



Catalog HG 11.03 · 2007

3AH1/3AH3 Vacuum Circuit-Breakers

Medium-Voltage Equipment
Selection and Ordering Data

Power Transmission and Distribution

SIEMENS



3AH1/3AH3 Vacuum Circuit-Breakers

Medium-Voltage Equipment Catalog HG 11.03 · 2007

Invalid:
Catalog HG 11.11 · 1999, Part 2 and
Catalog HG 11.12 · 2005, Part 2

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RH611-1731f



Industrial application: Refinery

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3AH1 and 3AH3 vacuum circuit-breakers from 7.2 to 36 kV – The Powerful

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.

3AH1 – the all-rounder in the product range



The 3AH1 vacuum circuit-breaker is the universal circuit-breaker: It combines all system and product advantages of the 3AH series, which are decisive for most applications. With 10,000 operating cycles it covers the customary medium-voltage range from 7.2 to 24 kV and is maintenance-free throughout its entire service life.

Due to its compact design, panel widths of 600 mm are possible at 12 kV. The clear layout of the operating mechanism enables fast access to all components. Therefore, retrofitting of secondary equipment is also possible.

Note: The 3AH1 vacuum circuit-breaker will be discontinued by December 31, 2007. As of January 1, 2008, Siemens will offer this circuit-breaker type for another 10 years for replacement purposes only. We recommend to design new switchgear with circuit-breaker types SION or 3AH5.

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 as well as for rated voltages up to 36 kV.

Due to its high capacity, the circuit-breaker is especially suitable for generator operation and industrial applications. Just like 3AH1, the type 3AH3 meets the requirements of medium-voltage switchgear according to IEC.

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.

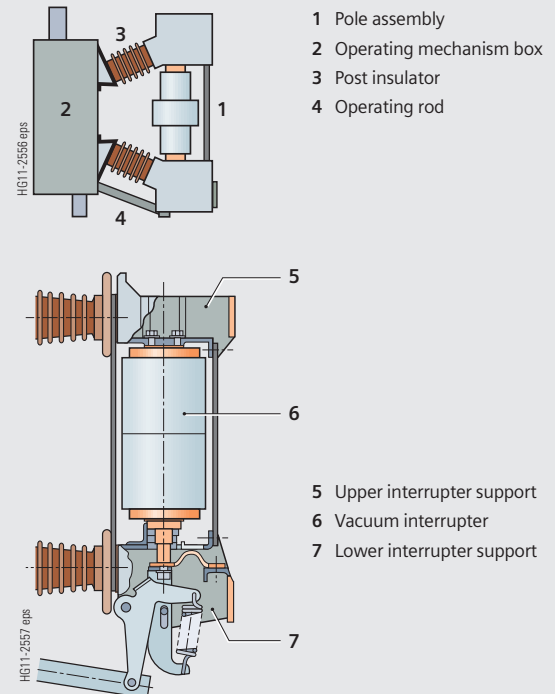
Operating mechanism

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 levers.

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

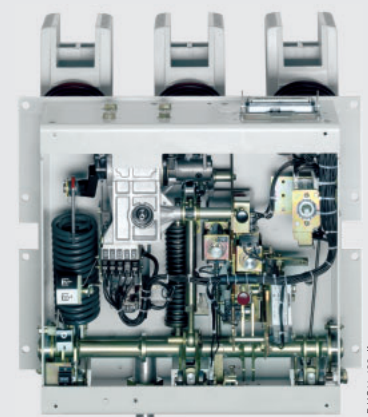
3AH1/3AH3 vacuum circuit-breakers have a trip-free mechanism according to IEC 62271-100. In the event of an opening command being given after a closing operation has been initiated, the moving contacts return to the open position and remain there even if the closing command is sustained. This means that the contacts of the vacuum circuit-breakers are momentarily in the closed position, which is permissible according to IEC 62271-100.



Circuit-breaker structure



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. The maximum possible equipment is one shunt release and two other releases. For release combinations, refer to page 16.

- The closing solenoid unlatches the charged closing spring of the vacuum circuit-breaker, closing it by electrical means.
- 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.
- 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, 3AH1/3AH3 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 an electrical 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 vacuum circuit-breaker at the same time, the vacuum 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 disconnector 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 disconnector can only be operated when the circuit-breaker is open. On the other hand, the circuit-breaker is also controlled by the disconnector or its operating mechanism, so that it can only be closed when the disconnector 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

3AH1 and 3AH3 vacuum circuit-breakers conform to the following standards:

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

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. 3AH1/3AH3 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 temperature of + 40 °C and apply to open switchgear. For enclosed switchgear the data of the switchgear manufacturer applies. At ambient 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 60694, the rated lightning impulse withstand voltage values 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 the rated short-duration power-frequency withstand voltage and the rated lightning impulse withstand voltage.

To select the devices, the following applies:

$$U \geq U_0 \times K_a$$

U Rated withstand voltage under standard reference atmosphere

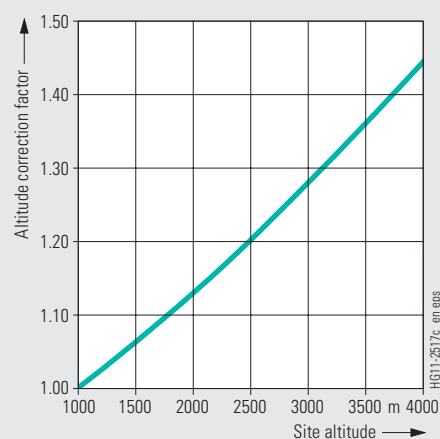
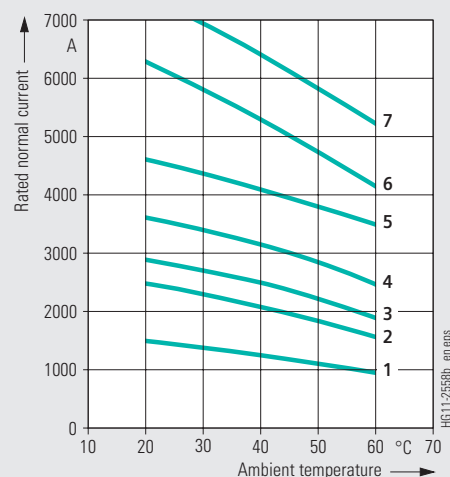
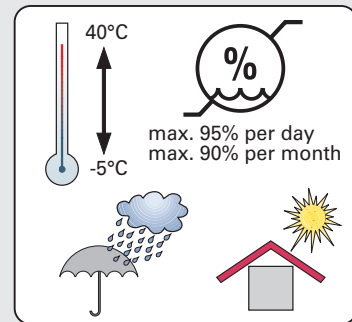
U_0 Rated withstand voltage requested for the place of installation

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 standard 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-center distance (mm)												
		210	275	350	210	350	210	275	350	210	275	275	300	300
7.2	40	□			□		□			□				
	50	■					■			■		■		
	63		■					■			■	■		
12	40	□			□		□			□				
	50	■					■			■		■		
	63		■					■			■	■		
15	40	□			□		□			□				
	50	■					■			■		■		
	63		■					■			■	■		
17.5	31.5									□				
	40	□			□		□			□				
	50	■					■			■	▲	■▲	▲	▲
	63		■					■			■▲	■▲	▲	▲
	72										▲	▲	▲	▲
24	40						■							
36	31.5			■		■			■					
	40								■					

□ 3AH1¹⁾

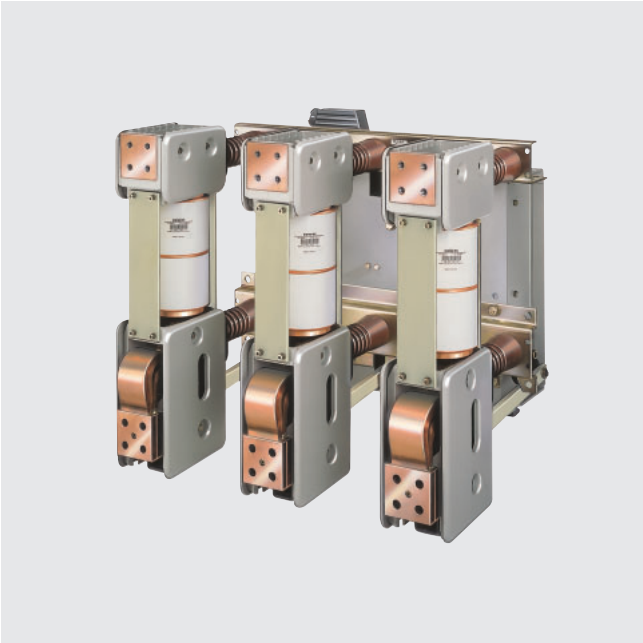
■ 3AH3

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

1) The 3AH1 vacuum circuit-breaker will be discontinued by December 31, 2007, and will then only be available as spare circuit-breaker

Basic equipment

Features	Minimum equipment	Alternative equipment	Remarks
Operating mechanism	Electrical operating mechanism	Manual operating mechanism (hand crank included in the scope of supply)	Hand crank also 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 16)
3 rd release	Without	Undervoltage release, c.t.-operated release	Max. 3 releases can be combined (for possible combinations, refer to page 16)
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	12 NO + 12 NC not available with 24-pole plug
Plug connector	24-pole terminal strip	24-pole plug, 64-pole plug	24-pole plug not together with 12 NO + 12 NC
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	–



3AH1 vacuum circuit-breaker



3AH3 (4000 A) vacuum circuit-breaker

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Order number structure

The 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.

Order codes

Individual equipment versions, marked with **9** or **Z** in the 9th or 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.

Special versions (★)

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 between your responsible sales partner and the order processing department (PTD M C S) in our Switchgear Factory in Berlin.

2

		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	n	n	n	n	—	n	a	a	n	n	—	n	a	a	n	—	★	■	■	■
1 st position	Primary part 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																								

Configuration example

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 side 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 23) 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 deter-
mined for your circuit-breaker.*

Example for Order No.:
Order codes:

[illegible]



7.2 kV

50/60 Hz

							Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Order codes		
							Order No.:	3	A	H																
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-center distance	Rated normal current																				
U_r	U_p	U_d	I_{sc}	I_{ma}		I_r																				
kV	kV	kV	kA	kA	mm	A																				
7.2	60	20	40	100/104	210	1250		3	A	H	1	0	5	6	-	2										
						2000		3	A	H	1	0	5	6	-	4										
						2500		3	A	H	1	0	5	6	-	6										
						3150		3	A	H	1	0	5	6	-	7										
			50	125/130	210	1250		3	A	H	3	0	5	7	-	2										
						2500		3	A	H	3	0	5	7	-	6										
						3150		3	A	H	3	0	5	7	-	7										
					275	4000 ¹⁾		3	A	H	3	0	7	7	-	8										
			63	160/164	275	1250		3	A	H	3	0	7	8	-	2										
						2500		3	A	H	3	0	7	8	-	6										
						3150		3	A	H	3	0	7	8	-	7										
						4000 ¹⁾		3	A	H	3	0	7	8	-	8										

Special version (available for all 7.2 kV circuit-breakers)
 $U_d = 32$ kV

- Z E 1 6

12 kV

50/60 Hz

U_r	U_p	U_d	I_{sc}	I_{ma}		I_r																				
kV	kV	kV	kA	kA	mm	A																				
12	75	28	40	100/104	210	1250		3	A	H	1	1	1	6	-	2										
						2000		3	A	H	1	1	1	6	-	4										
						2500		3	A	H	1	1	1	6	-	6										
						3150		3	A	H	1	1	1	6	-	7										
			50	125/130	210	1250		3	A	H	3	1	1	7	-	2										
						2500		3	A	H	3	1	1	7	-	6										
						3150		3	A	H	3	1	1	7	-	7										
					275	4000 ¹⁾		3	A	H	3	1	2	7	-	8										
			63	160/164	275	1250		3	A	H	3	1	2	8	-	2										
						2500		3	A	H	3	1	2	8	-	6										
						3150		3	A	H	3	1	2	8	-	7										
						4000 ¹⁾		3	A	H	3	1	2	8	-	8										

Special versions

 $U_d = 42$ kV (not for 3AH1 116- circuit-breaker)

- Z E 1 3

 $I_{sc} = 57.8$ kA $I_{ma} = 145$ kA

(for 3AH3 117- circuit-breaker)

- Z Y 0 3

- 1) With the supplement -Z Y04, the circuit-breaker can also be used for $I_r = 4500$ A under the following conditions: Ambient air temperature ≤ 40 °C, free air circulation and painted conductor bars of 4 x 100 x 10 mm per phase as a minimum

Configuration example

Vacuum circuit-breaker

Rated voltage $U_r = 12$ kV, 50/60 HzRated lightning impulse withstand voltage $U_p = 75$ kVRated short-circuit breaking current $I_{sc} = 50$ kA

Pole-center distance = 210 mm

Rated normal current $I_r = 1250$ A

Example for Order No.:

Order codes:

3	A	H	3	1	1	7	-	2																		
---	---	---	---	---	---	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



50/60 Hz

Position:

Order No.:

Order codes

[illegible] $U_d = 42 \text{ kV}$

- Z E 1 3

50/60 Hz

[illegible] $U_d = 42 \text{ kV}$

- Z E 1 3

1) With the supplement -Z Y04, the circuit-breaker can also be used for $I_r = 4500$ A under the following conditions: Ambient air temperature $\leq 40^\circ\text{C}$, free air circulation and painted conductor bars of $4 \times 100 \times 10$ mm per phase as a minimum

Vacuum circuit-breaker

Vacuum circuit-breaker

Rated voltage $U_r = 17.5 \text{ kV}$, 50/60 Hz

Rated lightning impulse withstand voltage $U_n = 95 \text{ kV}$

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

Pole-center distance = 275 mm

Rated normal current $I_r = 4000 \text{ A}$

Example for Order No.:

Order codes:



24 kV

50/60 Hz

24 kV

50/60 Hz

Position:

Order No.:

1

2

3

4

5

6

7

—

8

9

10

11

12

—

13

14

15

16

3

A

H

—

—

—

★

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-center distance

Rated normal current

U_r

U_p

U_d

I_{sc}

I_{ma}

I_r

kV

kV

kV

kA

kA

mm

A

24

125

50

40

100/104

275

2500

3

A

H

3

2

6

6

—

6

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36 kV

50/60 Hz

U_r	U_p	U_d	I_{sc}	I_{ma}		I_r																			
kV	kV	kV	kA	kA	mm	A																			
36	170	70	31.5	80/82	350	1250		3	A	H	3	3	0	5	-	2									
						2000		3	A	H	3	3	0	5	-	4									
						2500		3	A	H	3	3	0	5	-	6									
			40	100/104	350	2500		3	A	H	3	3	0	6	-	6									

Special versions (available for all 36 kV circuit-breakers):

$U_p = 185$ kV	(only possible together)																								
and $U_d = 85$ kV																									
$U_p = 195$ kV	(only possible together)																								
and $U_d = 95$ kV																									

17.5 kV

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

U_r	U_p	U_d	I_{sc}	I_{ma}		I_r																			
kV	kV	kV	kA	kA	mm	A																			
17.5	110	50	50	137	275	3150		3	A	H	3	8	1	7	-	7									
						4000		3	A	H	3	8	1	7	-	8									
					300	5000		3	A	H	3	7	1	2	-	4									
						6300 ²⁾		3	A	H	3	7	1	2	-	5									
		63		173	275	3150		3	A	H	3	8	1	8	-	7									
						4000 ¹⁾		3	A	H	3	8	1	8	-	8									
					300	5000		3	A	H	3	7	1	3	-	4									
						6300 ²⁾		3	A	H	3	7	1	3	-	5									
		72		198	275	3150		3	A	H	3	8	1	9	-	7									
						4000 ¹⁾		3	A	H	3	8	1	9	-	8									
					300	5000		3	A	H	3	7	1	4	-	4									
						6300 ²⁾		3	A	H	3	7	1	4	-	5									

- 1) With the supplement -Z Y04, the circuit-breaker can also be used for $I_r = 4500$ A under the following conditions: Ambient air temperature ≤ 40 °C, free air circulation and painted conductor bars of 4 x 100 x 10 mm per phase as a minimum
- 2) Higher rated normal currents on request

Configuration example

Vacuum circuit-breaker

Rated voltage $U_r = 36$ kV, 50/60 HzRated lightning impulse withstand voltage $U_p = 170$ kVRated short-circuit breaking current $I_{sc} = 40$ kA

Pole-center distance = 350 mm

Rated normal current $I_r = 2500$ A

Example for Order No.:

Order codes:

3	A	H	3	3	0	6	-	6																	
---	---	---	---	---	---	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



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	■	■	■	■	■	■	■	■	■	■	–	■	■	■	■	–	■	■	■	■	–	★	■	■	■
■	■	■															M	See page 17	See page 18	See page 19		See page 20	See page 21	See page 22	See page 22		See page 23								
■	■	■	■														N																		
■	■	■	■	■													T																		
■	■	■		■													P																		
■	■	■			■												P									–	Z			A	4	6			
■	■		■														R																		
■	■		■	■													S																		
■	■		■		■												S									–	Z		A	4	6				
■	■			■													U																		
■	■				■												U									–	Z		A	4	6				
■	■					■											V																		
■	■						■										V									–	Z		A	4	5				

Configuration example

Vacuum circuit-breaker
($U_r = 36$ kV, 50/60 Hz, $U_p = 170$ kV, $I_{sc} = 40$ kA, $I_r = 2500$ A,
pole-center distance = 350 mm)
Closing solenoid, 1st shunt release, undervoltage release and
c.t.-operated release with a rated normal current of 1 A

3	A	H																									
			3	3	0	6	–	6																			
									S																–	Z	A 4 6

Example for Order No.: 3 A H 3 3 0 6 – 6 S ■ ■ ■ – ■ ■ ■ ■ – Z
Order codes: 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																
Standard voltages	Special voltages												See page 18	See page 19	See page 20	See page 21	See page 22	See page 22	See page 23		
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 22)

Configuration example

Vacuum circuit-breaker

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

Manual electrical closing at the circuit-breaker,

operating voltage of the closing solenoid 32 V DC

Example for Order No.:

Order codes:

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



11 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 1 st shunt release		Order No.:	3	A	H																
Standard voltages	Special voltages													See page 19		See page 20	See page 21	See page 22	See page 22	See page 23	
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 22)

Configuration example
Vacuum circuit-breaker
($U_i = 36$ kV, 50/60 Hz, $U_p = 170$ kV, $I_{sc} = 40$ kA, $I_r = 2500$ A, pole-center distance = 350 mm)
Operating voltage of the 1st shunt release 48 V DC

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



Order codes

2

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

13th positionOperating voltage of the 3rd release

Undervoltage release or c.t.-operated 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	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Standard voltages																					
Special voltages																					
Without or c.t.-operated release															0						
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			N 1 A		
	32 V DC														9	With order code			N 1 B		
	120 V DC														9	With order code			N 1 C		
	125 V DC														9	With order code			N 1 D		
	127 V DC														9	With order code			N 1 E		
	240 V DC														9	With order code			N 1 F		
	120 V AC 50/60 Hz ¹⁾														9	With order code			N 1 K		
	125 V AC 50/60 Hz ¹⁾														9	With order code			N 1 L		
	240 V AC 50/60 Hz ¹⁾														9	With order code			N 1 M		
Special versions																					
To operate the 3 rd release as an undervoltage release on an energy store type AN 1902- (for DC) or AN 1901-2 (for AC), both make Bender, the operating voltage must be defined – and whether the energy store will be provided by the customer or included in the scope of supply.																					
	Energy store																				
	Type	In the scope of supply																			
60 V DC	AN 1902-	no													9	With order code			N 2 D		
110 V DC	AN 1902-	no													9	With order code			N 2 E		
220 V DC	AN 1902-	no													9	With order code			N 2 F		
100/110/230 V AC	AN 1901-2	no													9	With order code			N 2 G		
60 V DC	AN 1902-	yes													9	With order code			N 3 D		
110 V DC	AN 1902-	yes													9	With order code			N 3 E		
220 V DC	AN 1902-	yes													9	With order code			N 3 F		
100/110/230 V AC	AN 1901-2	yes													9	With order code			N 3 G		

1) The AC frequency 50 or 60 Hz is selected at the 16th position of the order number together with the language (see page 22)

Configuration example

Vacuum circuit-breaker

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

3rd release as c.t.-operated release

3 A H

3 3 0 6 - 6 S Z 2 9 - 0

Example for Order No.:

Order codes:

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



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	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Standard voltages	Special voltages																See page 22	See page 22	See page 23		
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 22)

Configuration example

Vacuum circuit-breaker

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

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

Example for Order No.:

Order codes:

3 A H

3 3 0 6 - 6 S Z 2 9 - 0

K

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



Auxiliary switch, secondary connection, interlocking

Position:

Order No.:

15 th position						Position:	1	2	3	4	5	6	7	–	8	9	10	11	12	–	13	14	15	16		Order codes						
Auxiliary switch, secondary connection, interlocking						Order No.:	3	A	H	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	■	–	★	■	■	■		
Mechanical interlocking	Auxiliary switch 6 NO + 6 NC	Auxiliary switch 12 NO + 12 NC	64-pole plug ¹⁾	24-pole plug	24-pole terminal strip ²⁾																											
	■		■																					A								
	■			■																				E								
	■				■																			G								
		■	■																					C								
		■																						M								
■	■		■																					B								
■	■			■																				F								
■	■				■																			H								
■			■																					D								
■		■																						N								
Special versions gold-plated contacts and pins																																
Auxiliary switch 6 NO + 6 NC and 24-pole terminal strip (G or H)																											–	Z	A	1	7	
Auxiliary switch 12 NO + 12 NC and 24-pole terminal strip (M or N)																												–	Z	A	1	8
Auxiliary switch 6 NO + 6 NC and 64-pole plug (A or B)																												–	Z	A	2	0
Auxiliary switch 12 NO + 12 NC and 64-pole plug (C or D)																												–	Z	A	2	1

- 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 terminal strip and must therefore be connected directly.

AC frequency of operating voltages and

languages of operating instructions and rating plate

[illegible]

Vacuum circuit-breaker

Vacuum circuit-breaker

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

pole-center 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]



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	■	■	■	■	–	■	■	■	■	■	–	■	■	■	■	–	★	■	■	■
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 (only for 3AH3 standard circuit-breakers)																				–	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
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 Dept. PTD M C S, Berlin). Information additionally in clear text.																				–	Z	Y	9	9

Configuration example

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-center 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

A

4

6

K

2

B

M

1

B

-

Z

A

2

0

2

-

Z

F

2

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

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 parts

When releases/solenoids are required as spare parts, the order number and the type of construction of the associated standard circuit-breaker must also be specified.

Remark for orders

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

Accessories for the plug connector

Included in the scope of supply of the basic equipment for standard 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

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

Designation	Remarks	Operating voltage	Order No.
Hand crank			3AX15 30-2B
Lubricant	(for special application conditions)		
	180 g Klüber-Isoflex Topas L32N		3AX11 33-3H
	1 kg Klüber-Isoflex Topas L32N		3AX11 33-3E
	1 kg Shell Tellus oil 32 (special oil)		3AX11 33-2D
Operating solenoid	Used as closing solenoid or	24 V DC	3AY15 10-5B
	1 st shunt release	30/32 V DC	3AY15 10-5M
		48 V DC	3AY15 10-5C
	From 60 V DC with integrated varistor	60 V DC	3AY15 10-5D
	From rated voltage 110 V with integrated rectifier	110 V AC/DC	3AY15 10-5E
	and varistor for operation with AC or DC voltage	125 V AC/DC	3AY15 10-5N
		220 V AC/DC	3AY15 10-5F
2nd shunt release	Without varistor, without rectifier	24 V – 32 V DC	3AX11 01-2B
	Including varistor	48 V – 60 V DC	3AX11 01-2C
		110 V – 127 V DC	3AX11 01-2E
		220 V – 240 V DC	3AX11 01-2F
	Including varistor and rectifier	100 V – 125 V AC, 50 Hz	3AX11 01-2G
		230 V – 240 V AC, 50 Hz	3AX11 01-2J
		100 V – 125 V AC, 60 Hz	3AX11 01-3G
		230 V – 240 V AC, 60 Hz	3AX11 01-3J
Current-transformer operated release	Rated normal current 0.5 A, including varistor and rectifier		3AX11 02-2A
	Rated normal current 1 A, including varistor and rectifier		3AX11 02-2B
	Tripping pulse ≥ 0.1 Ws (10 Ω), for protection relay 7SJ41		3AX11 04-0B
	Tripping pulse ≥ 0.1 Ws (20 Ω), for protection relay 7SJ45 and SEG WIP1		3AX11 04-2B

Designation	Remarks	Operating voltage	Order No.
Undervoltage release	Without varistor, without rectifier	24 V DC	3AX11 03-2B
		30/32 V DC	3AX11 03-2L
		48 V DC	3AX11 03-2C
	Including varistor	60 V DC	3AX11 03-2D
		110 V DC	3AX11 03-2E
		120 V – 127 V DC	3AX11 03-2N
		220 V DC	3AX11 03-2F
		240 V DC	3AX11 03-2P
	Including varistor and rectifier	100 V AC, 50 Hz	3AX11 03-2G
		110 V – 125 V AC, 50 Hz	3AX11 03-2H
		230 V AC, 50 Hz	3AX11 03-2J
		100 V AC, 60 Hz	3AX11 03-3G
		110 V – 125 V AC, 60 Hz	3AX11 03-3H
		230 V AC, 60 Hz	3AX11 03-3J
	In combination with energy store AN 1902-, specified voltage corresponds to the input voltage of the energy store	60 V DC	3AX11 03-2D
		110 V DC	3AX11 03-2E
		220 V DC	3AX11 03-2F
	In combination with energy store AN 1901-2, specified voltage corresponds to the input voltage of the energy store	100 V AC, 50/60 Hz	3AX11 03-3K
		110 V AC, 50/60 Hz	3AX11 03-3K
		230 V AC, 50/60 Hz	3AX11 03-3K
Mounting parts	For 2 nd shunt release or c.t.-operated release or undervoltage release		
	With 1 existing shunt release	For 3AH1	3AX17 11-2A
		For 3AH3	3AX17 11-3A
	With 2 existing releases (shunt release, c.t.-operated release or undervoltage release)	For 3AH1	3AX17 11-2B
		For 3AH3	3AX17 11-3B
Mechanical interlocking		For 3AH1	3AX17 20-2A
		For 3AH3	3AX15 20-3C
Varistor module	With 2 varistors		3AX15 26-0F
Energy store make Bender	For delayed tripping of the undervoltage release		
	Type AN 1901-2B, with dropout delay of approx. 1/1.8/2.5 s	Input voltage 100/110/230 V AC, 50/60 Hz, output voltage 220 V DC	3AX11 35-0A
	Type AN 1902-1B, with dropout delay of approx. 0.5/0.9/1.5 s	Input and output voltage 220 V DC	3AX11 35-0B
	Type AN 1902-2B, with dropout delay of approx. 0.5/0.9/1.5 s	Input and output voltage 110 V DC	3AX11 35-0C
	Type AN 1902-3B, with dropout delay of approx. 0.5/0.9/1.5 s	Input and output voltage 60 V DC	3AX11 35-0D
Digital, c.t.-operated overcurrent-time relay make SEG	As release		
	Type WIP1	For overcurrent	3AX11 35-1A
		For earth fault	3AX11 35-1B
Drive motor For 3AH1		24/30/32 V DC	3AY17 11-2B
		48 V DC	3AY17 11-2C
	From 60 V DC with integrated varistor	60 V DC	3AY17 11-2D
	For AC, rectifier required	100/110/126 V AC/DC	3AY17 11-2E
		220 V DC/230 V AC	3AY17 11-2F
For 3AH3		24/30/32 V DC	3AY15 11-2B
		48 V DC	3AY15 11-2C
	From 60 V DC with integrated varistor	60 V DC	3AY15 11-2D
	For AC, rectifier required	100/110/126 V AC/DC	3AY15 11-2E
		220 V DC/230 V AC	3AY15 11-2F
Rectifier module	For drive motor with AC operation	100 V – 250 V AC	3AX15 25-1F

2

Designation	Remarks	Operating voltage	Order No.
Auxiliary contactor	Type 3TH20 22-7		
	For anti-pumping	24/30/32 V DC	SWB: 48683
		48 V DC	SWB: 48687
		60 V DC	SWB: 48684
		110/120 V DC	SWB: 48685
		125 V DC	SWB: 47730
		220 V – 240 V DC	SWB: 48686
		100 V – 125 V AC, 50 Hz	SWB: 48680
		230 V – 240 V AC, 50 Hz	SWB: 49906
		100 V – 125 V AC, 60 Hz	SWB: 48679
		230 V – 240 V AC, 60 Hz	SWB: 49907
Position switch	Type 3SE4 (as spare part), without installation accessories		
	Used for:	Nos.	SWB: 46677
	– Electrical anti-pumping (-S3)	1	
	– Motor control (-S21, -S22)	2	
	– Closing spring charged (-S4)	1	
	– Circuit-breaker tripping signal (-S6, -S7)	2	
	– Electrical closing lock-out (-S5)	1	
Auxiliary switch (-S1)	6 NO + 6 NC		3SV92 73-2AA0
	12 NO + 12 NC		3SV92 74-2AA0
Wire bundle	With 10 wires for connection of auxiliary switch to		
	– 64-pole plug connector		3AX11 34-4F
	– 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

Spare vacuum interrupters

Designation	Remarks	Design code	Order No. (1 no.) Vacuum interrupter with adapter
For 3AH1 circuit-breakers			
	3AH1 056-■, 3AH1 116-■, 3AH1 166-■, 3AH1 215-■, 3AH1 216-■	1G	3AY17 12-1F
For 3AH3 circuit-breakers			
	3AH3 057-■, 3AH3 117-■, 3AH3 167-■, 3AH3 217-■	1J	3AY17 15-1J
	3AH3 078-2, 3AH3 078-6, 3AH3 078-7, 3AH3 128-2, 3AH3 128-6, 3AH3 128-7, 3AH3 178-2, 3AH3 178-6, 3AH3 178-7, 3AH3 228-2, 3AH3 228-6, 3AH3 228-7	1J	3AY17 15-1J
	3AH3 078-8, 3AH3 128-8, 3AH3 178-8, 3AH3 228-8	1J	3AY17 15-4J
	3AH3 266-6	2M	3AY17 15-2M
	3AH3 305-■	1L	3AY17 15-1L
	3AH3 306-■	1M	3AY17 15-1M
	3AH3 71■-■	3P	
	3AH3 818-7	1N	3AY17 15-1N
	3AH3 818-8	1N	3AY17 15-2N
	3AH3 818-7	1F	3AY17 15-1P
	3AH3 818-8	1F	3AY17 15-2P

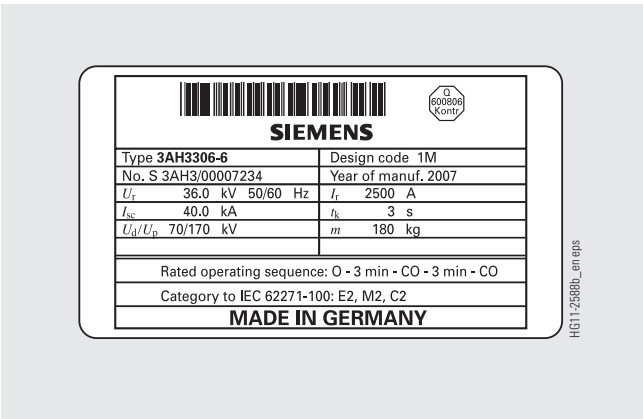
2

As spare parts, the vacuum interrupters are always supplied with adapter.

To select the correct spare interrupter, please specify the type designation, serial number, design code and year of manufacture of the circuit-breaker. All data is given on

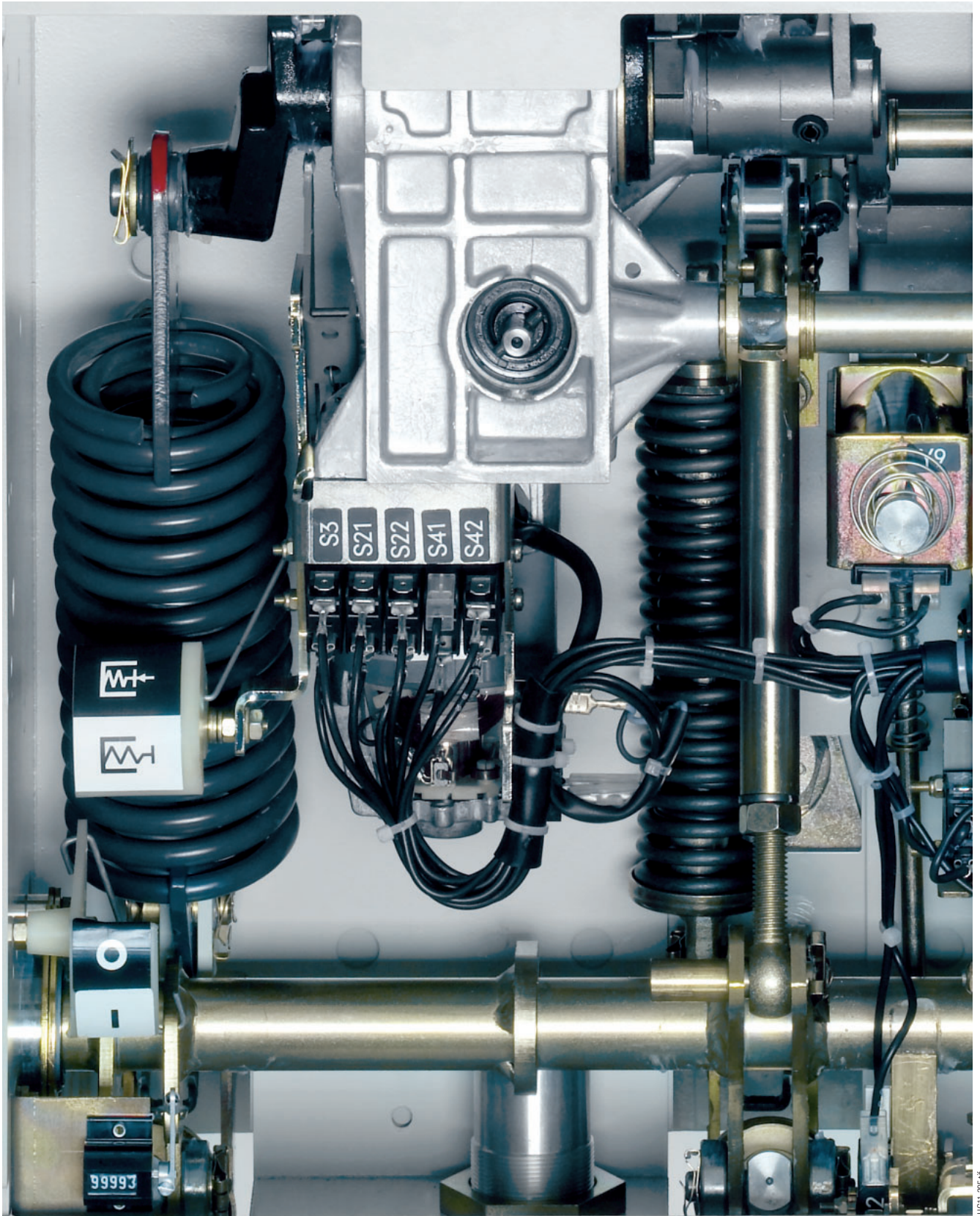
the rating plate. Vacuum interrupters and other spare parts must only be replaced by instructed personnel.

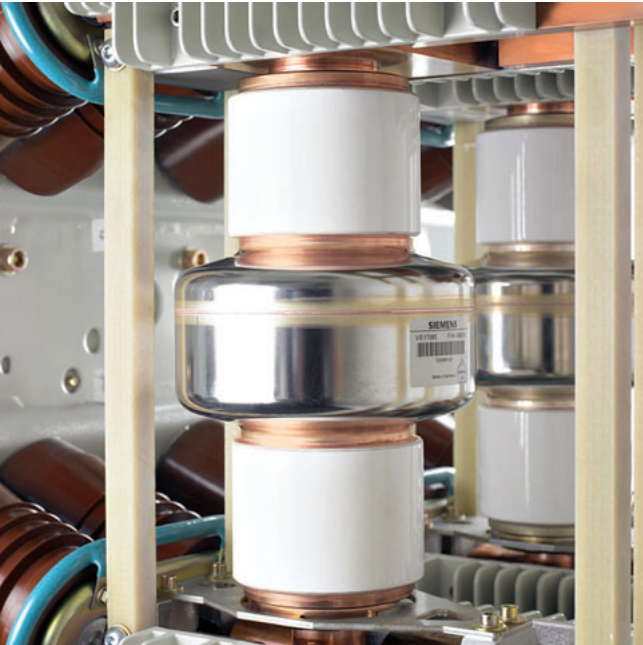
Data on the rating plate



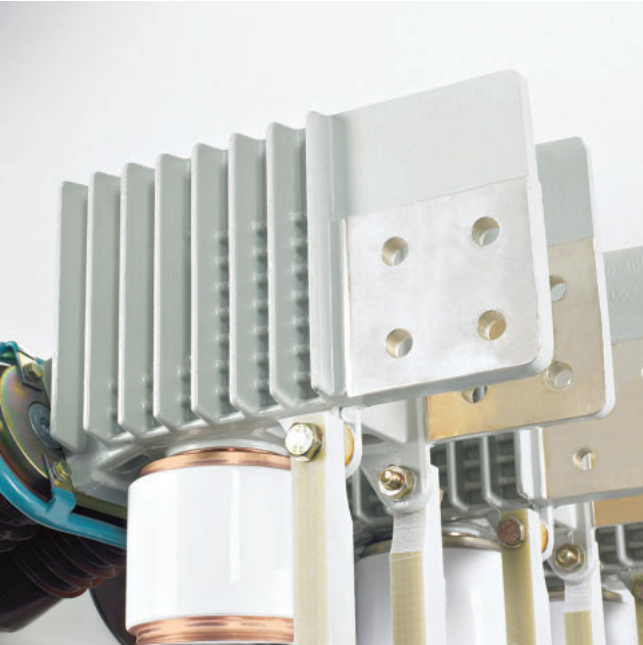
Note:
For any query regarding spare parts, subsequent deliveries, etc. the following four details are necessary:

- Type designation
- Serial No.
- Design code
- Year of manufacture





Vacuum interrupter



Post insulator and upper interrupter support

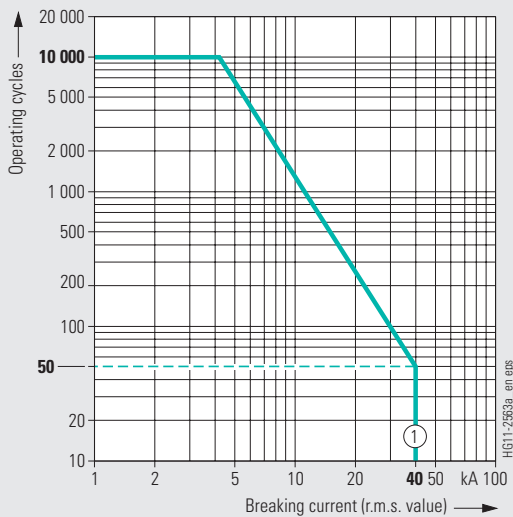
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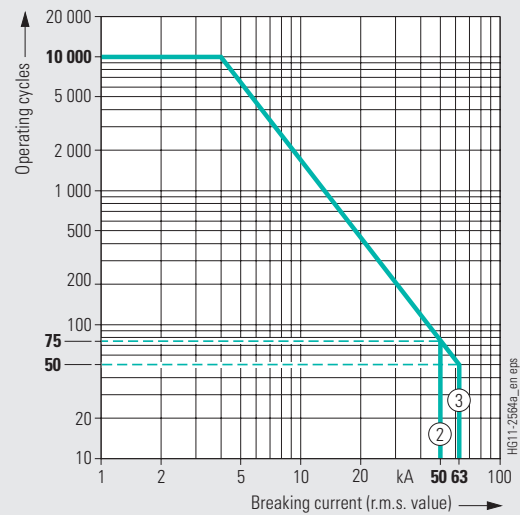
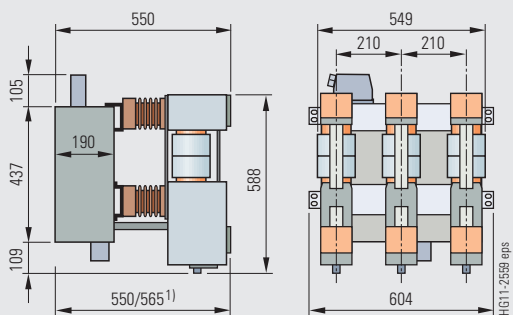
Electrical data, dimensions and weights:	
Voltage level 7.2 kV	30
Voltage level 12 kV	30
Voltage level 15 kV	32
Voltage level 17.5 kV	32
Voltage level 24 kV	34
Voltage level 36 kV	34
Electrical data, dimensions and weights of high-current and generator circuit-breakers	36
Circuit diagrams	38
Operating times	40
Short-circuit protection of motors	40
Consumption data of releases	40

Order No.	7.2 kV 50/60 Hz		Rated normal current		Pole-center 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 short-circuit duration		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 60694 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 31)		Catalog dimension drawing No. (see page 31)	
	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	kg																						
3AH1 056-2 ...	1250	210	■	○	○	3	40	36	44.9	100/104	60	20	2.0	140	170	92	130	125	3M 425 00389	1	1																				
3AH1 056-4 ...	2000	210	■	○	○	3	40	36	44.9	100/104	60	20	1.8	140	170	92	130	125	3M 425 00388	1	1																				
3AH1 056-6 ...	2500	210	■	○	○	3	40	36	44.9	100/104	60	20	1.5	140	170	92	130	130	3M 425 00375	1	1																				
3AH1 056-7 ...	3150	210	■	○	○	3	40	36	44.9	100/104	60	20	1.5	140	170	92	130	130	3M 425 00375	1	1																				
3AH3 057-2 ...	1250	210	■	○	○	3	50	36	56.1	125/130	60	20	1.8	160	230	80	130	180	3M 325 00001	2	2																				
3AH3 057-6 ...	2500	210	■	○	○	3	50	36	56.1	125/130	60	20	1.8	160	230	80	130	180	3M 325 00001	2	2																				
3AH3 057-7 ...	3150	210	■	○	○	3	50	36	56.1	125/130	60	20	1.8	160	230	80	130	180	3M 325 00001	2	2																				
3AH3 077-8 ...	4000	275	■	○	○	3	50	36	56.1	125/130	60	20	1.4	160	170	71	130	308	3M 325 00004	2	4																				
3AH3 078-2 ...	1250	275	■	○	○	3	63	36	70.7	160/164	60	20	1.8	160	170	71	130	196	3M 325 00003	3	3																				
3AH3 078-6 ...	2500	275	■	○	○	3	63	36	70.7	160/164	60	20	1.8	160	170	71	130	196	3M 325 00003	3	3																				
3AH3 078-7 ...	3150	275	■	○	○	3	63	36	70.7	160/164	60	20	1.8	160	170	71	130	196	3M 325 00003	3	3																				
3AH3 078-8 ...	4000	275	■	○	○	3	63	36	70.7	160/164	60	20	1.4	160	170	71	130	308	3M 325 00004	3	4																				
Order No.	12 kV 50/60 Hz		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	kg																						
3AH1 116-2 ...	1250	210	■	○	○	3	40	36	44.9	100/104	75	28	2.0	140	170	92	130	125	3M 425 00389	1	1																				
3AH1 116-4 ...	2000	210	■	○	○	3	40	36	44.9	100/104	75	28	1.8	140	170	92	130	125	3M 425 00388	1	1																				
3AH1 116-6 ...	2500	210	■	○	○	3	40	36	44.9	100/104	75	28	1.5	140	170	92	130	130	3M 425 00375	1	1																				
3AH1 116-7 ...	3150	210	■	○	○	3	40	36	44.9	100/104	75	28	1.5	140	170	92	130	130	3M 425 00375	1	1																				
3AH3 117-2 ...	1250	210	■	○	○	3	50	36	56.1	125/130	75	28	1.8	160	230	80	130	180	3M 325 00001	2	2																				
3AH3 117-6 ...	2500	210	■	○	○	3	50	36	56.1	125/130	75	28	1.8	160	230	80	130	180	3M 325 00001	2	2																				
3AH3 117-7 ...	3150	210	■	○	○	3	50	36	56.1	125/130	75	28	1.8	160	230	80	130	180	3M 325 00001	2	2																				
3AH3 127-8 ...	4000	275	■	○	○	3	50	36	56.1	125/130	75	28	1.4	160	170	71	130	308	3M 325 00004	2	4																				
3AH3 128-2 ...	1250	275	■	○	○	3	63	36	70.7	160/164	75	28	1.8	160	170	71	130	196	3M 325 00003	3	3																				
3AH3 128-6 ...	2500	275	■	○	○	3	63	36	70.7	160/164	75	28	1.8	160	170	71	130	196	3M 325 00003	3	3																				
3AH3 128-7 ...	3150	275	■	○	○	3	63	36	70.7	160/164	75	28	1.8	160	170	71	130	196	3M 325 00003	3	3																				
3AH3 128-8 ...	4000	275	■	○	○	3	63	36	70.7	160/164	75	28	1.4	160	170	71	130	308	3M 325 00004	3	4																				

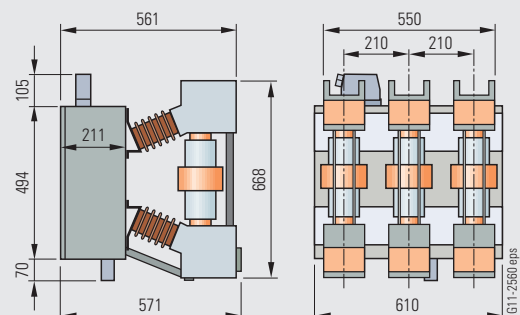
■ Standard according to IEC 62271-100 ○ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagrams for 7.2 kV and 12 kV


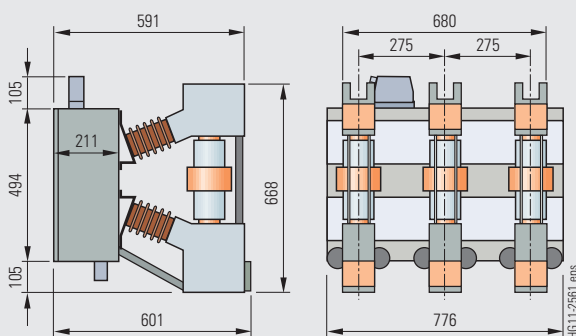
The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience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


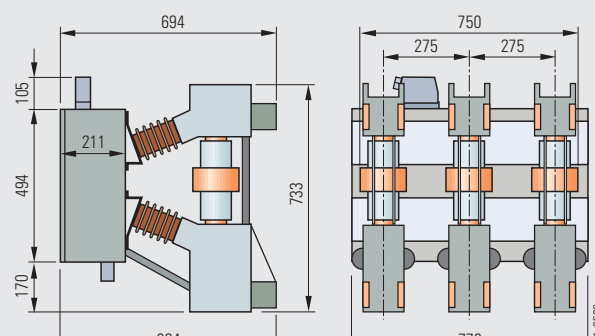
Dimension drawing 1

 1) from $I_r = 2500$ A


Dimension drawing 2



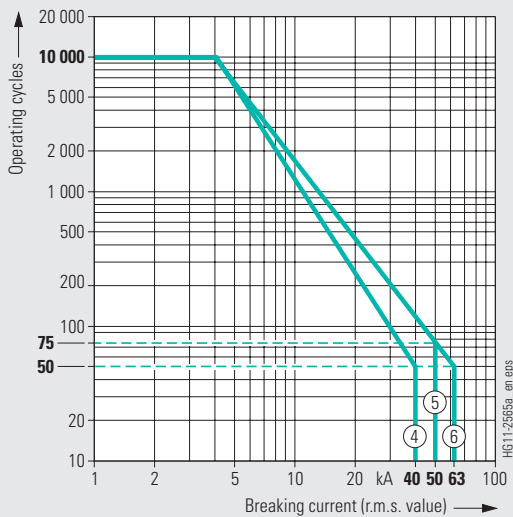
Dimension drawing 3



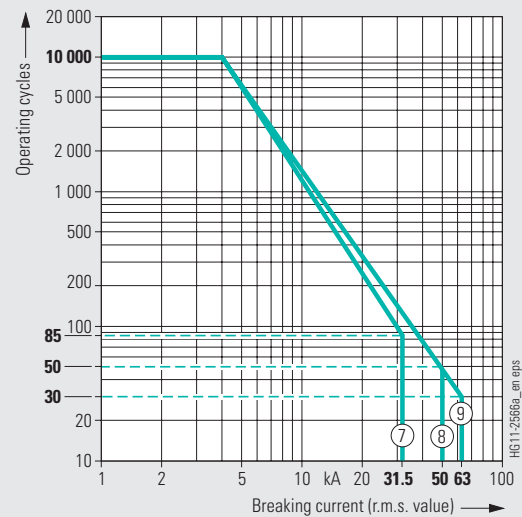
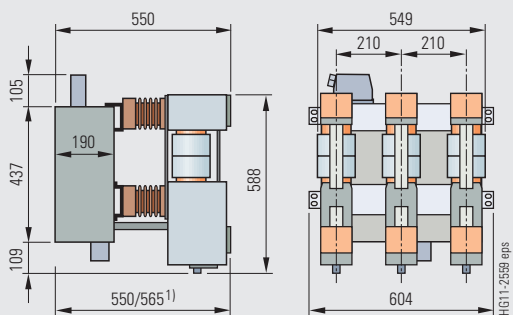
Dimension drawing 4

Order No.	15 kV 50/60 Hz		Rated normal current		Pole-center 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 short-circuit duration		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 60694 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									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	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3AH1 166-2 ...	1250	210	■	○	○	3	40	36	44.9	100/104	95	36	2.0	140	170	90	130	130	3M 425 00387	4	5																				
3AH1 166-4 ...	2000	210	■	○	○	3	40	36	44.9	100/104	95	36	1.8	140	170	90	130	130	3M 425 00380	4	5																				
3AH1 166-6 ...	2500	210	■	○	○	3	40	36	44.9	100/104	95	36	1.5	140	170	90	130	135	3M 425 00378	4	5																				
3AH1 166-7 ...	3150	210	■	○	○	3	40	36	44.9	100/104	95	36	1.5	140	170	90	130	135	3M 425 00378	4	5																				
3AH3 167-2 ...	1250	210	■	○	○	3	50	36	56.1	125/130	95	36	1.8	160	230	110	130	184	3M 325 00002	5	6																				
3AH3 167-6 ...	2500	210	■	○	○	3	50	36	56.1	125/130	95	36	1.8	160	230	110	130	184	3M 325 00002	5	6																				
3AH3 167-7 ...	3150	210	■	○	○	3	50	36	56.1	125/130	95	36	1.8	160	230	110	130	184	3M 325 00002	5	6																				
3AH3 177-8 ...	4000	275	■	○	○	3	50	36	56.1	125/130	95	36	1.4	160	170	135	130	310	3M 325 00006	5	8																				
3AH3 178-2 ...	1250	275	■	○	○	3	63	36	70.7	160/164	95	36	1.8	160	170	71	130	196	3M 325 00003	6	7																				
3AH3 178-6 ...	2500	275	■	○	○	3	63	36	70.7	160/164	95	36	1.8	160	170	71	130	196	3M 325 00003	6	7																				
3AH3 178-7 ...	3150	275	■	○	○	3	63	36	70.7	160/164	95	36	1.8	160	170	71	130	196	3M 325 00003	6	7																				
3AH3 178-8 ...	4000	275	■	○	○	3	63	36	70.7	160/164	95	36	1.4	160	170	71	130	308	3M 325 00004	6	8																				
17.5 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	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
3AH1 215-7 ...	3150	210	■	□	□	3	31.5	36	35.4	80/82	95	38	1.5	140	170	90	130	135	3M 425 00378	7	5																				
3AH1 216-2 ...	1250	210	■	○	○	3	40	36	44.9	100/104	95	38	2.0	140	170	90	130	130	3M 425 00387	4	5																				
3AH1 216-4 ...	2000	210	■	○	○	3	40	36	44.9	100/104	95	38	1.8	140	170	90	130	130	3M 425 00380	4	5																				
3AH1 216-6 ...	2500	210	■	○	○	3	40	36	44.9	100/104	95	38	1.5	140	170	90	130	135	3M 425 00378	4	5																				
3AH1 216-7 ...	3150	210	■	○	○	3	40	36	44.9	100/104	95	38	1.5	140	170	90	130	135	3M 425 00378	4	5																				
3AH3 217-2 ...	1250	210	■	○	○	3	50	36	56.1	125/130	95	38	1.8	160	230	110	130	184	3M 325 00002	8	6																				
3AH3 217-6 ...	2500	210	■	○	○	3	50	36	56.1	125/130	95	38	1.8	160	230	110	130	184	3M 325 00002	8	6																				
3AH3 217-7 ...	3150	210	■	○	○	3	50	36	56.1	125/130	95	38	1.8	160	230	110	130	184	3M 325 00002	8	6																				
3AH3 227-8 ...	4000	275	■	○	○	3	50	36	56.1	125/130	95	38	1.4	160	170	135	130	310	3M 325 00006	8	8																				
3AH3 228-2 ...	1250	275	■	○	○	3	63	36	70.7	160/163.8	95	38	1.8	160	170	145	130	198	3M 325 00005	9	7																				
3AH3 228-6 ...	2500	275	■	○	○	3	63	36	70.7	160/163.8	95	38	1.8	160	170	145	130	198	3M 325 00005	9	7																				
3AH3 228-7 ...	3150	275	■	○	○	3	63	36	70.7	160/163.8	95	38	1.8	160	170	145	130	198	3M 325 00005	9	7																				
3AH3 228-8 ...	4000	275	■	○	○	3	63	36	70.7	160/163.8	95	38	1.4	160	170	135	130	310	3M 325 00006	9	8																				

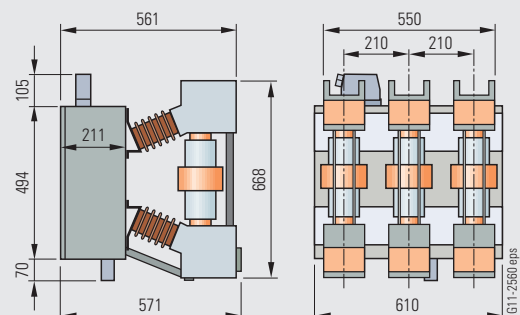
■ Standard according to IEC 62271-100 □ Possible ○ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagrams for 15 kV and 17.5 kV


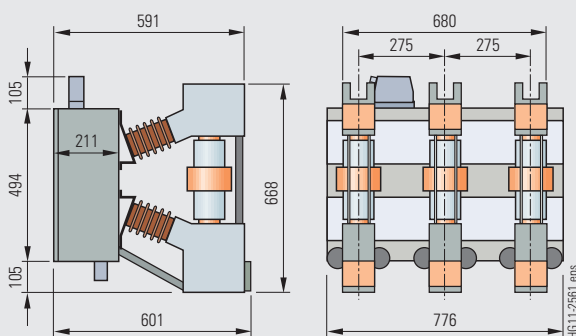
The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience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


Dimension drawings for 15 kV and 17.5 kV


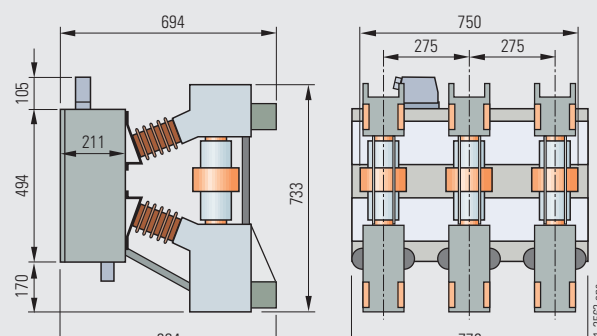
Dimension drawing 5

 1) from $I_r = 2500$ A


Dimension drawing 6



Dimension drawing 7

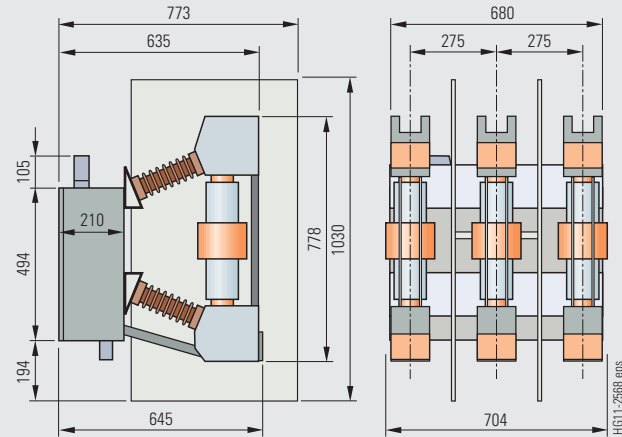
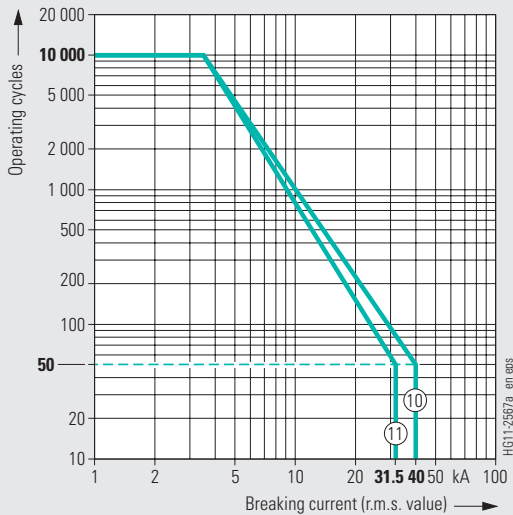


Dimension drawing 8

Order No.	24 kV 50/60 Hz																				
	Rated normal current	Pole-center 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 short-circuit duration	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 60694 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 35)	Catalog dimension drawing No. (see page 35)
	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 266-6 ...	2500	275	■	○	○	3	40	36	44.9	100/104	125	50	2.0	360	226	245	173	168	3M 325 00007	10	9

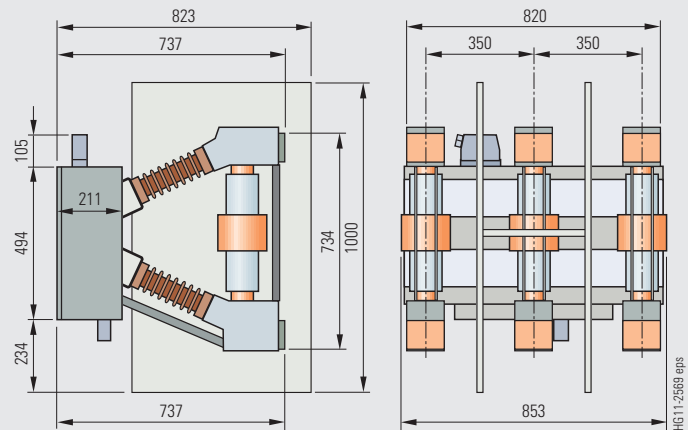
36 kV 50/60 Hz	I_r A	mm				t_k s	I_{sc} kA	%	kA	I_{ma} kA	U_p kV	U_d kV	mV	mm	mm	mm	mm	kg			
3AH3 305-2 ...	1250	350	■	□	□	3	31.5	36	35.4	80/82	170	70	2.3	360	330	314	260	170	3M 325 00008	11	10
3AH3 305-4 ...	2000	350	■	□	□	3	31.5	36	35.4	80/82	170	70	2.3	360	330	314	260	175	3M 325 00008	11	10
3AH3 305-6 ...	2500	350	■	□	□	3	31.5	36	35.4	80/82	170	70	2.3	360	330	314	260	175	3M 325 00009	11	11
3AH3 306-6 ...	2500	350	■	○	○	3	40	36	44.9	100/104	170	70	2.0	360	330	314	260	175	3M 325 00009	11	11

■ Standard according to IEC 62271-100 □ Possible ○ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

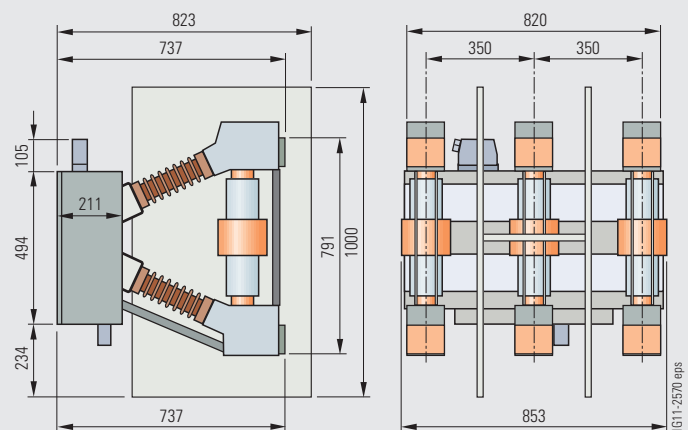
Operating cycle diagram and dimension drawings for 24 and 36 kV


Dimension drawing 9

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 drawing 10



Dimension drawing 11

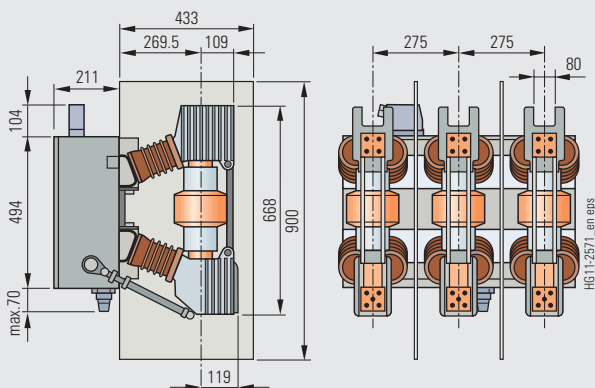
Order No.	17.5 kV 50/60 Hz																									
	Rated normal current I_r A	Pole-center distance mm	Rated operating sequence: O - 3 min - CO - 3 min - CO O - 30 min - CO	Rated short-circuit duration t_k s	Rated short-circuit breaking current I_{sc} kA	DC component in % of the rated short-circuit breaking current %	Asymmetrical breaking current kA	Rated short-circuit making current (at 50/60 Hz) I_{ma} kA	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Voltage drop ΔU between connections (according to IEC 60694 at DC 100 A) mV	Minimum creepage distance, interrupter mm	Minimum creepage distance, phase-to-earth mm	Minimum clearance, phase-to-phase mm	Minimum clearance, phase-to-earth mm	Weights kg	Detailed dimension drawing (can be ordered)	Operating cycle diagram No. (see page 37)	Catalog dimension drawing No. (see page 37)							
3AH3 712-4 ...	5000	300	■	○	3	50	75	73	137	110	50	1.4	160	230	230	230	470	3M 325 00587		14						
3AH3 712-5 ...	6300	300	■	○	3	50	75	73	137	110	50	1.4	160	230	230	230	500	3M 325 00587		14						
3AH3 713-4 ...	5000	300	■	○	3	63	65	86	173	110	50	1.4	160	230	230	230	470	3M 325 00588		14						
3AH3 713-5 ...	6300	300	■	○	3	63	65	86	173	110	50	1.4	160	230	230	230	500	3M 325 00588		14						
3AH3 714-4 ...	5000	300	■	○	3	72	65	96	198	110	50	1.4	160	230	230	230	470	3M 325 00589		14						
3AH3 714-5 ...	6300	300	■	○	3	72	65	96	198	110	50	1.4	160	230	230	230	500	3M 325 00589		14						
3AH3 817-7 ...	3150	275	■	○	3	50	75	73	137	110	50	1.4	160	170	145	130	230	3M 325 00592		12						
3AH3 817-8 ...	4000	275	■	○	3	50	75	73	137	110	50	1.4	160	170	135	130	320	3M 325 00593		13						
3AH3 818-7 ...	3150	275	■	○	3	63	65	86	173	110	50	1.4	160	170	145	130	230	3M 325 00019		15						
3AH3 818-8 ...	4000	275	■	○	3	63	65	86	173	110	50	1.4	160	170	135	130	320	3M 325 00030		13						
3AH3 819-7 ...	3150	275	■	○	3	72	65	96	198	110	50	1.4	160	170	145	130	250	3M 325 00019		15						
3AH3 819-8 ...	4000	275	■	○	3	72	65	96	198	110	50	1.4	160	170	135	130	320	3M 325 00030		13						

■ Standard according to IEC 62271-100 ○ According to IEEE Std C37.013

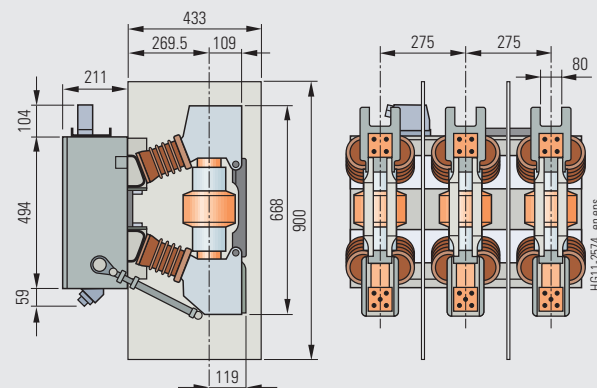
Number of operating cycles

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 service life, values ranging beyond this depend on the specific case of application.

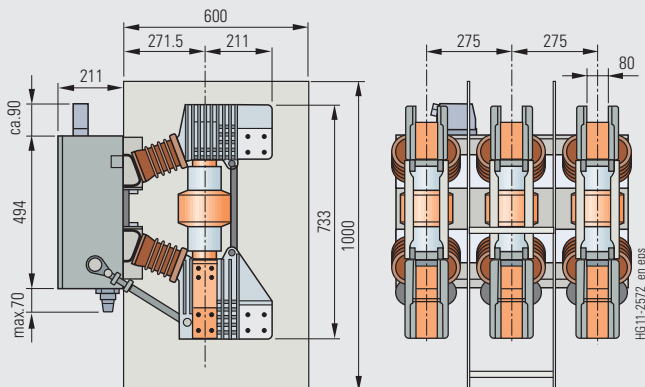
Dimension drawings for high-current and generator circuit-breakers 17.5 kV



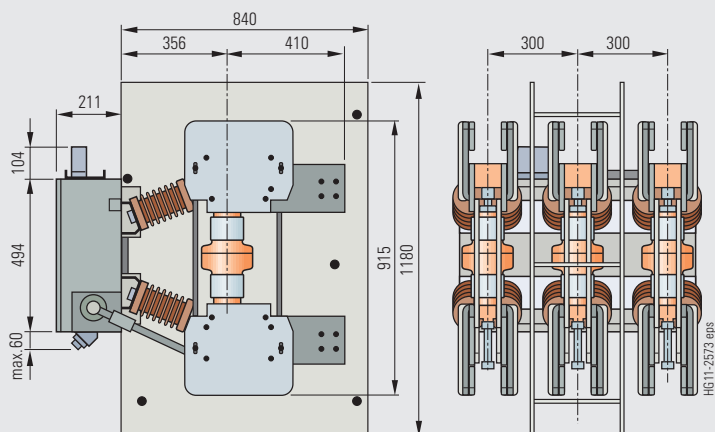
Dimension drawing 12



Dimension drawing 15

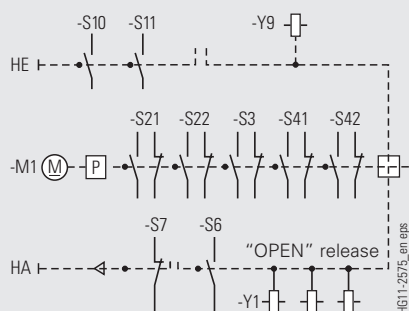


Dimension drawing 13

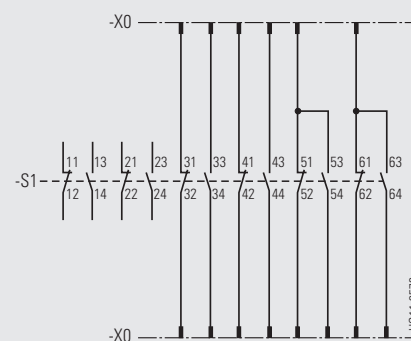


Dimension drawing 14

Basic equipment

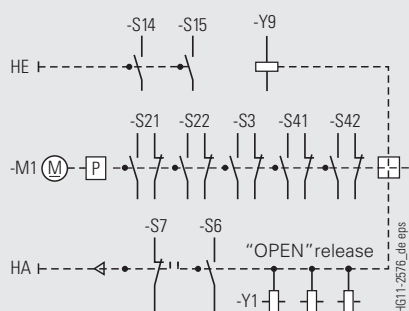


Manual closing – manual opening with auxiliary switch 6 NO + 6 NC

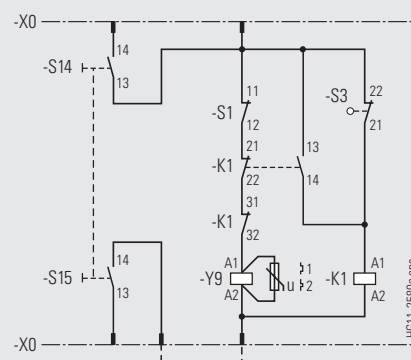


Contacts available for customer with basic circuit-breaker equipment and auxiliary switch 6 NO + 6 NC

Additional equipment: Motor operating mechanism and auxiliary switch

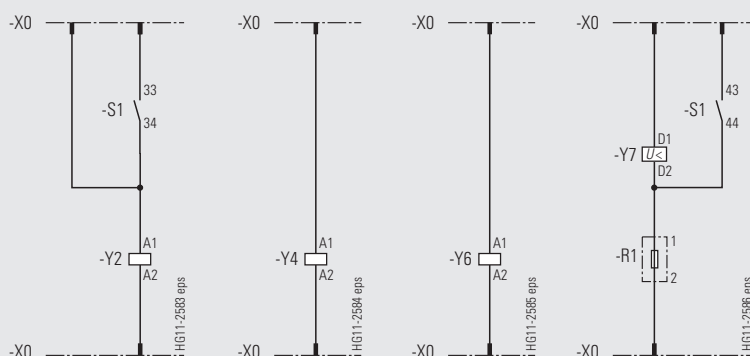


Motor operating mechanism with manual electrical closing



Manual electrical closing Closing and anti-pumping

Additional equipment: Releases (for combination possibilities see page 16)



2nd shunt release

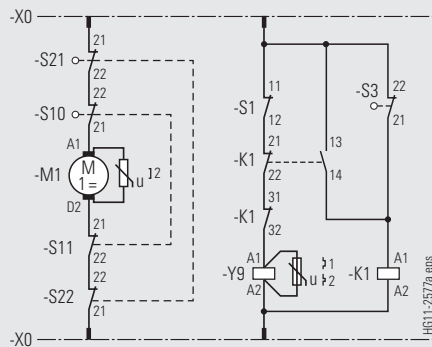
C.t.-operated
release 0.5 A
or 1 A

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

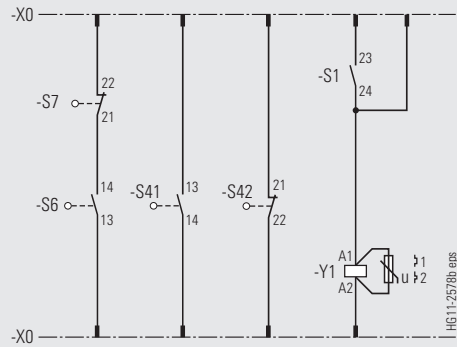
Undervoltage release

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

Basic equipment (continuation)



Motor operating mechanism with manual mechanical closing

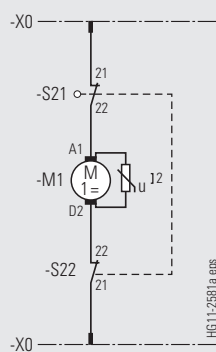


Circuit-breaker tripping signal

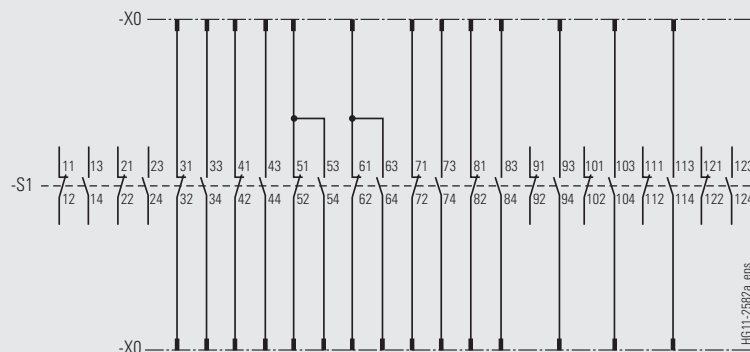
Signal "closing
spring charged"

1st shunt
release

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



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

HA	Manual opening	S14,	Anti-pumping	S41,	Position switches	Y1	1 st shunt release
HE	Manual closing	S15		S42	(to indicate the charging state)	Y2	2 nd shunt release
K1	Contactor (anti-pumping)	S21,	Position switches	S6	Circuit-breaker tripping signal	Y4	Current-transformer
M1	Motor operating mechanism	S22	(to de-energize the motor	S7	Cutout switch for circuit-		operated release
P	Energy store		operating mechanism		breaker tripping signal	Y6	Low-energy current-
R1	Resistance		after charging)	X0	Lower part of plug/		transformer operated release
S1	Auxiliary switch	S3	Position switch		terminal strip	Y7	Undervoltage release
S10,	Anti-pumping for		(opens when closing spring			Y9	Closing solenoid
S11	manual closing		is charged)				

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

Operating times

Operating times at rated voltage of the secondary circuit	Equipment of circuit-breaker	Operating time of circuit-breaker	
		3AH1	3AH3
Closing time	–	< 75 ms	< 80 ms
Opening time	1 st shunt release	< 65 ms	< 65 ms
	2 nd and 3 rd release	< 50 ms	< 50 ms
Arcing time	–	< 15 ms	< 15 ms
Opening time	1 st shunt release	< 80 ms	< 80 ms
	2 nd and 3 rd release	< 65 ms	< 60 ms
Dead time	–	300 ms	300 ms
CLOSE/OPEN contact time	1 st shunt release	< 80 ms	< 90 ms
	2 nd and 3 rd release	< 65 ms	< 70 ms
Minimum command duration	Closing solenoid	45 ms	45 ms
	1 st shunt release	40 ms	40 ms
	2 nd and 3 rd release	20 ms	20 ms
Pulse time for circuit-breaker tripping signal	1 st shunt release	> 15 ms	> 15 ms
	2 nd and 3 rd release	> 10 ms	> 10 ms
Charging time for electrical operation	–	< 15 s	< 15 s
Synchronism error between the poles	–	≤ 2 ms	≤ 2 ms

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 ¹⁾ 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	350/500 ²⁾	–	8/16 ²⁾
48 DC	53	41	350/500 ²⁾	–	6/8 ²⁾
60 DC	66	51	350/500 ²⁾	–	4/6 ²⁾
110 DC	121	93	350/500 ²⁾	–	2/3 ²⁾
220 DC	242	187	350/500 ²⁾	–	1.6
110 AC	121	93	–	400/650 ²⁾	2/3 ²⁾
230 AC	244	187	–	400/650 ²⁾	1.6

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

2) Values are valid for 3AH1/3AH3, 3AH37, 3AH38

Consumption data of releases

Release	Power consumption		Tripping ranges	
	Operation at		Tripping voltage at DC	Tripping voltage or tripping current at AC 50/60 Hz
	DC approx. W	AC 50/60 Hz approx. VA		
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
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Configuration instructions	43
Configuration aid	Foldout page

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

Inquiry concerning

- ☐ 3AH1 circuit-breaker
☐ 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	<input type="checkbox"/> 7.2 kV	<input type="checkbox"/> 12 kV	<input type="checkbox"/> 15 kV	
	<input type="checkbox"/> 17.5 kV	<input type="checkbox"/> 24 kV	<input type="checkbox"/> 36 kV	<input type="checkbox"/> ___ kV
Rated lightning impulse withstand voltage	<input type="checkbox"/> 60 kV	<input type="checkbox"/> 75 kV	<input type="checkbox"/> 95 kV	<input type="checkbox"/> 110 kV
	<input type="checkbox"/> 125 kV	<input type="checkbox"/> 170 kV	<input type="checkbox"/> 195 kV	<input type="checkbox"/> ___ kV
Rated short-duration power-frequency withstand voltage	<input type="checkbox"/> 20 kV	<input type="checkbox"/> 32 kV	<input type="checkbox"/> 36 kV	<input type="checkbox"/> 38 kV
	<input type="checkbox"/> 50 kV	<input type="checkbox"/> 70 kV	<input type="checkbox"/> 95 kV	<input type="checkbox"/> ___ kV
Rated short-circuit breaking current	<input type="checkbox"/> 31.5 kA	<input type="checkbox"/> 40 kA	<input type="checkbox"/> 50 kA	
	<input type="checkbox"/> 63 kA	<input type="checkbox"/> 72 kA		<input type="checkbox"/> ___ kA
Rated normal current	<input type="checkbox"/> 1250 A	<input type="checkbox"/> 2000 A	<input type="checkbox"/> 2500 A	<input type="checkbox"/> 3150 A
	<input type="checkbox"/> 4000 A	<input type="checkbox"/> 5000 A	<input type="checkbox"/> 6300 A	<input type="checkbox"/> ___ A
Pole-center distance	<input type="checkbox"/> 210 mm	<input type="checkbox"/> 275 mm	<input type="checkbox"/> 300 mm	<input type="checkbox"/> 350 mm

Secondary equipment

For possible combinations see pages 16 to 22

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

Application and other requirements

☐ Please check off ___ Please fill in

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

3AH1/3AH3 vacuum circuit-breakers

Instruction for configuration of the 3AH1 and 3AH3 vacuum circuit-breakers

1st step: Definition of the primary part (see pages 13 to 15)

Please specify the following ratings:	Possible options:
Rated voltage (U_r)	U_r : 7.2 kV to 36 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-center 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 16 to 22)

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
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 23)

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

1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16
3	A	H	■	■	■	■	-	■	■	■	■	■	-	■	■	■	■
			See page 13 to page 15						See page 16	See page 17	See page 18	See page 19		See page 20	See page 21	See page 22	See page 22
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	
3	A	H					-						-				
			+				+					+				+	
			+				+					+				+	



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Subject to change without notice
Order No. E50001-K1511-A031-A1-7600
Printed in Germany
Dispo 31601
KG 04.07 5.0 40 En
102412 6101/C6150

The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

