

UniGear ZS1 with VD4G circuit-breaker for generator applications



The worldwide increasing energy demand is covered more and more by decentralized power plants and renewable resources of small unit size. As the generated energy is fed into the grid by step-up transformers and MV distribution boards, VD4G offers a reliable and economical solution to protect the power plants assets.

— UniGear ZS1 with VD4G

VD4G is the vacuum circuit-breaker for generator (GCB) applications. VD4G is suitable for the small power plants as well as for industrial, oil and gas applications in which generators are connected to the MV distribution of the plant.

Protection

- Suitability analysis using grid calculation tool
- Optional system study for additional circuit-breakers in grid
- Fast interruption of system-fed short-circuit currents up to 63 kA and generatorfed short-circuit up to 50 kA
- Completely type-tested in accordance to the latest IEEE/IEC 62271-37-013 standards

Availability

- Severe TRV withstand capability
- Special design allows ultra-demanding breaking current switching without any additional opening
- More reliable synchronization
- More reliable supply for unit auxiliaries

Flexibility

- Only one circuit-breaker shall be operated during the starting-up or shutting-down of generator
- Maintenance-free solution
- Compact solution

Possible applications

- Renewable energy power plants
- Small energy power plants
- Networks with emergency power generator
- Process industry with own power generation
- Retrofit solutions

Special requirements for suitability analysis with grid calculation tool

ABB can provide you with adequate support for the suitability analysis and proper selection of GCB by providing the following information:

- Single Line Diagram
- Technical data sheet of generator, transformer and other grid equipment

Technical data

- System-fed faults tested up to 63 kA and generator-fed faults tested up to 50 kA
- Severe TRV withstand capability
- Suitable for switching under delayed current zero conditions
- Completely type tested according to Dual Logo IEC/IEEE 62271-37-013 covering also IEEE C37.013

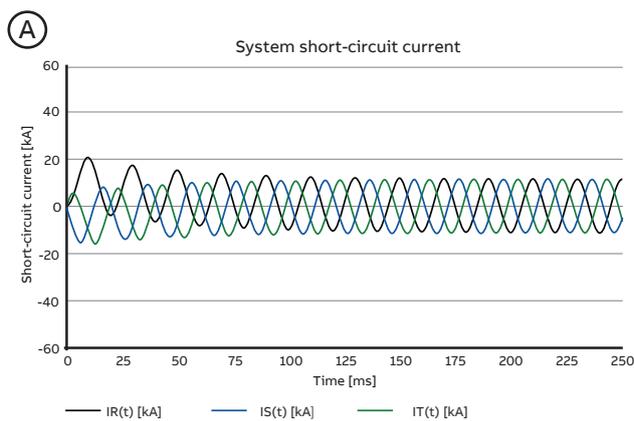
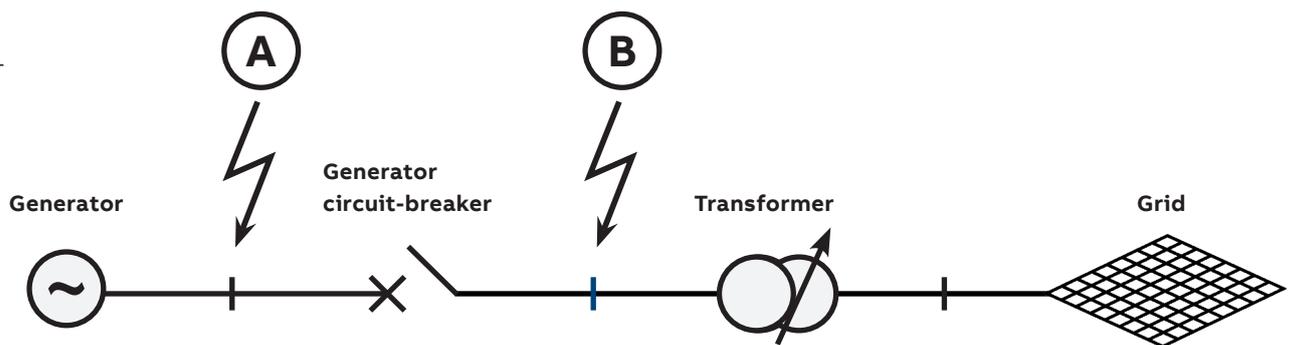
Electrical characteristics according to IEC 62271-200 and IEC/IEEE 62271-37-013

Switchgear		UniGear ZS1 with VD4G-25	UniGear ZS1 with VD4G-40	UniGear ZS1 with VD4G-50	UniGear ZS1 with VD4G-63
Rated voltage	[kV]		15*		
Maximum service voltage	[kV]		15		
Test voltage (50/60 Hz)	[kV / 1 min]		38		
Impulse withstand voltage	[kV]		95		
Rated frequency	[Hz]		50 / 60		
Rated short-time withstand current		25 kA / 3 s	40 kA / 3 s	50 kA / 3 s	63 kA / 1 s
Symmetrical short-circuit current I _{scg} Class G1	[kA]	16	25	50	50
Symmetrical short-circuit current I _{scg} Class G2	[kA]	16	25	37	37
Peak withstand current	[kA]	68.5	115	137	173
Internal arc withstand current		25 kA / 1 s	40 kA / 1 s	50 kA / 1 s	63 kA / 0.5 s
Rated current of the main busbars	[A]	...4 000	...4 000	...4 000	...4 000
	[A]	1 250	1 250		
	[A]		1 600		
	[A]		2 000		
Feeders rated current with natural ventilation	[A]		3 150	3 150	3 150
	[A]		4 000	4 000	4 000
	[A]				
	[A]				

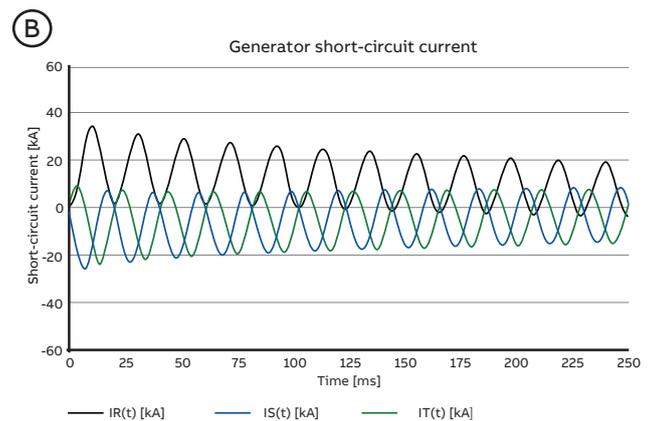
UniGear ZS1 panel with VD4G circuit-breaker can be coupled with standard UniGear ZS1 panel with VD4/P circuit-breaker

* Contact ABB for higher values

— Typical schematic of generator circuit-breaker application



Failure location A: System-fed fault
Fast decaying DC component



Failure location B: Generator-fed fault
Slowly decaying and raised DC component results in delayed current zero