Grid Solutions

F35-72.5 kV DUAL GAS

Insulated Substations
72.5 kV, 31.5 kA, 2500 A, 50/60 Hz
Compatible with SF_6 or g^3 gas

Grid Solutions at GE Vernova has more than 50 years of experience in the design, material selection, development, engineering, manufacturing and servicing of gas-insulated substations (GIS).

Our F35 Dual-Gas GIS bay – compatible with either SF_6 or g^3 gas – meets the challenges of networks up to 72.5 kV for the following applications: offshore and onshore wind power generation, distribution, infrastructure and industrial applications.

Reduced carbon footprint

The F35g is available in a fully SF_6-free version using g^3 technology, allowing for a 99% reduction in CO_2-eq gas contribution to global warming while maintaining the same performance and ratings as SF_6 equipment. Its low mass reduces the impacts of the manufacturing phase on the environment, and its advanced sealing system and improved tightness minimize both gas leaks and the frequency of maintenance.

Modular and Versatile

- Suitable for wind turbines as well as space-constrained and industrial substations
- High modularity enables complex layouts in a compact arrangement

Lowest Cost of Land and Civil Works

- Bay volume reduced by 23% as compared to the previous generation and by 40% compared to our F35 Dual Gas 145 kV GIS
- Compact GIS bay with a width of only 680 mm
- Up to three bays assembled together, wired, tested, and shipped directly to site
- Simple on-site testing due to the disconnecting function of voltage transformers and surge arresters

GE VERNOVA

The path to Decarbonization

- The F35g-72.5 kV SF_6-free GIS is part of our GRiDEA portfolio of solutions designed to accelerate the decarbonization of the grid
- Lower carbon footprint over a 40-year substation life cycle compared to the use of SF_6 products
- The gas contribution to global warming is reduced by 99% using g^3 gas instead of SF_6
- First-in-class gas sealing system
- Same GIS footprint with SF_6 or with g^3
- Tightness system improved by design with a reduction of the total sealing length of a factor of two in comparison to the previous version

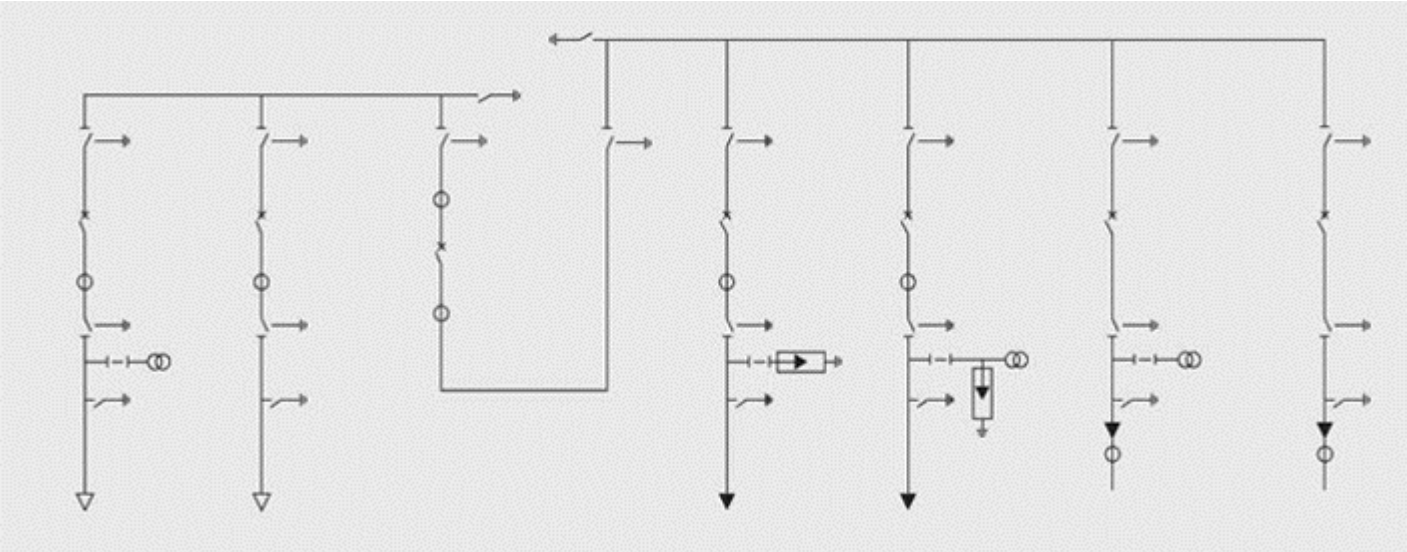
Smart Grid Features

- Full digital monitoring, control and protection
- 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_6-free whenever you're ready
- Similar operational and maintenance procedures as with SF_6 GIS for simple integration
- Compact design that's common to all substations, including extensions of existing substations
- State-of-the-art maintenance isolating device for separation of the surge arresters and/or voltage transformers avoiding gas operation or disassembly during on-site testing

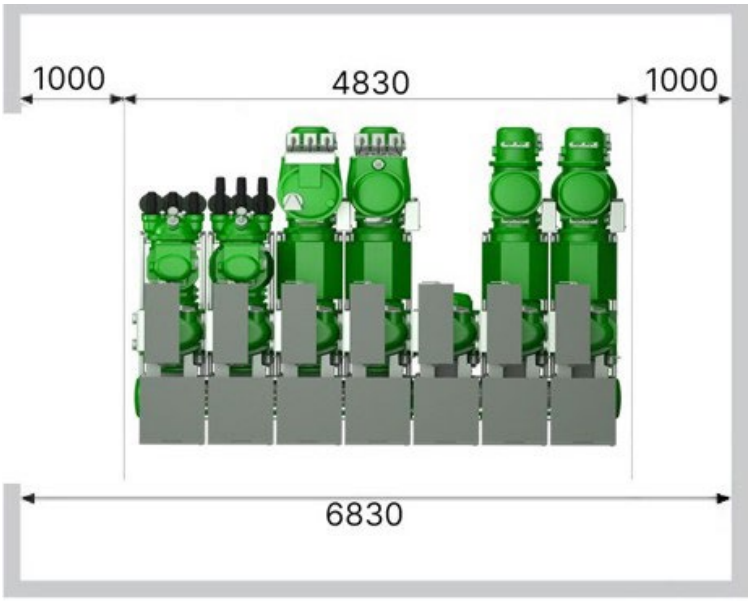
F35 - 72.5 kV, 31.5 kA, 2 500 A – Single-line diagram of single busbar substation

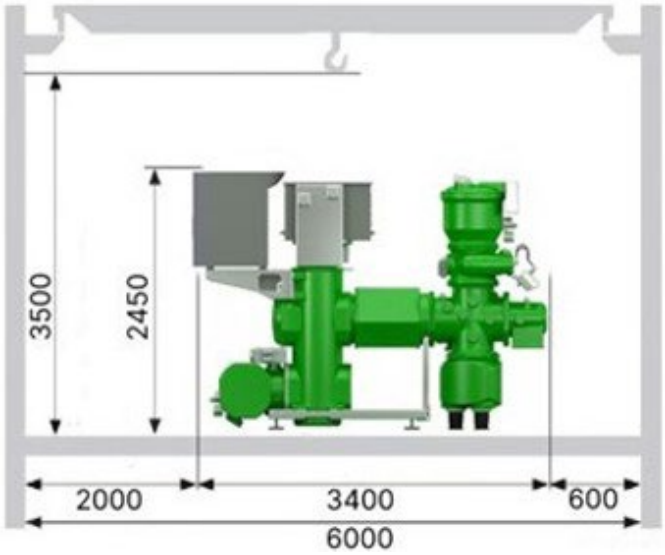


Bay width: 680 mm

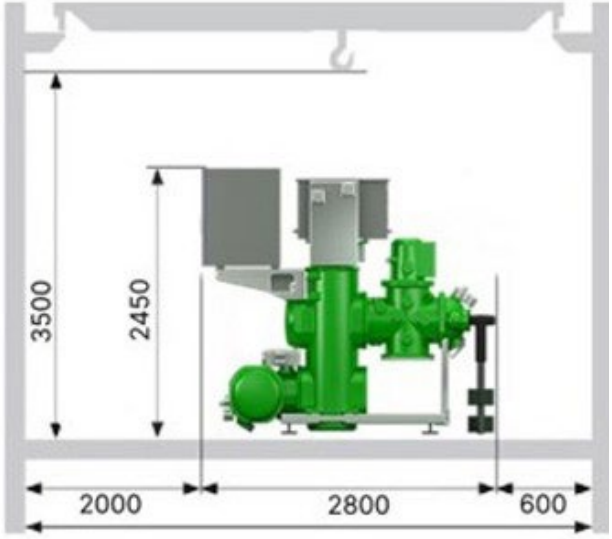
Also available:

- Other single-line diagrams
- Stand-alone control cubicles
- Specific layouts





Bay with cable box



Bay with cable box

Technical Specifications

GENERAL RATINGS		
Insulating and switching gas	g^3	SF_6
Reference electrotechnical standards	IEC /IEEE	IEC / IEEE
Rated voltage	72.5 kV	72.5 kV
Withstand voltages		
- Short-duration power-frequency, phase-to-earth / across isolating distance	140 / 160 kV	140 / 160 kV
- Lightning impulse, phase-to-earth / across isolating distance	325 / 375 kVp	325 / 375 kVp
Frequency	50 / 60 Hz	50 / 60 Hz
Continuous current	up to 2500 A	up to 2500 A
Short-time withstand current	31.5 kA	31.5 kA
Peak withstand current	85 kAp	85 kAp
Duration of short-circuit	3 s	3 s
Vibrations: IEEE-normalized seismic test at 1.0 g, including switching operations. Random vibration test acc. IEC at level 2M4.		
Installation	indoor/outdoor	indoor/outdoor

CIRCUIT-BREAKER RATINGS		
First-pole-to-clear factor	1.5 / 1.3	1.5 / 1.3
Short-circuit breaking current	31.5 kA	31.5 kA
Short-circuit making current	85 kAp	85 kAp
Operating sequence	O - 0.3 s - CO - 3 min - CO / CO - 15 s - CO	O - 0.3 s - CO - 3 min - CO / CO - 15 s - CO
Drive type (three-phase)	pure-spring	pure-spring
Switching capacity	Class S2	Class S2
Mechanical endurance	class M2	class M2
Capacitive switching	class C2	class C2

DISCONNECTOR AND LOW-SPEED EARTHING SWITCH		
Capacitive current switching	0.1 A	0.1 A
Bus-transfer current switching capability	1600 A / 10 V	1600 A / 10 V
Mechanical endurance	class M2	class M2

MAKE-PROOF EARTHING SWITCH		
Making current capability	85 kAp	85 kAp
Switching capability - electromagnetic coupling	80 A / 2 kV	80 A / 2 kV
Switching capability - electrostatic coupling	2 A / 6 kV	2 A / 6 kV
Mechanical endurance	class M1	class M1

Gas Data

The functioning of this equipment relies upon SF_6 or a gas mixture based on CO_2/O_2 and 5% of an additive, C_4F_7N (also known as C_4-FN or Iso-C_3F_7CN), a fluorinated greenhouse gas, which helps preserve dimensions and performance equivalent to those of SF_6 equipment while reducing the gas carbon footprint.

	SF_6	g^3	
		C_4F_7N additive**	g^3 gas mixture
Average mass of gas/mixture in the equipment (kg)*	38.9	3.83	18.8
GWP_{100} of gas/mixture ($C0_2$-equivalent)	24,300	2,750	560
CO_2-eq of gas/mixture in the equipment ($t_{co2\text{-}eq}$) *	945.3	10.5	10.5

* 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^3.

For more information
visit gevernova.com/grid-solutions

GEA-33283-(E)
English
250404

GE VERNOVA