



**SIEMENS**

*Ingenuity for life*

Medium Voltage & Systems

# Vacuum generator circuit-breaker Type HB3

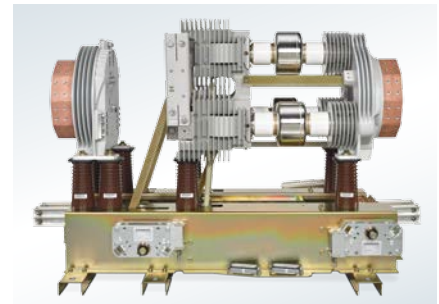
Horizontal busbar,  
single-phase encapsulated

## HB3 generator circuit-breaker switchgear with vacuum switching technology up to 400 MW

Siemens offers a fully customizable stationary type vacuum generator circuit-breaker switchgear tested to IEEE C37.013 standard. Each design is engineered to meet the specific electrical and mechanical application requirements of the project.

### Features and benefits:

- All medium-voltage switching components, including the vacuum generator circuit-breaker, are mounted on a removable, fully integrated, compact switching module for each pole
- Continuous current ratings up to 12,700 A, self-cooled
- Interrupting ratings up to 110 kA
- Maximum design voltage up to 24 kV
- Tested to IEEE C37.013 standard for generator circuit-breakers
- Up to 30 interruptions at rated short-circuit current
- No use of gas for insulation or interruption
- Pair with Siemens protective relays to provide complete generator protection switchgear
- Uses the latest developments in vacuum interrupter axial-magnetic-field (AMF) technology
- Highly reliable vacuum interrupters
  - MTTF over 53,550 years
- Highly reliable spring-drive operating mechanism due to use of common type 3AH3 operator platform
- Over 120,000 type 3AH3 operators produced since 1998 and over 25,000 operators produced per year
- 10,000 continuous current switching operations
- Complete switchgear shipped as one final-assembled unit
- Significantly lower life-cycle costs due to:
  - Reduced inspection and maintenance costs
  - Maintenance-free, stored-energy (spring) operator
- Optional start-up disconnecter for connection to SFC
- Connections to generator and step-up transformer using isolated-phase busbar (not furnished)
- Current and voltage transformers available to suit specifications
- Surge arresters and surge capacitors optionally available.



One pole of type HB3 vacuum generator circuit-breaker



HB3 vacuum generator circuit-breaker switchgear

## Technical data

Rated values and related capabilities	IEEE C37.013 standard	Units	Circuit-breaker type (up to)
Rated maximum voltage	5.1	kV	24
Power frequency	5.2	Hz	50/60
Rated continuous current with natural cooling	5.3	A	12,700
Rated dielectric strength (withstand voltage) 1. Power frequency (dry) 2. Full-wave impulse (1.2 x 50)	5.4.2 C37.013a, Table 4	kV kV peak	60, 70 125, 145
Rated short-circuit duty cycle	5.5		CO-30 min-CO
Rated short-circuit current (up to) 1. System source (100%) (I) • dc component • Asymmetrical (total) 2. Generator source • dc component • Asymmetrical (total)	5.8.1  5.8.2.3	kA sym % kA rms kA sym % kA rms	110 60 144 75 130 157
Close and latch capability (274% I)		kA peak	302
Short-time current carrying capability (100% I)	5.8.2.7	kA sym	110
Short-time current duration	5.8.2.7	s	3
Transient recovery voltage (TRV) rating System source 1. E <sub>2</sub> peak voltage 2. RRRV (TRV rate)  Generator source 1. E <sub>2</sub> crest voltage 2. RRRV (TRV rate)  Out-of-phase 1. E <sub>2</sub> crest voltage 2. RRRV (TRV rate)	5.9 C37.013a, Table 5  C37.013a, Table 6  C37.013a, Table 9	kV kV/μs  kV kV/μs  kV kV/μs	32.2 5  32.2 2  45.5 3.1
Rated load-current switching capability	5.10	A	12,700
Out-of-phase current switching capability	5.12	kA	55
Mechanical endurance		operations	20,000
Continuous current switching endurance		operations	10,000
Weight in lbs (kg)	6,300 A; 15,212 (6,900); 8,000 A; 15,873 (7,200); 10,000 A; 16,535 (7,500); 12,700 A; 16,535 (7,500)		

Published by  
Siemens AG

Smart Infrastructure  
Distribution Systems  
Mozartstrasse 31c  
91052 Erlangen  
Germany

For the U.S. published by  
Siemens Industry Inc.

100 Technology Drive  
Alpharetta, GA 30005  
United States

Article No. SIDS-B10016-00-7600  
TH 260-190967 DA 1019

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