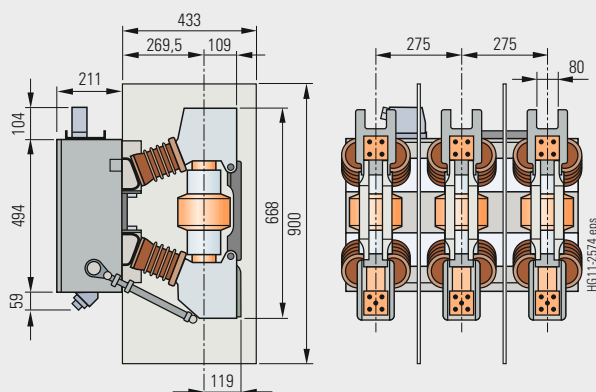
Dimension drawing 13



Dimension drawing 14



Dimension drawing 15



Dimension drawing 16

Technical Data

Electrical data, dimensions and weights
of high-current and generator circuit-breakers

3AH3 Vacuum Circuit-Breakers

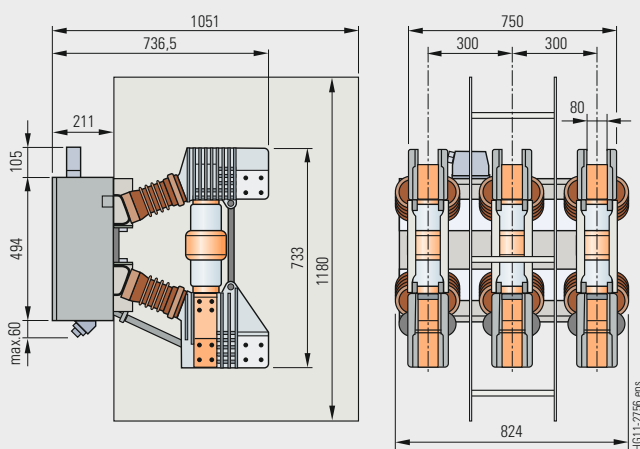
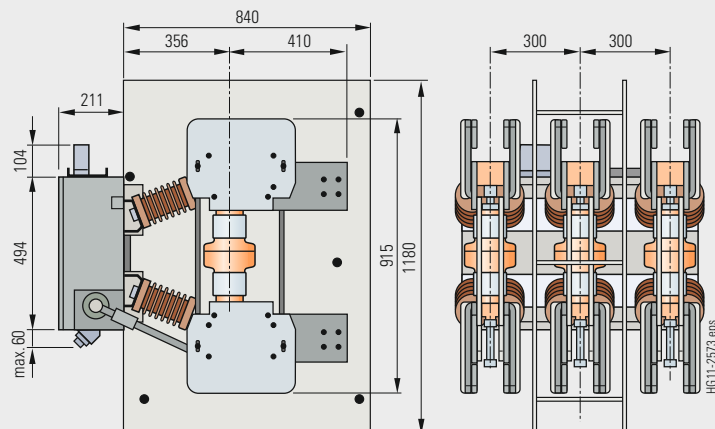
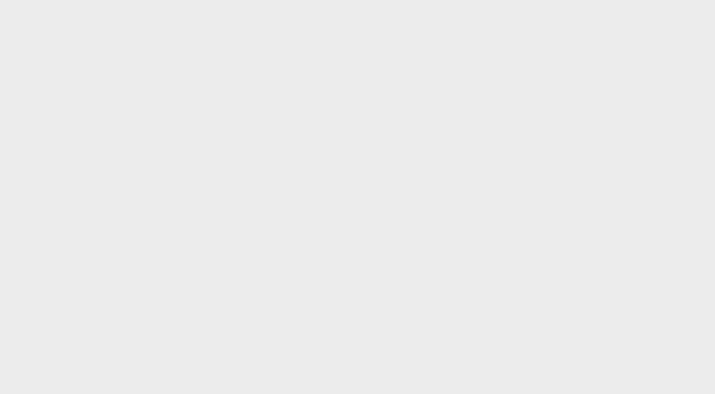
High-current and generator circuit-breakers according to IEEE C37.013	24 kV 50/60 Hz		Order No.																																							
	Rated normal current		Pole-centre distance		Rated operating sequence: O - 3 min - CO - 3 min - CO		O - 30 min - CO		Rated duration of short-circuit		Rated short-circuit breaking current		DC component in % of the rated short-circuit breaking current		Asymmetrical breaking current		Rated short-circuit making current (at 50/60 Hz)		Rated lightning impulse withstand voltage		Rated short-duration power-frequency withstand voltage		Voltage drop ΔU between connections (according to IEC 62271-1 at DC 100 A)		Minimum creepage distance, interrupter		Minimum creepage distance, phase-to-earth		Minimum clearance, phase-to-phase		Minimum clearance, phase-to-earth		Weights		Detailed dimension drawing (can be ordered)		Catalog dimension drawing no. (see page 41)					
	I_r																																									
A	mm				s	kA	%	kA	kA	kV	kV	mV	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
3AH3 722-2 ...	3150	300	□	■	3	50	75	73	137	125	50	1.6	160	220	538	170	350																									
3AH3 722-3 ...	4000	300	□	■	3	50	75	73	137	125	50	1.6	160	220	538	170	350																									
3AH3 722-4 ...	5000	300	□	■	3	50	75	73	137	125	50	1.6	160	207	293	170	470																									
3AH3 722-5 ...	6300	300	□	■	3	50	75	73	137	125	50	1.6	160	207	293	170	500																									
3AH3 723-2 ...	3150	300	□	■	3	63	65	86	173	125	50	1.6	160	220	538	170	350																									
3AH3 723-3 ...	4000	300	□	■	3	63	65	86	173	125	50	1.6	160	220	538	170	350																									
3AH3 723-4 ...	5000	300	□	■	3	63	65	86	173	125	50	1.6	160	207	293	170	470																									
3AH3 723-5 ...	6300	300	□	■	3	63	65	86	173	125	50	1.6	160	207	293	170	500																									
3AH3 724-2 ...	3150	300	□	■	3	72	65	96	198	125	50	1.6	160	220	538	170	350																									
3AH3 724-3 ...	4000	300	□	■	3	72	65	96	198	125	50	1.6	160	220	538	170	350																									
3AH3 724-4 ...	5000	300	□	■	3	72	65	96	198	125	50	1.6	160	207	293	170	470																									
3AH3 724-5 ...	6300	300	□	■	3	72	65	96	198	125	50	1.6	160	207	293	170	500																									

■ Standard information on the rating plate

□ Possible with order number suffix Z and order code F27

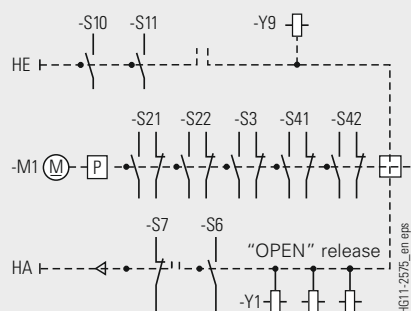
Number of operating cycles

The maximum permissible number of mechanical operating cycles is 10,000. Short-circuit breaking operations have been tested and proved under various conditions according to IEEE C37.013. As regards the electrical endurance, values ranging beyond this depend on the specific case of application.

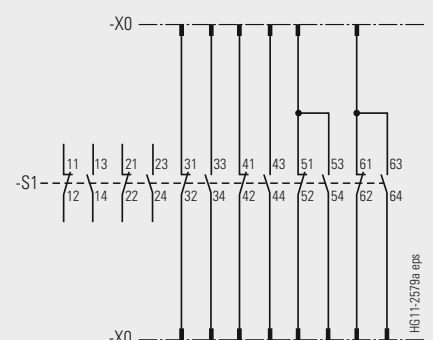
Dimension drawings for high-current and generator circuit-breakers 24 kV**Dimension drawing 9****Dimension drawing 15**

Circuit diagrams

The circuit diagrams shown here are examples from the manifold possibilities of circuit-breaker wiring.

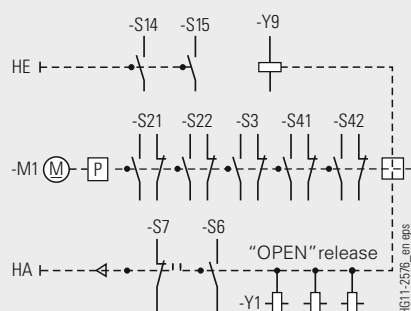


Manual closing – manual opening with auxiliary switch 6 NO + 6 NC

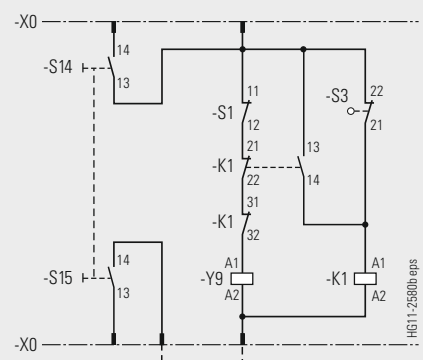


Contacts available for customer with basic circuit-breaker equipment and auxiliary switch 6 NO + 6 NC

Additional equipment: Motor operating mechanism and auxiliary switch

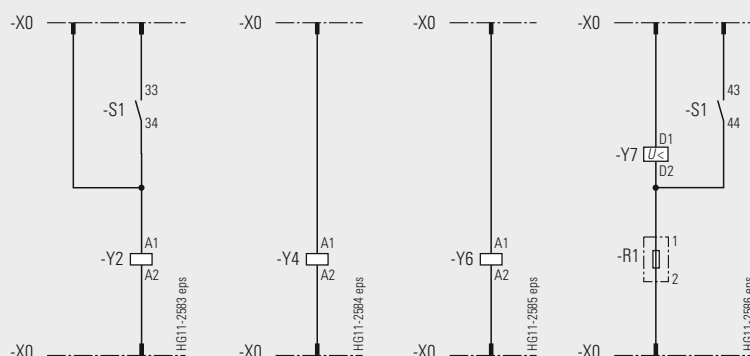


Motor operating mechanism with manual electrical closing



Manual electrical closing Closing and anti-pumping

The available possible combinations are described in the chapter "Selection of secondary equipment".



2nd shunt release

C.t.-operated
release 0.5 A
or 1 A

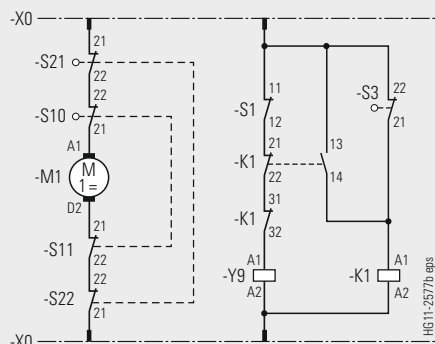
Low-energy
c.t.-operated
release 0.1 Ws

Undervoltage release

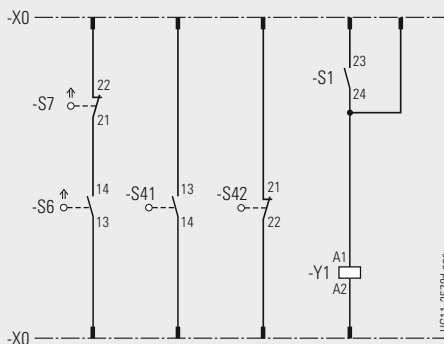
Legend see page 43

Circuit diagrams (continued)

The circuit diagrams shown here are examples from the manifold possibilities of circuit-breaker wiring.



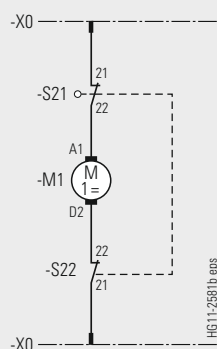
Motor operating mechanism with manual mechanical closing



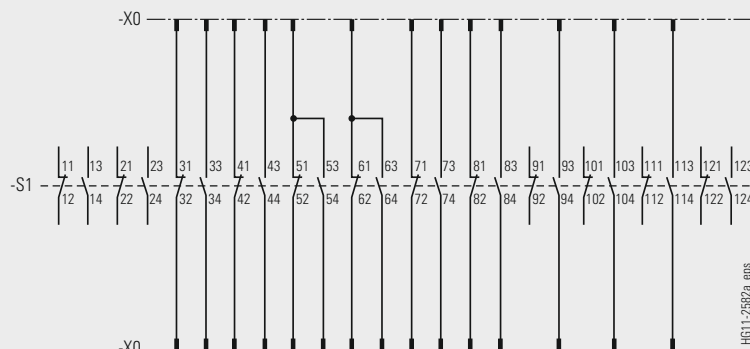
Circuit-breaker tripping signal

Signal "closing spring charged"

1st shunt release

Additional equipment: Motor operating mechanism and auxiliary switch (continued)

Motor operating mechanism



Contacts available for customer with basic circuit-breaker equipment

Auxiliary switch –S1 (12 NO + 12 NC) instead of auxiliary switch 6 NO + 6 NC

Legend (also for page 42)

HA Manual opening
HE Manual closing
K1 Contactor (anti-pumping)
M1 Motor operating mechanism
P Energy store
R1 Resistance

S1 Auxiliary switch
S3 Position switch (opens when closing spring is charged)
S6 Circuit-breaker tripping signal
S7 Cutout switch for circuit-breaker tripping signal
S10, S11 Anti-pumping for manual closing

S14, S15 Anti-pumping
S21, S22 Position switches (to de-energize the motor operating mechanism after charging)
S41, S42 Position switches (to indicate the charging state)

X0 Lower part of plug/terminal strip
Y1 1st shunt release
Y2 2nd shunt release
Y4 Current-transformer operated release
Y6 Low-energy current-transformer operated release
Y7 Undervoltage release
Y9 Closing solenoid

Operating times

Operating times at rated voltage of the secondary circuit	Equipment of circuit-breaker	Operating time of circuit-breaker
Closing time	–	< 75 ms ¹⁾
Opening time	1 st shunt release	< 60 ms ¹⁾
	2 nd and 3 rd release	< 55 ms
Arcing time	–	< 15 ms
Break time	1 st shunt release	< 80 ms
	2 nd and 3 rd release	< 60 ms
Dead time	–	300 ms
CLOSE/OPEN contact time	1 st shunt release	< 90 ms
	2 nd and 3 rd release	< 70 ms
Minimum command duration	Closing solenoid	45 ms
	1 st shunt release	40 ms
	2 nd and 3 rd release	20 ms
Pulse time for circuit-breaker tripping signal	1 st shunt release	> 15 ms
	2 nd and 3 rd release	> 10 ms
Charging time for electrical operation	–	< 15 s
Synchronism error between the poles	–	≤ 2 ms

1) Shorter operating times on request.

Short-circuit protection of motors (fuse protection of drive motors)

Rated voltage of the motor	Operating voltage		Power consumption of the motor		Smallest possible rated current ²⁾ of the m.c.b. (miniature circuit-breaker) with C-characteristic
	max. V	min. V	W (at DC)	VA (at AC)	
24 DC	26	20	500	–	16
48 DC	53	41	500	–	8
60 DC	66	51	500	–	6
110 DC	121	93	500	–	4
220 DC	242	187	500	–	2
110 AC	121	93	–	650	4
230 AC	244	187	–	650	2

2) The current inrush in the drive motor can be neglected due to its very short presence.

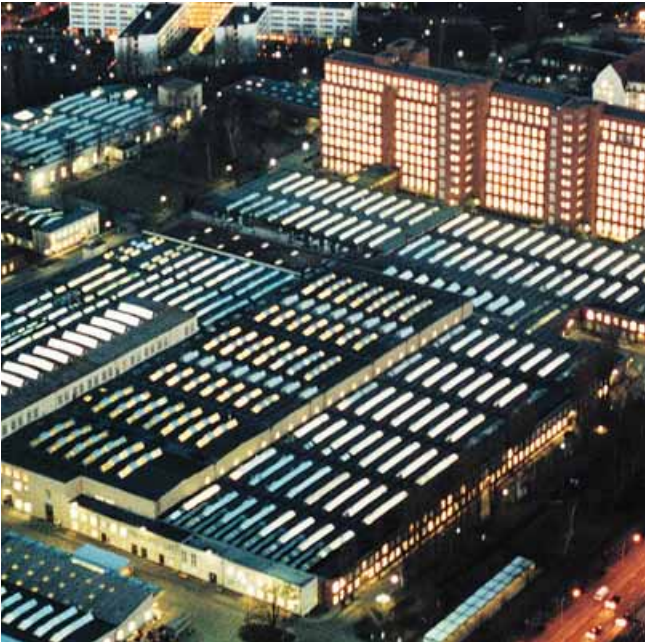
Consumption data of releases

Release	Power consumption		Tripping ranges	
	Operation at		Tripping voltage	Tripping voltage or tripping current
	DC approx. W	AC 50/60 Hz approx. VA	at DC	at AC 50/60 Hz
Closing solenoid 3AY15 10	140	140	85 to 110 % U	85 to 110 % U
1 st shunt release (without energy store) 3AY15 10	140	140	70 to 110 % U	85 to 110 % U
2 nd shunt release (with energy store) 3AY11 01	70	50	70 to 110 % U	85 to 110 % U
Undervoltage release 3AY11 03	20	20	35 to 0 % U	35 to 0 % U
Current-transformer operated release 3AX11 02 (rated normal current 0.5 or 1 A)	–	10 ³⁾	–	90 to 110 % I _a
Current-transformer operated release 3AX11 04 (tripping pulse ≥ 0.1 Ws)	–	–	–	–

3) Consumption at pickup current (90 % of the rated normal current) and open armature.



Brandenburg Gate, Berlin, Germany



Switchgear Factory in Berlin, Germany

Contents	Page
Annex	45
Inquiry form	46
Configuration instructions	47
Configuration aid	Foldout page

Please copy, fill in and return to your Siemens partner or you can use our prompted online configurator under www.siemens.com/energy

Inquiry concerning

- ☐ 3AH3 circuit-breaker
☐ 3AH37/38 generator circuit-breaker

Please

- ☐ Submit an offer
☐ Call us
☐ Visit us

Your address

Company

Dept.

Name

Street

Postal code/city

Phone

Fax

E-mail

Siemens AG

Dept.

Name

Street

Postal code/city

Fax

Technical Data

	Other values			
Rated voltage	☐ 7.2 kV	☐ 12 kV	☐ 15 kV	☐ 17.5 kV
	☐ 24 kV	☐ 36 kV	☐ 40.5 kV	☐ ___ kV
Rated lightning impulse withstand voltage	☐ 60 kV	☐ 75 kV	☐ 95 kV	☐ 110 kV
	☐ 125 kV	☐ 170 kV	☐ 195 kV	☐ ___ kV
Rated short-duration power-frequency withstand voltage	☐ 20 kV	☐ 32 kV	☐ 36 kV	☐ 38 kV
	☐ 50 kV	☐ 70 kV	☐ 95 kV	☐ ___ kV
Rated short-circuit breaking current	☐ 31.5 kA	☐ 40 kA	☐ 50 kA	☐ ___ kA
	☐ 63 kA	☐ 72 kA		
Rated normal current	☐ 1250 A	☐ 2000 A	☐ 2500 A	☐ 3150 A
	☐ 4000 A	☐ 5000 A	☐ 6300 A	☐ ___ A
Pole-centre distance	☐ 210 mm	☐ 275 mm	☐ 300 mm	☐ 350 mm

Secondary equipment

For possible combinations see pages 17 to 23

Circuit-breaker equipment	☐ Manual mechanical closing ☐ Manual electrical closing ☐ Manual operating mechanism			
Motor operating mechanism	☐ ___ V DC		☐ ___ V AC, ___ Hz	
Closing solenoid	☐ ___ V DC		☐ ___ V AC, ___ Hz	
1 st shunt release	☐ ___ V DC		☐ ___ V AC, ___ Hz	
2 nd shunt release	☐ ___ V DC		☐ ___ V AC, ___ Hz	
Current-transformer operated release	☐ 0.5 A	☐ 1 A	☐ ≥ 0.1 Ws (10 Ω)	☐ ≥ 0.1 Ws (20 Ω)
Undervoltage release	☐ ___ V DC		☐ ___ V AC, ___ Hz	
	☐ Without energy store		☐ With energy store	
Auxiliary switch	☐ 6 NO + 6 NC	☐ 12 NO + 12 NC		
Low-voltage connection	☐ 24-pole terminal strip	☐ 24-pole plug	☐ 64-pole plug	
☐ Mechanical interlocking				
Operating instructions	☐ English	☐ German	☐ French	☐ Spanish

Application and other requirements

☐ Please check off ___ Please fill in

You prefer to configure your 3AH3 vacuum circuit-breaker on your own?
Please follow the steps for configuration and enter the order number in the configuration aid.
Alternatively you can also use our prompted online configurator under www.siemens.com/energy

For configuration of your
3AH3 vacuum circuit-breaker

Instruction for configuration of the 3AH3 vacuum circuit-breaker

1st step: Definition of the primary part (see pages 13 to 16)

Please specify the following ratings:	Possible options:
Rated voltage (U_r)	U_r : 7.2 kV to 40.5 kV
Rated lightning impulse withstand voltage (U_p)	U_p : 60 kV to 195 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d : 20 kV to 95 kV
Rated short-circuit breaking current (I_{sc})	I_{sc} : 31.5 kA to 72 kA
Rated normal current (I_r)	I_r : 1250 A to 6300 A
Pole-centre distance	210 mm to 350 mm

These ratings define the positions 4 to 8 of the order number.

2nd step: Definition of the secondary equipment (see pages 17 to 23)

Please specify the following equipment features:	Possible options:
Release combination (position 9)	Shunt release, current-transformer operated release and undervoltage release
Closing solenoid (position 10)	Operating voltages from 24 V DC to 240 V AC
Operating voltage of the releases (positions 11/12)	Operating voltages from 24 V DC to 240 V AC
Type of local closing (position 10)	Mechanical closing, manual electrical closing
Type of operating mechanism and operating voltage of a motor, if available (position 14)	Manual operating stored-energy mechanism, motor operating stored-energy mechanism with operating voltages from 24 V DC to 240 V AC
Number of auxiliary contacts (position 15)	6 NO + 6 NC, 12 NO + 12 NC
Design of the secondary connection (position 15)	24-pole terminal strip, 24-pole plug connector, 64-pole plug connector
Language of the documentation (position 16)	English, German, French, Spanish, other languages on request
Frequency of the operating voltage of the secondary equipment at AC (position 16)	50 Hz/60 Hz

These equipment features define the positions 9 to 16 of the order number.

3rd step: Do you have any further requirements concerning the equipment? (Please refer to page 24)

Should you still need more options than the possible special equipment like halogen-free and flame-retardant or silicone-free version, condensation protection or an additional rating plate, etc., please contact your responsible sales partner.

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Order No. E50001-K1511-A031-A3-7600 korr
Printed in Germany
Dispo 40402, c4bs 7470
KG 05.10 2.0 50 En
3600/24904

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