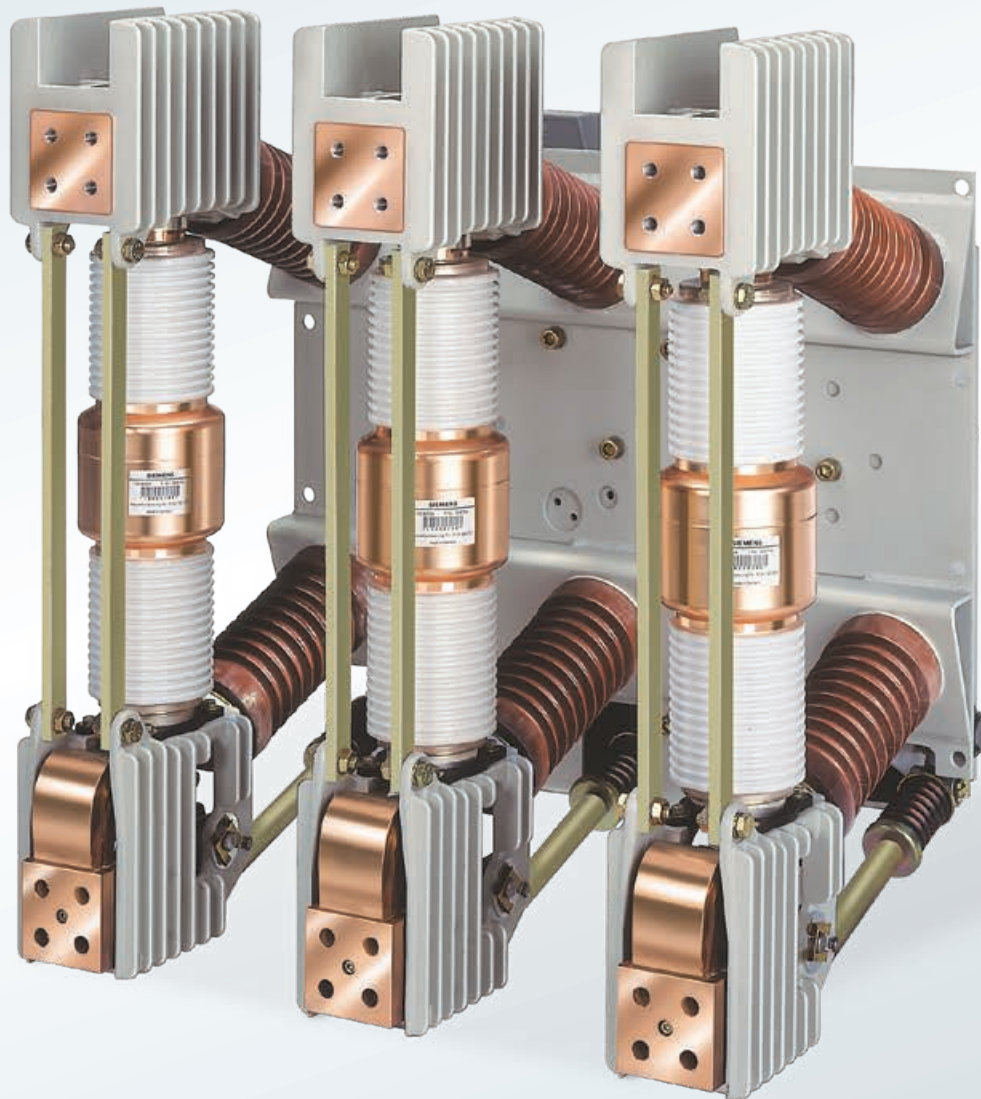


SIEMENS



Catalog
HG 11.04 ·
Edition 2018

3AH4 Vacuum Circuit-Breakers

Medium-Voltage Equipment

[siemens.com/3AH4](https://www.siemens.com/3AH4)



3AH4 Vacuum Circuit-Breakers

Medium-Voltage Equipment Catalog HG 11.04 · 2018

Invalid:
Catalog HG 11.04 · August 2010

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The products and systems described in this catalog are manufactured and sold according to a certified management system (acc. to ISO 9001, ISO 14001 and BS OHSAS 18001).



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Industrial application: Refinery

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3AH4 frequent-operation circuit-breaker from 12 to 40.5 kV – The Persistent

Certain applications, especially in the industry, need high and up to very high numbers of operating cycles.

For example, operation of arc furnaces requires more than 100 operating cycles a day.

3AH4 – the circuit-breaker for a maximum number of operating cycles



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The vacuum circuit-breaker type 3AH4 up to 40.5 kV is designed for extremely high numbers of operating cycles: Depending on the design, it controls 30,000, 60,000 or even 120,000 operating cycles.

Minimum maintenance work, such as greasing of operating mechanisms after 10,000 operating cycles and replacement of vacuum interrupters after 30,000 operating cycles, preserves the reliability of these circuit-breakers throughout their entire service life – despite high mechanical stress.

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 40 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.

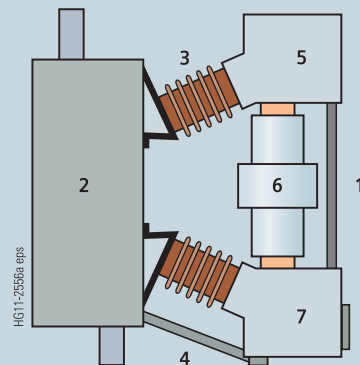
Operating mechanism

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

3AH4 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.

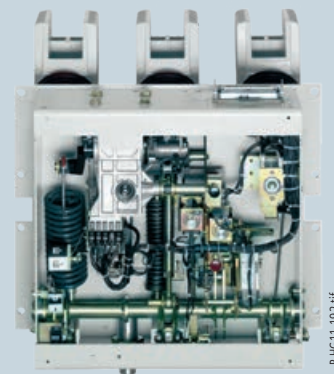


Circuit-breaker structure

- 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

Description

Construction and mode of operation, standards

1

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 15.

- 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, 3AH4 vacuum circuit-breakers can be remote-closed electrically. They can also be closed locally by mechanical unlatching of the closing spring via push-button. 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 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 vacuum 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

3AH4 vacuum circuit-breakers conform to the following standards:

- IEC 62271-100
- IEC 62271-1
- VDE 0671.

All 3AH4 vacuum circuit-breakers fulfil the endurance classes E2, S1 and C2 according to IEC 62271-100 and surpass the endurance class M2 twelve times (30,000/60,000/120,000 operating cycles).

Maintenance

The 3AH4 vacuum circuit-breakers are maintenance-free up to 10,000 operating cycles under normal ambient conditions according to IEC 62271-1. After that, maintenance is to be effected according to the maintenance schedule, e.g. relubrication every 10,000 operating cycles, and replacement of the vacuum interrupters every 30,000 operating cycles.

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. 3AH4 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 (see diagram)

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.

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

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: $U \geq U_0 \times K_a$

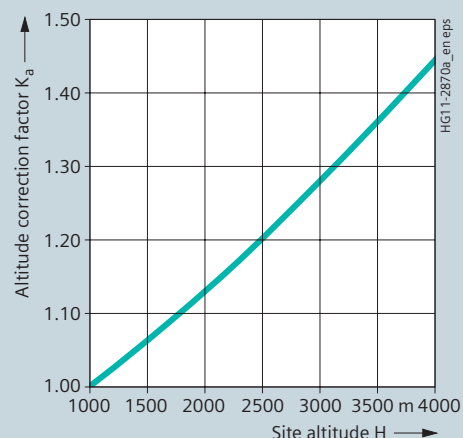
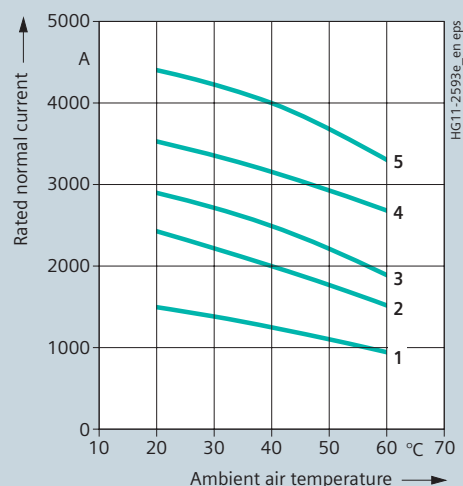
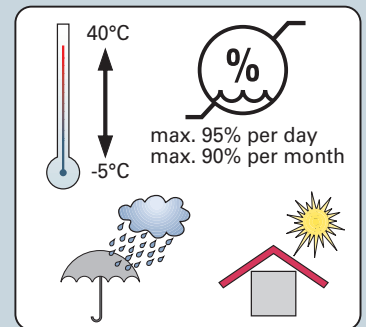
U Rated withstand voltage under reference atmosphere

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



Description

Product range overview and basic equipment

1

Product range overview 3AH4

| Rated voltage | Rated short-circuit breaking current | Rated normal current (A) | | | | | | | | | | | | | |
|---------------|--------------------------------------|---------------------------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|--|
| | | 1250 | | | 2000 | | | 2500 | | | 3150 | | | 4000 | |
| | | Pole-centre distance (mm) | | | | | | | | | | | | | |
| kV | kA | 210 | 275 | 350 | 210 | 275 | 350 | 210 | 275 | 350 | 210 | 275 | 350 | 350 | |
| 12 | 31.5 | □ | | | □ | | | | | | | | | | |
| | 40 | □ | | | □ | | | □ | | | □ | | | | |
| 17.5 | 31.5 | □ | | | □ | | | | | | | | | | |
| | 40 | □ | | | □ | | | □ | | | □ | | | | |
| 24 | 25 | □ | □ | | □ | □ | | | | | | | | | |
| | 40 | | | | | | | | ■ | | | ■ | | | |
| 36 | 31.5 | | | ■ | | | ■ | | | ■ | | | ■ | ■ | |
| | 40 | | | | | | | | | ■ | | | ■ | ■ | |
| 40.5 | 31.5 | | | ■ | | | ■ | | | ■ | | | ■ | ■ | |
| | 40 | | | | | | | | | ■ | | | ■ | ■ | |

■ Available design 120,000 operating cycles

□ Available design 30,000/60,000 operating cycles

For the endurance class C2, all circuit-breakers fulfil the following values according to IEC 62271-100

| | Line | Cable | Single capacitor bank | Back-to-back capacitor bank ¹⁾ | |
|---------------------|--------------------------------------|---------------------------------------|------------------------------------------------------------|----------------------------------------------------|---------------------------------|
| Rated voltage | Rated line-charging breaking current | Rated cable-charging breaking current | Rated single capacitor bank breaking current ²⁾ | Rated back-to-back capacitor bank breaking current | Frequency of the inrush current |
| U_r kV, r.m.s. | I_l A, r.m.s. | I_c A, r.m.s. | I_{sb} A, r.m.s. | I_{bb} A, r.m.s. | f_{bl} Hz |
| 12 | 10 | 25 | 400 | 400 | 4250 |
| 17.5 | 10 | 31.5 | 400 | 400 | 4250 |
| 24 | 10 | 31.5 | 400 | 400 | 4250 |
| 36 | 10 | 50 | 400 | 400 | 4250 |
| 40.5 | 10 | 50 | 400 | 400 | 4250 |

1) Rated back-to-back capacitor bank making current for a back-to-back capacitor bank – see chapter 3: Technical data

2) The capacitive switching capacity of the circuit-breaker is $0.7 \times I_r$ above the standard specification

Basic equipment

| Features | Minimum equipment | Alternative equipment | Remarks |
|----------------------------------------|------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------|
| Operating mechanism | Electrical operating mechanism | None | Also for manual operation; 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 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 protection circuit | Generally installed for DC ≥ 60 V | 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 | – |



3AH4 vacuum circuit-breaker

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Order number structure and configuration example

The 3AH4 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.

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 25) 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.

[illegible]



12 kV

50/60 Hz, 30,000/60,000 operating cycles

| Rated voltage U_r kV | Rated lightning impulse withstand voltage U_p kV | Rated short-duration power-frequency withstand voltage ¹⁾ U_d kV | Rated short-circuit breaking current at 36 % DC component I_{SC} kA | Rated short-circuit making current (at 50/60 Hz) I_{ma} kA | Pole-centre distance mm | Rated normal current I_r A | Position: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order codes | | |
|------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------|------------------------------------|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|-------------|--|--|
| | | | | | | | Order No.: | 3 | A | H | 4 | | | | | | | | | | | | | | | |
| 12 | 75 | 28 | 31.5 | 80/82 | 210 | 1250 | | 3 | A | H | 4 | 1 | 1 | 5 | - | 2 | | | | | | | | | | |
| | | | | | | 2000 | | 3 | A | H | 4 | 1 | 1 | 5 | - | 4 | | | | | | | | | | |
| | | | 40 | 100/104 | | 1250 | | 3 | A | H | 4 | 1 | 1 | 6 | - | 2 | | | | | | | | | | |
| | | | | | | 2000 | | 3 | A | H | 4 | 1 | 1 | 6 | - | 4 | | | | | | | | | | |
| | | | | | | 2500 | | 3 | A | H | 4 | 1 | 1 | 6 | - | 6 | | | | | | | | | | |
| | | | | | | 3150 | | 3 | A | H | 4 | 1 | 1 | 6 | - | 7 | | | | | | | | | | |

1) Higher U_d on request

17.5 kV

50/60 Hz, 30,000/60,000 operating cycles

| U_r kV | U_p kV | U_d kV | I_{SC} kA | I_{ma} kA | mm | I_r A | | | | | | | | | | | | | | | | | | | | |
|-------------|-------------|-------------|----------------|----------------|-----|------------|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|
| 17.5 | 95 | 38 | 31.5 | 80/82 | 210 | 1250 | 3 | A | H | 4 | 2 | 1 | 5 | - | 2 | | | | | | | | | | | |
| | | | | | | 2000 | 3 | A | H | 4 | 2 | 1 | 5 | - | 4 | | | | | | | | | | | |
| | | | 40 | 100/104 | | 1250 | 3 | A | H | 4 | 2 | 1 | 6 | - | 2 | | | | | | | | | | | |
| | | | | | | 2000 | 3 | A | H | 4 | 2 | 1 | 6 | - | 4 | | | | | | | | | | | |
| | | | | | | 2500 | 3 | A | H | 4 | 2 | 1 | 6 | - | 6 | | | | | | | | | | | |
| | | | | | | 3150 | 3 | A | H | 4 | 2 | 1 | 6 | - | 7 | | | | | | | | | | | |

2) Obligatory with selection of the number of operating cycles via order code:

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 30,000 operating cycles | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60,000 operating cycles | | | | | | | | | | | | | | | | | | | | | | | | | | |

Configuration example

3AH4 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} = 40 kA

Pole-centre distance = 210 mm

Rated normal current I_r = 3150 A

Example for Order No.:

Order codes:

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 3 | A | H | 4 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2 | 1 | 6 | - | 7 | | | | | | | | | | | | | | | | | | |

Equipment Selection

Selection of basic types, circuit-breakers



24 kV

50/60 Hz, 30,000/60,000/120,000 operating cycles

Position:

Order No.:

| Rated voltage U_r kV | Rated lightning impulse withstand voltage U_p kV | Rated short-duration power-frequency withstand voltage ¹⁾ U_d kV | Rated short-circuit breaking current at 36 % DC component I_{SC} kA | Rated short-circuit making current (at 50/60 Hz) I_{ma} kA | Pole-centre distance mm | Rated normal current I_r A | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order codes |
|--------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------|------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|-------------|
| 24 | 125 | 50 | 25 | 63/65 | 210 | 1250 | 3 | A | H | 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 2000 | 3 | A | H | 4 | 2 | 5 | 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 275 | 3 | A | H | 4 | 2 | 6 | 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 2000 | 3 | A | H | 4 | 2 | 6 | 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | 40 | 100/104 | 275 | 2500 | 3 | A | H | 4 | 2 | 6 | 6 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 3150 | 3 | A | H | 4 | 2 | 6 | 6 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | 150 | 60 | 25 | 63/65 | 275 | 1250 | 3 | A | H | 4 | 2 | 9 | 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 2000 | 3 | A | H | 4 | 2 | 9 | 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1) Obligatory with selection of the number of operating cycles via short code: | | | | | | | | | | | | | | | | | | | | | | | |
| 30,000 operating cycles | | | | | | | | | | | | | | | | | | | | | | | |
| 60,000 operating cycles | | | | | | | | | | | | | | | | | | | | | | | |

36 kV

50/60 Hz, 120,000 operating cycles

| U_r kV | U_p kV | U_d kV | I_{SC} kA | I_{ma} kA | mm | I_r A | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order codes |
|------------------|-------------|-------------|-----------------------------------------|----------------|-----|------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|-------------|
| 36 | 170 | 70 | 31.5 | 80/82 | 350 | 1250 | 3 | A | H | 4 | 3 | 0 | 5 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 2000 | 3 | A | H | 4 | 3 | 0 | 5 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 2500 | 3 | A | H | 4 | 3 | 0 | 5 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 3150 | 3 | A | H | 4 | 3 | 0 | 5 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 4000 | 3 | A | H | 4 | 3 | 0 | 5 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | 40 | 100/104 | 350 | 2500 | 3 | A | H | 4 | 3 | 0 | 6 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 3150 | 3 | A | H | 4 | 3 | 0 | 6 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | | | 4000 | 3 | A | H | 4 | 3 | 0 | 6 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Special versions | | | | | | | | | | | | | | | | | | | | | | | |
| U_r kV | U_p kV | U_d kV | | | | | | | | | | | | | | | | | | | | | |
| 36 | 185 | 85 | | | | | | | | | | | | | | | | | | | | | |
| 36 | 195 | 95 | not for 8 th position 7 or 8 | | | | | | | | | | | | | | | | | | | | |

Configuration example

3AH4 vacuum circuit-breaker

Rated voltage U_r = 36 kV, 50/60 Hz

Rated lightning impulse withstand voltage U_p = 170 kV

Rated short-circuit breaking current I_{SC} = 40 kA

Pole-centre distance = 350 mm

Rated normal current I_r = 2500 A

Increase of rated lightning impulse withstand voltage U_p = 195 kV

and rated short-duration power-frequency withstand voltage U_d = 95 kV

Example for Order No.:

Order codes:

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| 3 | A | H | 4 | 3 | 0 | 6 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| E | 2 | 4 | + | E | 2 | 5 | | | | | | | | | | | | | | | | | |



40.5 kV

50/60 Hz, 120,000 operating cycles

| 40.5 kV | | | | | | | Position: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Order codes | | | | | | | | |
|------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------|------------------------------------|------------|---|---|---|---|---|---|---|---|-------------|-------------|-------------|-------------|----|-------------|-------------|-------------|-------------|---|-------------|---|---|---|---|---|---|
| 50/60 Hz, 120,000 operating cycles | | | | | | | Order No.: | 3 | A | H | 4 | ■ | ■ | ■ | - | ■ | ■ | ■ | ■ | - | ■ | ■ | ■ | ■ | - | ★ | ■ | ■ | ■ | | | |
| Rated voltage U_r kV | Rated lightning impulse withstand voltage U_p kV | Rated short-duration power-frequency withstand voltage ¹⁾ U_d kV | Rated short-circuit breaking current at 36 % DC component I_{SC} kA | Rated short-circuit making current (at 50/60 Hz) I_{ma} kA | Pole-centre distance mm | Rated normal current I_r A | | | | | | | | | | See page 16 | See page 17 | See page 18 | See page 19 | | See page 20 | See page 21 | See page 22 | See page 23 | | See page 24 | | | | | | |
| 40.5 | 185 | 85 | 31.5 | 80/82 | 350 | 1250 | 3 | A | H | 4 | 3 | 0 | 5 | - | 2 | | | | | - | ★ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| | | | | | | 2000 | 3 | A | H | 4 | 3 | 0 | 5 | - | 4 | | | | | - | Z | Y | 0 | 9 | + | E | 1 | 4 | + | E | 1 | 5 |
| | | | | | | 2500 | 3 | A | H | 4 | 3 | 0 | 5 | - | 6 | | | | | - | Z | Y | 0 | 9 | + | E | 1 | 4 | + | E | 1 | 5 |
| | | | | | | 3150 | 3 | A | H | 4 | 3 | 0 | 5 | - | 7 | | | | | - | Z | Y | 0 | 9 | + | E | 1 | 4 | + | E | 1 | 5 |
| | | | | | | 4000 | 3 | A | H | 4 | 3 | 0 | 5 | - | 8 | | | | | - | Z | Y | 0 | 9 | + | E | 1 | 4 | + | E | 1 | 5 |
| | | | 40 | 100/104 | 350 | 2500 | 3 | A | H | 4 | 3 | 0 | 6 | - | 6 | | | | | - | Z | Y | 0 | 9 | + | E | 1 | 4 | + | E | 1 | 5 |
| | | | | | | 3150 | 3 | A | H | 4 | 3 | 0 | 6 | - | 7 | | | | | - | Z | Y | 0 | 9 | + | E | 1 | 4 | + | E | 1 | 5 |
| | | | | | | 4000 | 3 | A | H | 4 | 3 | 0 | 6 | - | 8 | | | | | - | Z | Y | 0 | 9 | + | E | 1 | 4 | + | E | 1 | 5 |

Special versions

| U_r kV | U_p kV | U_d kV | not for 8 th position 7 or 8 | | | | | | | | | | - ★ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ 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Configuration example

3AH4 vacuum circuit-breaker

Rated voltage U_r = 36 kV, 50/60 Hz

Rated lightning impulse withstand voltage U_p = 170 kV

Rated short-circuit breaking current I_{SC} = 40 kA

Pole-centre distance = 350 mm

Rated normal current I_r = 2500 A

Increase of rated lightning impulse withstand voltage U_p = 195 kV

and rated short-duration power-frequency withstand voltage U_d = 95 kV

Example for Order No.:

Order codes:

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | A | H | 4 | 3 | 0 | 6 | - | 6 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| E | 2 | 4 | + | E | 2 | 5 | | | | | | | | | | | | | | | | | | | | |

Selection of secondary equipment



Release combination 1)

1 2 3 4 5 6 7 - 8 9 10 11 12 13 14 15 16

3 A H 4 ■ ■ ■ - ■ ■ ■ ■ ■ - ■ ■ ■ ■

[illegible]



Operating voltage of the closing solenoid

1 2 3 4 5 6 7 - 8 9 10 11 12 - 13 14 15 16

Order No.:

[illegible]

Configuration example

operating voltage of the closing solenoid **30 V DC**

3 A H 4 3 0 6 - 6 P Z ■ ■ - ■ ■ ■ ■ - Z

Order codes:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| E | 2 | 4 | + | E | 2 | 5 | + | K | 2 | A |
|---|---|---|---|---|---|---|---|---|---|---|

Selection of secondary equipment



Operating voltage of the 1st shunt release

1 2 3 4 5 6 7 - 8 9 10 11 12 - 13 14 15 16

3 A H 4 ■ ■ ■ - ■ ■ ■ ■ ■ - ■ ■ ■ ■

| Standard voltages | | | Special voltages | | | | | | | | | | | | | | | See page 19 | See page 20 | See page 21 | See page 22 | 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 | | | | | | | | | L | 1 | A | |
| | | | 32 V DC | | | | | | | | | | | | | | | 9 | | | | | | | | | L | 1 | B | |
| | | | 120 V DC | | | | | | | | | | | | | | | 9 | | | | | | | | | L | 1 | C | |
| | | | 125 V DC | | | | | | | | | | | | | | | 9 | | | | | | | | | L | 1 | D | |
| | | | 127 V DC | | | | | | | | | | | | | | | 9 | | | | | | | | | L | 1 | E | |
| | | | 240 V DC | | | | | | | | | | | | | | | 9 | | | | | | | | | L | 1 | F | |
| | | | 120 V AC | | | 50/60 Hz ¹⁾ | | | | | | | | | | | | | 9 | | | | | | | | | L | 1 | K |
| | | | 125 V AC | | | 50/60 Hz ¹⁾ | | | | | | | | | | | | | 9 | | | | | | | | | L | 1 | L |
| | | | 240 V AC | | | 50/60 Hz ¹⁾ | | | | | | | | | | | | | 9 | | | | | | | | | 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)

Operating voltage of the 1st shunt release **48 V DC**

2

3 A H 4 3 0 6 - 6 P Z 2 ■ - ■ ■ ■ ■ - Z ■ ■ ■

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| E | 2 | 4 | + | E | 2 | 5 | + | K | 2 | A |
|---|---|---|---|---|---|---|---|---|---|---|



12th position

Operating voltage of the 2nd release

Shunt 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 | 4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 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 | | | | | M | 1 | A |
| | 32 V DC | | | | | | | | | | | | | 9 | | | | | M | 1 | B |
| | 120 V DC | | | | | | | | | | | | | 9 | | | | | M | 1 | C |
| | 125 V DC | | | | | | | | | | | | | 9 | | | | | M | 1 | D |
| | 127 V DC | | | | | | | | | | | | | 9 | | | | | M | 1 | E |
| | 240 V DC | | | | | | | | | | | | | 9 | | | | | M | 1 | F |
| | 120 V AC 50/60 Hz ¹⁾ | | | | | | | | | | | | | 9 | | | | | M | 1 | K |
| | 125 V AC 50/60 Hz ¹⁾ | | | | | | | | | | | | | 9 | | | | | M | 1 | L |
| | 240 V AC 50/60 Hz ¹⁾ | | | | | | | | | | | | | 9 | | | | | M | 1 | M |
| Special versions | | | | | | | | | | | | | | | | | | | | | |
| To operate the 2 nd 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 | | | | | M | 2 | D |
| 110 V DC | AN 1902- | no | | | | | | | | | | | | 9 | | | | | M | 2 | E |
| 220 V DC | AN 1902- | no | | | | | | | | | | | | 9 | | | | | M | 2 | F |
| 100 V/110 V/230 V AC | AN 1901-2 | no | | | | | | | | | | | | 9 | | | | | M | 2 | G |
| 60 V DC | AN 1902- | yes | | | | | | | | | | | | 9 | | | | | M | 3 | D |
| 110 V DC | AN 1902- | yes | | | | | | | | | | | | 9 | | | | | M | 3 | E |
| 220 V DC | AN 1902- | yes | | | | | | | | | | | | 9 | | | | | M | 3 | F |
| 100 V/110 V/230 V AC | AN 1901-2 | yes | | | | | | | | | | | | 9 | | | | | M | 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 23)

Configuration example

3AH4 vacuum circuit-breaker

($U_r = 36 \text{ kV}$, $50/60 \text{ Hz}$, $U_p = 195 \text{ kV}$, $I_{SC} = 40 \text{ kA}$, $I_r = 2500 \text{ A}$, pole-centre distance = 350 mm)

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

Example for Order No.:

Order codes:

3 A H 4

3 0 6 - 6 P Z 2

9

M 1 B

3 A H 4 3 0 6 - 6 P Z 2 9 - ■ ■ ■ ■ - Z E 2 4 + E 2 5 + K 2 A + M 1 B

Equipment Selection

Selection of secondary equipment



13th position

Operating voltage of the 3rd release

Undervoltage release or c.t.-operated release

| Standard voltages | | | Special voltages | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|--|--|------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|-------------------|--|--|------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|



Operating voltage of the operating mechanism

1 2 3 4 5 6 7 - 8 9 10 11 12 - 13 14 15 16

Order No. :

| Operating voltage of the operating mechanism | | Order No. | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|----------------------------------------------|------------------------|------------------------|--|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|-------------|-------------|-------------|----|----|----|----|----|----|
| Standard voltages | | Special voltages | | | | | | | | | | | | | | | | | | | | | See page 22 | See page 23 | See page 24 | | | | | | |
| 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 | | | | | P | 1 | A | |
| | 32 V DC | | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | B | |
| | 120 V DC | | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | C | |
| | 125 V DC | | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | D | |
| | 127 V DC | | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | E | |
| | 240 V DC | | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | F | |
| | 120 V AC | 50/60 Hz ¹⁾ | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | K | |
| | 125 V AC | 50/60 Hz ¹⁾ | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | L | |
| | 240 V AC | 50/60 Hz ¹⁾ | | | | | | | | | | | | | | | | | | | | | Z | | | | | P | 1 | | |

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)

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

3 A H 4 3 0 6 - 6 P Z 2 9 - 0 K ■ ■ - Z

E 2 4 + E 2 5 + K 2 A + M 1 B

Selection of secondary equipment



Auxiliary switch, low-voltage interface,
interlocking

- 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.

Auxiliary switch 12 NO + 12 NC, 64-pole plug, without mechanical interlocking

Order codes:



Languages of operating instructions and rating plate, as well as AC frequency of operating voltage ¹⁾

Position: 1 2 3 4 5 6 7 - 8 9 10 11 12 - 13 14 15 16 Order codes

Order No.: 3 A H 4 ■ ■ ■ - ■ ■ ■ ■ ■ - ■ ■ ■ ■ - ★ ■ ■ ■

[illegible]
$$-Z \quad Y \quad 1 \quad 2$$

- 7 Y 4 0

3 A H 4

3 0 6 - 6 P Z 2 9 - 0 K C

2

3 A H 4 3 0 6 - 6 P Z 2 9 - 0 K C 2 - Z

Order codes: E 2 4 + E 2 5 + K 2 A + M 1 B



| Position: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | - | 8 | 9 | 10 | 11 | 12 | | 13 | 14 | 15 | 16 | | Order codes | |
|------------|---|---|---|---|---|---|---|---|---|---|----|----|----|---|----|----|----|----|---|-------------|-------|
| Order No.: | 3 | A | H | 4 | ■ | ■ | ■ | - | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ | ■ | ■ | - | ★ | ■ ■ ■ |

*) Functionalities of the mechanical interface for a solution with withdrawable part
 "Closed breaker" interrogation: Through the mechanical interface, the circuit-breaker position can be inquired and racking of the closed circuit-breaker can be blocked.
 Prevalent trip: When the mechanical interlocking device is operated, the circuit-breaker is opened and reclosing is prevented.
 Spring-dump: The circuit-breaker's closing and opening springs can be discharged by operating the mechanical interface.

24 3AH4 Vacuum Circuit-Breakers · Siemens HG 11.04 · 2018



Additional equipment (continued)

| 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 | | | | | | | | | | | | | | | | | |
| Seaworthy transport for Germany | | | | | | | | | | | | | | | | - Z | F 0 2 |
| Voltage of 3 rd shunt release (voltage according to 13 th position) | | | | | | | | | | | | | | | | - Z | F 1 5 |
| Routine test certificate enclosed with stamp and passport | | | | | | | | | | | | | | | | - Z | F 1 9 |
| Routine test certificate enclosed | | | | | | | | | | | | | | | | - Z | F 2 0 |
| Routine test certificate with stamp and signature | | | | | | | | | | | | | | | | - Z | F 2 1 |
| Routine test certificate (to orderer) | | | | | | | | | | | | | | | | - Z | F 2 3 |
| Rated operating sequence O – 3 min – CO – 3 min – CO (only for IEC) | | | | | | | | | | | | | | | | - Z | F 2 7 |
| 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 operation) for manual charging of the closing spring | | | | | | | | | | | | | | | | - Z | F 3 0 |
| Mounted cover for CLOSING (lockable) | | | | | | | | | | | | | | | | - Z | J 6 2 |
| 30,000 Schaltspiele | | | | | | | | | | | | | | | | - Z | M 3 0 |
| 60,000 Schaltspiele | | | | | | | | | | | | | | | | - Z | M 6 0 |
| Warranty 24 months | | | | | | | | | | | | | | | | - Z | W 7 0 |
| Warranty 36 months | | | | | | | | | | | | | | | | - Z | W 7 1 |
| Warranty 60 months | | | | | | | | | | | | | | | | - Z | W 7 2 |
| Higher rated voltage 40.5 kV (instead of 36 kV) only in combination with E14/E15 as well as E24/E25, and obligatory with E19 | | | | | | | | | | | | | | | | - Z | Y 0 9 |
| Additional specifications on the rating plate (only after consultation with the order processing department of the Switchgear Factory Berlin). Specifications in clear text. | | | | | | | | | | | | | | | | - Z | Y 1 2 |
| Operating instructions and product designation for USA | | | | | | | | | | | | | | | | - Z | Y 4 0 |
| Adhesive label yellow/green – ON/OFF | | | | | | | | | | | | | | | | - Z | Y 4 5 |
| Other non-listed special design (only after consultation with the order processing department of the Switchgear Factory Berlin). Specifications additionally in clear text. | | | | | | | | | | | | | | | | - Z | Y 9 9 |

Configuration example

3AH4 vacuum circuit-breaker

3 A H 4

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 $I_r = 2500 \text{ A}$

Increase of rated lightning impulse withstand voltage $U_p = 195 \text{ kV}$

and rated short-duration power-frequency withstand voltage $U_d = 95 \text{ kV}$

Closing solenoid, 1st shunt release, 2nd shunt release

and c.t.-operated release with a rated normal current of 0.5 A

Manual electrical closing at the circuit-breaker, operating voltage

of the closing solenoid 30 V DC

Operating voltage of the 1st shunt 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 12 NO + 12 NC, 64-pole plug, without mechanical interlocking

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

Condensation protection, heating for 230 V AC, 50 W

Routine test certificate enclosed

3 0 6 - 6 P Z 2 9 - 0 K C

2

Example for Order No.:

3 A H 4 3 0 6 - 6 P Z 2 9 - 0 K C 2 - Z

Order codes:

E 2 4 + E 2 5 + K 2 A + M 1 B + A 3 0 + F 2 0

Equipment Selection

Accessories and spare parts



Remark for orders of accessories and spare parts

The order numbers in the spare part overviews 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. This data is given on the rating plate.

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 interrupters

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

Vacuum interrupters 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 3AH4 vacuum circuit-breakers:

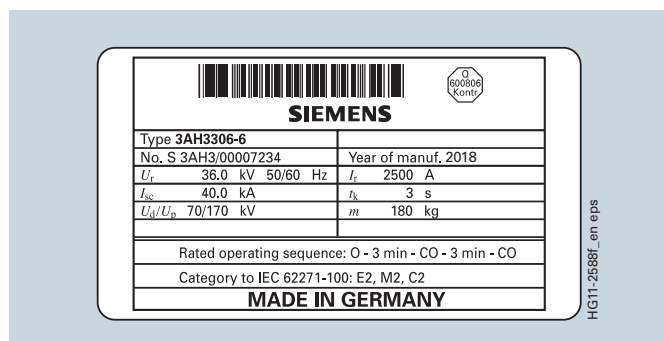
For 24-pole plug connector

- 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



Note:

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

- Type designation
- Serial No.
- Year of manufacture



Accessories and spare parts

| Designation | Remarks | Operating voltage | Order No. |
|---------------------------------------|-----------------------------------------------------|--------------------------|-------------|
| Hand crank | Short design | | 3AX15 30-4A |
| for charging | Standard design | | 3AX15 30-4B |
| the closing spring | Long design | | 3AX15 30-4C |
| | Bit for battery screwdriver | | 3AX15 30-3D |
| 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 |
| 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 |
| Plug connector and accessories | (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 |
| | Complete plug connector | 24-pole | 3AX11 34-7A |
| | | 64-pole | 3AX11 34-6A |
| | Plug connector (lower part) | 24-pole | 3AX11 34-5D |
| | Plug connector (upper part) | 24-pole | 3AX11 34-5C |
| | Plug connector (lower part) | 64-pole | 3AX11 34-5B |
| | Plug connector (upper part) | 64-pole | 3AX11 34-5A |
| Operating solenoid | Used as closing solenoid or | 24 V DC | 3AY15 10-5K |
| | 1 st shunt release | 30/32 V DC | 3AY15 10-5M |
| | | 48 V DC | 3AY15 10-5C |
| | | 60 V DC | 3AY15 10-5D |
| | | 110/120 V DC | 3AY15 10-5E |
| | | 125/127 V DC | 3AY15 10-5L |
| | | 220/240 V DC | 3AY15 10-5F |
| | Including varistor and rectifier | 100 – 125 V AC, 50/60 Hz | 3AY15 10-5E |
| | | 230/240 V AC, 50/60 Hz | 3AY15 10-5F |
| 2nd shunt release | | 24 – 32 V DC | 3AX11 01-2B |
| | | 48 – 60 V DC | 3AX11 01-2C |
| | | 110 – 127 V DC | 3AX11 01-2E |
| | | 220 – 240 V DC | 3AX11 01-2F |
| | | 100 – 125 V AC, 50 Hz | 3AX11 01-2G |
| | | 230 – 240 V AC, 50 Hz | 3AX11 01-2J |
| | | 100 – 125 V AC, 60 Hz | 3AX11 01-3G |
| | | 230 – 240 V AC, 60 Hz | 3AX11 01-3J |
| Undervoltage release | | 24 V DC | 3AX11 03-2B |
| | | 30/32 V DC | 3AX11 03-2L |
| | | 48 V DC | 3AX11 03-2C |
| | | 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 |
| | | 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 |
| | | 240 V AC, 50 Hz | 3AX11 03-2M |
| | | 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 |
| | | 240 V AC, 60 Hz | 3AX11 03-3M |

Continued on next page

Equipment Selection

Accessories and spare parts



Accessories and spare parts (continued)

| Designation | Remarks | Operating voltage | Order No. |
|---------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------|---------------|
| Mounting parts | For 2 nd shunt release or undervoltage release | | |
| | For 1 existing shunt release (up to serial number 3AH4/00007611) | | 3AX17 11-3A |
| | For 2 existing releases (up to serial number 3AH4/00007611) | | 3AX17 11-3B |
| | For 1 existing shunt release (as of serial number 3AH4/00007612) | | 3AX17 11-4A |
| | For 2 existing releases (as of serial number 3AH4/00007612) | | 3AX17 11-4B |
| Drive motor | | 24/30/32 V DC | 3AY15 11-3B |
| | | 48 V DC | 3AY15 11-3C |
| | | 60 V DC | 3AY15 11-3D |
| | | * 100/110/125/127 V DC/AC | 3AY15 11-3E |
| | | * 220 – 250 V DC/AC | 3AY15 11-3F |
| Rectifier element | * For drive motor with AC operation | 100 V – 250 V AC | 3AX15 25-1F |
| Auxiliary contactor for anti-pumping | Type 3TH20 22-7 up to serial number 3AH4/00006350 or for all circuit-breakers with supplement S98 | 24/30/32 V DC | SWB: 48683 |
| | | 48 V DC | SWB: 48687 |
| | | 60 V DC | SWB: 48684 |
| | | 100/120 V DC | SWB: 48685 |
| | | 125 V – 127 V DC | SWB: 47730 |
| | | 220 V – 240 V DC | SWB: 48686 |
| | | 100 – 125 V AC, 50 Hz | SWB: 48680 |
| | | 230 – 240 V AC, 50 Hz | SWB: 55550 |
| | | 100 – 125 V AC, 60 Hz | SWB: 48679 |
| | | 230 – 240 V AC, 60 Hz | SWB: 55550 |
| | Type 3RH1122-2 as of serial number: 3AH4/00006351 | 24 V DC | SWB: 55656 |
| | | 30/32 V DC | SWB: 55658 |
| | | 48 V DC | SWB: 55659 |
| | | 60 V DC | SWB: 55660 |
| | | 110 V DC | SWB: 55661 |
| | | 120/127 V DC | SWB: 55662 |
| | | 220 V DC | SWB: 55663 |
| | | 240/250 V DC | SWB: 55665 |
| | | 110 V AC, 50/60 Hz | SWB: 55666 |
| | | 120 V AC, 50/60 Hz | SWB: 55667 |
| | | 125 V AC, 50/60 Hz | SWB: 55668 |
| | | 230 V AC, 50/60 Hz | SWB: 55669 |
| | | 240 V AC, 50/60 Hz | SWB: 55670 |
| Position switch | Type 3SE4 (as spare part), without installation accessories | | 3AX42 06-0A |
| | Used for: | Number | |
| | – Electrical anti-pumping (-S3) | 1 | |
| | – Motor control (-S21, -S22) | 2 | |
| | – Closing spring charged (-S4) | 1 | |
| | – Circuit-breaker tripping signal (-S6, -S7) | 2 | |
| | – Electrical closing lockout (-S5) | 1 | |
| Auxiliary switch (-S1) | 6 NO + 6 NC | | 3SV92 73-2AA0 |
| | 12 NO + 12 NC | | 3SV92 74-2AA0 |
| Mechanical interlocking | | | 3AX15 20-4C |
| Retaining elements and cotters | For circuit-breaker revisions | Set for one circuit-breaker | 3AY15 50-1A |

* For AC operation a DC motor with an upstream rectifier element must be used

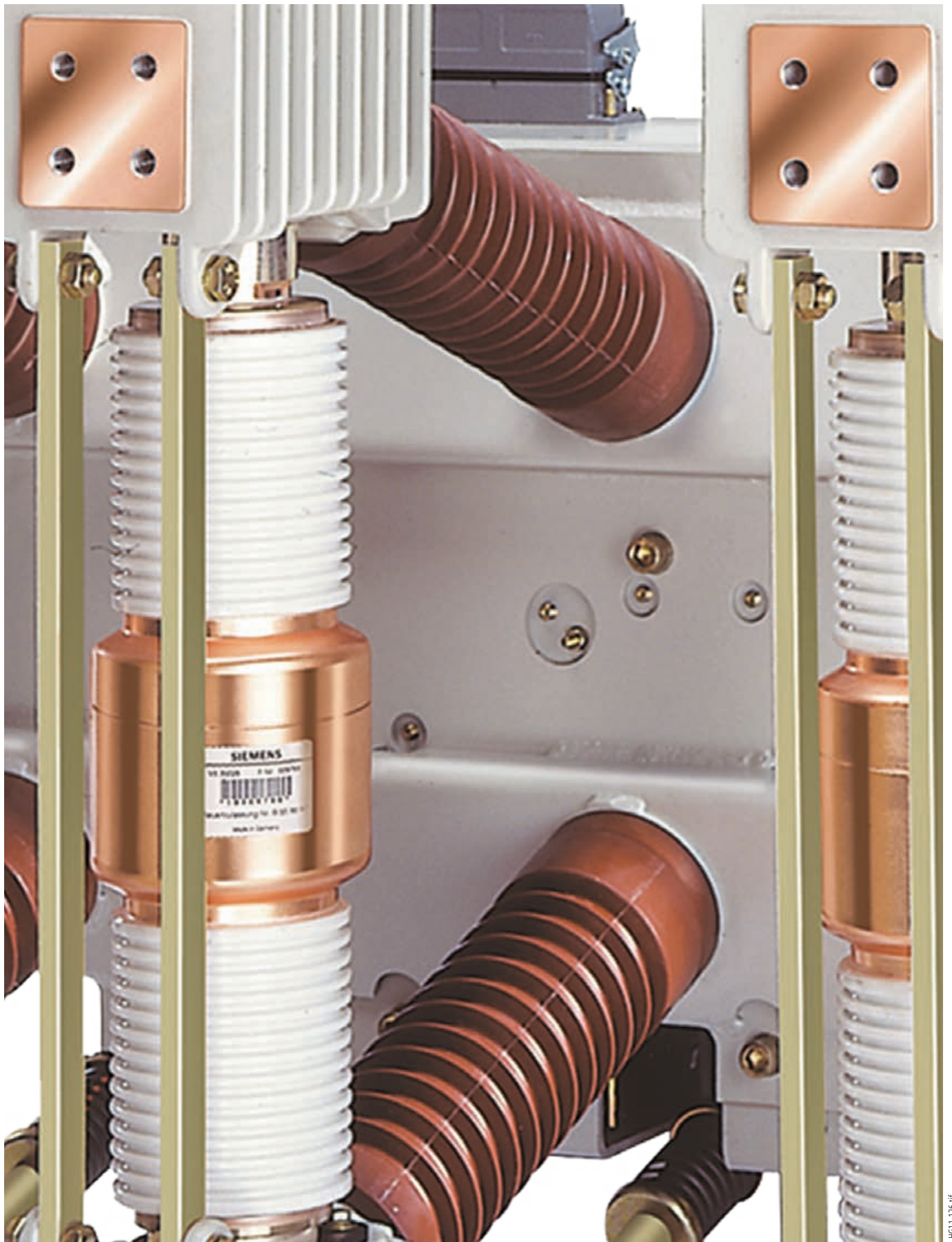
Continued on next page



Accessories and spare parts (continued)

| Designation | Remarks | Operating voltage | Order No. |
|--------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------|---------------------------|
| Spare vacuum interrupters | 3AH4 | | |
| | 3AH4115-2/4 | | 3AY17 15-2B |
| | 3AH4116-2/4/6/7 | | 3AY17 15-1D |
| | 3AH4215-2/4 | | 3AY17 15-2B |
| | 3AH4216-2/4/6/7 | | 3AY17 15-1D |
| | 3AH4254-2 | | 3AY17 15-1F |
| | 3AH4254-4 | | 3AY17 15-1G |
| | 3AH4264-2 | | 3AY17 15-3F |
| | 3AH4264-4 | | 3AY17 15-1G |
| | 3AH4266-6 | | 3AY17 15-2M |
| | 3AH4266-7 | | 3AY17 15-6M |
| | 3AH4294-2 | | 3AY17 15-5F |
| | 3AH4294-4 | | 3AY17 15-3G |
| | 3AH4305-2/4/6 | | 3AY17 15-6L |
| | 3AH4305-7 | | 3AY17 15-5M ¹⁾ |
| | 3AH4305-8 as of serial no. 4434 (for older serial nos. on request) | | 3AY17 15-5M ¹⁾ |
| | 3AH4306-6 | | 3AY17 15-1M |
| | 3AH4306-7 | | 3AY17 15-5M ¹⁾ |
| | 3AH4306-8 as of serial no. 4434 (for older serial nos. on request) | | 3AY17 15-5M ¹⁾ |
| Spare contact pressure system | per phase: Coupling rod, contact pressure spring, bush, ball bearing and further accessories | | |
| | 3AH4305-2/4/6 | | 3AX15 45-1C |
| | 3AH4305-7/8 | | 3AX15 45-1A |
| | 3AH4305-2/4/6 -Z E14+E15 | | 3AX15 45-1E |
| | 3AH4305-7/8 -Z E14+E15 | | 3AX15 45-1A |
| | 3AH4305-2/4/6 -Z E24+E25 | | 3AX15 45-1G |
| | 3AH4305-7/8 -Z E24+E25 | | 3AX15 45-1A |
| | 3AH4306-6 | | 3AX15 45-1D |
| | 3AH4306-7/8 | | 3AX15 45-1A |
| | 3AH4306-6 -Z E14+E15 | | 3AX15 45-1F |
| | 3AH4306-7/8 -Z E14+E15 | | 3AX15 45-1A |
| | 3AH4306-6 -Z E24+E25 | | 3AX15 45-1H |
| | 3AH4306-7/8 -Z E24+E25 | | 3AX15 45-1A |

1) Interrupters must be exchanged at the Siemens factory



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Power connection 3AH4

R-HG11-199.eps



Vacuum interrupter with ribs

R-HG11-198.tif

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| Operating times, short-circuit protection of motors, consumption data of releases | 44 |

Technical Data

Electrical data, dimensions, weights and dimension drawings

3

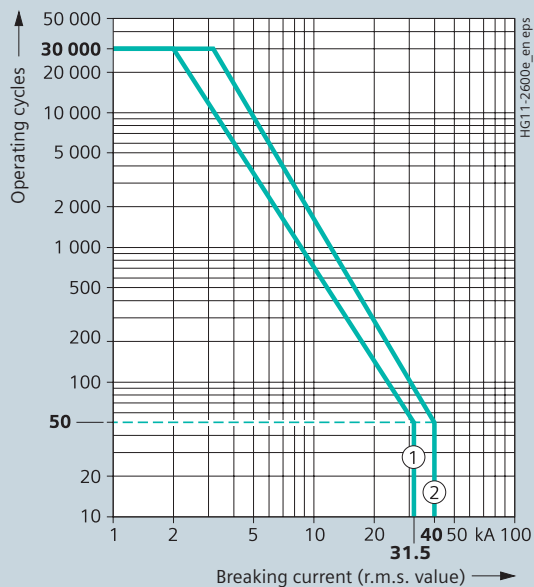
| Order No. | 12 kV 50/60 Hz | | Rated normal current | | Pole-centre distance | | Rated operating sequence: O – 3 min – CO – 3 min – CO O – 0.3 s – CO – 3 min – CO O – 0.3 s – CO – 15 s – CO | | | Rated duration of short-circuit | | Rated short-circuit breaking current | | DC component in % of the rated short-circuit breaking current | | Asymmetrical breaking current | | Rated short-circuit making current (at 50/60 Hz) | | Rated back-to-back capacitor bank making current | | 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 | | | | | | | | | t_k | | I_{sc} | | | | I_{ma} | | I_{bi} | | U_p | | U_d | | | | | | | | | | | | | | | | | | | | | |
| | A | mm | | | | | | | | s | kA | % | kA | kA | kA Peak | kV | kV | mV | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg | | | | | | | | | | | | |
| 3AH4 115-2... | 1250 | 210 | □ | ■ | ○ | 3 | 31.5 | 36 | 35.4 | 80/82 | 10 | 75 | 28 | 2.5 | 130 | 164 | 112 | 119 | 100 | M30: A7E32500912 M60: A7E32500930 | 1 | 3 | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 115-4... | 2000 | 210 | □ | ■ | ○ | 3 | 31.5 | 36 | 35.4 | 80/82 | 10 | 75 | 28 | 2.5 | 130 | 164 | 90 | 119 | 105 | M30: A7E32500901 M60: A7E32500931 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 116-2... | 1250 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 75 | 28 | 2.5 | 184 | 144 | 97 | 110 | 135 | M30: A7E32500902 M60: A7E32500932 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 116-4... | 2000 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 75 | 28 | 2.5 | 184 | 144 | 97 | 110 | 135 | M30: A7E32500903 M60: A7E32500933 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 116-6... | 2500 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 75 | 28 | 2.0 | 184 | 144 | 97 | 110 | 135 | M30: A7E32500904 M60: A7E32500934 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 116-7... | 3150 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 75 | 28 | 2.0 | 184 | 144 | 97 | 110 | 142 | M30: A7E32500904 M60: A7E32500934 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | |

| Order No. | 17.5 kV 50/60 Hz | | I_r | | | | | | t_k | | I_{sc} | | | | | | I_{ma} | | I_{bi} | | U_p | | U_d | | | | | | | | | | | | | | | | | | | | | |
|---------------|---------------------|-----|-------|---|---|---|------|----|-------|---------|----------|----|----|-----|---------|-----|----------|-----|----------|--------------------------------------|-------|----|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|--|
| | A | mm | | | | | | | s | kA | % | kA | kA | kA | kA Peak | 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 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 215-2... | 1250 | 210 | □ | ■ | ○ | 3 | 31.5 | 36 | 35.4 | 80/82 | 10 | 95 | 36 | 2.5 | 130 | 164 | 165 | 117 | 100 | M30: A7E32500951 M60: A7E32500956 | 1 | 3 | | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 215-4... | 2000 | 210 | □ | ■ | ○ | 3 | 31.5 | 36 | 35.4 | 80/82 | 10 | 95 | 36 | 2.5 | 130 | 164 | 150 | 117 | 105 | M30: A7E32500952 M60: A7E32500957 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 216-2... | 1250 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 95 | 36 | 2.5 | 184 | 144 | 141 | 110 | 142 | M30: A7E32500953 M60: A7E32500958 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 216-4... | 2000 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 95 | 36 | 2.5 | 184 | 144 | 141 | 110 | 142 | M30: A7E32500954 M60: A7E32500959 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 216-6... | 2500 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 95 | 36 | 2.0 | 184 | 144 | 141 | 110 | 142 | M30: A7E32500955 M60: A7E32500960 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3AH4 216-7... | 3150 | 210 | ■ | Δ | Δ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 95 | 36 | 2.0 | 184 | 144 | 141 | 110 | 142 | M30: A7E32500955 M60: A7E32500960 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | |

- Standard data 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

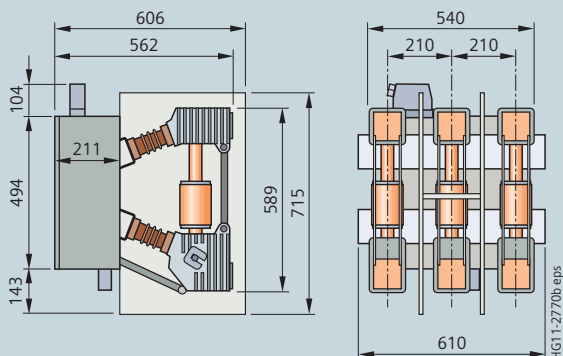
M30: 30,000 operating cycles
M60: 60,000 operating cycles

Operating cycle diagram for 12 kV and 17.5 kV

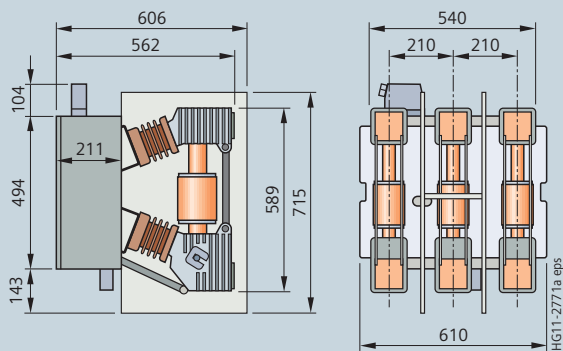


The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All vacuum circuit-breakers fulfil the endurance classes E2, M2 and C2 according to IEC 62271-100. The curve shape beyond the parameters defined in IEC 62271-100 is based on average experience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

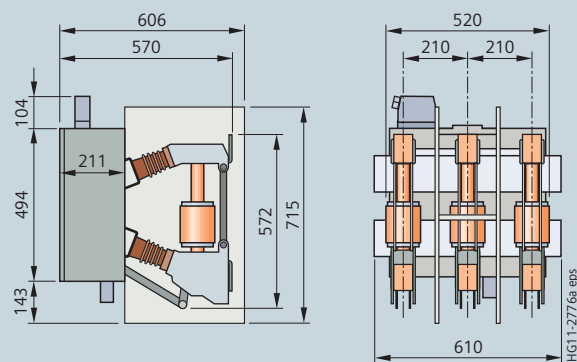
Dimension drawings for 12 kV and 17.5 kV



Dimension drawing 1



Dimension drawing 2



Dimension drawing 3

Technical Data

Electrical data, dimensions, weights and dimension drawings

| Order No. | 24 kV 50/60 Hz | | Technical specifications and dimensions | | | | | | | | | | | | | | | | | | | |
|---------------|------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------|---|----|-----------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|--------------------------------------------|--------------------------------------------|---------------|------------------------------------------------|-------------------------------------------|------------------------------------------------------|
| | Rated normal current I_r A | Pole-centre distance mm | 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 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) kA | Rated back-to-back capacitor bank making current kA Peak | 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 62271-1 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 to 41) |
| 3AH4 254-2... | 1250 | 210 | □ ■ ○ | 3 | 25 | 36 | 28 | 63/65 | 20 | 125 | 50 | 2.5 | 200 | 210 | 209 | 159 | 112 | M30: A7E32500905 M60: A7E32500935 | 3 | 8 | | |
| 3AH4 254-4... | 2000 | 210 | □ ■ ○ | 3 | 25 | 36 | 28 | 63/65 | 20 | 125 | 50 | 2.5 | 200 | 210 | 250 | 164 | 131 | M30: A7E32500906 M60: A7E32500936 | 3 | 6 | | |
| 3AH4 264-2... | 1250 | 275 | □ ■ ○ | 3 | 25 | 36 | 28 | 63/65 | 20 | 125 | 50 | 2.5 | 200 | 210 | 173 | 167 | 112 | M30: A7E32500907 M60: A7E32500937 | 3 | 9 | | |
| 3AH4 264-4... | 2000 | 275 | □ ■ ○ | 3 | 25 | 36 | 28 | 63/65 | 20 | 125 | 50 | 2.5 | 200 | 210 | 205 | 165 | 131 | M30: A7E32500908 M60: A7E32500938 | 3 | 7 | | |
| 3AH4 266-6... | 2500 | 275 | ■ △ △ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 125 | 50 | 2.0 | 360 | 226 | 244 | 163 | 165 | A7E32500007 | 5 | 4 | | |
| 3AH4 266-7... | 3150 | 275 | ■ △ △ | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 125 | 50 | 2.0 | 360 | 226 | 244 | 163 | 165 | A7E32500007 | 5 | 4 | | |
| 3AH4 294-2... | 1250 | 275 | □ ■ ○ | 3 | 25 | 36 | 28 | 63/65 | 20 | 150 | 60 | 2.4 | 250 | 246 | 300 | 200 | 115 | M30: A7E32500921 M60: A7E32500939 | 3 | 11 | | |
| 3AH4 294-4... | 2000 | 275 | □ ■ ○ | 3 | 25 | 36 | 28 | 63/65 | 20 | 150 | 60 | 2.4 | 200 | 246 | 276 | 197 | 133 | M30: A7E32500922 M60: A7E32500940 | 3 | 12 | | |

- Standard data 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

M30: 30,000 operating cycles
M60: 60,000 operating cycles

3

- Standard data 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

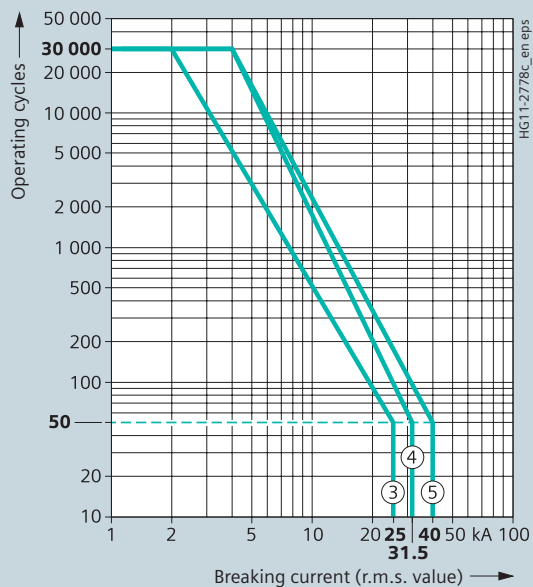
Technical Data

Electrical data, dimensions, weights and dimension drawings

| Order No. | 40.5 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 back-to-back capacitor bank making current | | Rated lightning impulse withstand voltage | | Rated short-duration power-frequency withstand voltage | | Minimum creepage distance, interrupter | | Minimaler Kriechweg Schaltröhre | | 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 38 to 41) | |
|-----------------------------|---------------------|-----|----------------------|---|----------------------|--|-----------------------------------------------------------------------------------------------------------------------|---|---------------------------------|----|--------------------------------------|---------|------------------------------------------------------------------|---------|-------------------------------|-----|-----------------------------------------------------|-----|-----------------------------------------------------|-----|-------------------------------------------|-------------|-----------------------------------------------------------|----|-------------------------------------------|--|------------------------------------|--|----------------------------------------------|--|--------------------------------------|--|--------------------------------------|--|---------|--|------------------------------------------------|--|-------------------------------------------|--|------------------------------------------------------|--|
| | I_r | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | A | mm | | | | | | | s | kA | % | kA | kA | kA Peak | kV | kV | mV | mm | mm | mm | mm | mm | mm | kg | | | | | | | | | | | | | | | | | | |
| 3AH4 305-2...-Z Y09+E14+E15 | 1250 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 185 | 85 | 2.3 | 360 | 420 | 317 | 257 | 170 | A7E32500008 | 4 | 5 | | | | | | | | | | | | | | | | | | |
| 3AH4 305-4...-Z Y09+E14+E15 | 2000 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 185 | 85 | 2.3 | 360 | 420 | 316 | 257 | 175 | A7E32500008 | 4 | 5 | | | | | | | | | | | | | | | | | | |
| 3AH4 305-6...-Z Y09+E14+E15 | 2500 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 185 | 85 | 2.3 | 360 | 420 | 318 | 257 | 180 | A7E32500009 | 4 | 13 | | | | | | | | | | | | | | | | | | |
| 3AH4 305-7...-Z Y09+E14+E15 | 3150 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 185 | 85 | 1.9 | 360 | 365 | 294 | 260 | 380 | A7E32500011 | 4 | 10 | | | | | | | | | | | | | | | | | | |
| 3AH4 305-8...-Z Y09+E14+E15 | 4000 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 185 | 85 | 1.9 | 360 | 365 | 294 | 260 | 380 | A7E32500011 | 4 | 10 | | | | | | | | | | | | | | | | | | |
| 3AH4 306-6...-Z Y09+E14+E15 | 2500 | 350 | ■ | △ | △ | | | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 185 | 85 | 2.3 | 360 | 420 | 318 | 257 | 180 | A7E32500009 | 5 | 13 | | | | | | | | | | | | | | | | | | |
| 3AH4 306-7...-Z Y09+E14+E15 | 3150 | 350 | ■ | △ | △ | | | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 185 | 85 | 1.9 | 360 | 365 | 294 | 260 | 380 | A7E32500011 | 5 | 10 | | | | | | | | | | | | | | | | | | |
| 3AH4 306-8...-Z Y09+E14+E15 | 4000 | 350 | ■ | △ | △ | | | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 185 | 85 | 1.9 | 360 | 365 | 294 | 260 | 380 | A7E32500011 | 5 | 10 | | | | | | | | | | | | | | | | | | |
| 3AH4 305-2...-Z Y09+E24+E25 | 1250 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 195 | 95 | 2.3 | 360 | 420 | 311 | 264 | 170 | A7E32500554 | 4 | 14 | | | | | | | | | | | | | | | | | | |
| 3AH4 305-4...-Z Y09+E24+E25 | 2000 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 195 | 95 | 2.3 | 360 | 420 | 309 | 272 | 175 | A7E32500554 | 4 | 14 | | | | | | | | | | | | | | | | | | |
| 3AH4 305-6...-Z Y09+E24+E25 | 2500 | 350 | □ | ■ | ○ | | | 3 | 31.5 | 36 | 35.4 | 80/82 | 20 | 195 | 95 | 2.3 | 360 | 420 | 304 | 273 | 180 | A7E32500553 | 4 | 15 | | | | | | | | | | | | | | | | | | |
| 3AH4 306-6...-Z Y09+E24+E25 | 2500 | 350 | ■ | △ | △ | | | 3 | 40 | 36 | 44.9 | 100/104 | 20 | 195 | 95 | 2.3 | 360 | 420 | 304 | 273 | 180 | A7E32500553 | 5 | 15 | | | | | | | | | | | | | | | | | | |

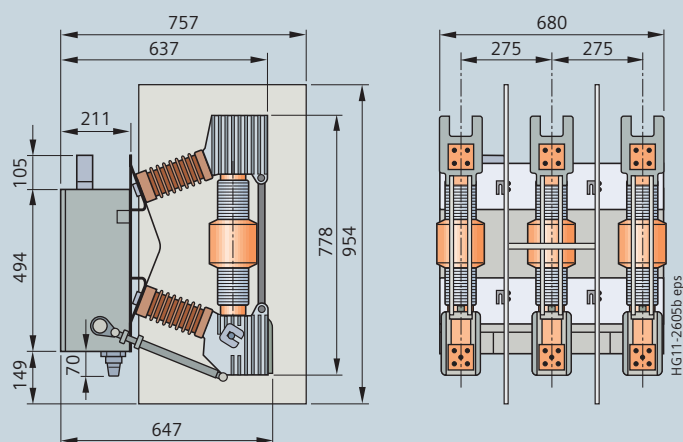
- Standard data on the rating plate
- Possible with order number suffix Z and order code F27
- Possible with order number suffix Z and order code F28
- △ Rated operating sequence possible up to $I_{sc} = 31.5$ kA

Operating cycle diagram for 24, 36 and 40.5 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 24, 36 and 40.5 kV

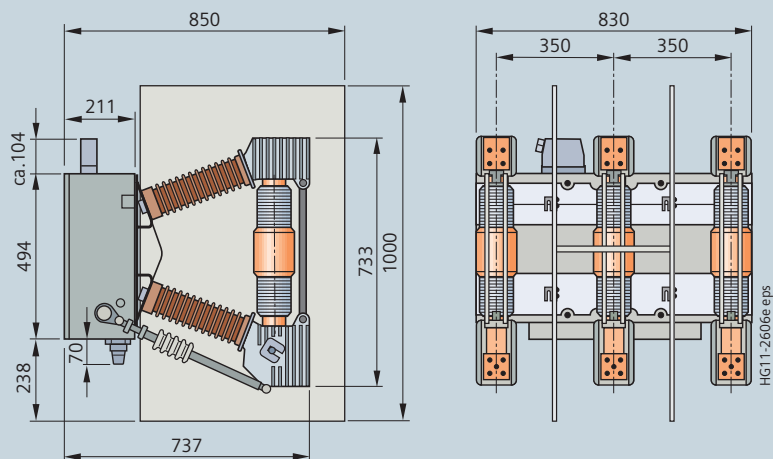


Dimension drawing 4

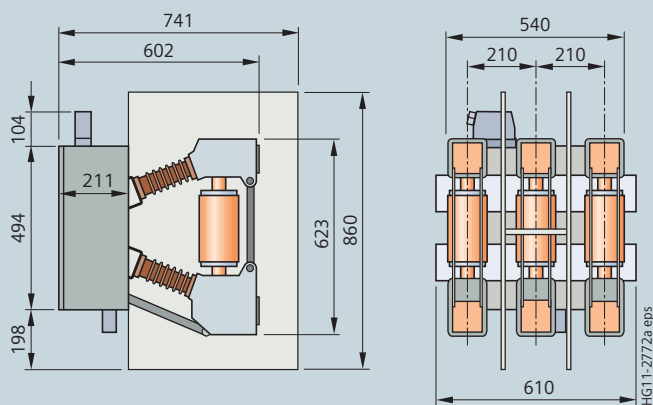
Technical Data

Electrical data, dimensions, weights and dimension drawings

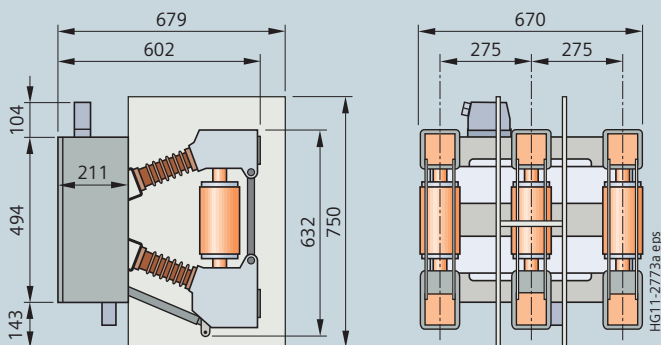
Dimension drawings for 24, 36 and 40.5 kV (continued)



Dimension drawing 5

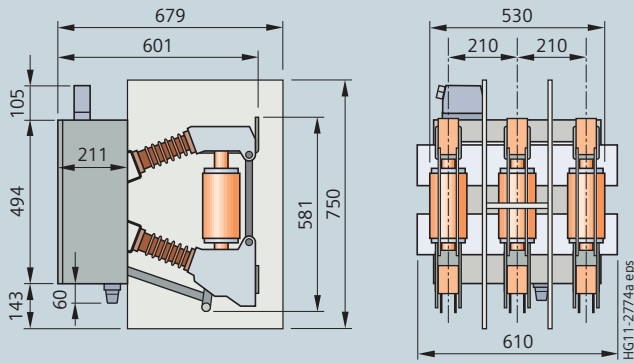


Dimension drawing 6

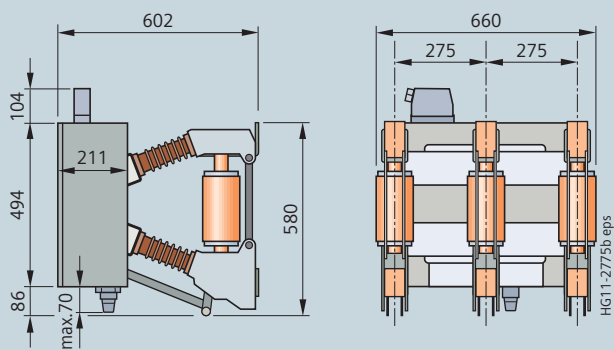


Dimension drawing 7

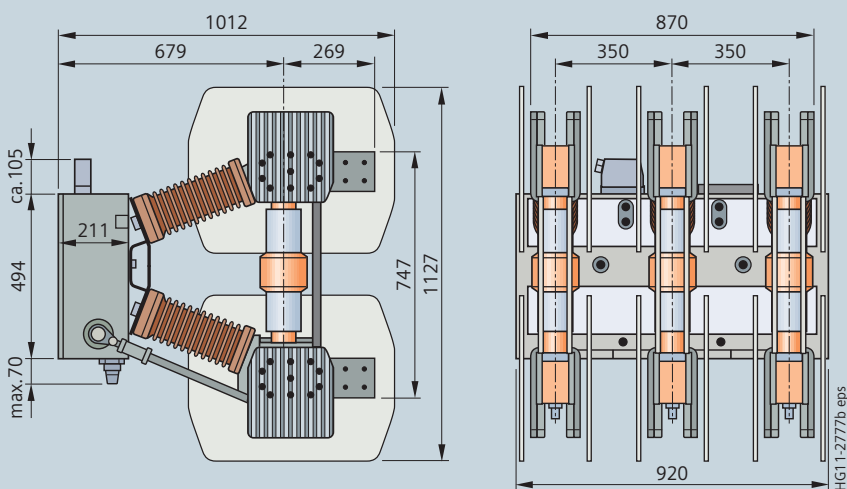
Dimension drawings for 24, 36 and 40.5 kV (continued)



Dimension drawing 8



Dimension drawing 9

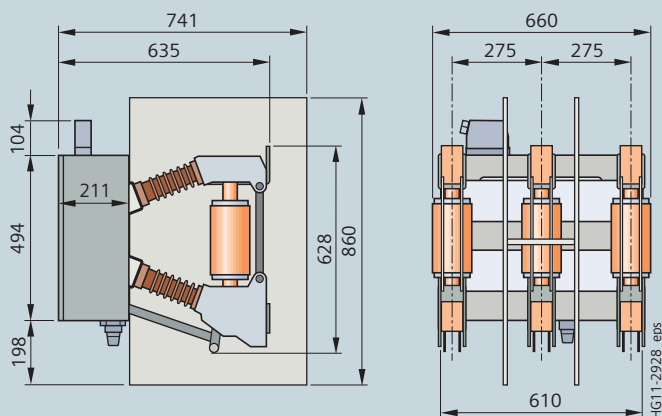


Dimension drawing 10

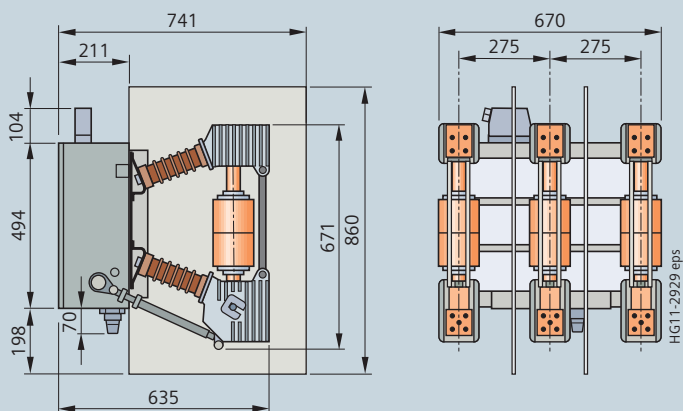
Technical Data

Electrical data, dimensions, weights and dimension drawings

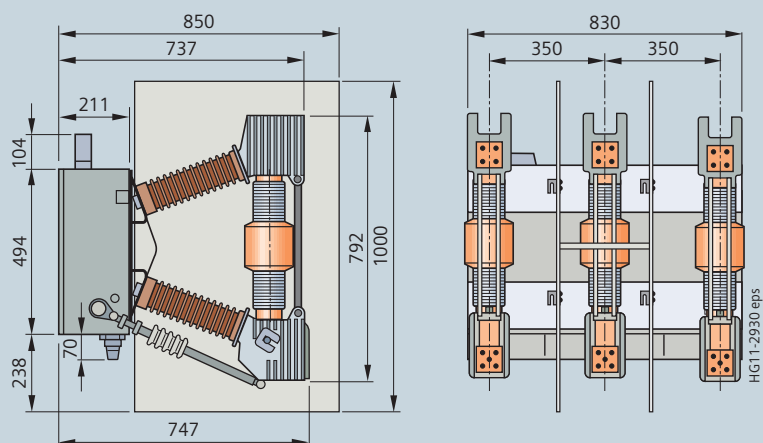
Dimension drawings for 24, 36 and 40.5 kV (continued)



Dimension drawing 11

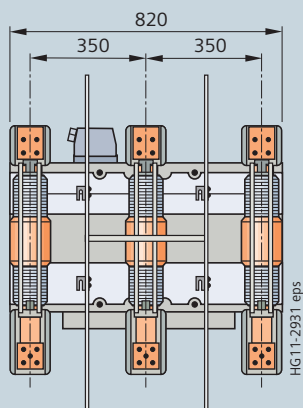
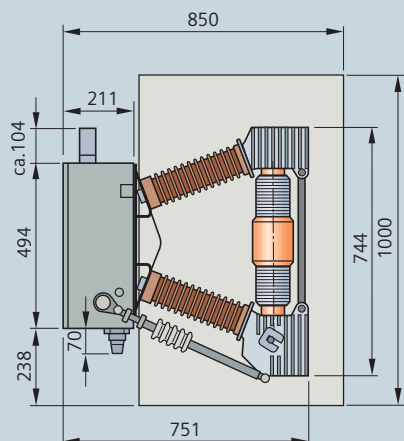


Dimension drawing 12

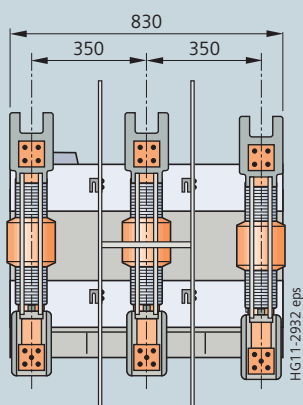
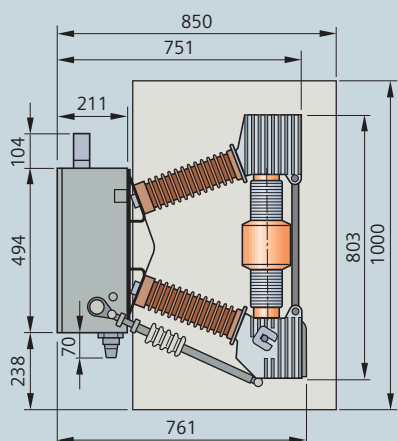


Dimension drawing 13

Dimension drawings for 24, 36 and 40.5 kV (continued)



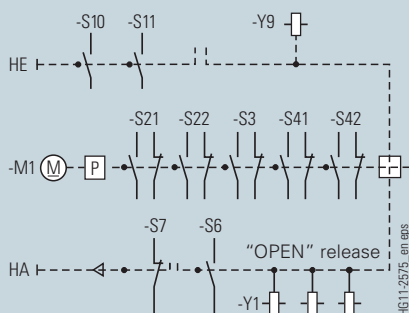
Dimension drawing 14



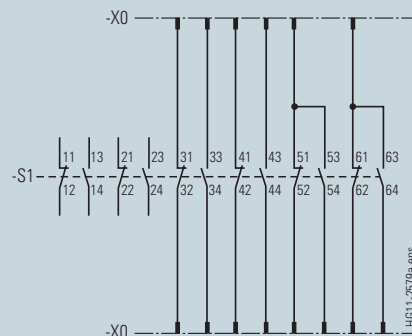
Dimension drawing 15

Circuit diagrams

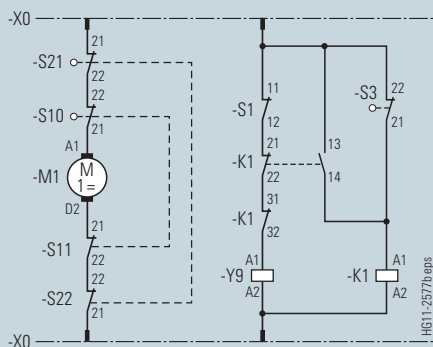
The circuit diagrams shown here are examples from the manifold possibilities of circuit-breaker wiring.



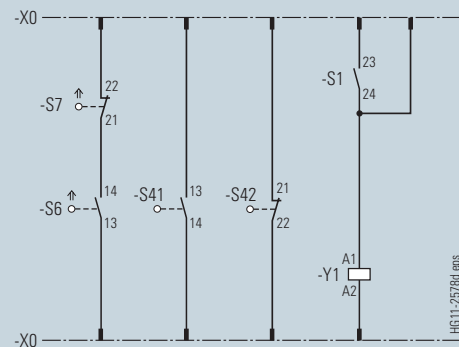
Manual closing – manual opening with auxiliary switch 6 NO + 6 NC



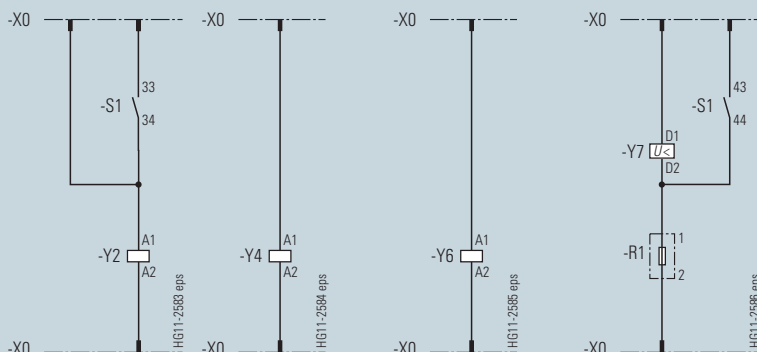
Contacts available for customer with basic circuit-breaker equipment and auxiliary switch 6 NO + 6 NC



Motor operating mechanism with manual mechanical closing



Circuit-breaker tripping signal Signal "closing spring charged" 1st shunt release



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

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

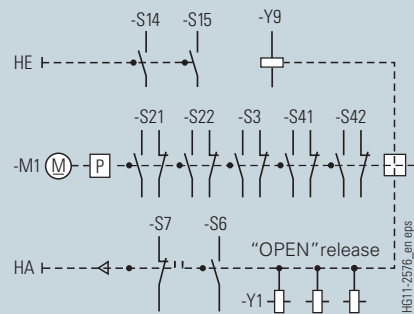
S14, S15 Manual electrical closing
S21, S22 Position switches (to de-energize the motor operating mechanism after charging)
S41, S42 Position switches (to indicate the charging state)

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

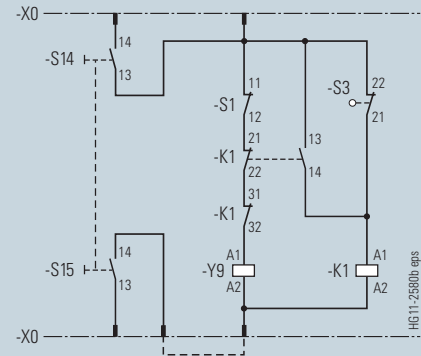
Circuit diagrams (continued)

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

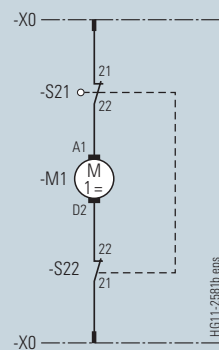
Additional equipment: Motor operating mechanism and auxiliary switch



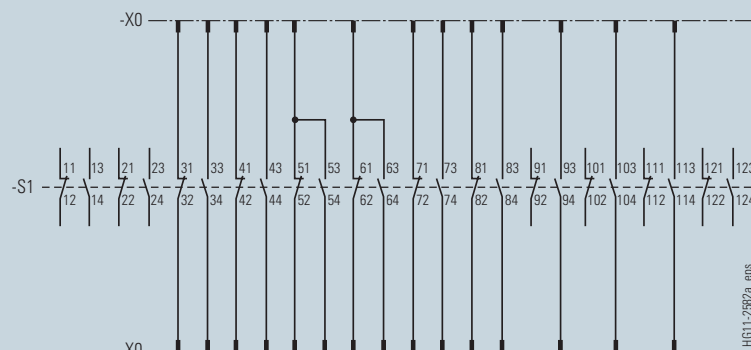
Motor operating mechanism with manual electrical closing



Manual electrical closing
Closing and anti-pumping



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

Technical Data

Operating times, short-circuit protection of motors, consumption data of releases

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 | < 75 ms |
| | 2 nd and 3 rd release | < 70 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 | 100 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 V | Operating voltage | | Power consumption of the motor | | Smallest possible rated current ²⁾ of the m.c.b. (miniature circuit-breaker) with C-characteristic A |
|---------------------------------|-------------------|--------|--------------------------------|------------|-----------------------------------------------------------------------------------------------------------------|
| | max. V | min. V | W (at DC) | VA (at AC) | |
| 24 DC | 26 | 20 | 750 | – | 16 |
| 48 DC | 53 | 41 | 750 | – | 10 |
| 60 DC | 66 | 51 | 750 | – | 6 |
| 110 DC | 121 | 93 | 1000 | – | 4 |
| 220 DC | 242 | 187 | 1000 | – | 2 |
| 110 AC | 121 | 93 | – | 1000 | 6 |
| 230 AC | 244 | 187 | – | 1000 | 3 |

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) 3AX11 01 | 60 | 60 | 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 A 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

R-HG11-181.tif



Switchgear Factory, Berlin, Germany

R-HG11-180.eps

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

Annex

Inquiry form

Please copy, fill in and return to your Siemens partner.

Inquiry concerning

☐ 3AH4 circuit-breaker

Please

- ☐ Submit an offer
☐ Call us
☐ Visit us

Your address

Company

Dept.

Name

Street

Postal code/city

Country

Phone

Fax

E-mail

4

Siemens AG

Dept.

Name

Street

Postal code/city

Country

Fax

Technical data

| | Other values | | | |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------|
| Rated voltage | <input type="checkbox"/> 12 kV <input type="checkbox"/> 36 kV | <input type="checkbox"/> 17.5 kV <input type="checkbox"/> 40.5 kV | <input type="checkbox"/> 24 kV | <input type="checkbox"/> ___ kV |
| Rated lightning impulse withstand voltage | <input type="checkbox"/> 75 kV <input type="checkbox"/> 170 kV | <input type="checkbox"/> 95 kV <input type="checkbox"/> 185 kV | <input type="checkbox"/> 125 kV <input type="checkbox"/> 195 kV | <input type="checkbox"/> ___ kV |
| Rated short-duration power-frequency withstand voltage | <input type="checkbox"/> 28 kV <input type="checkbox"/> 50 kV <input type="checkbox"/> 85 kV | <input type="checkbox"/> 36 kV <input type="checkbox"/> 60 kV <input type="checkbox"/> 95 kV | <input type="checkbox"/> 38 kV <input type="checkbox"/> 70 kV | <input type="checkbox"/> ___ kV |
| Rated short-circuit breaking current | <input type="checkbox"/> 25 kA | <input type="checkbox"/> 31.5 kA | <input type="checkbox"/> 40 kA | <input type="checkbox"/> ___ kA |
| Rated normal current | <input type="checkbox"/> 1250 A <input type="checkbox"/> 3150 A | <input type="checkbox"/> 2000 A <input type="checkbox"/> 4000 A | <input type="checkbox"/> 2500 A | <input type="checkbox"/> ___ A |
| Pole-centre distance | <input type="checkbox"/> 210 mm | <input type="checkbox"/> 275 mm | <input type="checkbox"/> 350 mm | |

Secondary equipment

For possible combinations see pages 16 to 23

| | |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Circuit-breaker equipment | <input type="checkbox"/> Manual mechanical closing <input type="checkbox"/> Manual electrical closing |
| 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 |
| 3 rd 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

You prefer to configure your 3AH4 vacuum circuit-breaker on your own?

Follow the steps to the configuration and enter the order number in the configuration aid.

Or you may also use our online configuration tool on our homepage:

<https://mall.industry.siemens.com/mall/en/de/Catalog/Configurators>

Instruction for configuration of the 3AH4 vacuum circuit-breaker

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

| Please specify the following ratings: | Possible options: |
|------------------------------------------------------------------|---------------------------|
| Rated voltage (U_r) | U_r : 12 kV to 40.5 kV |
| Rated lightning impulse withstand voltage (U_p) | U_p : 75 kV to 195 kV |
| Rated short-duration power-frequency withstand voltage (U_d) | U_d : 28 kV to 95 kV |
| Rated short-circuit breaking current (I_{sc}) | I_{sc} : 25 kA to 40 kA |
| Rated normal current (I_r) | I_r : 1250 A to 4000 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 16 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 |
| Operating voltage of the motor (position 14) | 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? (see pages 24 and 25)

Your Siemens sales partner will be pleased to support you.

For configuration of your
3AH4 vacuum circuit-breaker

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Published by
Siemens AG 2018

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Article No. EMMS-K1511-A041-A6-7600
Printed in Germany
Dispo 18301
PU 184/367 KG 09.18 0.4

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