Grid Solutions

DT1-145g-63

SF_6-free Dead Tank Circuit Breaker 145 kV, 63 kA, 4,000 A

Grid Solutions, a GE Vernova Company, has more than 100 years of experience in the design, material selection, development, engineering, manufacturing and servicing of circuit breakers.

As compact as a SF_6 Breaker, just with reduced carbon footprint

Based on this expertise, we have developed a SF_6-free dead tank circuit breaker (DTCB) that is very similar to its SF_6 predecessor, the DT1-145-63. Using our g^3 insulating and switching SF_6-free technology, the new DT1-145g-63 remains compact with the same footprint. Performance and life-cycle costs remain similar while offering a significant decrease in carbon footprint. The SF_6-free gas mixture used in the new DT1-145g-63 works on the same well-known principle for insulation and breaking purposes as that of SF_6 gas. Thus, the operational and maintenance procedures are similar to SF_6 dead tank circuit breakers.

The g^3 gas is a mixture of carbon dioxide (CO_2) with oxygen (O_2) and an additive, which is a Fluoronitrile (C_4F_7N)*. Its contribution to global warming is significantly lower than that of SF_6 gas: reduced by roughly 99% on average.

Reliable Performance

The DT1-145g-63 is suitable for application up to nameplate ratings, including definite-purpose switching. It meets the challenges of networks up to 145 kV for power generation, transmission and energy-intensive industry applications.

Our spring-spring-operated mechanism and extensive mechanical design testing to 10,000 operations and class M2 certification ensure trouble-free operation for the lifetime of the circuit breaker.

Certified Quality

We design, manufacture, test and deliver our dead tank circuit breakers in accordance with the latest IEEE/ANSI and IEC Standards, maintaining a quality assurance system according to ISO-9001 and ISO 14001 certifications.

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The path to Decarbonization

- DT1-145g dead tank circuit breakers are part of GRiDEA portfolio of solutions designed to accelerate the decarbonization of the grid.
- SF_6-free circuit breakers
- Lower carbon footprint over a 40-year substation life cycle compared to other SF_6 alternatives
- The gas contribution to global warming is reduced by about 99% using g^3 gas instead of SF_6
- Similar weight and dimensions as the SF_6 circuit breaker, thus no need to increase the overall size of the substation
- Fitted with digital gas monitoring

Main Characteristics

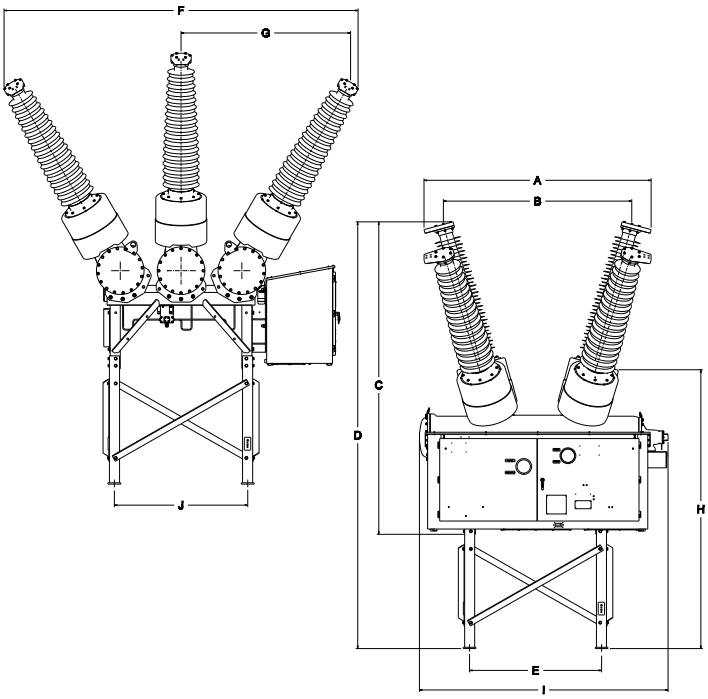
- Advanced self-blast interrupters
- Shares many components with the DT1-145-63 SF_6 circuit breaker
- Durable low-energy spring/spring operated mechanisms
- More than 100,000 circuit breakers with self-blast interrupters and FK spring-operated mechanisms in service since 1989
- 2 µs chopped wave 838 kV
- Zero bar withstand capability

Easy System Integration

- Breakers are completely factory-assembled, wired and tested before shipment
- Similar operational and maintenance procedures as with SF_6 circuit breakers
- Compact design that's common to all substation applications, including extension of existing substations

* The fluorinated nitrile (C_4F_7N) component of g^3 is a type of PFAS. This component's physical properties are essential to g^3. C_4F_7N is not one of the PFAS currently restricted under United States federal or state PFAS laws.

Dimensions



RATED MAX. VOLTAGE	145 kV
A (in/mm)	89.2/2264
B (in/mm)	73.85/1876
C (in/mm)	122.9/3120
D (in/mm)	167.5/4254
E (in/mm)	51.83/1316
F (in/mm)	137.4/3490
G (in/mm)	65.9/1674
H (in/mm)	107.85/2739.5
I (in/mm)	97.5/2476
J (in/mm)	51.83/1316

Technical Data

	VALUE	UNITS
Ambient temperature range*	-30° to +40° -22° to +104°	Celsius/ Fahrenheit
High seismic capability in accordance with IEEE 693-2018		
Weight (without current transformers) *Optional values available on request	4,413/2,006	lb/kg

Ratings*

IEEE/ANSI	IEC	VALUE	UNITS
Rated maximum voltage	Rated voltage	145	kV
Rated power frequency	Rated frequency	60	Hz
Rated dielectric withstand capability	Rated insulation level		
• dry withstand	• at power frequency, dry	315	kV
• wet withstand	• at power frequency, wet	315	kV
Rated lightning impulse withstand voltage	• at lighning impulse	650	kV
Rated chopped wave impulse voltage 2us		838	kV
Rated continuous current	Rated normal current	4000	A
Rated short-circuit current	Rated short-circuit breaking current	63	kA
Rated short-time current (1s)		63	kA
Rated peak withstand current		164	kA
Rated capacitance switching		Class C2	
Rated interrupting time		3	cycles
	Rated break time	50	ms
Rated standard operating duty	Rated operating sequence	O-CO-15s-CO / O-0.3s-CO-180s-CO	

(*) Standard values: further data is available on request.

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For more information
visit gevernova.com/grid-solutions

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