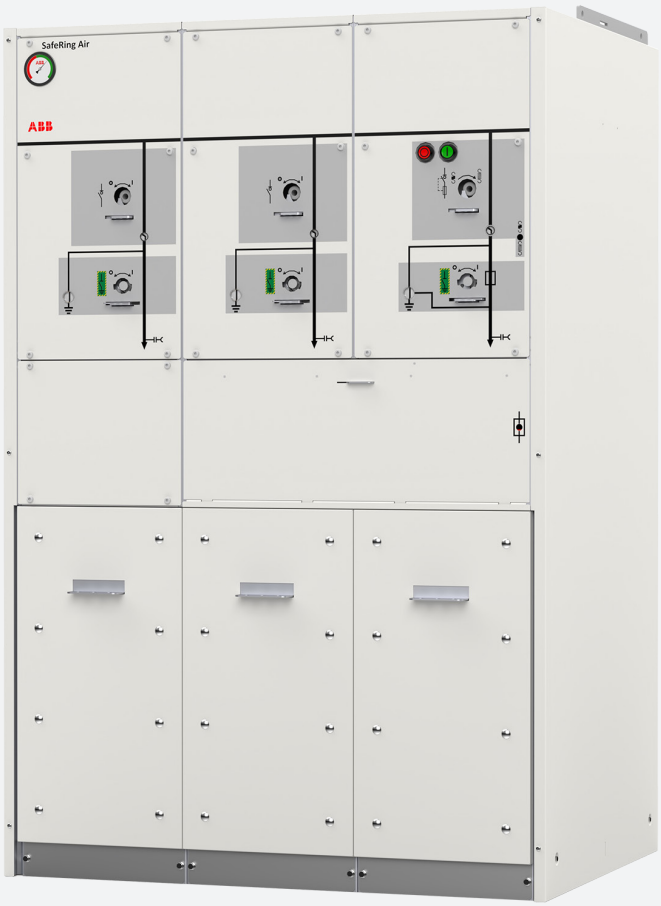
DISTRIBUTION SOLUTIONS

SafeRing/SafePlus Air 24kV

SF6-free gas-insulated switchgear for secondary distribution



Product scope

- Rated voltage up to 24kV
- Rated current up to 630A
- Rated short-time withstand current up to 20kA / 3s
- Internal Arc Classified IAC AFLR 20kA / 1s
- High duty circuit breakers with M2 (10000 operations) mechanical endurance
- Indoor and outdoor applications

The SafeRing Air ring main unit (RMU) and SafePlus Air switchgear utilize dry air as their insulation medium, resulting in a global warming potential (GWP) of zero. Our units are fully compliant with IEC standards and the EU F-gas regulation (EU) 2024/573.

ABB's introduction of dry air insulation has led to the design of an optimized puffer-type load break switch (LBS) for applications that reliably interrupt load currents of 630 A. This switch, based on proven technology and part of the installed base of over 40,000 functional units with Dry Air, is specifically optimized for SafeRing and SafePlus Air, ensuring a reliable and tested solution.

The sulfur hexafluoride (SF6)-free platform is designed with the same interface, footprint, and operations as the original SafeRing/SafePlus portfolio. The standard SafeRing Air RMU, suitable for most 6kV to 24kV switching applications, is available in various configurations, typically including up to 4 modules. SafePlus Air is a compact, metal-enclosed switchgear system for distribution applications up to 24kV. It features a flexible, modular or semi-modular design for easy system expansion, higher ratings, and compatibility with a broader range of protective relays.

SafeRing/SafePlus Air are internal arc classified, IAC AFLR up to 20kA / 1 sec., assuring safe operations when standing in front of the switchgear.

SafeRing/SafePlus Air 24kV
Customer benefits

01

Compliant with IEC standards and F-gas regulation

- SF6-free, with dry air as the insulation medium, GWP = 0, and compliant with the EU F-gas regulation (EU) 2024/573
- Able to operate in harsh environmental conditions, including altitudes exceeding 1500 m above sea level

02

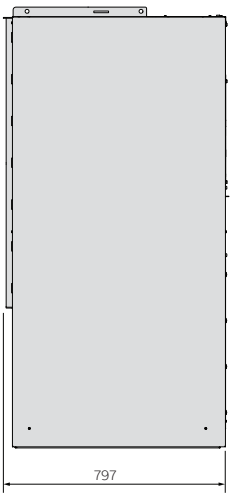
Compact, reliable and flexible

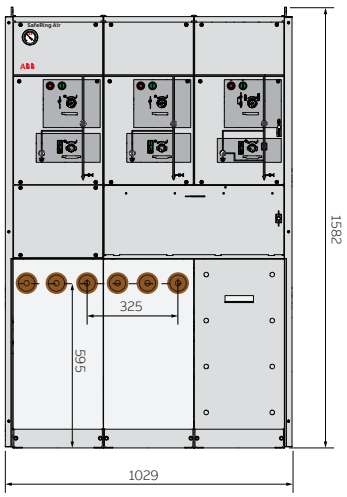
- Very low maintenance required as all high voltage parts are permanently sealed in a gas tank and protected from soiling, humidity, entry of foreign bodies and other environmental influences. The platform is compliant with the latest IEC standards for sealed pressure systems
- Compact design with small footprint and high mechanical endurance up to 10000 operations
- Outfitted with traditional transformers or sensor technology for current and voltage measurement
- Advanced automation and control with the IEC 61850 communication protocol.
- Clean production processes and high recyclability at end-of-life
- Simple, reliable and robust kinematic design: one moving part with main contact, arcing contact and linear puffer piston

03

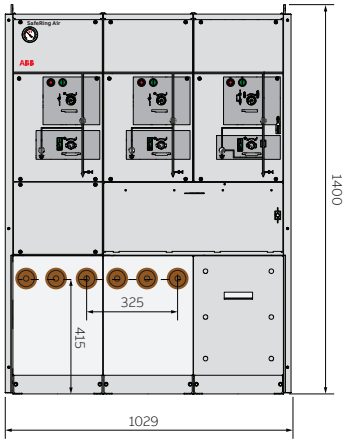
Safety

- Internal arc certified design offers high level of operator safety with front, rear and lateral arc protection, certified with accessibility AFLR 20kA/1s according to IEC 62271-200
- Active internal arc protection with an arc suppressor device enhances operator safety by rapidly detecting and eliminating internal arcs. This additional safety option prevents any gas blowout, ensuring no impact on the surroundings
- Same operations as classic SF6 versions with no additional training required
- Modified gas enclosure design to withstand higher filling pressure.
- Wide range of monitoring and diagnostic features for safe and reliable operations
- Downstream earthing switch ensures that the section of the circuit being worked on is completely de-energized, reducing the risk of electrical accidents, allowing safe operations and maintenance





Standard cable compartment



Low cable compartment

SafeRing/SafePlus Air - Electrical data

Rating	Unit	Value
Rated voltage	kV	24
Rated frequency	Hz	50
Rated conitnuous current	A	630
Rated short-time withstand current	kA	20
Rated peak withstand current	kA	50
Rated duration of short-circuit	s	3
Rated short-time phase-to-earth withstand current	kA	20
Rated peak phase-to-earth withstand current	kA	50
Rated duration of phase-to-earth short-circuit	s	1
Filling level for insulation and/or switching (abs.)	kPa	250
Minimum functional level for insulation and/or switching (abs.)	kPa	230
Rated short-duration power-frequency withstand voltage	kV	50
Rated lightning impulse withstand voltage	kV	125
Rated DC cable test voltage	kV	60
Rated duration for DC cable test	min.	60
C - module		
Rated cable charging current	A	60
Rated line charging current	A	1,5
Rated earth-fault breaking current	A	180
Rated cable- and line-charging breaking current under earth-fault	A	104
Rated short-circuit making current, switch and earthing switch	kA	50
Electrical and mechanical endurance class, earthing switch		E2, M0
Electrical and mechanical endurance class, load-break switch		E3, C2, M1
F - module		
Rated mainly active load breaking current	A	200
Rated distribution line closed-loop breaking current	A	200
Rated cable charging current	A	16
Rated line charging current	A	1,5
Rated earth-fault breaking current	A	48
Rated cable- and line-charging breaking current under earth-fault	A	28
Rated short-circuit breaking current	kA	20
Mechanical endurance class, load-break switch		M1
Rated short-time withstand current, downstream earthing switch	kA	2,5
Rated peak withstand current, downstream earthing switch	kA	6,3
Rated duration of short-circuit, downstream earthing switch	s	1
Electrical and mechanical endurance class, earthing switch		E2, M0
V - module		
Rated short-circuit breaking current	kA	20
Rated duration of short-circuit	s	3
Rated operating sequence		O-0.3s-CO-15s-CO
Rated Line-charging breaking curreny	A	10
Rated cable-charging breaking current	A	31,5
Rated first pole-to-clear factor, Kpp:		1,3 and 1,5
Electrical and mechanical endurance class,		E2, C2, S1, M2
Rated short-time withstand current, earthing switch	kA	20
Rated duration of short-circuit, earthing switch	s	3
Rated short-time withstand current, single phase, earthing switch	kA	20
Rated duration of short-circuit, single phase, earthing switch	s	1
Electrical and mechanical endurance class, earthing switch		E2, M1

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3XAA077711 EN - REV.A.1 05-2025