

B105 DUAL GAS

Gas-Insulated Substations 245 kV, up to 63 kA, 4000 A Compatible with SF₆ or g³ gas

Grid Solutions, a GE Vernova company, has more than five decades of experience in the design, material selection, development, engineering, manufacturing, and servicing of gas-insulated substations (GIS).

The design of our B105 Dual Gas GIS is grounded in more than 50 years of field experience in SF₆ and eight years in g₃ technology as insulating and switching medium. Our B105 Dual Gas GIS bay – compatible with either SF₆ or g³ gas – meets the challenges of networks up to 245 kV for onshore and offshore power generation and transmission, as well as energy-intensive industry applications.

Future-proofed for flexibility

Anticipating future SF₆ regulations, this dual gas equipment is available with either SF₆ or g³ gas. Because of its identical foundational design, transmission system operators can implement the SF₆ version today and easily make the switch to our g³ solution later to decarbonize their substations.

All bay components, except the circuit breaker, are g³- or SF₆-compatible. They have been type-tested to demonstrate the same performances and ratings with both gases.

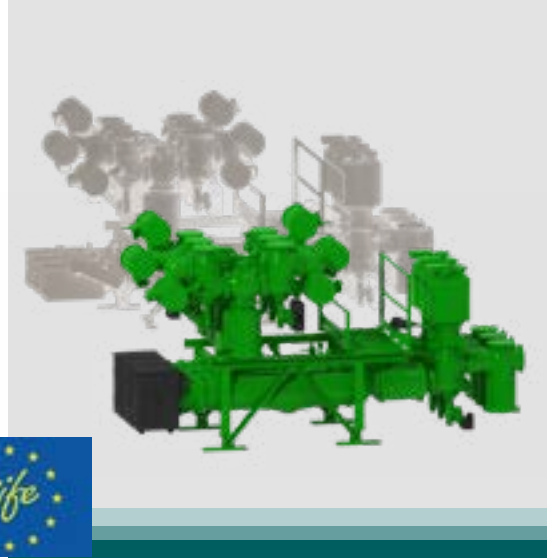
Reduced carbon footprint

The B105g is available in a fully SF₆-free version using our g³ technology, one of the company's alternative technologies to SF₆, allowing for an about 99% CO₂eq reduction of the gas contribution to global warming. While it has the same dimensions, performance and ratings as SF₆, the B105g advanced sealing system and improved tightness reveal a significantly lower carbon footprint compared to its SF₆ equivalent.

The integration of low-power instrument transformers (LPITs), also known as digital voltage and current transformers, further contributes to decarbonize the B105 Dual Gas GIS and reduce strategic raw material consumption.

Low Cost of Land and Civil Works

- One of the most compact 245 kV GIS
- Complete bays including digital devices and the low voltage control cabinet are assembled, wired, factory-tested and shipped
- The standardized digital native B105 GIS allows for an easier and faster supply chain process, shorten delivery, erection and commissioning times.



The SF₆-free B105g development is being co-funded by the European Union

The path to Decarbonization

- The B105g SF₆-free GIS is part of GRIDEA, our portfolio of solutions designed to accelerate the decarbonization of the grid
- Lower carbon footprint during a 40-year substation life cycle
- Improved tightness due to sealing length divided by two, compared to the previous version
- The gas contribution to global warming is reduced by about 99% using g³ gas instead of SF₆
- Reduction of strategic raw material consumption, and thus their carbon footprint, thanks to low power instrument transformers

Digital Native GIS

- Mechanically engineered to reach the accuracy required by advanced monitoring and control solutions
- Digital power sensing using low-power instrument transformers

Easy Upgrades

- Bays are completely factory-assembled, wired and tested before shipment
- Easily make the switch to SF₆-free whenever you're ready
- Similar operational and maintenance procedures as with SF₆ GIS for simple integration
- Compact design that applies to all substation applications, including extension of existing substations
- State-of-the-art maintenance isolating device

SPECIFICATIONS

General Ratings

Reference electrotechnical standards	IEC	IEC/IEEE
Voltages	up to 245 kV	up to 245 kV
Insulating and switching gas:	g ³	SF ₆

Withstand voltages

<ul style="list-style-type: none"> Short-duration power-frequency, phase-to-earth/ across open switching device 	460/530 kV	460/530 kV
<ul style="list-style-type: none"> Lightning impulse, phase-to-earth / across open switching device 	1050/1200 kVp	1050/1200 kVp
Frequency	50 Hz	50/60 Hz
Continuous current	4000 A	4000 A
Short-time withstand current	50 kA	50/63 kA
Peak withstand current	135 kAp	135/170 kAp
Duration of short-circuit	3s	3s
Installation	indoor/outdoor	indoor/outdoor

Circuit Breaker Ratings

Short-circuit breaking current	50 kA	50/63 kA
Short-circuit making current	135 kAp	135/170 kAp
Operating sequence	O-0.3s-CO-3 min-CO/CO-15s-CO	O-0.3s-CO-3 min-CO/CO-15s-CO
Drive type (three-phase or single-phase)	Pure-spring	Pure-spring
Breaking time	<50 ms	<50 ms
Mechanical endurance	M2 class	M2 class

Disconnecter and Low-speed Earthing Switch Ratings

Capacitive current switching	0.25 A	0.25 A
Bus-transfer current switching capability	2400 A / 25 V	2400 A / 25 V
Mechanical endurance	M2 class	M2 class

Make-proof Earthing Switch Ratings

Making current capability	135 kAp	135/170 kAp
Switching capability-electromagnetic coupling	80 A / 2 kV	80 A / 2 kV
Switching capability-electrostatic coupling	3 A / 12 kV	2 A / 12 kV
Mechanical endurance	M1 class	M1 class

Gas Data

The functioning of this equipment relies upon SF₆ or a gas mixture based on CO₂/O₂ and 5% of an additive, C₄F₇N (also known as C4-FN or Iso-C₃F₇CN), a fluorinated greenhouse gas, which helps preserve dimensions and performance equivalent to those of SF₆ equipment while reducing the gas carbon footprint.

	SF ₆	g ³	
		C ₄ F ₇ N additive**	g ³ gas mixture
Average mass of gas/mixture in the equipment (kg)*	127.9	12.8	62.9
GWP ₁₀₀ of gas/mixture (CO ₂ -equivalent)	24,300	2,750	560

CO ₂ -eq of gas/mixture in the equipment (t _{co2-eq})*	3,108	35.2	35.2
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*For information purposes only considering a typical GIS arrangement (double busbar cable bay). It varies depending on the equipment considered.

** This component's physical properties are essential to g³.

For more information visit governova.com/grid-solutions

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