

**SIEMENS**



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HG11.07  
Edition  
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## SION Lateral 3AE6 Vacuum Circuit Breaker with Lateral Operating Mechanism Medium-Voltage Equipment



# SION 3AE6

## Vacuum Circuit Breaker

Medium-Voltage Equipment  
Catalog Abridged HG 11.07 · 2017

First edition

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

**Description**

General information

Vacuum Circuit Breaker for Lateral Installation

## SION 3AE6 Lateral vacuum circuit breakers from 12 kV to 24 kV

SION vacuum circuit breakers control all switching operations in medium-voltage distribution systems and are suitable for installation in all established and new air-insulated medium-voltage switchgear as well as for retrofitting existing switchgear. They are applicable for operation of e.g. overhead lines, cables, transformers, capacitors and motors. The optional installation accessories enable easy integration into switchgear panels.

3AE61 SION Lateral for 12 kV



Thanks to a range of equipment options, SION vacuum circuit breakers can be precisely tailored to your requirements.

Our comprehensive range of lateral circuit breakers offers a wide selection of pole-center distances as well as various equipment options for voltage levels from 12 kV to 24 kV. Compact dimensions and well-protected terminals enable simple integration into commonly used medium-voltage switchgear. High reliability and availability are a matter of course, as are 10,000 maintenance-free operating cycles.

3AE63 SION Lateral for 24 kV



HG11-07\_3AE63.tif

## Switching medium

Proven and fully developed for more than 40 years, vacuum switching technology is the principal arc-quenching element used in vacuum interrupters.

## Pole assemblies

The pole assemblies consist of vacuum interrupters and pole shells. The vacuum interrupters are air-insulated and freely accessible. The pole assemblies are fixed on the mechanism mounting plate and supported by means of the pole shell (6). The vacuum interrupter (5) is mounted rigidly to the upper interrupter support. The lower part of the interrupter is guided into the lower interrupter support, allowing axial movement. The pole shell (6) absorbs external forces resulting from switching operations and the contact pressure.

## Operating mechanism

The whole operating mechanism with motor (13), releases, indicators and actuating devices is mounted on the mechanism mounting plate (9). This compact design enables very fast operating times.

The circuit breaker operating mechanism is a stored-energy spring mechanism. The force is transmitted from the operating mechanism to the pole assemblies via operating levers. The closing spring (12) can be charged either electrically or manually, and latches in automatically when charging is complete. The closing spring (12) acts as a stored-energy mechanism.

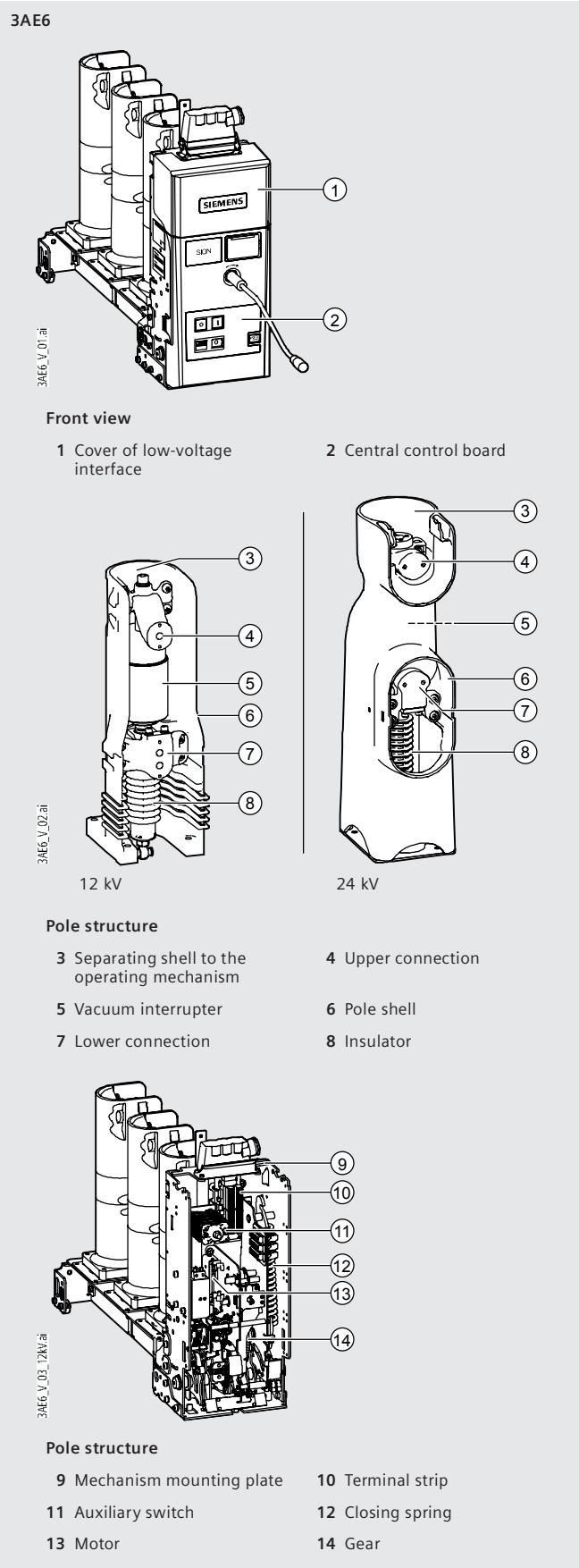
To close the breaker, the closing spring (12) can be unlatched either mechanically at the device (ON pushbutton), or electrically by remote control. The closing spring (12) charges the opening and/or contact-pressure springs as the breaker closes. The now discharged closing spring (12) will be charged again automatically by the motor (13).

In this way, the stored-energy mechanism stores the OPEN – CLOSE – OPEN operating sequence that is required for an auto-reclosing operation on the system side. All stored-energy mechanisms perform the switching duties of synchronizing, rapid load transfer, and auto-reclosing.

## Trip-free mechanism

The circuit breakers have a trip-free mechanism. 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. However, the vacuum circuit breaker contacts are momentarily in the closed position.

For charging the closing spring (12), the motor (13) operates in short-time duty. Therefore the voltage and power consumption might differ from the data of the motor rating plate.



## Description

Construction and mode of operation

### Releases

A release is a device which transfers electrical commands from an external source, such as a control room, to the latching mechanism of the vacuum circuit breaker so that it can be opened or closed. The releases are designed for short-time duty up to 1 minute and are reset internally.

The various types of releases available are described in detail below:

#### Closing solenoid

The closing solenoid unlatches the charged closing spring of the vacuum circuit breaker, closing it by electrical means.

#### Shunt releases

Shunt releases are used for automatic tripping of the circuit breaker 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).

#### Current-transformer-operated releases

Current-transformer-operated releases consist of a stored energy mechanism, an unlatching mechanism and an electromagnet system. They are used when there is no external source of auxiliary power (e.g. a battery). Tripping is effected by means of a protection relay (e.g. overcurrent time protection) acting on the current-transformer-operated release.

#### Undervoltage releases

Undervoltage releases consist of a stored-energy mechanism, an unlatching mechanism and an electromagnet system which is permanently connected to the secondary or auxiliary voltage while the 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.

A maximum of two releases can be equipped in accordance with page 13. The consumption data of the releases is listed on page 28.

### **Closing and anti-pumping**

In the standard version, the circuit breakers can be closed electrically via remote. In addition, they can be mechanically closed locally by direct unlatching of the closing spring. If constant electrical signals for CLOSE and OPEN commands are present at the circuit breaker at the same time, the circuit breaker will carry out an OPEN-CLOSE-OPEN or a CLOSE-OPEN operating sequence. A new CLOSE command is given only following a brief interruption of the closing signal. This prevents continuous closing and opening (= "pumping") operations.

### **Closing spring charged indication**

The circuit breakers have a mechanically operated spring charged indicator. The charging status of the closing spring can also be queried electrically by means of an integrated position switch.

### **Circuit breaker tripping signal**

During electrical opening, the NO contact S6 makes brief contact. This is often used to operate a hazard warning system which should respond to automatic tripping of the circuit breaker. In case of local control, the NO contact S6 does not close.

For the corresponding circuit diagrams, refer to page 29.

### **Interlocking**

#### Mechanical interlocking

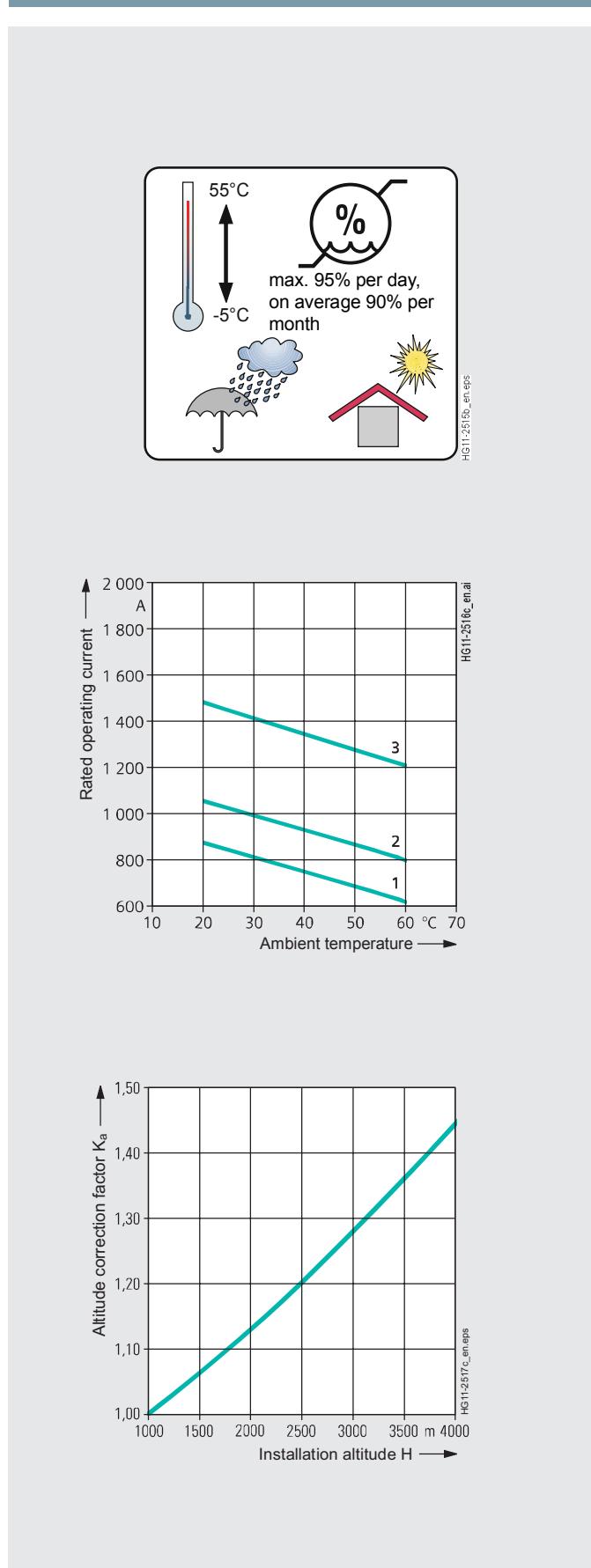
At the interface of the mechanical interlocking of the circuit breaker, sensors on the switchgear side can check the switch position and prevent the associated disconnector from being operated while the circuit breaker is closed. The system also prevents the circuit breaker from being closed while the associated disconnector is in the fault position.

#### Electrical interlocking

The auxiliary and signaling contacts which show the switch position of the circuit breaker electrically can be integrated into the switchgear interlocking concept in order to prevent impermissible switching sequences.

### **Low-voltage interface**

The removable cover of the SION 3AE6 vacuum circuit breakers enables easy access to the low-voltage interface. All customer-side control and signaling options are concentrated here.



## Description

Standards and maintenance-free design

### Standards

The circuit breakers conform to the following standards:

- IEC 62271-1
- IEC 62271-100

All circuit breakers fulfill the endurance classes C2, E2, M2 and S1 according to IEC 62271-100.

**For class C2, all circuit breakers fulfill the following values acc. to IEC 62271-100.**

	Line	Cable	Capacitors	Back-to-back capacitor bank	
Rated voltage $U_r$ kV, r.m.s.	Rated line-charging breaking current $I_l$ A, r.m.s.	Rated cable-charging breaking current $I_c$ A, r.m.s.	Rated single-capacitor- bank breaking current $I_{sb}$ A, r.m.s.	Rated back-to-back-capacitor- bank breaking current $I_{bb}$ A, r.m.s.	Frequency of the inrush current $f_{bi}$ Hz
12	10	25	400	400	4250
24	10	31.5	400	400	4250

### Maintenance-free design

The circuit breakers are maintenance-free:

- Under normal ambient conditions according to IEC 62271-1
- Up to 10,000 operating cycles
  - no regreasing
  - no readjusting

The ratings are independent within their tolerances of the switching frequency or standing times without switching.

**Product range overview**

Type	Rated voltage kV	Rated short-circuit breaking current kA	Rated operating current A	Pole-center distance (in mm)				
				150	210	230	250	300
				Width across flats (in mm)				
Type	kV	kA	A	150	210	230	250	300
3AE6	12	16	630/800/1250	■	■	■	■	
		20	630/800/1250	■	■	■	■	
		25	630/800/1250	■	■	■	■	
	24	16	630/800/1250		■	■	■	■
		20	630/800/1250		■	■	■	■
		25	630/800/1250		■	■	■	■

Note: The circuit breaker is available with various installation accessories. These versions can be configured on the following pages.

**Basic equipment**

Equipment	Minimum equipment	Alternative equipment	Remarks
Operating mechanism	Electrical operating mechanism	-	Also for manual operation
Closing	Closing solenoid and mechanical manual closing	-	-
1st release	Shunt release	-	-
2nd release	None	Shunt release, undervoltage release, c.t.-operated release	Maximum of two releases possible
Varistor circuit	Standard for $\geq 60$ V DC	-	For limiting switching overvoltages
Auxiliary switch	6 NO + 6 NC	12 NO + 12 NC	-
Plug connection	20-pole terminal strip	24-pole plug connector 64-pole plug connector	12 NO + 12 NC not available with 24-pole plug
Anti-pumping	Available	-	-
Circuit breaker tripping signal	None	Possible	-
Operation cycles counter	Available	-	-
Mechanical interlocking	None	Key-operated interlocking Mechanical interlocking	Interlock to prevent reclosing
Insertion aid	None	Wheels	-
Cover	Plastic cover	Metal cover	-

## Device selection

Ordering information and configuration example

### Article number structure

The circuit breakers consist of a primary and a secondary part. 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. The relevant data makes up the 16-digit article number.

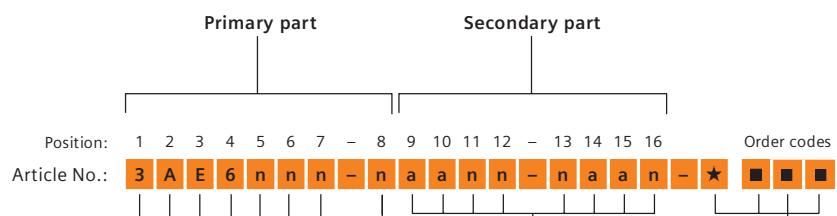
### Order codes

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

### Special versions (★)

In case of special versions, "**-Z**" is added to the article 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 with us. The consultation must take place directly between your sales partner and the order processing department at Siemens.

a: letter	n: digit
1st position	Superior group Switching devices
2nd position	Main group Circuit breaker
3rd position	Subgroup Circuit breaker type series
4th position	Circuit breaker version
5th position	Rated voltage from 12 kV to 24 kV
6th position	Pole-center distance/Width across flats
7th position	Rated short-circuit breaking current from 16 kA to 25 kA
8th position	Rated operating current from 630 A to 1250 A
9th to 16th position	Secondary equipment, operating mechanism, releases, operating voltages and other auxiliary equipment



#### Order codes

Groups of 3 after the article number  
Format: a n a

#### Special versions (★)

Initiated with "**-Z**"  
Groups of 3 after the article number  
Format: a n n





## Vacuum Circuit Breaker for Lateral Installation

## Device selection

Additional equipment for 3AE6 circuit breakers



Rated voltage $U_r$ kV	Rated lightning impulse voltage $\overline{U}_p$ kV	Rated short-time AC withstand voltage $\overline{U}_d$ kV	Rated short-circuit breaking current $I_{sc}$ kA	Rated short-circuit making current (at 50/60 Hz) $I_{ma}$ kA	Pole-center distance mm	Width across flats mm	Terminals left/right	Rated operating current $I_r$ A	Order codes
24	125	50	25	63 / 65	300	237.5	R	630	3 A E 6
			L		300	237.5	L	630	3 A E 6
			R		300	237.5	R	800	3 A E 6
			L		300	237.5	L	800	3 A E 6
			R		300	237.5	R	1250	3 A E 6
			L		300	237.5	L	1250	3 A E 6

Special versions  $U_d = 65$  kV for 24 kV devices

- Z E 6 5

## 9th position

Release combination<sup>1)</sup>

1st shunt release	2nd shunt release	Undervoltage release	Current-transformer-operated release 0.5 A <sup>2)</sup>	Current-transformer-operated release 1.0 A <sup>2)</sup>	Current-transformer-operated release with tripping pulse $\geq 0.1$ Ws (10 $\Omega$ )	Current-transformer-operated release with tripping pulse $\geq 0.1$ Ws (20 $\Omega$ )	Order codes
I							3 A E 6
	II						A
					II		B
						II	C
							D
							G
							H
							F

I = position of first release

II = position of second release

<sup>1)</sup> Operating voltage is selected at positions 11 + 22<sup>2)</sup> Special version with 5 A c.t.-operated release can be ordered with order code A49

- Z A 4 9

## 10th position

## Operating voltage of the closing solenoid

Standard voltages	Order codes
None	A
24 V DC	B
48 V DC	C
60 V DC	D
110 V DC	E
220 V DC	F
100 V AC 50/60 Hz <sup>3)</sup>	H
110 V AC 50/60 Hz <sup>3)</sup>	J
230 V AC 50/60 Hz <sup>3)</sup>	K
30 V DC	M
32 V DC	N
120 V DC	P
125 V DC	Q
127 V DC	R
240 V DC	S
120 V AC 50/60 Hz <sup>3)</sup>	U
125 V AC 50/60 Hz <sup>3)</sup>	V
240 V AC 50/60 Hz <sup>3)</sup>	W

<sup>3)</sup> The AC frequency 50 or 60 Hz is selected at the 16th position of the article number together with the language (see page 16)

**Device selection**

Additional equipment for 3AE6 circuit breakers

11th position Operating voltage of the 1st release		1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	Order codes
Standard voltages		3	A	E	6	■	■	■	-	■	■	■	■	■	-	■	■	■	■	
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 <sup>1)</sup>															6					
110 V AC 50/60 Hz <sup>1)</sup>															7					
230 V AC 50/60 Hz <sup>1)</sup>															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 <sup>1)</sup>															9		L 1 K			
125 V AC 50/60 Hz <sup>1)</sup>															9		M 1 L			
240 V AC 50/60 Hz <sup>1)</sup>															9		M 1 M			
12th position Operating voltage of the 2nd release																0				
Standard voltages																				
None 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 <sup>1)</sup>																6				
110 V AC 50/60 Hz <sup>1)</sup>																7				
230 V AC 50/60 Hz <sup>1)</sup>																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 <sup>1)</sup>																9		L 1 K		
125 V AC 50/60 Hz <sup>1)</sup>																9		M 1 L		
240 V AC 50/60 Hz <sup>1)</sup>																9		M 1 M		

<sup>1)</sup> The AC frequency 50 or 60 Hz is selected at the 16th position of the article number together with the language (see page 16)

13th position Attachment of wheels																			Order codes
	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	Order codes
Transport/movement wheels	3	A	E	6	■	■	■	-	■	■	■	■	■	-	■	■	■	■	★
No movement wheels																			0
With movement wheels																			1
14th position Operating voltage of the drive motor																			Order codes
	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	Order codes
Standard voltages	3	A	E	6	■	■	■	-	■	■	■	■	■	-	■	■	■	■	★
No motor																			A
24 V DC																			B
48 V DC																			C
60 V DC																			D
110 V DC																			E
220 V DC																			F
100 V AC 50/60 Hz <sup>1)</sup>																			H
110 V AC 50/60 Hz <sup>1)</sup>																			J
230 V AC 50/60 Hz <sup>1)</sup>																			K
30 V DC																			M
32 V DC																			N
120 V DC																			P
125 V DC																			Q
127 V DC																			R
240 V DC																			S
120 V AC 50/60 Hz <sup>1)</sup>																			U
125 V AC 50/60 Hz <sup>1)</sup>																			V
240 V AC 50/60 Hz <sup>1)</sup>																			W
<sup>1)</sup> AC voltage refers to the low-voltage equipment																			
15th position Interlocking, auxiliary switch, low-voltage interface																			Order codes
	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	Order codes
Auxiliary switch	3	A	E	6	■	■	■	-	■	■	■	■	■	-	■	■	■	■	★
Mechanical interlocking																			see page 16
6 NO + 6 NC	■																		B
12 NO + 12 NC		■																	D
Circuit breaker tripping signal			■				■												F
20-pole terminal strip				■															H
24-pole plug connector					■														K
64-pole plug connector						■													M
																			R
																			Q
	■	■																	A
	■	■																	C
	■	■																	E
	■	■																	G
	■	■																	J
	■	■																	L
	■	■																	N
	■	■																	P

**Device selection**

Additional equipment for 3AE6 circuit breakers

**16th position**

**Language version of the operating instructions and rating plate, as well as AC voltage frequency of the operating voltages<sup>1)</sup>**

Language selection				Frequency selection		1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	-	★	Order codes
German	English	French	Spanish	50 Hz DC or AC	60 Hz																					
■				■																					0	
■					■																				1	
	■					■																			2	
		■					■																		3	
			■					■																	4	
				■					■																5	
					■					■															6	
						■					■														7	
<b>Special versions</b>																										
Portuguese, 50 Hz / DC																										
Portuguese, 60 Hz																										
Italian, 50 Hz / DC																										
Russian, 50 Hz / DC																										
Polish, 50 Hz / DC																										
Other languages on request																										

<sup>1)</sup> AC voltage refers to the low-voltage equipment**Additional equipment**

Options	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	-	★	Order codes
Wire ends with marking at the plug connector																					Z A 0 5
Wiring cables halogen-free and flame-retardant																					Z A 1 0
Wiring cables tinned																					Z A 1 2
Anti-condensation heating for 110 V AC, 50 W																					Z A 2 9
Anti-condensation heating for 230 V AC, 50 W																					Z A 3 0
Circuit breaker for operation at ambient air temperatures down to -25 °C																					Z A 4 0
Without upper part of plug																					Z B 2 3
Without supplementary equipment																					Z B 2 4
Rated short-time AC withstand voltage $U_d = 42 \text{ kV}$																					Z E 1 3
Rated short-time AC withstand voltage $U_d = 65 \text{ kV}$																					Z E 6 5
Routine test certificate enclosed																					Z F 2 0
Hand crank (for manual charging of the closing spring) (scope of supply: one hand crank per circuit breaker)																					Z F 3 0
Metal cover																					Z J 1 9
Switch-off interlocking																					Z J 5 5
Key-operated interlocking																					Z J 6 0
Other special versions not listed here (following consultation with order processing department at Berlin switchgear factory) specified additionally in plain text																					Z Y 9 9

## Ordering information for accessories and spare parts

The article numbers in the spare part overviews are valid for currently manufactured vacuum circuit breakers. 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 parts.

### Retrofitting

When releases/soleenoids are retrofitted, the article numbers of the mounting parts must also be specified.  
For other additional equipment, the required mounting parts are included in the scope of supply.

**Spare parts may only be replaced by qualified personnel.**

## Accessories for the plug connector

Included in the scope of supply of the basic equipment for 3AE6 vacuum circuit breakers:

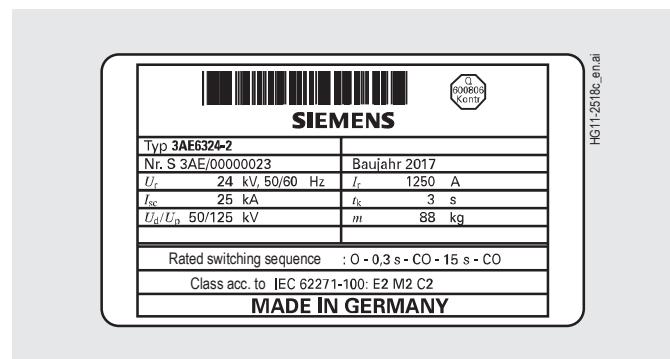
### For 24-pole plug connector

- 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

## Rating plate



### Note:

The following 3 details are necessary for any query regarding spare parts, subsequent deliveries, etc.:

- Type designation
- Serial No.
- Year of manufacture

Designation	Description	Feature	Position: <b>1 – 9</b>	Article No.
<b>Handles</b>	Hand crank for circuit breaker			3AX15 30-4B
<b>Lubricants</b>	180 g of Klüber-Isoflex Topas L32N			3AX11 33-3H
	1 kg of Klüber-Isoflex Topas L32N			3AX11 33-3E
	1 kg Molykote grease			3AX11 33-2L
	1 kg Vaseline, Atlantic			3AX11 33-4A
<b>Covers</b>	Metal cover			3AX14 70-4A
	Plastic cover			3AX14 70-5A

**Device selection**

Accessories and spare parts

Vacuum Circuit Breaker for Lateral Installation

Designation	Description	Feature	Position: 1 – 9	Article No.
Closing solenoid		24 – 32 V DC 48 V DC 60 V DC 110 – 127 V DC 220 – 240 V DC 100/125 V AC, 50/60 Hz 230/240 V AC, 50/60 Hz		3AY14 10-0B 3AY14 10-0C 3AY14 10-0D 3AY14 10-0E 3AY14 10-0F 3AY14 10-0J 3AY14 10-OK
2nd shunt release		24 – 32 V DC 48 – 60 V DC 110 – 127 V DC 220 – 240 V DC 100 – 125 V AC, 50 Hz 230 – 240 V AC, 50 Hz 100 – 125 V AC, 60 Hz 230 – 240 V AC, 60 Hz		3AX11 01-2B 3AX11 01-2C 3AX11 01-2E 3AX11 01-2F 3AX11 01-2G 3AX11 01-2J 3AX11 01-3G 3AX11 01-3J
Mounting parts	For 2nd shunt release			3AX14 11-5A
Current-transformer-operated release	For rated operating current 0.5 A For rated operating current 1 A For tripping impulse $\geq 0.1 \text{ Ws}$ , $20 \Omega$ for 7SJ45 protection relay For rated operating current 5 A incl. rectifier			3AX11 02-2A 3AX11 02-2B 3AX11 04-2B 3AX14 02-2E
Mounting parts	For current-transformer-operated releases			3AX14 11-5A
Undervoltage release		24 V DC 30/32 V DC 48 V DC 60 V DC 110 V DC 120/127 V DC 220 V DC 240 V DC 100 V AC, 50 Hz 110/125 V AC, 50 Hz 230 V AC, 50 Hz 240 V AC, 50 Hz 100 V AC, 60 Hz 110/125 V AC, 60 Hz 230 V AC, 60 Hz 240 V AC, 60 Hz		3AX11 03-2B 3AX11 03-2L 3AX11 03-2C 3AX11 03-2D 3AX11 03-2E 3AX11 03-2N 3AX11 03-2F 3AX11 03-2P 3AX11 03-2G 3AX11 03-2H 3AX11 03-2J 3AX11 03-2M 3AX11 03-3G 3AX11 03-3H 3AX11 03-3J 3AX11 03-3M
Mounting parts	For undervoltage releases			3AX14 13-5A
Drive motor		24/30/32 V DC 48/60 V DC 110 – 127 V DC 100 – 125 V AC 220 – 240 V DC 220 – 240 V AC		3AY14 11-0B 3AY14 11-0C 3AY14 11-0E 3AY14 11-0F

Designation	Description	Feature	Position:	1 – 9
				Article No.
<b>Electronic module</b>		24 – 60 V DC 110 – 240 V DC 100 – 240 V AC		3AY14 20-1B 3AY14 20-1E
<b>PG cable gland</b>				3AX14 58-0A
<b>Anti-condensation heating</b>	Anti-condensation heating for 230 V AC, 50 W Anti-condensation heating for 110 V AC, 50 W			3AX14 57-5A 3AX14 57-5B
<b>Position switches</b>	Type SE4 without mounting accessories Used for: – Electrical anti-pumping (-S3) – Electrical interlocking (-S12) – Motor control (-S21, -S22) – Closing spring charged (-S4) – Circuit breaker tripping signal (-S6)	Quantity		3AX42 06-0A
<b>Auxiliary switches (-S1)</b>	6 NO + 6 NC 12 NO + 12 NC			3SV92 73-2AA0 3SV92 74-2AA0
<b>Accessories for plug connection</b>	Crimp pins (for conductor cross-section 1.5 mm) Crimp pins (for lower part of plug) Crimp sockets (for upper part of plug) Crimping pliers Disassembly tool Plug connector, complete	24-pole 64-pole 64-pole 3AX11 34-4D 3AX11 34-4G 24-pole 64-pole		3AX11 34-3A 3AX11 34-4B 3AX11 34-4C 3AX11 34-4D 3AX11 34-4G 3AX11 34-7A 3AX11 34-6A





**Technical data**

Electrical data, dimensions and masses

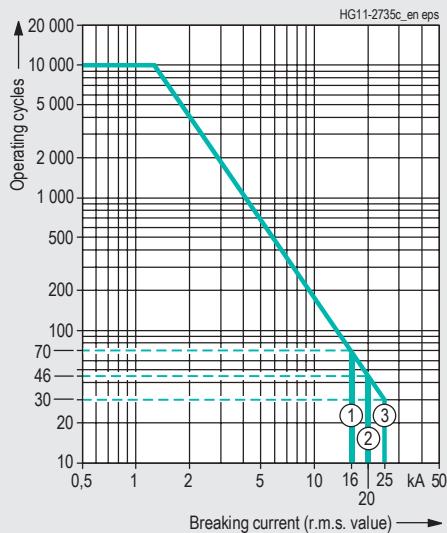
Article No.	12 kV 50/60 Hz												Detailed dimension drawing (must be explicitly requested)				Operating cycle diagram No. (see page 25)		
	Rated operating current $I_r$	Width across flats	Pole-center distance	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration $t_r$	Rated short-circuit breaking current $I_{sc}$	DC share in % of the rated short-circuit breaking current	Asymmetric breaking current	Rated short-circuit making current (at 50/60 Hz) $I_{ma}$	Rated lightning impulse voltage $U_p$	Rated short-time AC withstand voltage $U_d$	Voltage drop $\Delta U$ between the connections (acc. to IEC 62271-1 at 100 A DC)	Minimum creepage distance Interrupters	Minimum creepage distance Phase-to-earth	Minimum clearance Phase-to-phase	Minimum clearance Phase-to-earth	Mass		
	A	mm	mm	s	kA	%	kA	kA	kV	kV	mV	mm	mm	mm	mm	mm	kg		
3AE6133-2	1250	205	250	■	3	20	50	22.4	50/52	75	28	3	93	245	190	129	73	A7E10903020	2
3AE6183-2	1250	205	250	■	3	20	50	22.4	50/52	75	28	3	93	245	190	129	73	A7E10903020	2
3AE6134-0	630	205	250	■	3	25	50	28	63/65	75	28	3	93	245	190	129	73	A7E10903020	3
3AE6184-0	630	205	250	■	3	25	50	28	63/65	75	28	3	93	245	190	129	73	A7E10903020	3
3AE6134-1	800	205	250	■	3	25	50	28	63/65	75	28	3	93	245	190	129	73	A7E10903020	3
3AE6184-1	800	205	250	■	3	25	50	28	63/65	75	28	3	93	245	190	129	73	A7E10903020	3
3AE6134-2	1250	205	250	■	3	25	50	28	63/65	75	28	3	93	245	190	129	73	A7E10903020	3
3AE6184-2	1250	205	250	■	3	25	50	28	63/65	75	28	3	93	245	190	129	73	A7E10903020	3

■ Standard information on rating plate

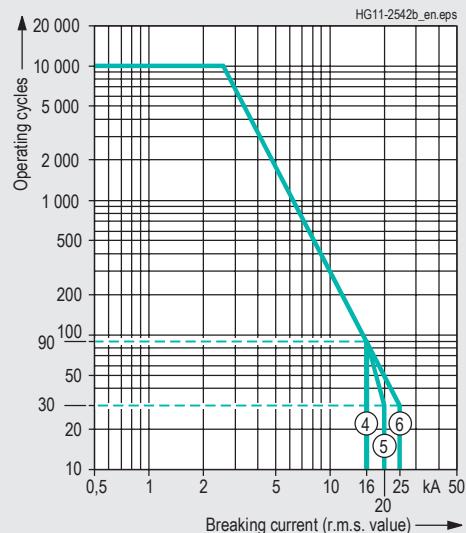
Article No.	24 kV 50/60 Hz												Detailed dimension drawing (must be explicitly requested)				Operating cycle diagram No. (see page 25)		
	Rated operating current $I_r$	Width across flats	Pole-center distance	Rated switching sequence: O – 0.3 s – CO – 15 s – CO	Rated short-circuit duration $t_r$	Rated short-circuit breaking current $I_{sc}$	DC component in % of the rated short-circuit breaking current	Asymmetric breaking current	Rated short-circuit making current (at 50/60 Hz) $I_{ma}$	Rated lightning impulse voltage $U_p$	Rated short-time AC withstand voltage $U_d$	Voltage drop $\Delta U$ between connections (acc. to IEC 62271-1 at 100 A DC)	Minimum creepage distance Interrupters	Minimum creepage distance Phase-to-earth	Minimum clearance Phase-to-phase	Minimum clearance Phase-to-earth	Mass		
	A	mm	mm	s	kA	%	kA	kA	kV	kV	mV	mm	mm	mm	mm	mm	kg		
3AE6312-0	630	237.5	210	■	3	16	50	17.9	40/42	125	50	3	240	250	170	185	70	A7E10903000	4
3AE6362-0	630	237.5	210	■	3	16	50	17.9	40/42	125	50	3	240	250	170	185	70	A7E10903000	4
3AE6312-1	800	237.5	210	■	3	16	50	17.9	40/42	125	50	3	240	250	170	185	87	A7E10903000	4
3AE6362-1	800	237.5	210	■	3	16	50	17.9	40/42	125	50	3	240	250	170	185	87	A7E10903000	4
3AE6312-2	1250	237.5	210	■	3	16	50	17.9	40/42	125	50	3	240	250	170	185	87	A7E10903000	4
3AE6362-2	1250	237.5	210	■	3	16	50	17.9	40/42	125	50	3	240	250	170	185	87	A7E10903000	4
3AE6313-0	630	237.5	210	■	3	20	50	22.4	50/52	125	50	3	240	250	170	185	87	A7E10903000	5
3AE6363-0	630	237.5	210	■	3	20	50	22.4	50/52	125	50	3	240	250	170	185	87	A7E10903000	5





**Operating cycle diagrams for 12 kV**

The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value). All SION vacuum circuit breakers fulfill the endurance classes E2, M2 and C2 according to IEC 62271-100.

**Operating cycle diagrams for 24 kV**

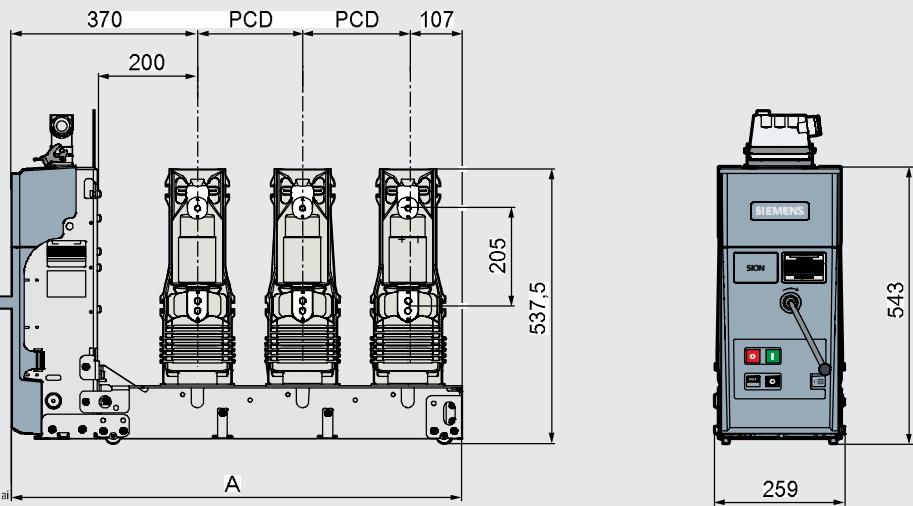
The curve shape beyond the parameters defined in IEC 62271-100 is based on average usage data. The number of operating cycles that can actually be reached can be different depending on the respective application.

## Technical data

Dimension drawings

Vacuum Circuit Breaker for Lateral Installation

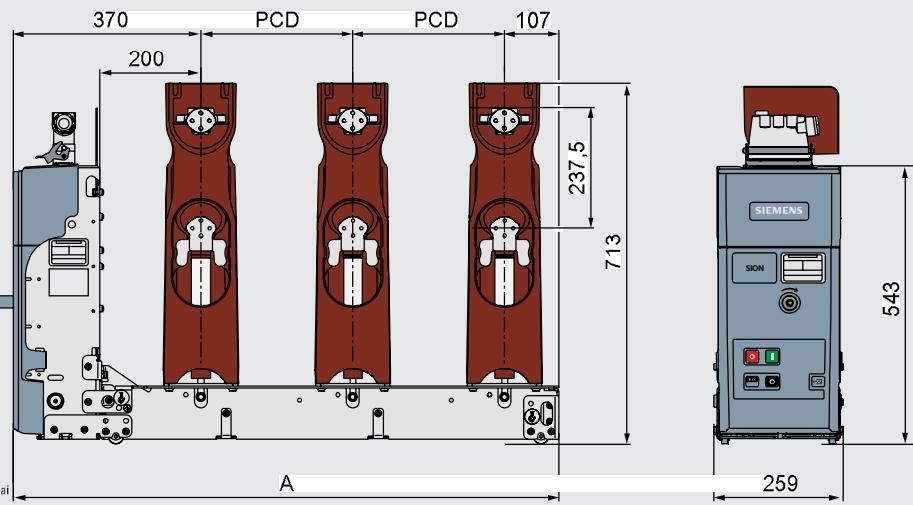
3AE61 for 12 kV



$U_r$ [kV]	$I_{sc}$ [kA]	$I_r$ [A]	PCD [mm]	A [mm]	Mass [kg]	Dimension drawing
12	16/20/25	630/800/1250	150	777	65	A7E10903020
12	16/20/25	630/800/1250	210	897	70	A7E10903020
12	16/20/25	630/800/1250	230	937	72	A7E10903020
12	16/20/25	630/800/1250	250	977	73	A7E10903020

Hinweis: Geringe Abweichungen der Maße sind zulässig / Note: Minor deviations from shown dimensions permitted

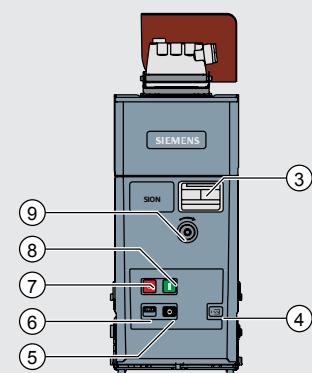
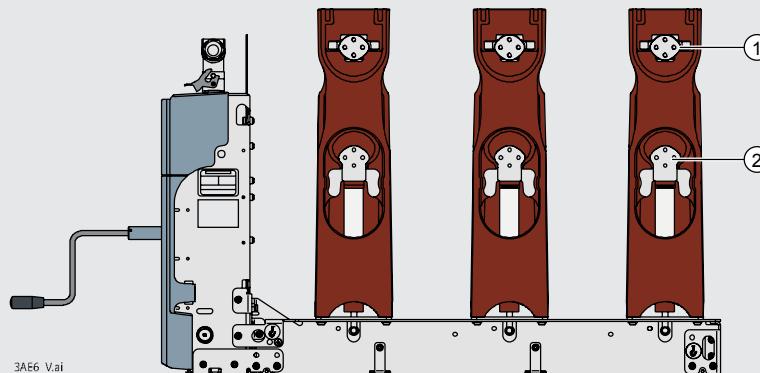
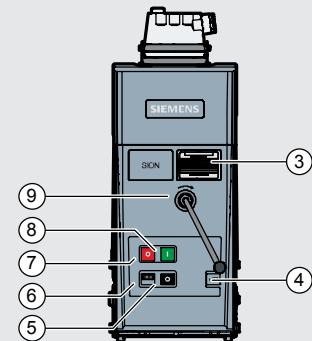
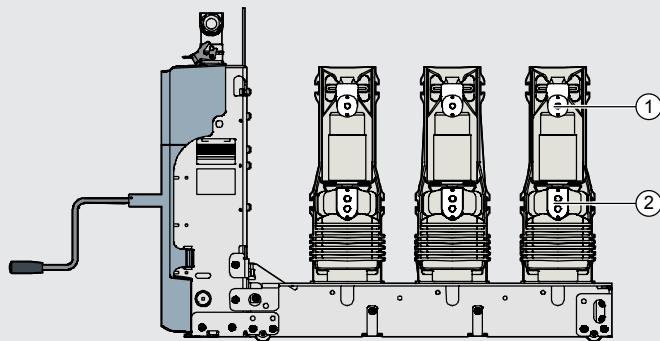
3AE63 for 24 kV



$U_r$ [kV]	$I_{sc}$ [kA]	$I_r$ [A]	PCD [mm]	A [mm]	Mass [kg]	Dimension drawing
24	16/20/25	630/800/1250	210	897	87	A7E10903000
24	16/20/25	630/800/1250	230	937	88	A7E10903000
24	16/20/25	630/800/1250	250	977	88	A7E10903000
24	16/20/25	630/800/1250	300	1077	89	A7E10903000

Hinweis: Geringe Abweichungen der Maße sind zulässig / Note: Minor deviations from shown dimensions permitted

For all other details, please refer to the Catalog SION Vacuum Circuit Breakers 3AE5 and 3AE1, HG11.02



① Anschlussfläche, oben  
Upper terminal

② Anschlussfläche, unten  
Lower terminal

③ Leistungsschild  
Rating plate

④ Anzeige "Gespannt"  
"Charged" indicator

⑤ Schaltstellungsanzeige  
Position indicator

⑥ Schaltspielzähler  
Operation cycles counter

⑦ Druckknopf "AUS"  
"OPEN" pushbutton

⑧ Druckknopf "EIN"  
"CLOSE" pushbutton

⑨ Öffnung für Handkurbel  
Opening for hand crank

#### Allgemeine Angaben / General data:

Bemessung der Stromschienen nach DIN 43 670/671  
Rating of bus bars according to DIN 43 670/671

**Technical data**

Additional technical data

**Operating times and internal times**

Operating times at rated voltage of the secondary circuit	Equipment of circuit breaker	Circuit breaker operating time
Closing time	–	< 60 ms
Opening time	1st shunt release	< 45 ms
	2nd release	< 45 ms
Arcing time	–	< 15 ms
Break time	1st shunt release	< 60 ms
	2nd release	< 60 ms
Dead time	–	300 ms
CLOSE/OPEN contact time	1st shunt release	< 75 ms
	2nd release	< 60 ms
Minimum command duration	Closing solenoid	45 ms
	1st shunt release	40 ms
	2nd release	20 ms
Pulse time for circuit breaker tripping signal	1st shunt release	> 10 ms
	2nd release	> 6 ms
Charging time for electrical operation		< 15 s
Synchronism error between the poles		≤ 2 ms

**Motor short-circuit protection (fuse protection of drive motors)**

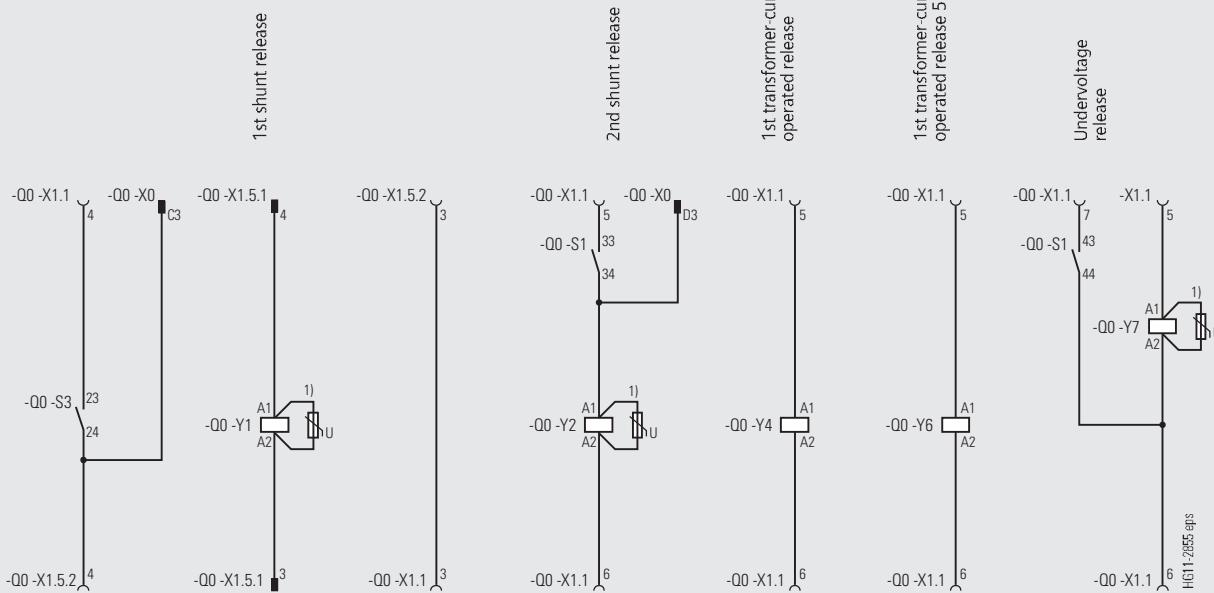
Rated voltage of the motor	Operating voltage		Power consumption of the motor	Smallest possible rated current <sup>1)</sup> of the miniature circuit breaker with C-characteristic	
	V	max. V	min. V		A
24 DC	26	20	140 + -50	2	
48 DC	53	41	110	1	
60 DC	66	51	130	1	
110 DC	121	93	100	0.5	
220 DC	242	187	110	0.315	
110 AC	121	93	170	0.315	
230 AC	244	187	200	0.25	

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

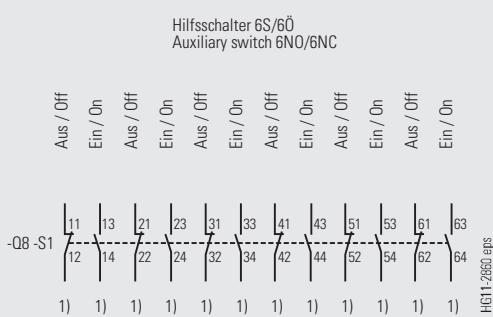
**Release consumption data**

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 3AY14 10	300 – 370	300 – 370	85 to 110 % U	85 to 110 % U
1st shunt release (without stored-energy mechanism) 3AY14 10	300	300	70 to 110 % U	85 to 110 % U
2nd shunt release (with stored-energy mechanism) 3AX11 01	70	50	70 to 110 % U	85 to 110 % U
Undervoltage release 3AX11 03	20	20	35 to 0 % U	35 to 0 % U
Current-transformer-operated release 3AX14 02 (rated operating current 0.5 A, 1 A or 5 A)	–	10 <sup>2)</sup>	–	90 to 110 % $I_a$
Current-transformer-operated release 3AX14 04 (tripping pulse ≥ 0.1 Ws)	–	–	–	–

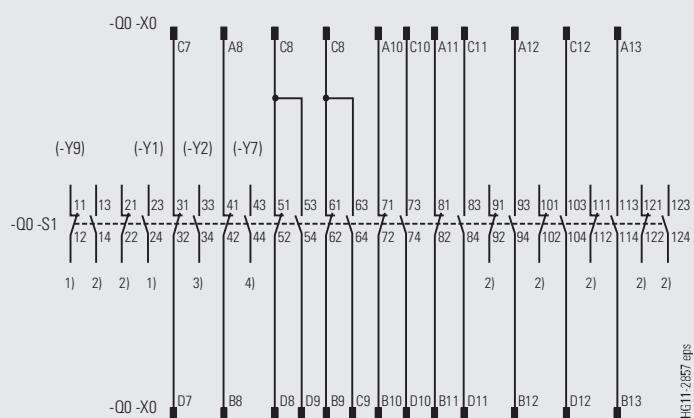
2) Consumption at pickup current (90 % of the rated operating current) and open armature.


**Standard scheme for plug connector**


S\_A7E\_449\_41020\_001 S\_A7E\_449\_41020\_010 S\_A7E\_449\_41020\_002 S\_A7E\_449\_41021\_001 S\_A7E\_449\_41024\_001 S\_A7E\_449\_41023\_001 S\_A7E\_449\_41026\_001  
 Part of basic wiring S\_A7E\_449\_41099\_010 S\_A7E\_449\_41099\_010 HG11-2857 eps

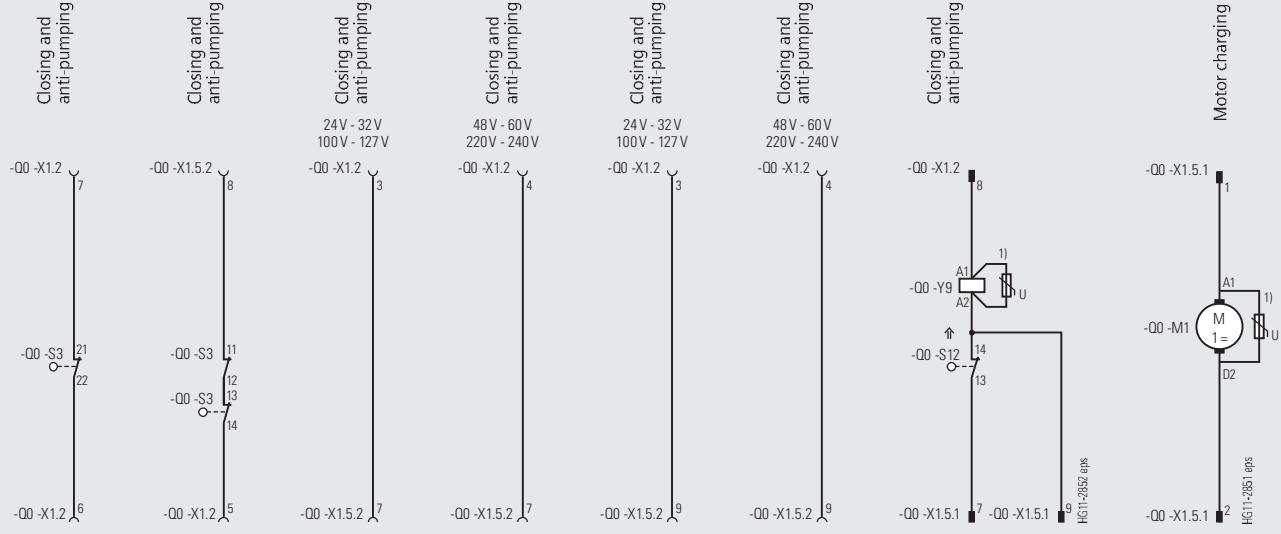
**Contact assignment for auxiliary switch**


S\_A7E\_449\_41066\_401

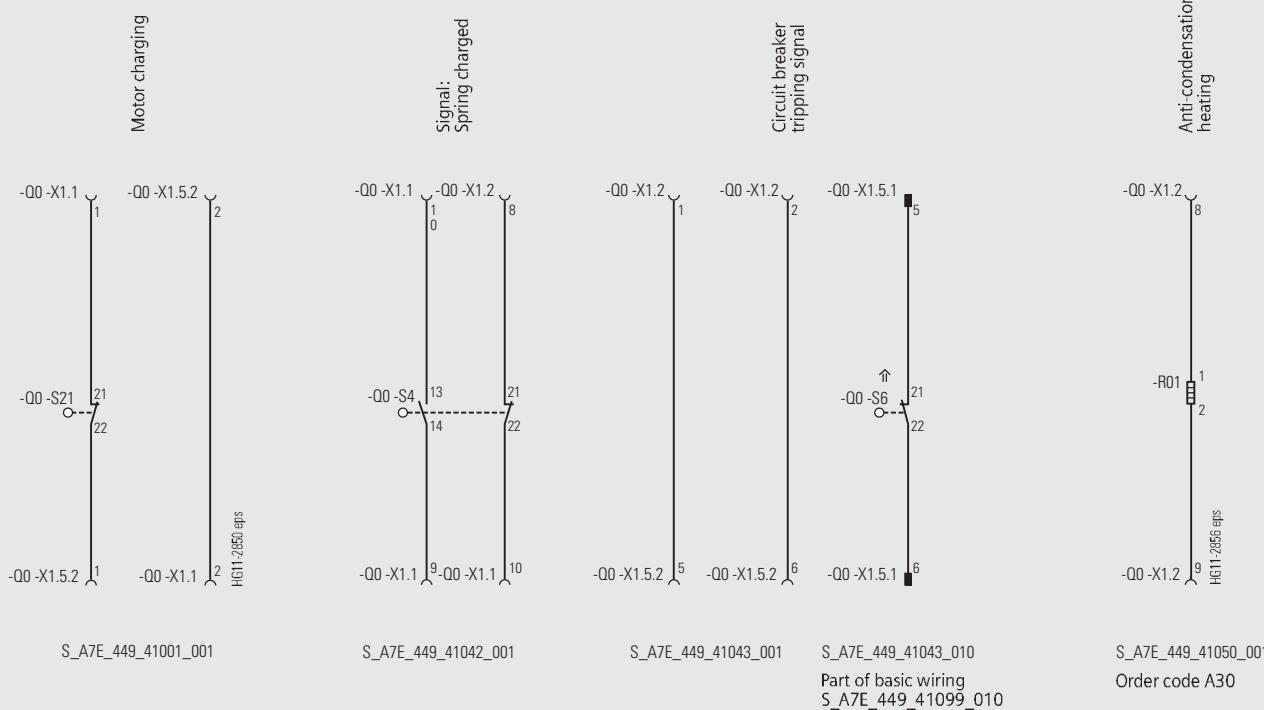


S\_A7E\_449\_41063\_001

**Legend see page 31**


**Additional equipment**


S\_A7E\_449\_41012\_001 S\_A7E\_449\_41012\_002 S\_A7E\_449\_41012\_003 S\_A7E\_449\_41012\_004 S\_A7E\_449\_41012\_005 S\_A7E\_449\_41012\_006 S\_A7E\_449\_41012\_010 Part of basic wiring S\_A7E\_449\_41099\_010  
S\_A7E\_449\_41001\_010 Part of basic wiring S\_A7E\_449\_41099\_010

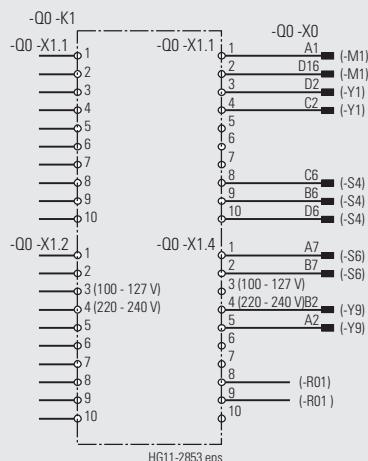
**Additional equipment: Releases**


Legend see page 31



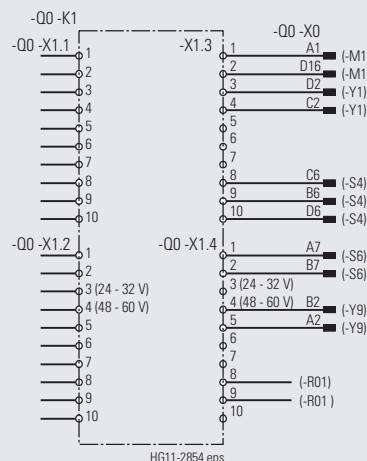
### Additional equipment: Releases

Closing and anti-pumping



S\_A7E\_449\_41012\_051

Closing and anti-pumping



S\_A7E\_449\_41012\_053

#### Legend (for pages 29 to 31)

K1 Contactor (anti-pumping)  
M1 Motor operating mechanism  
Q0 Circuit breaker wiring  
Q1 Wiring of withdrawable part  
R1 Resistance  
S1 Auxiliary switch  
S3 Position switch (anti-pumping)

S4 Position switch (for closing spring charged)  
S5 Electrical closing lock-out  
S6 Circuit breaker tripping signal  
S12 Mechanical interlocking  
S21 Position switches  
S22 (to deenergize the motor operating mechanism after charging)

X0 Plug connector, 24 or 64-pole  
X1 Terminal strip, 27-pole  
Y1 1st shunt release  
Y2 2nd shunt release  
Y4 Current-transformer-operated release (rated operating current 0.5 A or 1 A)

Y6 Current-transformer-operated release (tripping pulse  $W \geq 0.1 \text{ Ws}$ )  
Y7 Undervoltage release  
Y9 Closing solenoid

Abbreviations:  
NC = Normally closed  
NO = Normally open

The circuit diagrams shown here are only examples from the many possible circuit breaker wiring options.

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