

# B105 DUAL GAS

## Gas-Insulated Substations 245 kV, up to 63 kA, 4000 A Compatible with SF<sub>6</sub> or g<sup>3</sup> 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 SF<sub>6</sub> and eight years in g<sup>3</sup> technology as insulating and switching medium. Our B105 Dual Gas GIS bay – compatible with either SF<sub>6</sub> or g<sup>3</sup> 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 SF<sub>6</sub> regulations, this dual gas equipment is available with either SF<sub>6</sub> or g<sup>3</sup> gas. Because of its identical foundational design, transmission system operators can implement the SF<sub>6</sub> version today and easily make the switch to our g<sup>3</sup> solution later to decarbonize their substations.

All bay components, except the circuit breaker, are g<sup>3</sup>- or SF<sub>6</sub>-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 SF<sub>6</sub>-free version using our g<sup>3</sup> technology, one of the company's alternative technologies to SF<sub>6</sub>, allowing for a roughly 99% CO<sub>2</sub>eq reduction of the gas contribution to global warming. While it has the same dimensions, performance and ratings as SF<sub>6</sub>, the B105g advanced sealing system and improved tightness reveal a significantly lower carbon footprint compared to its SF<sub>6</sub> equivalent.

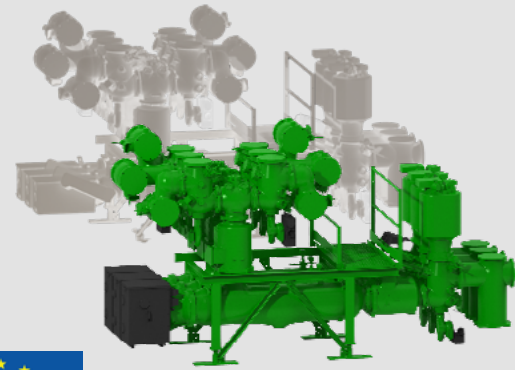
The integration of low-power instrument transformers (LPITs), also known as digital voltage and current transformers, further contributes to decarbonize the B105 Dual Gas GIS and reduce strategic raw material consumption.

### 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.



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The SF<sub>6</sub>-free B105g development is being co-funded by the European Union

### The path to Decarbonization

- The B105g SF<sub>6</sub>-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 g<sup>3</sup> gas instead of SF<sub>6</sub>
- 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 SF<sub>6</sub>-free whenever you're ready
- Similar operational and maintenance procedures as with SF<sub>6</sub> 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 <sup>3</sup>	SF <sub>6</sub>

### Withstand voltages

<ul style="list-style-type: none"> <li>Short-duration power-frequency, phase-to-earth/ across open switching device</li> </ul>	460/530 kV	460/530 kV
<ul style="list-style-type: none"> <li>Lightning impulse, phase-to-earth / across open switching device</li> </ul>	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 SF<sub>6</sub> or a gas mixture based on CO<sub>2</sub>/O<sub>2</sub> and 5% of an additive, C<sub>4</sub>F<sub>7</sub>N (also known as C4-FN or Iso-C<sub>3</sub>F<sub>7</sub>CN), a fluorinated greenhouse gas, which helps preserve dimensions and performance equivalent to those of SF<sub>6</sub> equipment while reducing the gas carbon footprint.

	SF <sub>6</sub>	g <sup>3</sup>	
		C <sub>4</sub> F <sub>7</sub> N additive**	g <sup>3</sup> gas mixture
Average mass of gas/mixture in the equipment (kg)*	127.9	12.8	62.9
GWP <sub>100</sub> of gas/mixture (CO <sub>2</sub> -equivalent)	24,300	2,750	560
CO <sub>2</sub> -eq of gas/mixture in the equipment (t <sub>co2-eq</sub> )*	3,108	35.2	35.2

\*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 g<sup>3</sup>.

For more information  
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