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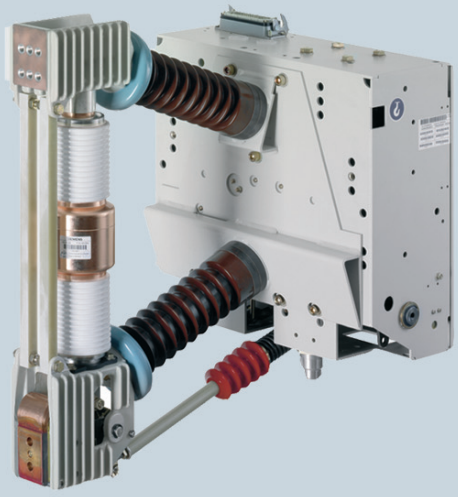

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3AH47 Vacuum circuit breakers

for AC traction power supply

The 3AH47 series vacuum circuit-breakers are 1-pole or 2-pole circuit-breakers for indoor applications suitable for the special requirements and switching duties in AC traction power supply systems.

Features

- Proven vacuum switching technology for reliable switching duties
- Maximum operating safety due to
  - rated short-circuit breaking currents up to 50 kA
  - opening times up to 17 ms
- High number of make-break operations up to 60,000 times
- Maintenance-free up to 10,000 make-break operations
- Compact design

Technical data			
Rated voltage	[kV]	17.5	27.5
Rated frequency	[Hz]	16.7	50 / 60
Rated short duration power frequency withstand voltage	[kV]	≤70	≤105
Rated lightning impulse withstand voltage	[kV]	≤170	≤250
Rated normal current	[A]	≤2,500	≤2,500
Rated short-circuit breaking current	[kA]	≤50	31.5
Number of pole assemblies		1	1 or 2
Weight	[kg]	≤138	≤130
Maximum side altitude above sea level	[m]	1,000*	1,000*
Maximum humidity	[%]	≤95	≤95
Permissible ambient temperature	[°C]	-5...+40	-5...+40

* For altitudes above 1000 m the insulation level must be corrected.

Description

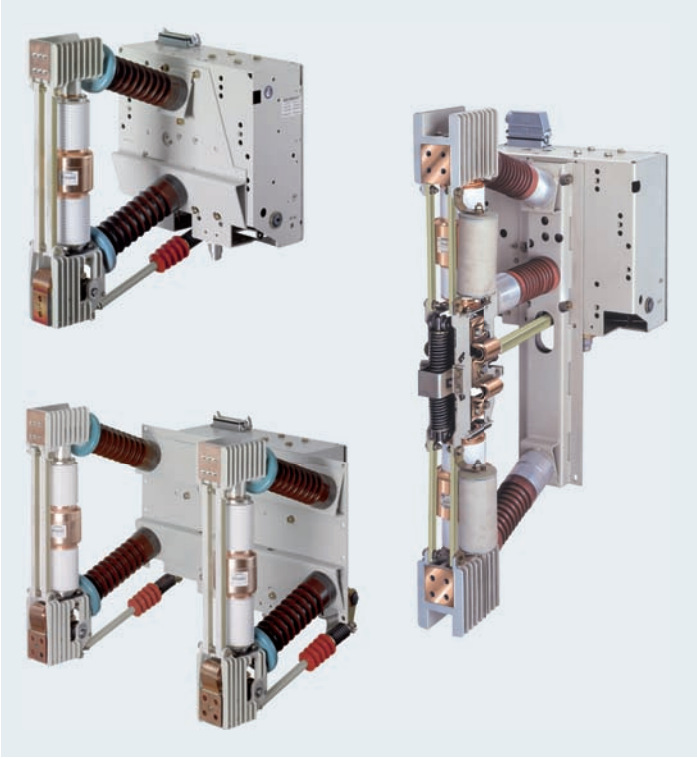
3AH47 vacuum circuit-breakers can be installed cost-effectively in existing as well as in new switchgears. They can be mounted on withdrawable switching trucks and plug-in modules or are also suitable for fixed installation in factory-assembled and expandable switchgear arrangements.

Maintenance
The vacuum interrupters and the operating mechanism are maintenance-free and assure maintenance-free operation without relubrication and without subsequent adjustment throughout the entire equipment life. According IEC 62271-1 this applies to all normal operating conditions up to 10,000 make-break operations both in cases of frequent actuation and after long periods of non-actuation.

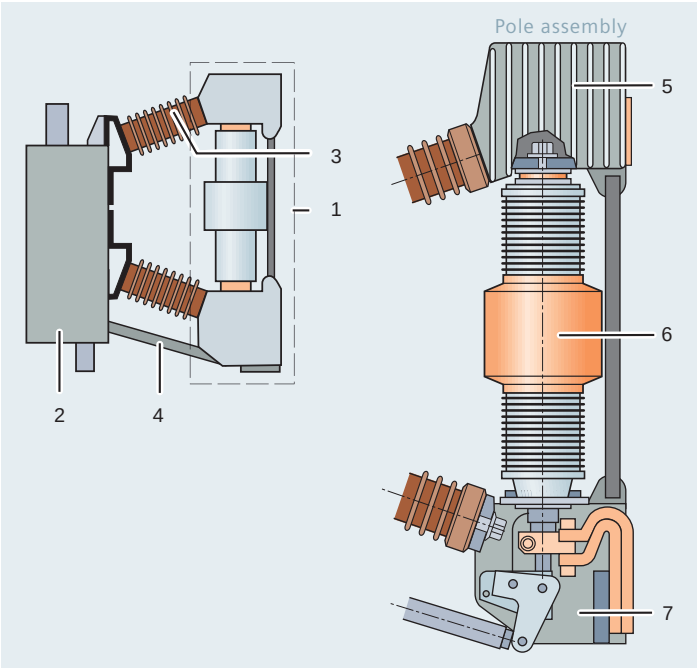
Quality
The constant high quality and precision is achieved through a high degree of automation in production, machine-tool-made parts and due to design characteristics (few aligning places).

Environment
The vacuum circuit-breakers are:
- Environmentally compatible in terms of material selection and manufacturing processes
- Environmentally neutral in operation and during make-break operations
- Easy to dispose at the end of life time

Standards
The vacuum circuit-breakers conform to the following standards (and the previous versions respectively applicable at the time of the type-test):
- IEC 62271-1
- IEC 62271-100
- EN 50152-1
- DIN VDE 0671
- DIN VDE 0115



1-pole and 2-pole vacuum circuit-breaker variants



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

Design of a 1-pole vacuum circuit-breaker

Technical data

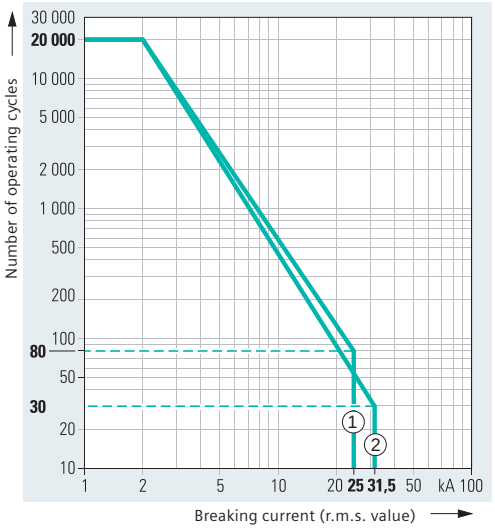
3AH47 Vacuum circuit-breaker (17.5 kV; 16.7 Hz)		54-4	55-4	56-6	57-6	66-6
Rated short duration power frequency withstand voltage	[kV]	50	50	50 / 70*	50	50
Rated lightning impulse withstand voltage	[kV]	125	125	125 / 170*	125	125
Rated normal current	[A]	2,000	2,000	2,500	2,500	2,500
Rated short-circuit breaking current (duration)	[kA]	25 (3 s)	31.5 (3 s)	40 (3 s)	50 (3 s)	40 (3 s)
DC component of short-circuit breaking current	[%]	≤65	≤65	≤65	≤65	≤65
Peak value of rated transient recovery voltage	[kV]	36	36	36	36	36
Rate of rise of transient recovery voltage	[kV/µs]	0.481	0.481	0.481	0.481	0.33
Rated short-circuit making current	[kA]	63	80	100	125	100
Arcing time	[ms]	3 - 33	3 - 33	3 - 33	3 - 33	3 - 35
Rated operating sequence***		O - 3 min - CO - 3 min - CO or O - 15 s - CO				
Number of pole assemblies		1	1	1	1	1
Opening time with instantaneous release	[ms]	<17	<17	<17	<17	<17
Number of the characteristics curve in the operating cycle diagrams**		①	②	③	④	⑦
Weight	[kg]	90	90	138	138	110
Width	[mm]	531	531	531	531	510
Height	[mm]	732	732	1,276	1,276	668
Depth	[mm]	636	636	716	716	640

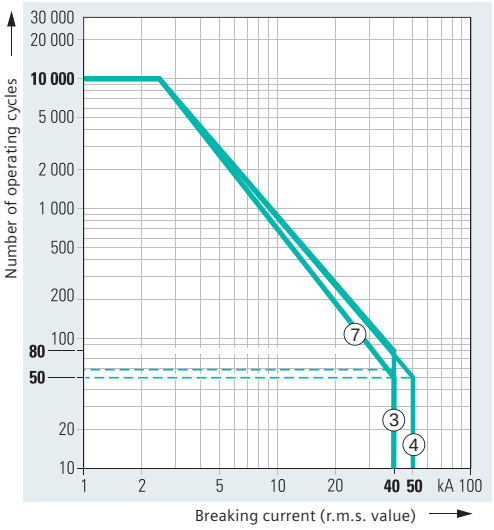
3AH47 Vacuum circuit-breaker (27.5 kV; 50 / 60 Hz)		84-2	84-4	85-6	94-2	94-4
Rated short duration power frequency withstand voltage	[kV]	85 / 95*	85 / 95*	85 / 95*	105	105
Rated lightning impulse withstand voltage	[kV]	185 / 200*	185 / 200*	185 / 200*	250	250
Rated normal current	[A]	1,250	2,000	2,500	1,250	2,000
Rated short-circuit breaking current (duration)	[kA]	25 (3 s)	25 (3 s)	31.5 (3 s)	25 (3 s)	25 (3 s)
DC component of short-circuit breaking current	[%]	≤36	≤36	≤36	≤36	≤36
Peak value of rated transient recovery voltage	[kV]	57	57	57	57	57
Rate of rise of transient recovery voltage	[kV/µs]	0.5	0.5	0.5	0.5	0.5
Rated short-circuit making current	[kA]	63	63	80	63	63
Arcing time	[ms]	3 - 13	3 - 13	3 - 13	3 - 13	3 - 13
Rated operating sequence***		O - 3 min - CO - 3 min - CO or O - 15 s - CO				
Number of pole assemblies		1 or 2	1 or 2	1 or 2	1	1
Number of the characteristics curve in the operating cycle diagrams**		⑤	⑤	⑥	⑤	⑤
Weight	[kg]	95	95	110	130	130
Width (for 1-pole version)	[mm]	534	534	534	531	531
Height (for 1-pole version)	[mm]	732	732	732	1,203	1,238
Depth (for 1-pole version)	[mm]	721	721	721	914	914

* optional ** see last page *** other values on request

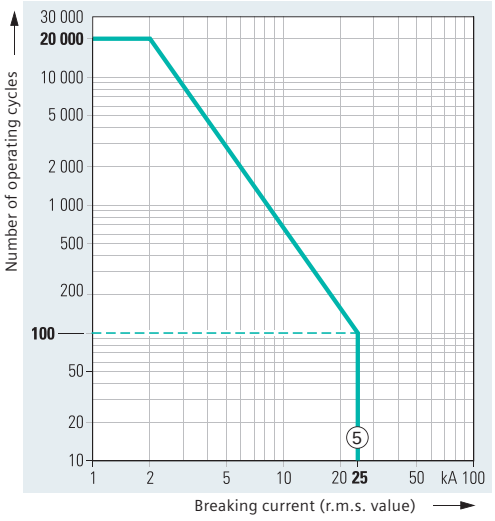
Operating cycle diagrams

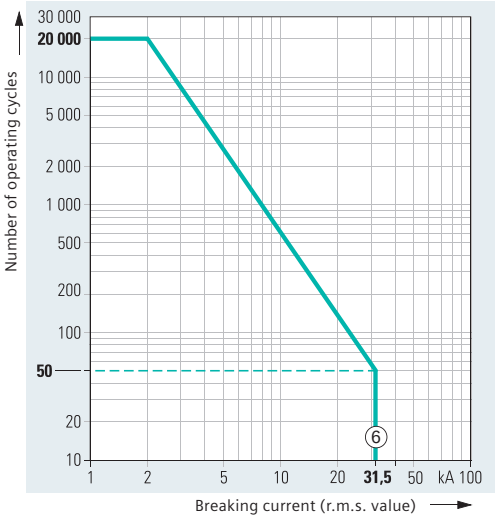
17.5 kV, 1-pole





27.5 kV, 1-pole and 2-pole





The permissible number of electrical operating cycles is shown as a function of the breaking current (r.m.s. value).

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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. If not stated otherwise, we reserve the right to include modifications, especially regarding the stated values and dimensions.