

GL309c, GL310c, GL311c, GL312c

Co-funded by



SF₆-free Live Tank Circuit Breakers From 72.5 kV to 145 kV down to -50 °C

A SF₆-free solution to reduce carbon footprint

More and more electrical grid operators are taking action against climate change and are setting ambitious goals to cut their greenhouse gas emissions. As one of the major grid original equipment manufacturers, GE Vernova's Grid Solutions business is in the best position to support them in moving a step closer to reaching their carbon reduction targets by building the transmission infrastructure necessary to connect and transport renewable energy, while avoiding the addition of tons of CO₂ equivalent to their grid. Benefiting from more than 60 years of expertise in SF₆ and ten years in SF₆-free technology, we innovate in developing a range of SF₆-free products suitable for all climate down to -50°C.

GL309c, GL310c, GL311c and GL312c belong to our SF₆-free live tank circuit-breaker portfolio for applications within networks at 72.5 kV, 100 kV, 123 kV and 145 kV rated voltages. They have the same dimensions as SF₆ solutions, which means that they can be installed in place of SF₆ circuit breakers. Their composite insulators allow higher dielectric withstand under pollution and provide higher safety for employees at substation. GL309c, GL310c, GL311c and GL312c feature the latest double-motion interrupting technology and tri-pole or single-pole spring-operated mechanisms while benefiting from our latest development in SF₆ and SF₆-free circuit breakers.

Digital Native Solution

Factory-testing: Like on our entire digital-native equipment portfolio, CSD100 point-on-wave controller is integrated and tested in our factories. This minimizes onsite activities and ensures reliable and consistent performance at commissioning. Learn more about digital-native live tank circuit breakers with our dedicated brochure.

Monitoring of circuit-breaker: Unlike competing controlled-switching solutions, CSD100 also provides essential monitoring functions, including advanced tracking of the CO₂-O₂ interrupting medium.

Shunt Reactor Switching

The GL309c to GL312c enable smooth shunt reactor switching by combining the CSD100 point-on-wave controller with CO₂/O₂ gas technology, effectively eliminating the risk of multiple high-frequency re-ignitions.

Quality and Testing

Our live tank circuit breakers meet the latest versions of national and international standards, such as IEC 62271-100.

The entire development and production procedures are fully compliant with the latest ISO 9001, ISO 14001 and OHSAS 18001 quality standards.



GE VERNOVA



Decarbonization Through Innovation

- GL SF₆-free Live Tank circuit breakers are part of our GRiDEA portfolio of solutions designed to accelerate the decarbonization of the grid
- SF₆-free products enable considerable reduction in carbon footprint over the complete life cycle compared to the equivalent SF₆ range

High Safety Level

- Pressure relief device prevents injuries and damage in case of over-pressure within the circuit breaker
- Support frame design ensures personnel cannot be injured by motion of parts
- Dedicated tools available to assemble and disassemble circuit breaker parts in safe condition
- Unlike vacuum switching technology, no X-Ray emissions in open position

Easy Installation and Light Maintenance

- Transportation and handling as easy as SF₆ circuit breakers
- Spring-operated mechanism preset at factory - no adjustments necessary during installation and commissioning
- Circuit breaker pre-filled at factory before shipping
- Fill-in and top-up procedures same as for SF₆ circuit-breaker
- Specific fill-in valve design to avoid mis-operations
- Two-stage transducer densimeters are within easy reach, on the front side of the circuit breaker, for periodic/ regular check

Specifications

BREAKER TYPE	GL309C, GL310C GL311C, GL312C
Switching and insulating medium	CO ₂ -O ₂
Rated voltage	72.5 kV to 145 kV
Rated frequency	50 Hz
Rated normal current	up to 3,150 A
Rated short-circuit breaking current	up to 40 kA
Rated short-circuit making current	108 kA
Rated duration of short-circuit	3 s
Transient Limited Fault (TLF) compliant	4 - 12 kA
First pole to clear factor	1.3 - 1.5
Opening time	27 - 33 ms
Break time	60 ms
Closing time	<100 ms
Average ambient temperature	-50 °C up to +40 °C
Pollution level*	25-31 mm/kV
Design altitude*	1,000 m.a.s.l.

*Standard values according to IEC; Higher altitudes available on request

Components

- Interrupter chamber with self-blast system and reliable double motion technology
- Reliable spring-operated mechanism with position indicator clearly visible from outside
- Pressure relief system for passive protection of substation and personnel
- Field-proven, temperature-compensated density monitor with two-stage transducer and three-color dial
- Easy access to the filling connection
- Non-return (check) valve on each pole column
- Opening and closing spring in drive
- Steel support frame design prevents corrosion issues and provides high safety for employees and high protection against environmental ingress (e.g. ice)
- Optimum designed kinematics between mechanism and interrupting chamber to increase mechanical energy efficiency and mechanical moving parts reliability

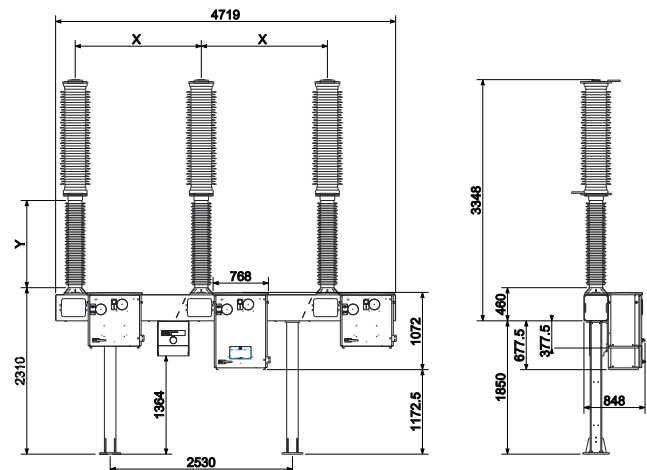
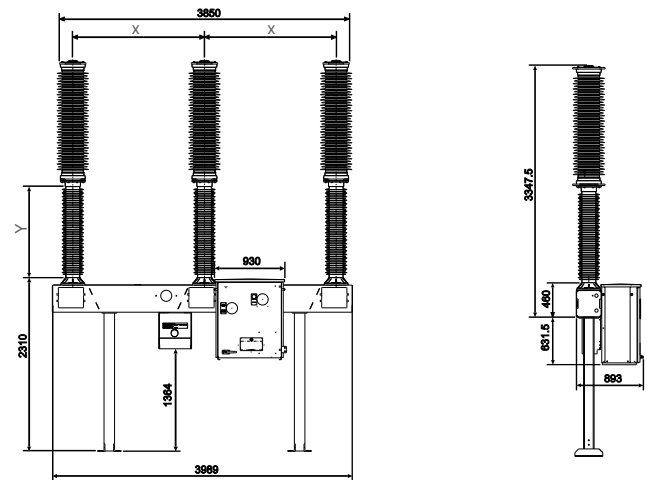
Technical Characteristics

- **Spring-operated mechanism / degree of protection:**
One FK 3-2 mechanism/ IP 55 or three FK3-1 mechanisms / IP55
- **Rated operating sequence:**
O-0.3s-CO-3min-CO resp. CO-15s-CO
- **Rated supply voltage:**
From 24 V up to 250 V dc/ac

Product Options

- CBWatch monitoring system

Dimensions



Dimensions (mm)	GL309c	GL310c	GL311c	GL312c
Voltage Level	72.5 kV	100 kV	123 kV	145 kV
Phase Distance (X)	1050/1300	1300/1750	1300/1750	1750*
Insulator Length (Y)	710	1210	1210	1210

* Other distances available on request

** Other low voltage control cubicle positioning on request.

For more information visit
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