

FKGA8

Generator Circuit Breaker for Power Plants from 600 MW*

Power plant owners are concerned with the availability and reliability of their plants. That is why it is crucial to rely on equipment capable of safely interrupting fault conditions while protecting connected equipment and reduce outage periods.

Advanced Architecture

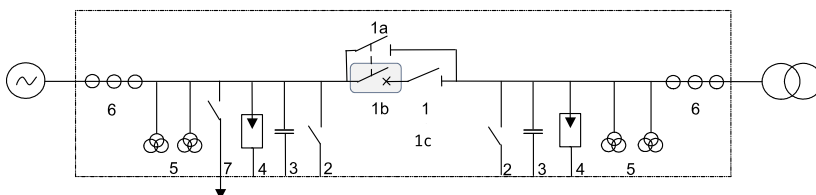
Based on more than 40 years experience in providing Generator Circuits Breakers (GCB) for power plants with performances from 600 MW, GE introduces FKGA8 with well recognized and advanced architecture suitable for large power plants. The circuit breaker's main contacts are in air, separated from the arcing SF₆ chamber. They are therefore protected from the hot current breaking SF₆ gases including contaminated particles and associated by-products, reducing premature aging of the equipment. Additionally the combination of the circuit breaker and the disconnecter functions avoids energy losses caused by conventional in-line disconnecter. Also FKGA8 is designed for new large power plants, it is highly suitable for retrofits or replacements of old GCBs or load break switch with air-blast technology providing low cost lifecycle with maximum availability and reliability.

Enhanced Inspection and Maintenance

This advanced architecture allows an easy observation of the main contacts throughout the GCB's periodic inspections. The value of having accessibility without dismantling of circuit breaker is enhanced by the fact that contact resistance measurement cannot alone be considered as reliable evidence (as notified by the latest IEC/IEEE 62271-37-013 GCB standard) of the contact health. By segregating the main contacts from the interrupting SF₆ gas, the new FKGA8 provides also simple access from outside the breaker during a short, normally scheduled power plant shutdown.

Components & Single Line Diagram

- | | |
|--|------------------------------------|
| 1. Circuit breaker with integrated air-disconnector | 2. Earthing switch |
| 1a. Main contacts | 3. Capacitors |
| 1b. Arcing contacts in SF ₆ | 4. Surge arresters |
| 1c. Safety Visual Switch (SVS) in air | 5./6. Voltage/Current transformers |
| 1a + 1b = Circuit breaker / 1a + 1c = Air-Disconnector | 7. Starting Switch |



Technical Data

- 30,000 A - 250 kA - 50 Hz
- 28,800 A - 210 kA - 60 Hz
- Up to 50,000 A with IPB forced air cooling

Key Benefits

- Advanced architecture of circuit breaker with main contacts in air with direct visual control and easy access
- Less energy losses thanks to the design of the circuit breaker with integrated air-disconnector
- SF₆ volume limited to arcing chamber for low environmental impact
- Utmost reliable full spring mechanisms per pole
- Compact breaker size both for retrofits and new installations
- Easier and faster inspection & maintenance

Additional Features

- Breaker tested in accordance to the IEC/IEEE 62271-37-013 GCB standard
- The first GCB designed with nominal current up to 30,000 A and natural cooling
- Optional monitoring system CBWatch3 for preventive maintenance
- Interlocking system
- Transportation by lots using conventional lorries

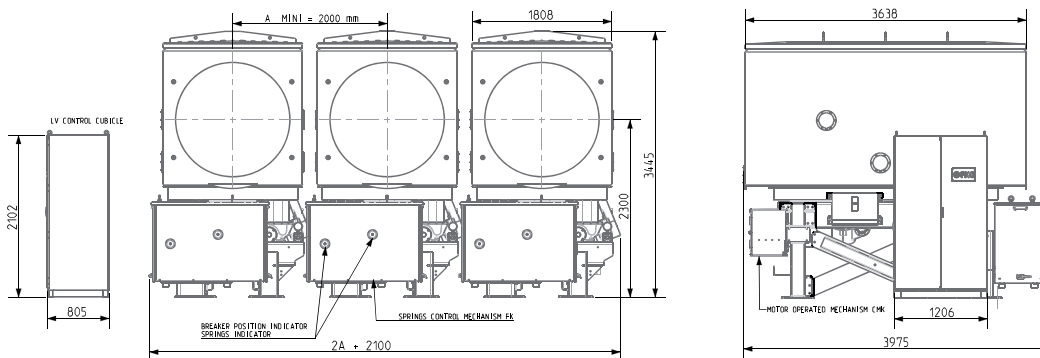
* Depending upon the power station's specifications, GE may propose an alternative GCB power rating.

Technical Specifications

Ratings	Unit	FKGA8			
Rated voltage	kV	33			
Short-circuit breaking current	kA	Up to 250 (50 Hz) / Up to 210 (60 Hz)			
Rated out-of-phase breaking current	kA	Up to 165			
Rated breaking time	ms	< 75			
Rated closing time	ms	< 95			
Insulating gas		SF ₆			
Ambient air temperature limits	°C	-20 to +40			
Busbar temperature limit/Enclosure temperature limit	°C	90 / 70		105 / 80	
Frequency	Hz	50	60	50	60
Maximum rated normal current*					
- Indoor with ambient air 40 °C	A	30,150	28,900	27,300	26,200
- Outdoor with ambient air 40 °C	A	29,300	28,000	26,550	25,400
* Up to 50,000 A with IPB longitudinal forced air cooling					
Phase spacing	mm	2,000 (2,300 with Starting Switch)			

		Circuit Breaker	Integrated Air-Disconnect	Earthing Switch	Starting Switch
Rated peak withstand current	kA _{peak}	685	685	685	274 **
Rated short time withstand current	kA	250	250	250	100 **
Rated duration of short-circuit	s	3	3	3	1 **
Rated insulation level (at sea level) - Phase to earth					
- Rated power frequency withstand voltage	kV	80	80		30 **
- Rated lightning impulse withstand voltage: wave 1,2/50 μs	kV _{peak}	170	170		60 **
** In closed position during starting sequence					
Rated insulation level (at sea level) - Across terminals					
- Rated power frequency withstand voltage	kV	95	95	80	80
- Rated lightning impulse withstand voltage: wave 1,2/50 μs	kV _{peak}	195	195	170	170

Dimensions



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Imagination at work