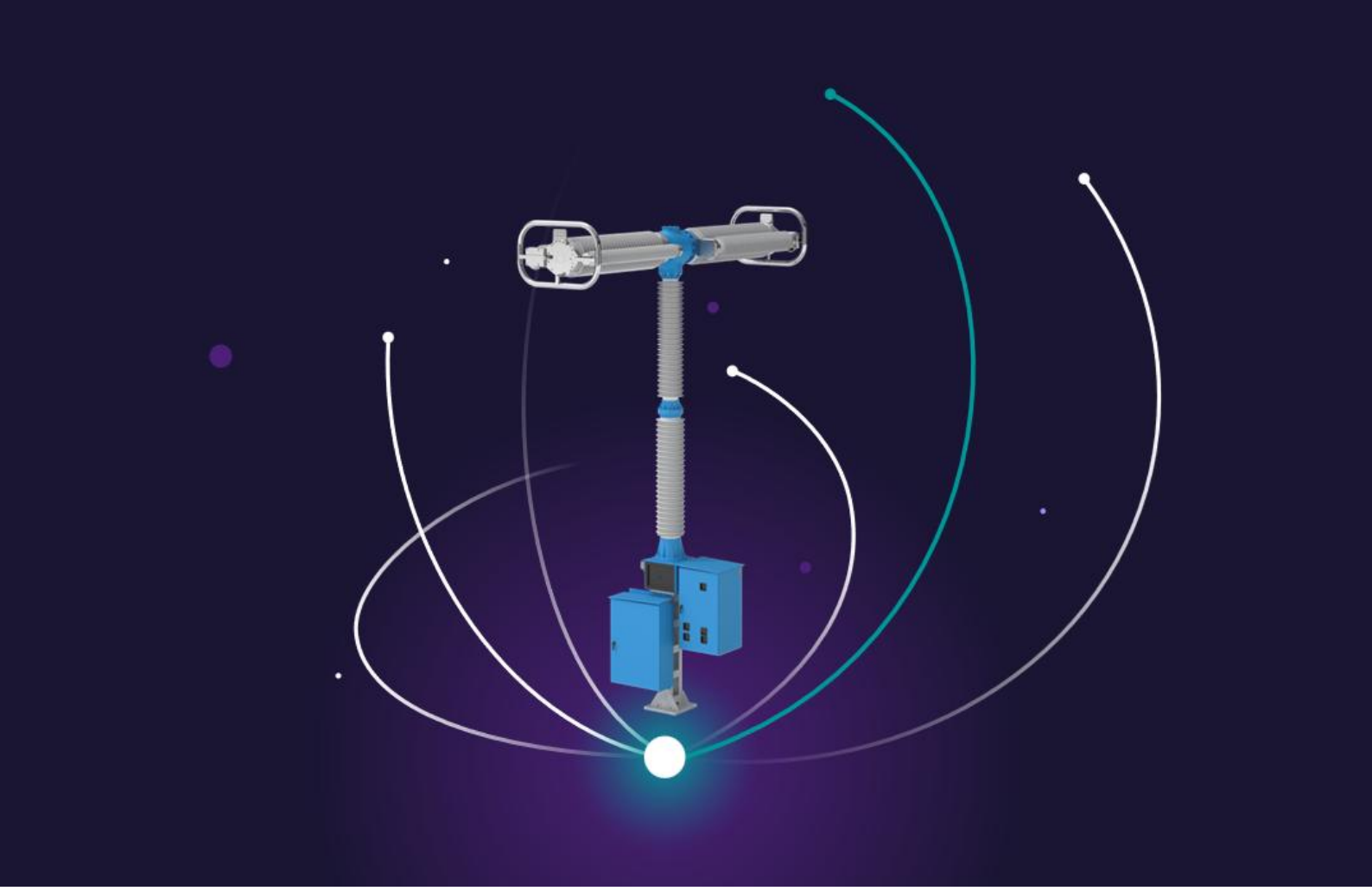


3AV2 Blue LT Circuit Breaker™

Our clean air insulated live tank circuit breaker with zero F-gases up to 420 kV

siemens-energy.com/blue-products

SIEMENS energy

Vacuum technology + Clean air → Blue (GWP = 0)



Zero F-gases. Clean Air. Vacuum Interruption.

At the heart of 3AV2FI is a simple idea done exceptionally well: use **clean air** as the insulating medium and **vacuum interruption** for switching, so you get transmission-class performance without fluorinated gases. That means **zero GWP, zero toxic decomposition products**, and no special handling or disposal routines - just dry, stable air (~80% N_2 / 20% O_2) doing its job day in, day out. Pair that with **fast two-cycle interruption** and high switching endurance at both normal and fault currents, and you have a breaker engineered for the realities of 420 kV duty - powerful, predictable, and uncomplicated.

Proven Platform. Familiar Footprint. No Re-learning.

Built on proven Siemens Energy's 3AP2/3 platform, 3AV2FI keeps the same modular base, similar mechanism, and layout - so, teams get next-generation tech that feels instantly familiar in planning, installation, and operation. Dimensions are **compact and comparable to mainstream AIS layouts** (overall width ~5.2 m), making brownfield replacements and approvals straightforward, while service focuses on **periodic visual inspections** rather than gas handling routines or certification overhead.

Sustainable by Design. Circular in Practice.

Eliminating F-gases removes a major source of lifecycle emissions and complexity - **no end-of-life gas recovery**, no energy-intensive recycling steps, and no hazardous by-products to manage. The 3AV2FI follows the Blue portfolio philosophy: design **for resource efficiency**, emphasize **recyclable materials**, and reduce waste across the whole product life. That circular mindset turns into day-to-day benefits - fewer special processes, simpler decommissioning, and a cleaner material loop that aligns engineering decisions with sustainability targets.

Reliability & Safety First. Ready for What's Next.

Engineered for availability in the real world, 3AV2FI withstands **–60 °C to +55 °C**, clears faults in **two cycles**, and delivers endurance figures up to **30 operations at 63 kA and 10,000 operations at 4,000 A –** Offers significant stability when the transmission corridors are put under stress. In addition, the 3AV2FI circuit breaker has an expected service life of at least 40 years and probably **up to 50 years** under normal service conditions. Using **non-toxic clean air** enhances safety and streamlines maintenance, avoiding special precautions or exposure risks for crews. And because it's **free of F-gases**, the breaker is inherently aligned with tightening policy trends and reporting regimes - **regulatory-proof and future-ready** from day one

- **Zero environment impact**
- **Zero impact on health & safety**
- **Zero regulations**
- **Easily exchangeable**

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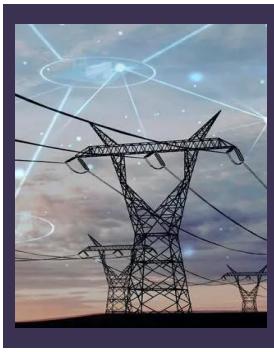


Reliable protection
for critical 420 kV transmission infrastructure

Why it matters

Extra-high-voltage levels like 420 kV move bulk power across regions, underpinning cross-border trade, national security of supply, and the electrification of industry. ENTSO-E and the European Commission both frame this transmission voltages as the **backbone** of reliability and market integration—where **interconnectors** and robust substations keep power flowing during peaks, contingencies, and extreme events.

Who depends on it - directly and every day



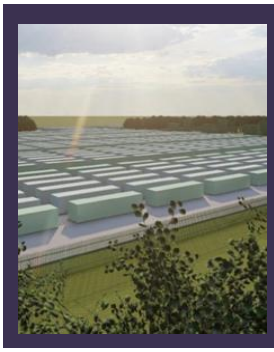
Cross-border interconnectors & security of supply

420 kV corridors enable countries to support each other during stress, integrate renewables and lower system costs.



HVDC converter stations & renewable hubs

Offshore wind landing points and long-distance transfers rely on dependable AC switchgear interfaces for stability.



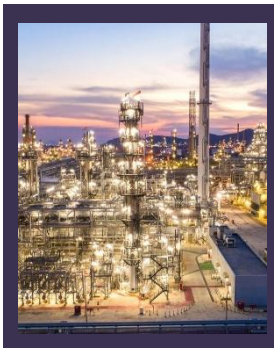
Utility-scale battery energy storage systems (BESS)

Large-scale BESS connects to 420 kV networks to deliver balancing services such as frequency regulation and reserve.



Hyperscale data centers & digital infrastructure

Explosive demand growth and uptime expectations have turned grid access and HV reliability into critical campus expansion constraints.

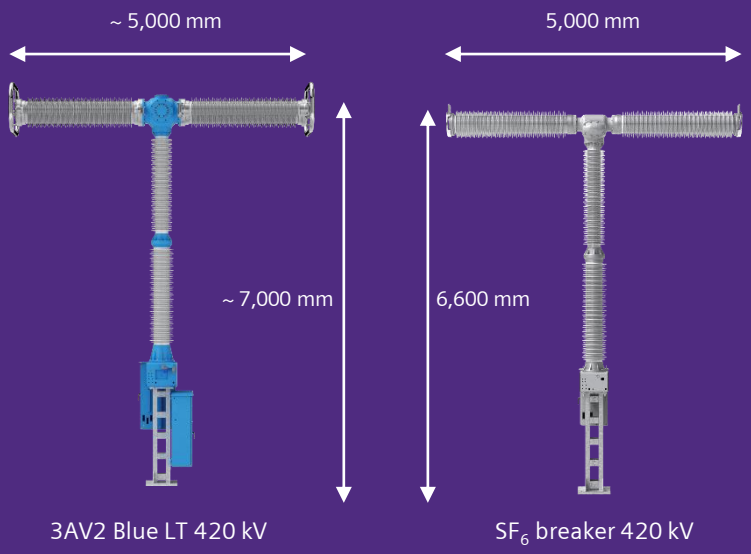


Refineries, ports, airports & industry

Continuous-process sites demand high availability; secure transmission feeds remain the foundation for operations.

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Technical details



3AV2 Blue LT 420 kV

SF_6 breaker 420 kV

	3AV2 Blue LT 420 kV	vs. SF_6 breaker 420 kV
No. of operations at rated short-circuit breaking current (63 kA)	30	10 - 12
No. of interrupter units per pole	2	2
No. of operations at rated normal current	10,000	6,000
Break-time	2 cycles	2 cycles
Rated normal current, up to	4000 / 5000* A	5,000 A
Rated short-circuit breaking current, up to	63 / 80* kA	63 / 80 kA
Rated frequency	50 / 60 Hz	50 / 60 Hz
Rated short-duration power-frequency withstand voltage	610 kV	610 kV
Rated lightning impulse withstand voltage	1,425 kV	1,425 kV
Rated switching impulse withstand voltage	1,050 kV	1,050 kV
Rated duration of short circuit	3 s	3 s
Peak withstand current	170 kA (2.7 p.u.)	170 kA (2.7 p.u)
Rated first-pole-to-clear factor	1.3 p.u.	1.3 p.u.
Capacitive voltage factor (class C2)	1.4 p.u.	1.4 p.u.
Ambient air temperature range	–60 up to +55 °C	–30 up to +55 °C
Maintenance schedule	visual inspection at 13 & 26 years. Condition check only at 40 years;	every 12 years: visual inspection and checks; 25 years: maintenance
Insulating medium	Clean air / Vacuum	SF_6
Mass of fluorinated greenhouse gases / mass of CO_2 equivalent	0 kg / 0 t	53 kg / 1245 t

* Expected in 2028. All values in accordance with IEC; other values on request

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Noedra Node
for Substation Digitalization

From switchgear condition to operational confidence

Noedra Node interface for 3AV2FI turns the circuit breaker into a connected, self-supervising asset. It continuously captures relevant operational signals and converts them into clear condition transparency and decision support — helping utilities shift from time-based routines to condition-based actions without adding complexity to daily operations

Continuously monitoring mechanical, electrical, and insulation health to identify anomalies early and reduce forced outages across AIS and GIS environments.

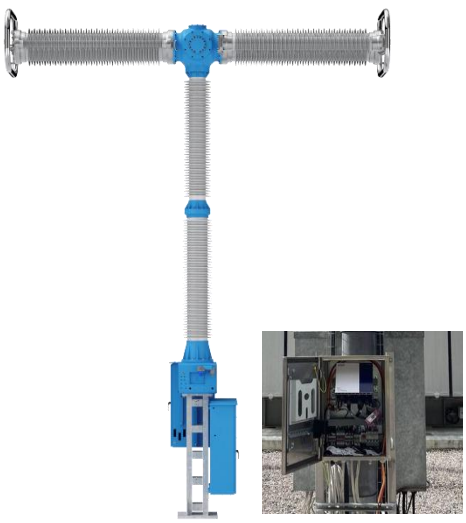


Figure 1: 3AV2 Blue LT 420 kV

Offerings

Mechanical & Thermal

- High Frequency sampling: signals acquired from field at 10kHz and plotted at HMI
- Coil and motor currents monitoring
- Advanced Signal Processing including failure mode description, recommended actions, and prognosis (i.e. total i2t and fault currents, operation count, Motor & Travel curve...)

Insulation condition

- ✓ Gas Density
- ✓ Gas Pressure
- ✓ Gas Temperature
- ✓ Trend analysis
- ✓ Gas Inventory

Electrical

- ✓ Ultra High Frequency sensor
- ✓ Phase resolved Partial Discharge
- ✓ Single-Line Diagram fault location
- ✓ Advanced Diagnostics via Pattern Recognition Model
- ✓ Expert view with recording functionality

Real time monitoring

End-to-end, real-time monitoring for gas density, partial discharge, and circuit breaker performance

Advanced diagnostic and prognostic capabilities

Delivers condition insight through Pattern recognition and root cause analysis; High-frequency signal sampling; "Time to Next Alarm" and trend analysis.

Connectivity & security

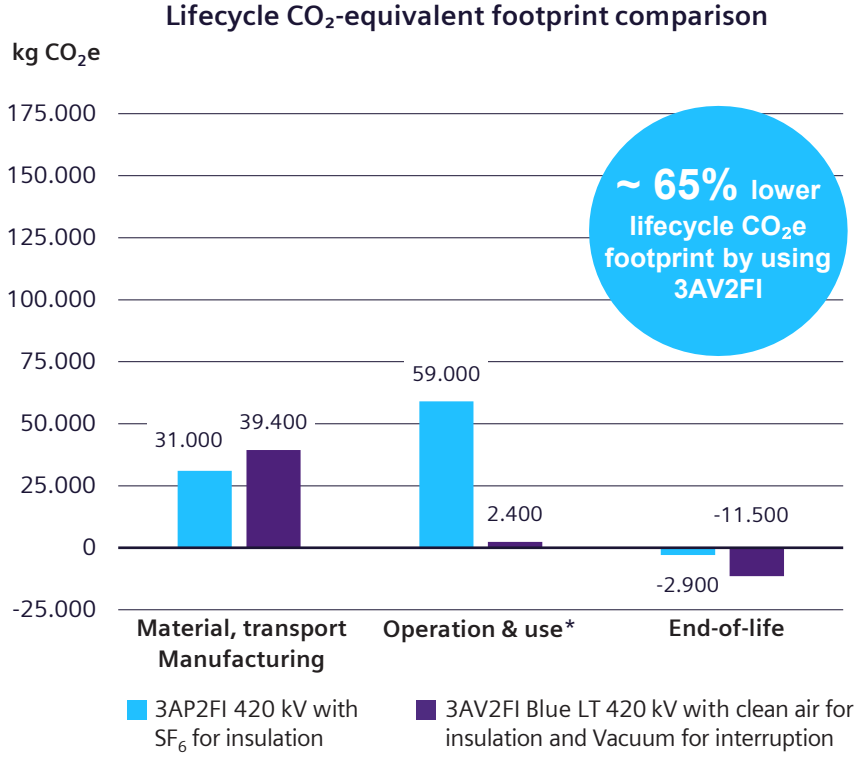
Secure, flexible data access with encrypted transfer and API/SCADA integration

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Advancing sustainable transmission infrastructure

3AV2FI combines proven transmission-class reliability with a reduced environmental footprint. By utilizing clean air insulation and vacuum interruption technology, beyond at 60% reduction in CO2 footprint, the 3AV2 circuit breaker saves up to 25% of Water consumption and waste generation by nearly half, while completely eliminating SF_6-related impacts.



*Power losses calculated with 4000A with electricity mix of Norway 2020, Ecoinvent 3.11_EN 15804

No fluorinated greenhouse gases

Clean air insulation eliminates SF_6 and other fluorinated gases from the primary insulation system, supporting decarbonization strategies and future environmental requirements.

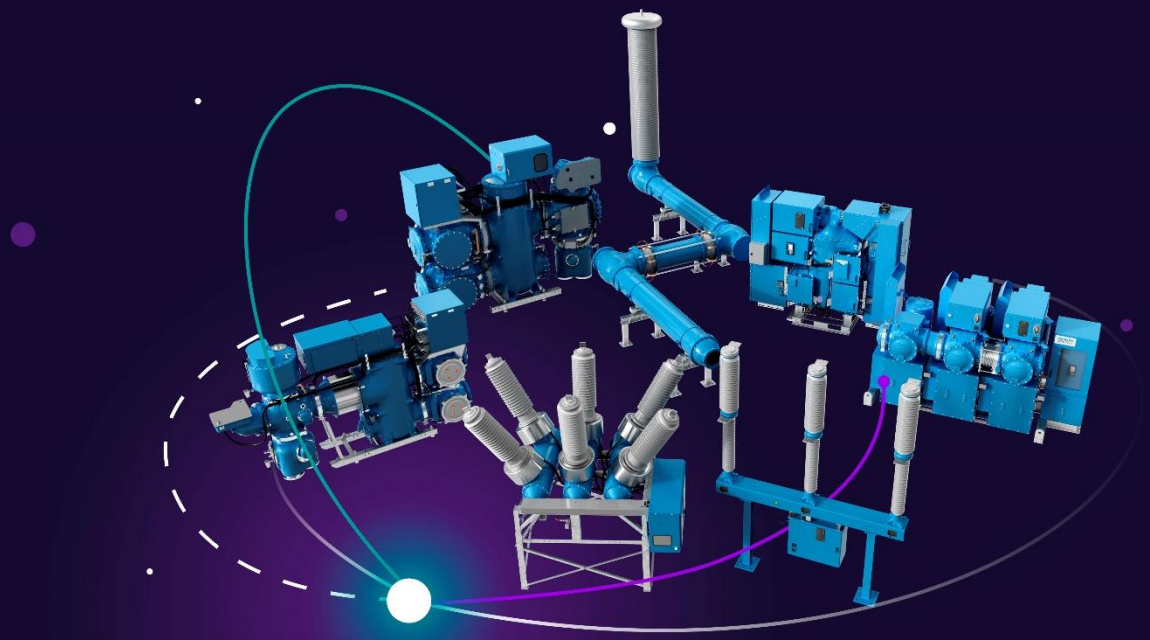
Simplified lifecycle management

No gas recovery, no gas quality monitoring, and no end-of-life treatment of fluorinated gases reduce handling complexity throughout the asset lifecycle.

Lower lifecycle climate impact

Lifecycle assessment results demonstrate a significantly lower CO_2-equivalent footprint compared with conventional SF_6-insulated alternatives.

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Siemens Energy Blue portfolio covers many more F-gas free product lines and ratings.
Learn more at siemens-energy.com/blue-products

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For more information, please visit our website:
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or contact us via Email:
support@siemens-energy.com

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USA

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