

MV Switchgear Portfolio

Bernd Schüpferling, PLM GIS Secondary Switchgear VAR Partner Day 2022 | September 12 - 14 | Zagreb, Croatia

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Smart power distribution from medium-voltage to low-voltage



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Air-insulated switchgear (AIS) – NXAir - Family



≤ 17.5 kV,

≤ 40 kA,

≤ 4000 A

LSC 2B



NXAIR ≤ 17.5 kV, 50 kA, ≤ 4000 A LSC 2B



24 kV,

≤ 25 kA,

≤ 2500 A

LSC 2B



≤ 24 kV,

≤ 25 kA,

≤ 2000 A

LSC 2



NXAIR H
≤ 36 kV
≤ 31.5 k/
≤ 2900 A
LSC 2B



NXAIR C – LSC 2 vs. NXAIR – LSC 2B Loss of Service Continuity Category





SIQuench – Arc quenching device

SIQuench is available

as a **complete solution** integrated into type-tested, internal arc classified,

medium-voltage switchgear type NXAIR, rated up to 17.5 kV, 50 kA, 4000A





SIQuench – system components



Powerbox with switching elements

SIQuench Controller

Arc protection relay



SF6 GIS – Primary Portfolio



Main features

- · Gas-insulated (hermetically sealed) and compact
- Cost efficient due to maintenance-free operation with fixed-mounted vacuum circuit-breakers
- Secure operation and safe-to-touch design provides high personal safety
- Climate independent and reliable even under most extreme ambient conditions



8DA10 – Single Pole Encapsulated Design



NXPLUS C – Three Pole Encapsulated Design



SF6 GIS – Secondary Portfolio



Secondary Switchgear – Your Primary Choice! Main features

- Gas-insulated (hermetically sealed) and compact
- Cost efficient due to maintenance-free operation
 with fixed-mounted switching devices
- · Secure operation and high personal safety
- Climate independent and reliable even under most extreme ambient conditions





Secondary Switchgear 8DJH / 8DJH36 - GIS Design Example for CB panel



Secondary Switchgear SIMOSEC – Hybrid Design

- Classification according to IEC 62271-200
- **Partition class: PM** (metallic partition)
- Loss of service continuity category: LSC 2
- Pressure relief systems
 - Discharge to the rear/up into the switchgear room (Pressure relief duct per panel)
- Accessibility to compartments
 - Busbar compartment: Tool-based
 - Switching-device compartment: Non-accessible
 - Low-voltage compartment: Tool-based
 - Cable compartment <u>without</u> HV HRC fuses:
 Interlock-controlled or tool-based
 - Cable compartment <u>with</u> HV HRC fuses:
 Interlock-controlled





Our contribution

blue GIS® with Clean Air

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Status of regulations for the use of SF6 in Medium Voltage Switchgear

Natural-origin gases with GWP < 1 are 100 % future-proof with no risk for regulatory exposure!

EU: <u>Proposal for F-Gases</u> in new installations Decision and Adoption expected mid 2023

EUROPEAN COMMISSION	Strasbourg, 5.4.2022 COM(2022) 150 final		
Prohibition of F-gases GWP ≥ 10			
≤ 24 kV	January 1, 2026		
≤ 52 kV	January 1, 2030		
≤ 145 kV, 50 kA	January 1, 2028		
> 145 kV, 50 kA	January 1, 2031		

For other alternative F-Gases reporting obligations

EU: <u>Registry of restriction</u> of PFAS**, where non-essential, Adoption expected in 2025



CARB: <u>Phase-out</u> for new installations, Effective since 2022 Adoption in other parts of USA expected in next years

Rated Voltage	Rated Short- Circuit Current	SF ₆ Phase-Out Date
< 38 kV* 38 kV*	All	January 1, 2025 January 1, 2028
< 145 W/	< 63 kA	January 1, 2025
\geq 145 KV	≥ 63 kA	January 1, 2028
< 215 W/	< 63 kA	January 1, 2027
$\simeq 243 \text{ KV}$	≥ 63 kA	January 1, 2031
> 245 kV	All	January 1, 2033

For GWP > 1 reporting obligations * Aboveground, Belowground slightly different

USA: PFAS** Restrictions: First laws effective, Further decision and adoptions expected in next years

- The Environmental Protection Agency (EPA) in US established a PFAS** <u>Council</u>, Adoption expected in 2024
- US state <u>Maine placed a first PFAS ban from 01.01.2030</u>



blue GIS Triple benefits with intelligent and digital features



Clean Air offers customers impressive benefits



Environmentally-friendly

- No use of F-gases or chemical additives
- GWP < 1: minimum global warming potential
- ODP = 0: no ozone depletion potential
- No acidification potential (AP)

Safe

- Non-toxic (non-carcinogenic, non-mutagenic)
- Non-flammable
- Extremely stable
- Low boiling point, insulating medium does not liquefy
- 100% material compatibility



Cost-efficient

- F-gas-free insulation with minimum requirements placed on training, transportation, installation, and operation
- No documentation or reporting requirements
- Zero additional costs due to CO₂ compensation fees
- No gas recycling required

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blue GIS **Product Announcements***

12kV **Clean Air** VI

24kV



36kV



2018 - 2019 8DAB 12 2018 8DJH 12 2019

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2020 - 2022 NXPLUS C 24 2020 8DJH 24 2021

2023 - 2025+





blue GIS Overview of portfolio: today and...





Sustainable power distribution – blue GIS



Primary power distribution

SIEMENS

Secondary power distribution

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