Product brochure
IEC medium-voltage switchgear up to 24 kV - 1250 A - 25 kA

Xiria NGX

Make the switch to natural air

Powering Business Worldwide

Powering business worldwide

Medium-voltage switchgear up to 24 kV - 1250 A - 25 kA

Modular, compact, single panel, Air-GIS based on proven technology for high-end secondary switchgear in distribution substations, commercial and industrial applications

Utility

Industry

Infrastructure

Data center

Commercial & Institutional

Power generation

Xiria NGX: Eaton's new modular switchgear for high-end secondary applications in distribution grids. A medium-voltage switchgear platform uniquely combines up to 24 kV - 1250 A - 25 kA ratings with safe, reliable, natural air technology without overpressure

Maximized uptime, optimized safety, and high energy capabilities are increasingly important for asset managers with power distribution responsibilities.

Eaton's IEC-certified, medium-voltage Xiria NGX switchgear of up to 1250 A busbar and 25 kA short circuit level meets these challenges by building on proven Xiria 630 A / 21 kA technology that served the market for more than 20 years. It uses clean and reliable natural air-GIS requiring no overpressure in a safe, sealed-for-life, IP65 stainless steel welded tank that fully retains its dielectric properties. Combining this with its uniquely high rating capabilities for natural air-only switchgear, Xiria NGX is the ideal 'fit and forget' choice. That's whether upgrading old infrastructure to strengthen or expand existing networks or ensuring safe, dependable power distribution in new ones.

Respected industry testing of Xiria applications in harsh conditions shows its high quality and low maintenance requirements mean asset owners can be assured of the minimized total cost of ownership (TCO) over a product lifetime of more than 40 years. A compact Xiria NGX footprint based on 500 mm panels makes the most of a valuable floor space. Critically, NGX also offers the flexibility valued by many network managers – for example, those starting with a 12 kV grid before making a later move to 24 kV.

Other key features of the simple-to-operate Xiria NGX, that's IEC-certified by KEMA laboratories, include the highest classifications for safety and uptime – IAC AFL(R) and LSC2, respectively. Its modular design enables easy upgrades with CTs, VTs, and motorized operation. Incorporating unique status visibility windows, NGX is one of few switchgear platforms currently offering motorized remote control for both the circuit breaker and disconnector. Smart switchgear solutions built around current and voltage sensors and a comprehensive set of additional options are also available.

A complete range featuring circuit breaker panels up to 1250 A, sectionalizer/riser, and metering panels, Eaton's next-level Xiria NGX changes the game for flexible, medium-voltage switchgear. It meets the high energy, minimized TCO and planet-friendly requirements now top of the power distribution agenda.

We know today's power grid needs

Since its launch in 2002, Eaton has successfully sold Xiria 630 systems for RMU and secondary applications. This product family has grown to a complete and diverse portfolio of extendable panels with a 630 A busbar at 21 kA-3 s short circuit rating.

Xiria NGX is Eaton's next-level product family for medium-voltage secondary applications with higher specifications (1250 A busbar at 25 kA-3 s short circuit rating). It is based on the same proven sustainable technology and extensive Xiria 630 experience.

Xiria 630 (block) | Xiria 630 (extendable) | Xiria NGX

The Xiria NGX range comprises single extendable compact circuit breaker panels, including metering and sectionalizer. Compact in design, available in any panel combination or sequence, enabling easy installation in small switch rooms or prefabricated substations. It is even possible to deliver sections of a maximum of five panels, pre-assembled and coupled in the factory to reduce the installation time at the site.

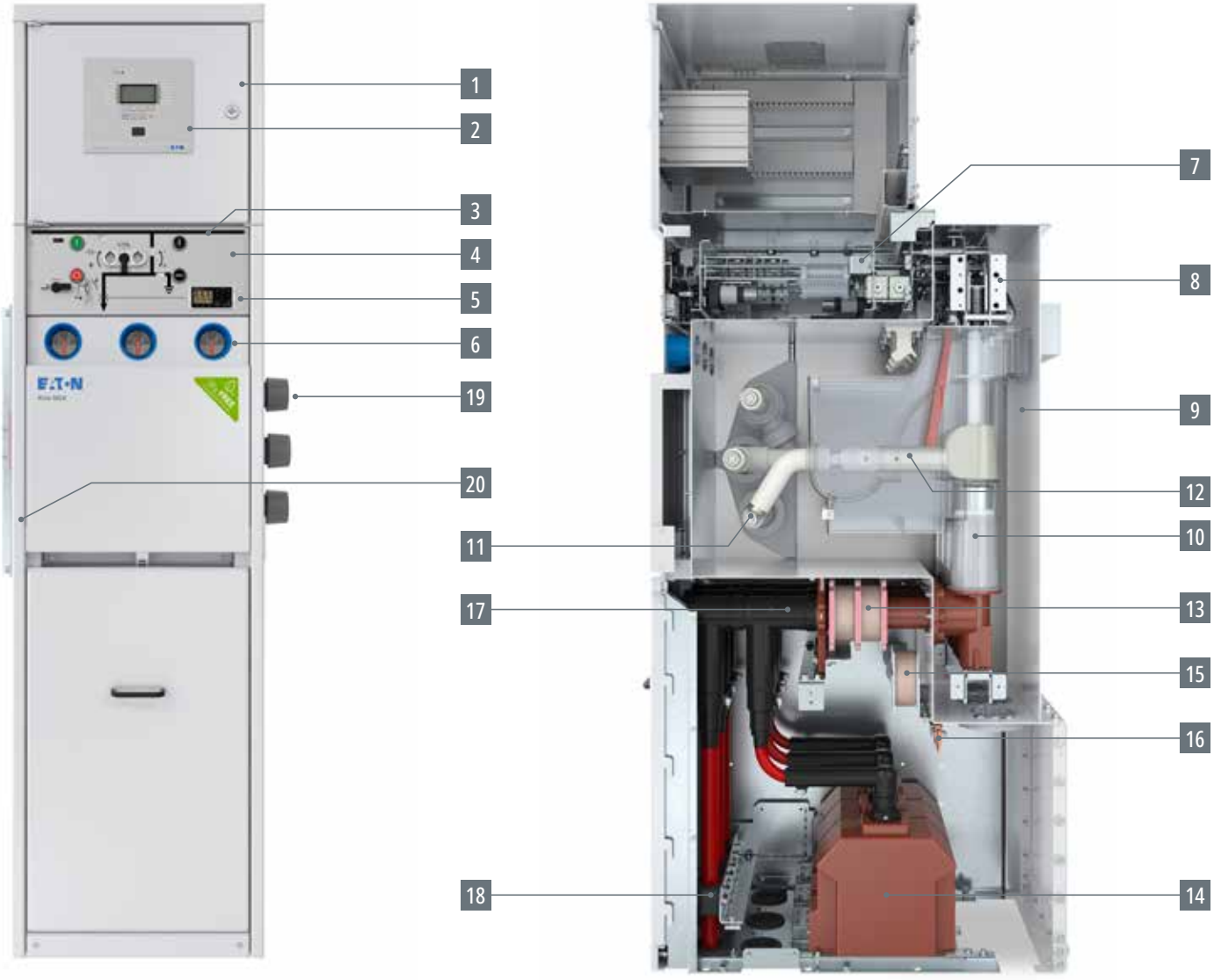
It offers features in line with market needs, like OCO (auto reclose), cable backside connection and motorized disconnector operation. Flexible solutions are available for internal arc exhaust: directly into the cable cellar, outside the switch room via arc channel/wall flange or inside the switch room via arc chimney with integrated arc absorbers.

By adding the Xiria NGX, Eaton can offer Xiria technology for multiple levels based on the same and proven key technologies. The table below is an overview of the ratings and features of both platforms.

Platform (*)	Xiria 630	Xiria NGX
Panels	Single extendable Block versions up to 5 panels, extendable	Single extendable, with option to deliver switchboard sections up to 5 panels from factory
Voltage rating	Up to 24 kV	Up to 24 kV
Short circuit rating	Up to 21 kA - 3 s	Up to 25 kA - 3 s
Main busbar rating	630 A	1250 A
Tank concept	Mild steel powder coating, filled with natural air	Stainless steel welded tank, filled with natural air
Cable connection	Front side	Front side and back side connection (top and bottom)
Circuit breaker panels	200 A / 630 A	630 A / 1250 A
Load break panels	630 A	Not available
Switching routine	O - 3 min - CO - 3 min - CO	O - 0,3 s - CO - 1 min - CO
Spring charging mechanism VCB	Manual charge (standard) / motorized (option)	Manual & motorized (standard)
Operation disconnector	Manual (standard) / motorized (option)	Manual (standard) / motorized (option)

(*) Note that both platforms are not extendable with each other.

Xiria NGX design



Circuit breaker panel (example)

1. Low-voltage compartment (400 / 600 mm high)
2. Protection relay
3. Mimic diagram
4. Control panel with operation of the circuit breaker and change-over switch
5. Voltage detection system
6. Inspection window
7. Exchangeable front operation module
8. Spring charging mechanism
9. Stainless steel tank
10. Vacuum interrupter
11. Busbar
12. Change-over switch
13. Current transformers
14. Voltage transformers
15. Coil and resistor for protection against ferroresonance
16. Earth bar
17. Cable cones
18. Cable clamps
19. Connection cones for simple coupling and extension
20. Standard end cover

Eaton's core technologies

Transitioning to more sustainable energy means additional power demand, pushing the grid to its limits and significantly challenging its stability, security, and reliability. Improvements have been made in secondary distribution switchgear to increase their functionality and features and make them more reliable, flexible, compact, and low maintenance.

Eaton's medium-voltage Xiria NGX switchgear of up to 1250 A busbar and 25 kA short circuit level now delivers against these challenges by building on Eaton's core technologies.

Proven industry-leading technology

Eaton has more than 80 years long expertise in switchgear design and innovation, using Eaton's core technologies: solid insulation, electrical field control, and vacuum technology.

These technologies have been proven in the field time and again, as they are at the heart of the Xiria switchgear product family. Xiria 630 has an installed base of over 150,000 panels, catering to a wide range of applications for over 20 years.

Xiria NGX brings the proven Xiria technology to the next level with higher specifications (1250 A busbar application with 25 kA - 3 s short circuit ratings) and a sealed-for-life tank without overpressure.

Solid insulation

Years of experience designing and manufacturing insulation materials have taught us to construct smart single-phase insulated constructions. Using polycarbonate and thermoplastic elastomer (TPE) as high-quality primary insulation materials around live parts lets us shape the parts specifically for optimal insulation, robust construction, and cooling. Xiria NGX utilizes optimal field control through the special design of all primary components.

Electrical field control

With conventional shapes for primary busbars and conductors, the electrical field between the phases and between phase and earth is non-uniformly distributed. In areas with a high field, partial breakthrough can initiate avalanches resulting in flashovers.

In-depth knowledge about breakthrough phenomena and field steering techniques enables us to prevent flash over completely. The result is a particularly compact design.

Vacuum technology

Eaton vacuum interrupters consist of a ceramic cylinder housing a fixed and movable contact. The below facilitates contact movement under vacuum conditions. A shield surrounding the contacts prevents the insulators from becoming contaminated by metal vapor produced during the current interruption. This shield also ensures good potential distribution over the insulator.

A typical feature of Eaton vacuum interrupters is their low arc voltage and short arc times, resulting in an overall low arc energy. Contacts wear in a vacuum interrupter are, therefore, virtually negligible. Vacuum interrupters are maintenance-free and are certified for up to 30,000 operation cycles. They can withstand up to 100 short-circuit interruptions.

Air-GIS technology, natural air without overpressure as insulation medium

Xiria NGX is based on Air-GIS technology, using non-pressurized natural air as an insulation medium inside switchgear, reducing complexity and maintenance requirements and minimizing the risk of breakdowns and discharge. This means increased reliability, operational efficiency, and ensuring a safer environment by eliminating the potential hazards associated with high-pressure systems.

As a result, Eaton offers effective, streamlined and compact medium-voltage switchgear solutions prioritizing safety, performance, and longevity.

Features and benefits

Integrating Eaton's proven core technologies into the Xiria NGX ensures it is a compact, safe and reliable solution. Designed as a user and environment-friendly product throughout the whole chain from design to dismantling, Xiria NGX's features are constructed so that the costs for the owner are as low as possible, with no concessions to its quality during its lifetime of more than 40 years.

Environment and user-friendly design

- Air-GIS (switching in vacuum and natural air without overpressure in the tank for insulation)
- Environmental-friendly design for materials used (ROHS compliant)
- Only reusable and recyclable materials used
- Clear and straight-forward operation panels
- Easy and ergonomic cable connection and access
- Flexible solutions for bottom and top entry cable connections
- Ability to change cable cones while maintaining a sealed tank
- Coupling/extension of panels or switchboard sections via simple connection cones

Safe and reliable in use and operation

- Visible isolation using inspection windows in the front
- Logical mechanical and electrical interlocking prevents malfunctioning
- Fully IEC type-tested design by KEMA laboratories
- Internal arc type-tested solutions AFL(R) for exhaust in and outside the switch room
- Single pole insulated primary parts (applying phase houses for phase separation)
- Suitable for full remote operation and control
- Natural air in the tank without the need for overpressure guarantees dielectric properties
- Auto-reclosing function (OCO mechanism)

Low total cost of ownership (TCO)

Low initial costs

- Compact 500 mm wide panels up to 1250 A - 24 kV
- 12 kV and 24 kV panels in the same housing
- Cable connection from the front enabling wall standing arrangement
- Compact solution for cable back-side connection
- Reduced number of couplings at site due to option to deliver switchboard sections up to 5 panels, pre-assembled and coupled in the factory
- Compact solution to integrate busbar voltage measuring inside sectionalizer and riser panel

Minimized maintenance costs – fit and forget solution

- Primary parts and mechanism protected in welded sealed-for-life stainless steel tank (IP65)
- Maintenance-free vacuum circuit breaker
- Robust design with a minimum number of parts (routine tested in the factory)
- No pressure checks (GIS tank concept with natural air without overpressure)

Minimizing downtime

- Using proven technologies
- The highest degree of service continuity LSC2
- Preventing arc incidents with single-phase insulation
- Easy electrical upgrade of panel control via exchangeable front operation module

Low end-of-life disposal

- Materials are recyclable or can be re-used
- No special precautions, tools or decommissioning methods are needed

Main components

Vacuum circuit breaker

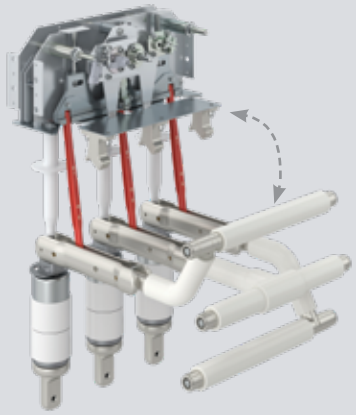
The vacuum circuit breaker uses a simple and reliable motor spring charging mechanism to operate the vacuum interrupters. The mechanism contains a low number of moving parts and makes no use of lubricants. It is completely housed in a sealed-for-life stainless steel welded tank and, therefore, needs no maintenance.

Features

- With environmentally friendly vacuum interrupters
- Simple spring charging mechanism
- Suitable for auto-reclosing (OCO mechanism)
- Housed in a sealed-for-life stainless steel tank
- Maintenance-free and no use of lubricants
- Manual and motor-operated
- Maintenance-free and tested up to 10,000 operations
- Free auxiliary contacts for open/closed positions (up to 5 NO + 5 NC)
- Inspection windows and mechanical indicators for position indication
- Integrated local/remote switch to allow the operator to take control of the switching

2-position change-over switch (disconnector)

All panels have a change-over switch in the same sealed-for-life tank as the circuit breaker. The change-over switch consists of three shafts connected to the tank's main busbars or earthing points. The operation of the change-over switch is mechanically interlocked with the circuit breaker. Only when the breaker is open it is possible to change the change-over position.

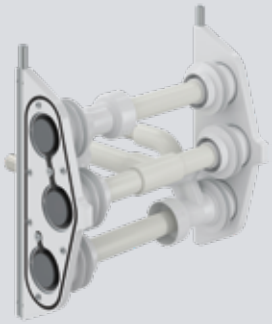


Features

- Manual-operated change-over switch with two positions (busbar / earth contact)
- Mechanically interlocked with the vacuum circuit breaker
- Option for the motorized operation of the change-over
- Maintenance-free and tested for 2,000 operations
- Housed in a stainless steel sealed-for-life tank
- Free auxiliary contacts for open/closed positions (up to 3 NO + 3 NC)
- Inspection windows and mechanical indicators for position indication

Main and vertical busbars

The main busbars are housed in the same sealed-for-life tank as the circuit breaker and change-over switch. Busbars are positioned outside the phase house. Via a vertical busbar, they connect to the disconnector mechanism inside the phase houses. All busbars are single-phase insulated with thermoplastic elastomers (TPE) to prevent a possible internal arc.



Features

- Copper main busbars, single phase insulated with thermoplastic elastomers (TPE)
- Natural air insulation between the busbars
- Simple and robust construction
- Housed in a stainless steel sealed-for-life tank
- Easy to couple via straightforward connection cones

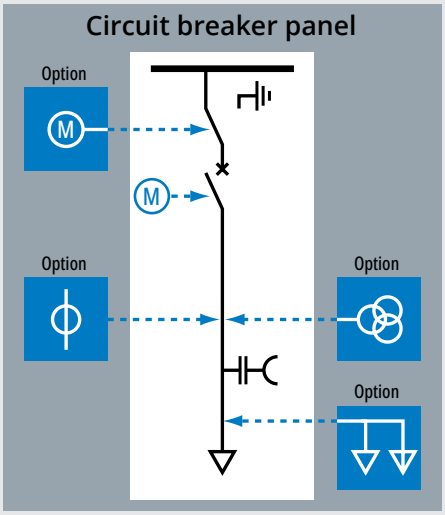
Stainless steel tank

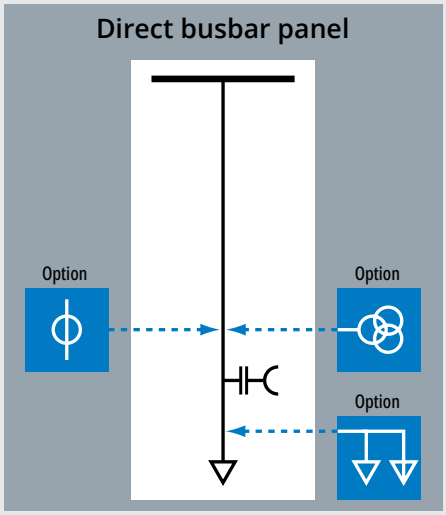
A sealed-for-life stainless steel welded tank with constant atmospheric conditions ensures high reliability and personnel safety. Primary parts and spring charging mechanism inside the tank are protected and maintenance-free.

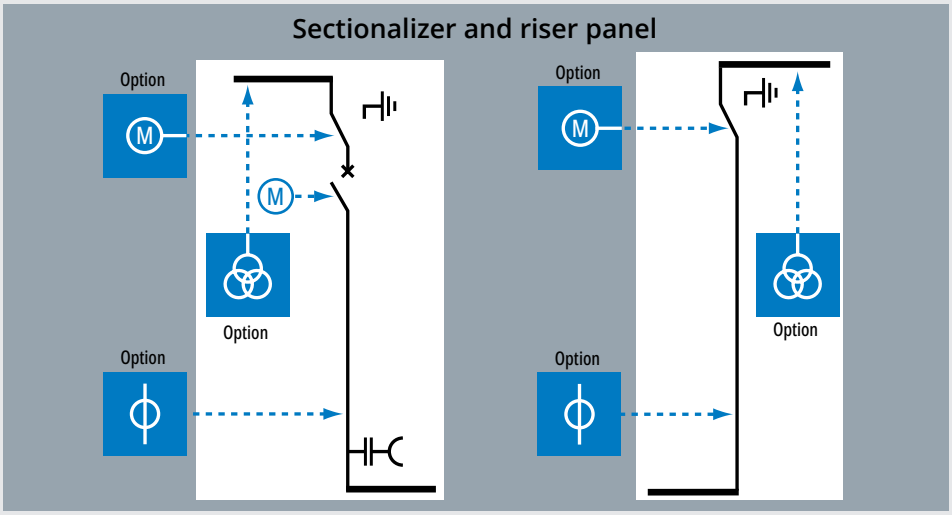
Features

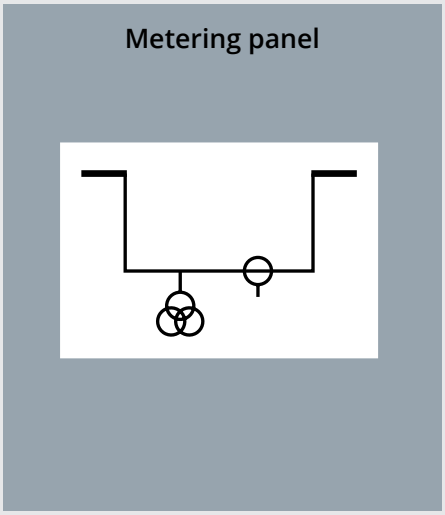
- Welded stainless steel design
- Ingress protection of IP65
- Parts inside the tank are fully protected against environmental conditions
- Maintenance-free

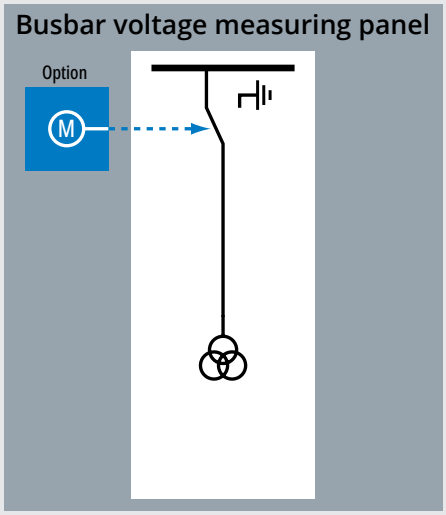
Panel types and options







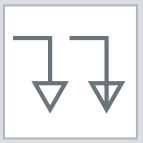





Circuit breaker


Change-over switch


Motor operation


Second or third cable


Capacitive voltage detection system


Voltage transformer


Current transformer

Technical data

General		3.6 kV	7.2 kV	12 kV	17.5 kV	24 kV
Rated voltage	kV	3.6	7.2	12	17.5	24
Impulse withstand voltage	kV	40	60	75 / 95	95	125
Power frequency withstand voltage	kV-1m	10	20	28 / 38 / 42	38	50
Rated frequency	Hz	50 / 60 (*)	50 / 60 (*)	50 / 60 (*)	50 / 60 (*)	50 / 60 (*)
Loss of service continuity		LSC2	LSC2	LSC2	LSC2	LSC2
Partition class		PM	PM	PM	PM	PM
Internal arc classification (IAC)		AFL(R)	AFL(R)	AFL(R)	AFL(R)	AFL(R)
Internal arc resistance (AFLR)	kA - s	25 - 1	25 - 1	25 - 1	25 - 1	25 - 1
Internal arc resistance with absorber (AFL)	kA - s	25 - 1	25 - 1	25 - 1	25 - 1	25 - 1
Degree of protection enclosure/control panel		IP3XD / IP2X (**)	IP3XD / IP2X (**)	IP3XD / IP2X (**)	IP3XD / IP2X (**)	IP3XD / IP2X (**)
Degree of protection with doors/covers open		IP2X	IP2X	IP2X	IP2X	IP2X
Ambient air temperature range	°C	-5...+40	-5...+40	-5...+40	-5...+40	-5...+40

Busbar system						
Rated normal current	A	1250	1250	1250	1250	1250
Rated short time withstand current	kA - s	25 - 3	25 - 3	25 - 3	25 - 3	25 - 3
Rated peak withstand current	kA	63	63	63	63	63

Circuit breakers						
Rated normal current	A	630 / 1250	630 / 1250	630 / 1250	630 / 1250	630 / 1250
Rated breaking current	kA	25	25	25	25	25
Rated short-circuit making current	kA	63	63	63	63	63
Rated capacitive switching current class		C2	C2	C2	C2	C2
Rated cable charging breaking current	A	31.5	31.5	31.5	31.5	31.5
DC Time Constant	msec	45	45	45	45	45
DC Component	%	35	35	35	35	35
Mechanical endurance class circuit breaker		M1 / M2 (*)	M1 / M2 (*)	M1 / M2 (*)	M1 / M2 (*)	M1 / M2 (*)
Mechanical endurance class as earth switch		M1	M1	M1	M1	M1
Mechanical endurance class disconnector		M1	M1	M1	M1	M1
Electrical endurance class		E2	E2	E2	E2	E2
Rated short time withstand current	kA - s	25 - 3	25 - 3	25 - 3	25 - 3	25 - 3
Minimum tripping time	msec	38	38	38	38	38
Mechanism type				O - 0,3 s - CO - 1 min - CO		

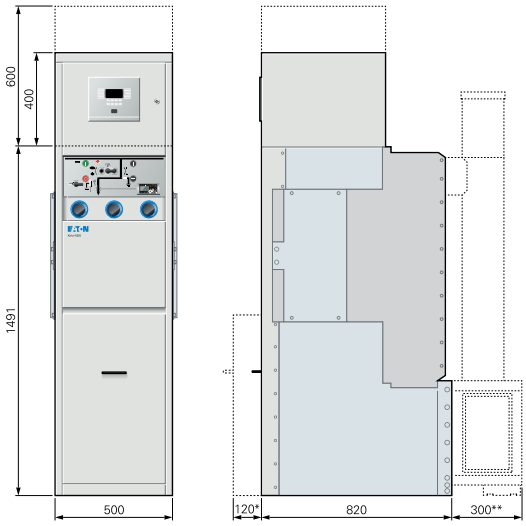
(*) Check availability
(**) Optional IP3XD

IEC standards / ISO norms

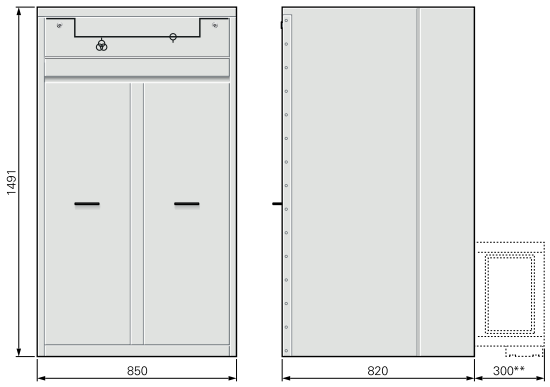
Xiria NGX complies with the following international standards.

Xiria NGX complies with the following international standards	
IEC 62271-1	Common specifications for high-voltage switchgear and control gear standards
IEC 62271-100	High-voltage alternating-current circuit breakers
IEC 62271-102	Alternating current disconnectors and earthing switches
IEC 62271-200	A.C. metal-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV
IEC 62271-213	Voltage detection and indication system
IEC 61869-1	Instrument transformers - Part 1: General requirements
IEC 61869-2	Instrument transformers - Part 2: Additional requirements for current transformers
IEC 61869-3	Instrument transformers - Part 3: Additional requirements inductive voltage transformers
IEC 60529	Degrees of protection provided by enclosures
EN 50181	Plug-in type bushings above 1 kV up to 36 kV
ISO 9001	Quality management system
ISO 14001	Environmental management

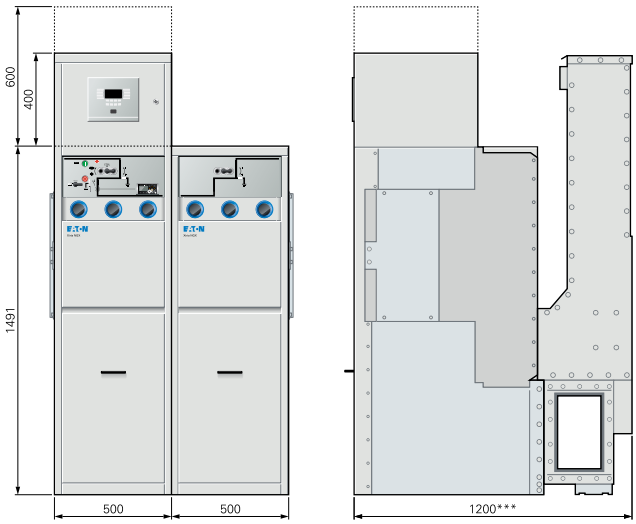
Dimensions (mm)



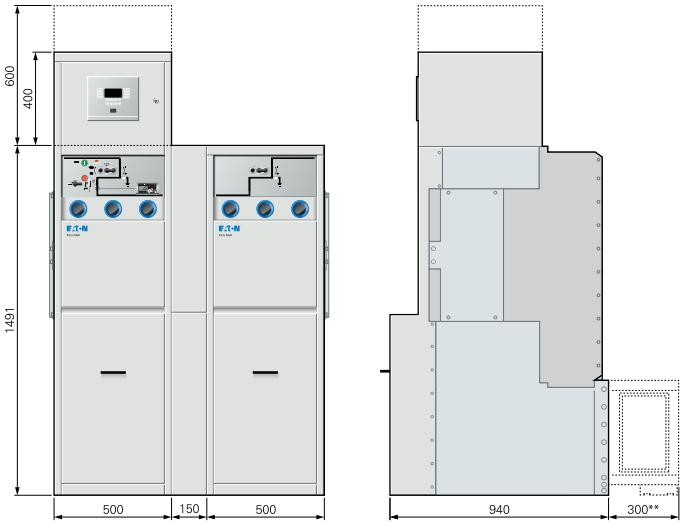
- Circuit breaker panel
- Direct busbar panel
- Busbar voltage measuring panel



- Metering panel



- Sectionalizer/riser with fixed rear connection (****)
  Option for integration voltage transformers



- Sectionalizer/riser with front side cable connection

(*) With extended base frame

(**) With optional arc channel or arc chimney with integrated arc absorbers (protection screen not shown)

(***) Including chimney for natural cooling

(****) Check availability

* At Eaton, we believe that power is a fundamental part of just about everything people do. Technology, transportation, energy and infrastructure—these are things the world relies on every day. That's why Eaton is dedicated to helping our customers find new ways to manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. To improve people's lives, the communities where we live and work, and the planet our future generations depend upon. Because that's what really matters. And we're here to make sure it works.

See more at Eaton.com/whatmatters

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