

Catalog HA 35.42 · 2025

MEDIUM-VOLTAGE SWITCHGEAR

Fixed-Mounted Circuit-Breaker Switchgear **Type NXPLUS C 24 – blue GIS up to 24 kV**, Gas-Insulated

siemens.com/nxplusc24



Applications Typical uses



Typical use:

Industry





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Bus sectionalizer 900 mm

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Applications Typical uses, ratings

Typical uses

Fixed-mounted circuit-breaker switchgear NXPLUS C 24 is a factory-assembled, type-tested, metal-enclosed, gas-insulated switchgear with metallic partitions ³⁾ for single-busbar and double-busbar applications and indoor installation.

It is used in transformer and switching substations, e.g., in:

- Power supply companies
- Power stations
- Cement industry
- Automobile industry
- Iron and steel works
- Rolling mills
- Mining industry
- Textile, paper and food industries
- Chemical industry
- Petroleum industry
- Pipeline installations
- Offshore installations
- Electrochemical plants
- Petrochemical plants
- Shipbuilding industry
- Diesel power plants
- Emergency power supply installations
- Lignite open-cast mines
- Traction power supply systems.

Ratings

Electrical data (maximum values) and dimensions

Rated voltage	kV	7.2	12	15	17.5	24
Rated frequency	Hz	50/60	50/60	50/60	50/60	50/60
Rated short-duration						
power-frequency						
withstand voltage	kV	20 1)	28 ²⁾	36	38	50
Rated lightning						
impulse voltage	kV	60 ¹⁾	75 ²⁾	95	95	125
Rated peak						
withstand current	kA	68	68	68	68	68
Rated short-circuit						
making current	kA	68	68	68	68	68
Rated short-time						
withstand current 3 s	kA	25	25	25	25	25
Rated short-circuit						
breaking current	kA	25	25	25	25	25
Rated continuous current						
of the busbar	Α	2500	2500	2500	2500	2500
Rated continuous current						
of the feeders	А	2000	2000	2000	2000	2000
Width	mm	300 ⁴⁾	300 ⁴⁾	300 4)	300 ⁴⁾	300 ⁴⁾
	mm	600	600	600	600	600
	mm	900	900	900	900	900
Depth	mm	1225	1225	1225	1225	1225
Height	mm	2250	2250	2250	2250	2250

1) 32 kV/60 kV according to some national requirements

2) 42 kV/75 kV according to some national requirements

3) Corresponds to "metal-clad" according to former standard IEC 60298

4) Only dummy panel

National approval by Intertek

The corresponding national approvals for the USA and Canada (approval number: 5022522) are available at Intertek. Thus, the NXPLUS C 24 switchgear fulfills the main requirements of the US-American IEEE Standard and the Canadian CSA Standard.





Requirements

Features

Environmental independence

Hermetically tight, welded switchgear vessels made of stainless steel as well as single-pole solid insulation make the parts of the primary circuit under high voltage of NXPLUS C 24 switchgear

- Insensitive to certain aggressive ambient conditions, such as saline air, air humidity, dust and condensation
- Tight to ingress of foreign objects, such as dust, pollution, small animals, humidity
- Independent of the site altitude.

Compact design

Thanks to the use of an insulation of natural gases (Clean Air), compact dimensions are possible. Thus:

- Existing switchgear rooms and substation rooms can be used effectively
- New constructions cost little
- Costly city-area space is saved.

Maintenance-free design

Switchgear vessels designed as sealed pressure systems, maintenance-free switching devices and enclosed cable plugs ensure:

- Maximum supply reliability
- Personnel safety
- Sealed-for-life design according to IEC 62271-200 (sealed pressure system)
- Installation, operation, extension and replacement without gas work
- Reduced operating costs
- Cost-efficient investment
- No maintenance cycles.

Innovation

The use of digital secondary systems and combined protection and control devices ensures:

- Clear integration in process control systems
- Flexible and highly simplified adaptation to new system conditions and thus to cost-efficient operation.

Service life

Under normal service conditions, the expected service life of gas-insulated switchgear NXPLUS C 24 is at least 40 years, taking the tightness of the hermetically welded switchgear vessel into account. The service life is limited by the maximum number of operating cycles of the switching devices installed.

Personal safety

- Safe-to-touch and hermetically sealed primary enclosure
- Cable terminations, busbars and voltage transformers are surrounded by earthed layers
- All high-voltage parts including the cable terminations, busbars and voltage transformers are metal-enclosed
- Capacitive voltage detecting system to verify safe isolation from supply
- Operating mechanisms and auxiliary switches safely accessible outside the primary enclosure (switchgear vessel)
- Due to the system design, operation is only possible with closed switchgear enclosure
- Standard degree of protection IP65 for all high-voltage parts of the primary circuit, IP3XD for the switchgear enclosure according to IEC 60529
- High resistance to internal arcs by logical mechanical interlocks and tested switchgear enclosure
- Panels tested for resistance to internal faults up to 25 kA
- Logical mechanical interlocks prevent maloperation
- Make-proof earthing by means of the vacuum circuit-breaker.

Security of operation

- Hermetically sealed primary enclosure independent of environmental effects (pollution, humidity and small animals)
- Maintenance-free in an indoor environment (IEC 62271-1)
- Operating mechanisms of switching devices accessible outside the primary enclosure (switchgear vessel)
- Metal-coated and plug-in inductive voltage transformers mounted outside the gas-insulated switchgear vessel
- Current transformers as ring-core current transformers mounted outside the gas-insulated switchgear vessel
- Complete switchgear interlocking system with logical mechanical interlocks
- Welded switchgear vessels, sealed for life
- Minimum fire load
- Type- and routine-tested
- Standardized and manufactured using numerically controlled machines
- Quality assurance in accordance with DIN EN ISO 9001
- More than 500,000 switchgear panels of Siemens in operation worldwide for many years.

Reliability

- Type- and routine-tested
- Standardized and manufactured using numerically controlled machines
- Quality assurance in accordance with DIN EN ISO 9001
- More than 500,000 switchgear panels of Siemens in operation worldwide for many years.

Requirements

Technology

General

- 3-pole enclosure of the primary part consisting of a switchgear vessel made of stainless steel
- Insulating gas Clean Air (natural gases, Global Warming Potential < 1)
- Three-position switch as busbar disconnector and feeder earthing switch
- Make-proof earthing by means of the vacuum circuitbreaker
- Compact dimensions due to gas insulation
- Hermetically tight, welded switchgear vessel made of stainless steel
- 1-pole, solid-insulated, screened busbars, plug-in type
- Cable connection with outside-cone plug-in system, or for connection of solid-insulated bars
- Wall-standing or free-standing arrangement
- Cable connection access from front
- Low-voltage door hinge on the left or right
- Installation and extension of existing switchgear at both ends without gas work and without modification of existing panels
- Option: Flexible pressure relief duct systems.

Interlocks

- According to IEC 62271-200
- Logical mechanical interlocks prevent maloperation
- Interlocking of three-position disconnector
- If the DISCONNECTING function is in CLOSED position, the READY-TO-EARTH function cannot be selected
- If the READY-TO-EARTH function is in CLOSED position, the DISCONNECTING function cannot be selected
- Three-position disconnector can only be operated with circuit-breaker in OPEN position
- Circuit-breaker can only be operated with three-position disconnector in end position and operating lever removed
- Locking device for "feeder earthed"
- Locking device for three-position disconnector The following interlocks can be fulfilled by placing the padlock accordingly:
 - Padlock on the left: Three-position disconnector DISCONNECTING function cannot be operated, three-position disconnector READY-TO-EARTH function can be operated
 - Padlock in the center: Control gate blocked, no switching operations possible
 - Padlock on the right: Three-position disconnector DISCONNECTING function can be operated, three-position disconnector READY-TO-EARTH function cannot be operated

- <u>Option:</u> Cable compartment cover interlocked against three-position disconnector (circuit-breaker panel)
- <u>Option:</u> Closing lockout for mechanical CLOSING of the circuit-breaker
- <u>Option</u>: Closing lockout for three-position disconnector DISCONNECTING function when the cable compartment cover / instrument transformer compartment cover is removed (circuit-breaker panel)
- <u>Option:</u> Electromagnetic interlocks (-Y1, -Y5, -Y8E, -Y16, -Y32)
- <u>Option:</u> Mechanical pushbuttons of the circuit-breaker can be padlocked
- Option: Locking device for "feeder".

Modular design

- · Panel replacement possible without gas work
- Low-voltage compartment removable, plug-in bus wires.

Instrument transformers

- Current transformers not subjected to dielectric stress
- Easy replacement of current transformers designed as ring-core transformers
- Metal-coated, plug-in and disconnectable voltage transformers.

Sensors

- Current sensor as inductive current transformer in combination with precision shunt (voltage signal)
- Voltage sensor as resistor divider
- In combination with secondary devices such as – SICAM FCM
 - 7SJ81.

Vacuum circuit-breaker

- Maintenance-free under normal ambient conditions according to IEC 62271-1
- No relubrication or readjustment
- Up to 10,000 operating cycles
- Vacuum-tight for life.

Secondary systems

- Customary protection, measuring and control equipment
- <u>Option:</u> Numerical multifunction protection relay with integrated protection, control, communication, operating and monitoring functions
- Can be integrated in process control systems.

Standards (see page 33)

Digitalization, condition monitoring

Siemens Xcelerator, available monitoring functionalities

Siemens Xcelerator

Siemens Xcelerator is an open digital business platform that enables customers to accelerate their digital transformation more easily, quickly, and at scale.

Addressing key challenges in the energy sector and beyond

Maintaining grid stability – Increasing energy demands often clash with fluctuating generation. Balancing both is crucial for tomorrow's grid stability.

Our smart energy solutions simplify management, align OT and IT, and ensure a resilient, scalable, and adaptable grid.

Maximizing cyber and asset security – Power grids can be a target for cyberattacks, which may cause power outages and unpredictable results.

Our solutions incorporate security measures to remove vulnerabilities in IT components, control devices, as well as transformer substation and switchgear systems.

Reducing expenditures – Our solutions enhance competitiveness through optimized CAPEX and OPEX with asset optimization, digital planning, simulation, and flexible financing options

Integrating distributed energy resources (DERs) – DERs are at the heart of a clean and resilient energy future. Nevertheless, a greater system flexibility is needed to consistently balance supply and demand.

Our solution offering covers the entire spectrum: from consulting through technical applications and services to tailored financing and business models.

Available monitoring functionalities for gas-insulated switchgear

Condition monitoring

Condition monitoring serves to continuously improve the resilience, reliability, and availability of maintenance-free, gas-insulated medium-voltage switchgear with an expected service life of 40 years. These values are based on the design and empirical data for switchgear assemblies, as well as on the intended use of the switchgear under normal service conditions according to IEC 62271-1.

To protect the investment (CAPEX) and reduce operational expenditures (OPEX), the extension of switchgear functions with a condition monitoring system is the appropriate way for early indication of irregularities at the switchgear and its peripheral components. This is the premise for condition-based inspection.

Temperature monitoring of the cable connections

Temperature monitoring of the cable connections ensures that the maximum permissible thermal service conditions of the gas-insulated switchgear and the cable connection set are not exceeded during operation. With the help of an intelligent correlation between the ambient air temperature, the cable connection temperature, and the switchgear utilization, anomalies can already be detected and indicated before the limit temperature is reached, based also on low-load scenarios.

Temperature and humidity monitoring of the environment (dew-point monitoring)

Ongoing condensation would lead to corrosion at the switchgear, and reduce its service life. Specific countermeasures after strong humidity at the switchgear assembly, as well as the prevention of further condensation, can remedy the situation.

Partial discharge monitoring

Partial discharges arise if the electrical insulation is damaged or insufficient. Partial discharge monitoring offers a pre-alarming in case of a possibly insufficient electrical insulation. In most cases, partial discharges are a long-term effect of thermal overstressing or of defective or incorrectly installed peripheral components.

Digital gas density monitoring

For perfect operation of a gas-insulated switchgear, the correct gas density inside the switchgear vessel is crucial. To maintain the full scope of functions of the switchgear, immediate action is required if the gas density falls below the necessary values.

Circuit-breaker monitoring

Continuous monitoring of circuit-breaker functions enables an evaluation of the actual health status of the circuit-breaker, based on both mechanical and electrical parameters. The evaluation of performed mechanical and electrical switching operations, as well as the monitoring of other components, allows to indicate at an early stage if servicing work is necessary, or if a suitable replacement switchgear should be procured.

Load flow monitoring

An increasing number of distributed energy resources and the growing share of e-mobility lead to ever more volatile load flows in the distribution grids. Capturing this data is an important element for identifying hotspots in the grid, and it offers planning security for the operator.

Digitalization, condition monitoring

Digitalization solutions from a single source



Sustainability

Our contribution to a sustainable and cleaner planet

At Siemens, sustainability is not just a commitment, but a core strategy deeply ingrained in our operations. Our DEGREE framework, representing **Decarbonization**, **Ethics**, **Governance**, **Resource Efficiency**, **Equity**, and **Employability**, guides our journey towards a sustainable future. It constitutes a 360-degree approach for all stakeholders – our customers, our suppliers, our investors, our people, the societies we serve, and our planet.

Siemens aims to limit global warming to 1.5 degrees Celsius and takes action across its operations, targeting various ESG (Environmental, Social, and Governance) topics. We further contribute to decarbonization by helping our customers reduce emissions, and aim to lower our own operational emissions significantly by 2030. Additionally, we promote resource efficiency through recycling and a circular economy, incorporating sustainable design criteria into our products and increasing the use of secondary materials. Siemens focuses on sustainable materials, energy sources, and product service life optimization to minimize resource consumption and waste. Ultimately, we strive to create a better future by achieving sustainability goals and minimizing environmental impacts.

Siemens gas-insulated switchgear (GIS) systems have played a key role over the last 40 years for a reliable and safe power distribution. The new Siemens blue GIS portfolio reflects our commitment to 100 % sustainable innovation, which integrates both Clean Air as an insulating medium and an eco-efficient design that reduces its CO₂ footprint throughout the entire life cycle. With a wide range of products covering all the needs, our blue GIS will be the core of a sustainable energy transition. The following innovative solutions offer a remarkable CO₂ footprint reduction:

F-gas-free insulation: Clean Air consists of natural-origin gases with a GWP < 1, which means it has virtually no negative impact on the environment or climate change during the entire life cycle. It can even be released into the atmosphere after reaching its end of life.

Space efficiency: Like the traditional GIS design, Siemens blue GIS also offer very compact solutions that save valuable space and additionally decrease the environmental impact of electrical infrastructure installations.



Material efficiency: blue GIS products are designed to have a very low CO₂ footprint. A prime example is SIBushing, a non-conventional instrument transformer that reduces the use of raw materials, energy consumption, and landfill waste.

Energy efficiency: An optimized main current path with a low ohmic resistance reduces the power loss during operation of the switchgear considerably, and thus increases the energy efficiency.

Long service life: With the right material selection and an innovative design, blue GIS have an expected service life of 40 years, thus extending the re-investment cycle and further diminishing the CO_2 footprint.

Maintenance-free design: No additional maintenance is necessary, and the CO₂ footprint can be reduced further by avoiding site visits during the operational phase of the switchgear.

Sustainable services: The CO_2 footprint can be diminished thanks to services from predictive maintenance to condition monitoring, remote FAT, CO_2 monitoring via NXpower monitor, the Totally Integrated Power planning tools, and paperless documentation.

Sustainability

The complete life cycle that counts

In view of the global climate crisis and the necessity to reduce carbon emissions and preserve natural resources, Siemens aims to decrease the environmental footprint of its own business operations as well as that of its customers and supply chains. With internationally standardized approaches, we provide transparency regarding the environmental impacts of our products, systems, solutions, and services.

Robust Eco Design: Our blue GIS panels are designed as a part of the Eco Efficiency @ Siemens program, where the environmental impacts to be expected in each of the product's life cycle phases are addressed right from the design phase. The switchgear is designed not only to minimize its CO₂ footprint, but also to prioritize resource efficiency and circular economy.

Siemens EcoTech: Our new label for Siemens products that shows great performance across a range of sustainability criteria compared to other products in the market, an external standard, or a predecessor product. Each Siemens EcoTech product must have at least an EPD type II, manufactured in a production facility that uses 100 % renewable energy and needs to fulfill a minimum of one criterion in each dimension of the EcoTech framework. NXPLUS C 24 blue GIS is now part of Siemens EcoTech portfolio*.



The Siemens Environmental Product Declaration (EPD)

adheres to ISO 14021 standards for environmental labels and declarations. It is based on a comprehensive Life Cycle Assessment (LCA) study conducted in accordance with ISO 14040/44, incorporating Product Category Rules (PCR) specified in EN 50693 for electronic and electrotechnical products and systems.

Product	NXPLUS C 24 – primary distribution blue GIS
Technical data	<i>U</i> _r = 24 kV, <i>I</i> _k = 25 kA, <i>I</i> _r = 1250 A
Product description	NXPLUS C 24 is an F-gas-free single-busbar gas-insulated circuit-breaker switchgear with Clean Air insulation for primary distribution grids, and available as circuit-breaker, bus sectionalizer and disconnector panels
Functional unit	Reference NXPLUS C 24 – circuit-breaker panel for 1250 A– blue GIS, primary part, type-tested according to IEC 62271-200. Maintenance-free, operating 24 h, 365 days/a with an considered service life of 40 years

Material composition



Resource efficiency

The end-of-life phase of an NXPLUS C 24 blue GIS was modeled with the LCA tool Green Digital Twin (GDT), Database: One Siemens LCA Database (based on MLC CUP 2023.2, formerly GaBi) by first dismantling the equipment, followed by a shredding, sorting, and material separation process, resulting in:

- An overall product recyclability of up to 87 % mainly thanks to high metal content
- An energy recoverability of up to 8 % from plastic materials
- A minimum disposal rate of 5 %

The exact final values depend on the used recycling processes.

Use of environmentally safe materials

At Siemens, we are committed to the development and production of environmentally friendly and sustainably produced equipment. This includes avoiding hazardous substances in our products without compromising their benefits for our customers. Please visit the following website** to learn more about how we comply with product-related environmental regulations like RoHS, REACh and others.

* https://www.siemens.com/global/en/company/sustainability/siemens-ecotech.html

** https://www.siemens.com/global/en/products/energy/ecotransparency/ ecotransparency-downloads.html

Electrical data, filling pressure, temperature for single-busbar switchgear

Common electrical data, filling pressure and temperature

Rated insulation level	Rated voltage U _r	kV	7.2	12	15	17.5	24
	Rated short-duration power-frequency						
	withstand voltage U _d						
	 phase-to-phase, phase-to-earth, open contact gap 	kV	20 ¹⁾	28 ²⁾	36	38	50
	 across the isolating distance 	kV	23 ¹⁾	32 ²⁾	40	45	60
	Rated lightning impulse withstand voltage Up						
	 phase-to-phase, phase-to-earth, open contact gap 	kV	60 ¹⁾	75 ²⁾	95	95	125
	 across the isolating distance 	kV	70 ¹⁾	85 ²⁾	110	110	145
Rated frequency fr		Hz	50/60	50/60	50/60	50/60	50/60
Rated continuous current ³⁾ I _r	for the busbar up	o to A	2500	2500	2500	2500	2500
Rated filling level (absolute) p _{re}	for gas-insulated switchgear vessel	kPa	190	190	190	190	190
Minimum functional level (absolute) pme	for gas-insulated switchgear vessel	kPa	180	180	180	180	180
Gas leakage rate		%	< 0.1 per y	ear —			
Ambient air temperatur	e	°C	-5 to +55 '	4)			>

Data of the switchgear panels

Circuit-breaker panel 63	0 A, 800 A, 1000 A, 1250 A, 1600 A, 200) A					
Bus sectionalizer 1000 A	, 1250 A						
Rated continuous	at an ambient air temperature of 40 °C	A	630	630	630	630	630
current Ir		A	800	800	800	800	800
		A	1000	1000	1000	1000	1000
		A	1250	1250	1250	1250	1250
		A	1600	1600	1600	1600	1600
		A	2000	2000	2000	2000	2000
Rated short-time	for switchgear with $t_k = 1$ s	kA	20 25	20 25	20 25	20 25	20 25
withstand current Ik	for switchgear with $t_k = 3$ s	kA	20 25	20 25	20 25	20 25	20 25
Rated peak	50 Hz	kA	54 68	54 68	54 68	54 68	54 68
withstand current Ip	60 Hz	kA	54 68	54 68	54 68	54 68	54 68
Rated short-circuit	50 Hz	kA	54 68	54 68	54 68	54 68	54 68
making current I _{ma}	60 Hz	kA	54 68	54 68	54 68	54 68	54 68
Rated short-circuit break	ing current I _{sc}	kA	20 25	20 25	20 25	20 25	20 25
Electrical endurance of	at rated continuous current		10,000 op	erating cycle	s ———		>
vacuum circuit-breakers	at rated short-circuit breaking current		50 breaking operations				
Endurance classes according to IEC 62271-100		M2, E2, C2	2, S2				
Endurance classes according to IEC 62271-102 DISCONN		DISCONNECTING	M1	M1	M1	M1	M1
		EARTHING	M0, E0	M0, E0	M0, E0	M0, E0	M0, E0

The EARTHING function with endurance class E2 is reached by closing the circuit-breaker in combination with the earthing switch (endurance class E0).

1) Higher values of the rated short-duration power-frequency withstand voltage available with:

- 32 kV for phase-to-phase, phase-to-earth and open contact gap, as well as - 37 kV across the isolating distance
- Higher values of the rated lightning impulse withstand voltage:
- 60 kV for phase-to-phase, phase-to-earth and open contact gap, as well as 70 kV across the isolating distance
- Higher values of the rated short-duration power-frequency withstand voltage available with:
 - -42 kV for phase-to-phase, phase-to-earth and open contact gap, as well as -48 kV across the isolating distance
 - Higher values of the rated lightning impulse withstand voltage:
 - 95 kV for phase-to-phase, phase-to-earth and open contact gap, as well as
 110 kV across the isolating distance

3) The rated continuous currents apply to ambient air temperatures of max. 40 °C. The 24-hour mean value is max. 35 °C (according to IEC 62271-1) 2500 A with natural ventilation

4) Optional ambient air temperature -25 °C to +55 °C (secondary devices (e.g. protection devices, meters, measuring transducers, etc.) must be suitable for the given ambient air temperature)

Electrical data, filling pressure, temperature for single-busbar switchgear

Data of the switchgear panels (continued)

Disconnector panel 630 A, 800 A, 1000 A, 1250 A, 1600 A, 2000 A							
Rated voltage Ur		kV	7.2	12	15	17.5	24
Rated continuous	at an ambient air temperature of 40 °C	A	630	630	630	630	630
current ³⁾ Ir		A	800	800	800	800	800
		A	1000	1000	1000	1000	1000
		A	1250	1250	1250	1250	1250
		A	1600	1600	1600	1600	1600
		A	2000	2000	2000	2000	2000
Rated short-time	for switchgear with $t_k = 1$ s	kA	20 25	20 25	20 25	20 25	20 25
withstand current Ik	for switchgear with $t_k = 3$ s	kA	20 25	20 25	20 25	20 25	20 25
Rated peak	50 Hz	kA	54 68	54 68	54 68	54 68	54 68
withstand current Ip	60 Hz	kA	54 68	54 68	54 68	54 68	54 68
Endurance classes according to IEC 62271-102 DISCONNE		DISCONNECTING	M1	M1	M1	M1	M1
	-	EARTHING	M0, E0	M0, E0	M0, E0	M0, E0	M0, E0
Metering panel, gas-in	sulated (with HV HRC fuses)						
Rated continuous current ³⁾ Ir	at an ambient air temperature of 40 $^\circ\mathrm{C}$	А	-	-	-	-	-
Rated short-time	for switchgear with $t_k = 1$ s	kA	20 25	20 25	20 25	20 25	20 25
withstand current Ik	for switchgear with $t_k = 3$ s	kA	20 25	20 25	20 25	20 25	20 25
Rated peak	50 Hz	kA	54 68	54 68	54 68	54 68	54 68
withstand current Ip	60 Hz	kA	54 68	54 68	54 68	54 68	54 68
Dimension "e" of HV HRC fuse-links mm		292	292	442	442	442	
		mm	442	442			
Endurance classes acco	rding to IEC 62271-103		M1	M1	M1	M1	M1
Endurance classes acco	rding to IEC 62271-102	DISCONNECTING	M0	M0	M0	MO	M0
		EARTHING	M0, E2	M0, E2	M0, E2	M0, E2	M0, E2

3) The rated continuous currents apply to ambient air temperatures of max. 40 °C. The 24-hour mean value is max. 35 °C (according to IEC 62271-1) 2500 A with natural ventilation

Room planning

Switchgear installation

- For single-busbar applications:
- Wall-standing arrangement or
- Free-standing arrangement
- Face-to-face arrangement accordingly.

Room dimensions

See dimension drawings on the following page.

Room height

• <u>≥ 2750 mm</u>

NXPLUS C 24, all technical data, all types of arrangement, with / without horizontal pressure relief duct

• <u>≥ 2400 mm</u>

NXPLUS C 24, wall-standing and free-standing arrangement with rear/central pressure relief duct, low-voltage compartment 761 mm, without horizontal pressure relief duct.

Door dimensions

Recommended as a minimum for the door dimensions: Door height: \geq 2500 mm Door width: \geq 900 mm (for panel widths of 600 mm)

 \geq 1200 mm (for panel widths of 900 mm).

Switchgear fixing

- For floor openings and fixing points of the switchgear, see pages 22 to 25
- Foundations:
- Steel girder construction
- Steel-reinforced concrete with foundation rails, welded or bolted on.

Panel dimensions

See pages 22 to 25.

Weights

<u>Single-busbar panels</u>
Panels for ≤ 1250 A: Approx. 800 kg.

Switchgear installation

Wall-standing arrangement for single-busbar switchgear

All panels with cable connection at the front and pressure relief duct at the rear



- Control aisle depending on national specifications; for extension/panel replacement: ≥ 1400 mm recommended (600 mm panels)
- ≥ 1600 mm recommended (900 mm panels)
 ** Lateral wall distances on the left or on the right; for installation and maintenance (according to IEC 61936-1):
 ≥ 500 mm recommendable

Room planning

Switchgear installation

Free-standing arrangement for single-busbar switchgear

All panels with cable connection at the front and pressure relief duct at the rear



- Control aisle depending on national specifications; for extension/panel replacement: ≥ 1400 mm recommended (600 mm panels)
- ≥ 1400 mm recommended (600 mm panels) ≥ 1600 mm recommended (900 mm panels) * Lateral wall distances on the left or on the right;
- for installation and maintenance (according to IEC 61936-1): \geq 500 mm recommendable *** \geq 500 mm aisle for installation and maintenance
 - SOU mm alse for installation a (according to IEC 61936-1)
 - \geq 800 mm aisle for operation (according to IEC 62271-200)

Switchgear installation

Free-standing / wall-standing arrangement for double-busbar switchgear



- Control aisle depending on national specifications; for extension/panel replacement: ≥ 1400 mm recommended (600 mm panels)
- 2 1600 mm recommended (900 mm panels)
 ** Lateral wall distances on the left or on the right; for installation and maintenance (according to IEC 61936-1):
 > 500 mm recommendable

Room planning, Shipping data

Free-standing arrangement for double-busbar switchgear

All panels with cable connection at the front and central pressure relief duct



≥ 800 mm for panel replacement (450 mm, 600 mm panels) ≥ 1100 mm for panel replacement (900 mm panels)

≥ 500 mm for installation and maintenance (according to IEC 61936-1)

left or on the right:

Control aisle depending on national specifications; for extension/panel replacement: ≥ 1400 mm recommended (450 mm, 600 mm panels)

 \geq 800 mm for operation (according to IEC 62271-200)

Transport

NXPLUS C 24 switchgear is delivered in form of individual panels. Please observe the following:

- Transport facilities on site
- Transport dimensions and transport weights
- Size of door openings in building.

Packing

Means of transport: Rail and truck

- Panels on pallets
- Open packing with PE protective foil.

Means of transport: Ship and airplane

- Panels on pallets
- In closed crates (cardboard) with sealed upper and lower PE protective foil
- With desiccant bags
- With sealed wooden base
- Max. storage time: 6 months.

Dimensions, weights

Transport	Panel spacing	Transport	Transport dimensions			Transport weight ¹⁾		
		Width	Height	Depth	With packing	Without packing		
	mm	mm	mm	mm	kg	kg		
Single busbar								
Truck or rail	1 × 600	1100	2460	1450	900	800		
	1 × 900	1100	2460	1450	1500	1400		
Ship or airplane	1 × 600	1130	2550	1450	900	800		
	1 × 900	1130	2550	1450	1500	1400		

1) The transport weights are maximum weights and do not include the additional weights of busbars and, depending on the design, the weights of voltage transformers at the busbar, horizontal pressure relief duct, cable-type current transformers, summation current transformers, and separate low-voltage compartment (supplied as accessories). The weights on the nameplate may indicate correspondingly higher weights.

16 Fixed-Mounted Circuit-Breaker Switchgear Type NXPLUS C 24 – blue GIS up to 24 kV, Gas-Insulated · Siemens HA 35.42 · 2025

Classification of NXPLUS C 24 switchgear according to IEC 62271-200

Design and construction

Partition class		PM (metal partition) ¹⁾					
Loss of service continuity ca	itegory						
Single-busbar panels with	Circuit-breaker panel	LSC 2					
connection compartment	Disconnector panel	-					
Panels without connection compartment	Bus sectionalizer, single-panel	No LSC assigned, as no connection compartment available. ⁵⁾ <u>Note:</u> The single-panel bus sectionalizer (incl. both busbar sections) can remain in operation if the lower compartment is opened.					
	Bus sectionalizer, two-panel	No LSC assigned, as no connection compartment available. ⁵⁾ <u>Note:</u> If the longitudinal panel interconnection is earthed, both busbar sections can remain in operation if the compartment of the longitudinal panel interconnection is opened.					
	Metering panel	No LSC assigned, as no connection compartment available. ⁵⁾ <u>Note:</u> The busbar of the switchgear can remain in operation if the voltage trans former compartment is opened.					
Accessibility to compartment	nts ⁶⁾ (enclosure)						
Busbar compartment		Tool-based					
Switching-device compartment		Non-accessible					
Instrument transformer compartment / transformer compartment		Tool-based					
Fuse compartment		Interlock-controlled and tool-based					
Low-voltage compartment 6)		Tool-based					
Cable compartment		Tool-based					
Internal arc classification							
Designation of the internal	arc classification IAC	7.2 kV, 12 kV, 15 kV, 17.5 kV, 24 kV					
IAC class	for wall-standing arrangement	IAC A FL 25 kA, 1 s ^{2) 3)}					
	for free-standing arrangement	IAC A FLR 25 kA, 1 s ^{2) 3)}					
Accessibility type A		Switchgear in closed electrical service location, access "for authorized personnel only" according to IEC 62271-200					
	— F	Front					
	- L	Lateral					
	- R	Rear (for free-standing arrangement)					
Arc test current Ia		25 kA					
Test duration		1 s					
Test arrangement		According to IEC 62271-200 Annex A: Minimum wall distance 800 mm (for accessible sides)					

1) Corresponds to "metal-clad" according to former standard IEC 60298

Corresponds to "metal-clad" according to former standard IEC 60298
 Metering panel: Voltage transformer compartment fuse-protected
 Valid for normal operating conditions, not for normal use ⁴)
 Normal operating conditions: At least one part of the panel is live, and all doors and covers are closed and locked Normal use: Use of the switchgear as described in the operating instructions
 According to standard IEC 62271-200
 The low-voltage compartment and the operating mechanism compartment (operating mechanisms of the switching devices) are not high-voltage compartments according to the IEC 62271-200 standard.

Design according to IEEE, CSA

Panel design

Panel design

- Factory-assembled, type-tested switchgear according to IEC 62271-200
- Fulfills the IEEE Std C37.20.7 and CSA C22.2 No. 31-18
- Circuit breaker panels, disconnecting switch panels, bus sectionalizers and dummy panels available
- Three-pole primary enclosure, metal-enclosed
- Welded switchgear vessel made of stainless steel, with welded-in bushings for electrical and mechanical components
- Installation and extension of existing switchgear assemblies at both ends without gas work and modifications on panels
- Bushings with outside cone according to EN 50181, size C
- Cable connection access from front
- Wall-standing or free-standing arrangement
- Pressure relief upwards, optionally with horizontal pressure relief duct with evacuation to the outside
- Vacuum circuit breaker
- Three-position disconnect switch in circuit breaker panel, disconnect switch panel, bus sectionalizer.

Viewing & Lighting System

• Patented Viewing & Lighting System (VLS) for visual verification of the switch position of the three-position switch.

Certification by Intertek

- The corresponding national approvals for the USA and Canada (approval number: 5022522) are available at Intertek.
- Thus, the NXPLUS C switchgear fulfills the main requirements of the US-American IEEE Standard and the Canadian CSA Standard.







Design according to IEEE, CSA Electrical data of the switchgear

Common electrical data	, filling pressure	and temperature
-------------------------------	--------------------	-----------------

Rated insulation level	Rated voltage U _r	kV	4.76	8.25	15
			IEEE, CSA	IEEE, CSA	IEEE, CSA
	Rated short-duration				
	power-frequency				
	withstand voltage U_{d}				
	– phase-to-phase, phase-to-				
	ground, open contact gap	kV	19	26	36
	- across the isolating distance	kV	21	29	40
	Rated lightning impulse				
	withstand voltage U _p				
	– phase-to-phase, phase-to-				
	ground, open contact gap	kV	60	75	95
	 across the isolating distance 	kV	66	85	105
Rated frequency fr		Hz	50/60	50/60	50/60
Rated continuous	for the main bus	Α	630	630	630
current Ir		Α	800	800	800
		Α	1000	1000	1000
		Α	1250	1250	1250
		А	1600	1600	1600
		А	2000	2000	2000
		Α	2500	2500	2500
Rated filling level	for gas-insulated	kPa	190	190	190
(absolute) pre	switchgear vessel				
Minimum functional	for gas-insulated	kPa	180	180	180
level (absolute) pme	switchgear vessel				
Ambient air temperature	_	°C	-5 to +55 -		>
	-	°C	-25 to +55 -		→

Data of the switchgear panels

Circuit breaker panel 63	80 A, 800 A				
Rated continuous	at an ambient air temp	perature A	630	630	630
current I _r	of 40 °C	A	800	800	800
Rated short-time	for switchgear with t_k	= 1 s kA	20	20	20
withstand current Ik		kA	25	25	25
	for switchgear with t_k	= 2 s kA	20	20	20
		kA	25	25	25
	for switchgear with t_k	= 3 s kA	20	20	20
		kA	25	25	25
Rated peak	50 Hz	kA	54	54	54
withstand current Ip		kA	68	68	68
	60 Hz	kA	54	54	54
		kA	68	68	68
Rated short-circuit	50 Hz	kA	54	54	54
making current Ima		kA	68	68	68
	60 Hz	kA	54	54	54
		kA	68	68	68
Rated short-circuit break	ing current I _{sc}	kA	20	20	20
		kA	25	25	25
Electrical endurance	at rated continuous cu	irrent	10,000 opera	ating cycles —	→
of vacuum	at rated short-circuit b	reaking	50 breaking	operations —	>
circuit breakers	current				
Endurance classes according to IEC 62271-100			M2, E2, C2, S	52	→
Endurance classes accor	ding to DIS	SCONNECTING	M1	M1	M1
IEC 62271-102 GROUND			M0, E0	M0, E0	M0, E0

Design according to IEEE, CSA Electrical data of the switchgear

Data of the switchgear panels (continued)

Circuit breaker panel and bus sectionalizer 1000 A, 1250 A, 1600 A, 2000	Α
--	---

Rated voltage Ur	Rated voltage Ur			8.25	15
			IEEE, CSA	IEEE, CSA	IEEE, CSA
Rated continuous	at an ambient air tempera	iture A	1000	1000	1000
current Ir	of 40 °C	А	1250	1250	1250
		A	1600	1600	1600
		A	2000	2000	2000
Rated short-time	for switchgear with $t_k = 1$	s kA	20	20	20
withstand current Ik		kA	25	25	25
	for switchgear with $t_k = 2$	s <u>kA</u>	20	20	20
		kA	25	25	25
	for switchgear with $t_k = 3$	s kA	20	20	20
		kA	25	25	25
Rated peak	50 Hz	kA	54	54	54
withstand current Ip		kA	68	68	68
	60 Hz	kA	54	54	54
		kA	68	68	68
Rated short-circuit	50 Hz	kA	54	54	54
making current I _{ma}		kA	68	68	68
	60 Hz	kA	54	54	54
		kA	68	68	68
Rated short-circuit brea	aking current Isc	kA	20	20	20
		kA	25	25	25
Electrical endurance	at rated continuous curre	nt	10,000 ope	rating cycles —	→
of vacuum	at rated short-circuit brea	king	50 breaking	operations —	
circuit breakers	current				
Endurance classes acco	ording to IEC 62271-100		M2, E2, C2,	S2	→
Endurance classes acco	ording to DISCC	NNECTING	M1	M1	M1
IEC 62271-102	G	ROUNDING	M0, E0	M0, E0	M0, E0

Disconnecting switch panel 630 A, 800 A, 1000 A, 1250 A, 1600 A, 2000 A

Rated continuous	at an ambient air t	temperature	А	630	630	630
current Ir	of 40 °C		А	800	800	800
			А	1000	1000	1000
			А	1250	1250	1250
			А	1600	1600	1600
			А	2000	2000	2000
Rated short-time	for switchgear wit	$h t_k = 1 s k$	A	20	20	20
withstand current Ik		k	A	25	25	25
	for switchgear wit	$h t_k = 2 s k$	A	20	20	20
		k	A	25	25	25
	for switchgear wit	$h t_k = 3 s k$	A	20	20	20
		k	A	25	25	25
Rated peak	50 Hz	k	A	54	54	54
withstand current Ip		k	A	68	68	68
	60 Hz	k	A	54	54	54
		k	A	68	68	68
Negligible breaking current A			A	0.5	0.5	0.5
Endurance classes according to DISCONNECTIN			G	M1	M1	M1
IEC 62271-102		GROUNDIN	G	M0, E0	M0, E0	M0, E0

Design according to IEEE, CSA

VL system, position indication

VL system (Viewing & Lighting System)

- Optical system for visual verification of the positions of the three-position switch
- No auxiliary voltage supply required
- Access from the switchgear front
- Fixed-mounted VL-base in the panel
- VLS module withdrawable and suitable for several feeders
- Protective bag with cleaning kit available (option).

Position indication

- Mechanical position indicator for circuit breaker and three-position switch
- Visual check of the switch position of the three-position switch through the VLS
- Electrical position indication of the circuit breaker via signaling lamps in the operating front.

VL system display on the front cover



1 VL-module

2 Eyepiece 3 Switch for light source

4 Protective cover

5 Reference images 6 Mechanical position indication

for circuit breaker

Circuit-breaker panel, single busbar

Circuit-breaker panel 630 A, 800 A, 1000 A, 1250 A 24 kV

600 mm





Legend for pages 22 to 25:

- 1 Left-side floor opening for control cables
- 2 Pressure relief duct
- 3 Fixing hole for M8/M10
- 4 Fixing hole for M8/M10 (only for resistance against shock, vibration, earthquakes)
- **5** Floor opening for high-voltage cables
- 7 Right-side floor opening for control cables (only required for zero-sequence current transformers in the cable basement)
- 8 Cross member (necessary for panel replacement)

1) 2650 mm for higher low-voltage compartment 2) 698 mm when using SIBushing

24 kV Circuit-breaker panel 1600 A, 2000 A





900 mm

1) 2650 mm for higher low-voltage compartment 2) 708 mm when using SIBushing

Disconnector panel, single busbar

24 kV Disconnector panel 630 A, 800 A, 1000 A, 1250 A

600 mm



24 kV Disconnector panel 1600 A, 2000 A

R-HA3542-008 png

900 mm



Bus sectionalizer, single busbar

24 kV Bus sectionalizer 1000 A, 1250 A

Bus sectionalizer 1600 A, 2000 A





Legend see page 22

900 mm

1) 2650 mm for higher low-voltage compartment

24 kV

409 761 . 10+ . 1 0. 后 2250¹⁾ DX I 130 7 HA3542CA-0022 eps <u>_</u> A R-HA3542-009 png 1800 1100 ≥50 125 280 300 0 300 270 70 3 4 1200 410 410 410 410 920 46 860 8 40 40 40

700

4

1800

700

3

100

ЭÖ

2 × 900 mm

2 .

726

125

Legend see page 22

1) 2650 mm for higher low-voltage compartment

1

180

40 25

100-

Metering panel, dummy panel, single busbar

24 kV Metering panel

600 mm



Legend see page 22

1) 2650 mm for higher low-voltage compartment



Product range

Single-busbar panels



Inverted phases

Ť

Prepared for installation of plug-in voltage transformers



Voltage sensor (resistor divider)



SIBushing





600 mm

eps

¥3

900 mm

eps

IA35-2609i

Product range

Single-busbar panels





900 mm

24 kV Bus sectionalizers, two-panel, 1600 A, 2000 A







Voltage sensor (resistor divider)

Product range

Single-busbar panels



300 mm, 600 mm

Components Panel connection

Features

- Bushings with outside cone
- With bolted contact (M16) as interface type C according to EN 50181
- For cable connection heights, see table on the right
- Max. connection depth: See side views on pages 22 to 25
- With cable bracket type C40 according to DIN EN 60715
- <u>Option:</u> Access to the cable compartment only if the feeder has been isolated and earthed
- For thermoplastic-insulated cables
- For shielded cable T-plugs or cable elbow plugs with bolted contact
- For connection cross-sections up to 1200 mm²
- Larger cross-sections on request
- Cable routing downwards, cable connection from the front
- For rated continuous currents up to 1250 A
- Cable T-plugs are not included in the scope of supply.

Surge arresters

- Pluggable on cable T-plug
- Surge arresters recommended if, at the same time
- the cable system is directly connected to the overhead line,
- the protection zone of the surge arrester at the end tower of the overhead line does not cover the switchgear.

Surge limiters

- Pluggable on cable T-plug
- Surge limiters recommended when motors with starting currents < 600 A are connected.

Cable compartment





Panel width 600 mm

Cable connection heights

Panels	Height of cable compartment		Distance between bushing and cable bracket	Distan cable - cable -	ces - cable - separatio	on wall
	(H2)		(H1)	D1	D2	D3
	mm		mm	mm	mm	mm
600 mm	700		500	112	188	_
	(H2.1)	(H2.2)	(H1)	D1	D2	D3
	mm	mm	mm	mm	mm	mm
900 mm	610	550	410	110	175	110

Connectable cables

Cable T-plug with coupling insert a) Panel width 600 mm

Solid-insulated bar

Cable T-plug with coupling T-plug





a) Connection with 2 cables per phase



3 cables per phase



a) Connection with 4 cables per phase





Components Panel connection

Permissible cable types

Cable type	Cable sealing er	ld		Remark		
	Make	Туре	Cross-section			
			mm²			
Thermoplastic-insulate	ed cables ≤ 12 kV ac	cording to IEC 60502-	2			
Single-core cable,	Nexans	480TB/G	35 to 300	EPDM with semi-conductive layer		
PE and XLPE-insulated	Euromold	484TB/G	50 to 630	EPDM with semi-conductive layer		
N2YSY (Cu) and		489TB/G	800 to 1200	EPDM with semi-conductive layer		
N2XSY (Cu)	NKT	CB 24-630	25 to 300	Silicone with semi-conductive layer (optionally with metal housing)		
or		CB 24-1250/2	95 to 500	Silicone with semi-conductive layer		
NAZYSY (AI) and		CB 36-630	35 to 400	Silicone with semi-conductive layer		
NAZXSY (AI)		CB 36-630(1250)	240 to 800	Silicone with semi-conductive layer		
		CB 42-1250/3	95 to 1000	Silicone with semi-conductive layer		
		CSE-A 12630	25 to 630	EPDM with semi-conductive layer		
	TE connectivity	RSTI-58xx	25 to 300	Silicone with semi-conductive layer, with capacitive measuring point		
		RSTI-395x	400 to 1000	Silicone with semi-conductive layer, with capacitive measuring point		
		ELBC-58xx	25 to 300	EPDM with semi-conductive layer		
	Cellpack	CTS 630A 24 kV	50 to 400	EPDM with semi-conductive layer		
		CTS 1250A 24 kV	500 to 630	EPDM with semi-conductive layer		
	Südkabel	SET 12	40 to 300	Silicone with semi-conductive layer		
		SAT 12	185 to 630	Silicone with semi-conductive layer		
Three-core cable	Nexans	480TB/G	35 to 300	EPDM with semi-conductive layer, in combination		
PE and XLPE-insulated	Euromold		<u></u>	with distribution kit		
N2YSY (Cu) and	NKT	CB 24-630	25 to 300	Silicone with semi-conductive layer (optionally with		
N2XSY (Cu)				metal housing), in combination with distribution kit		
or		CB 24-1250-2	185 to 500	Silicone with semi-conductive layer, in combination		
NAZYSY (AI) and			25 1 200	With distribution kit		
NAZXSY (AI)	TE connectivity	KSTI-58XX	25 to 300	point, in combination with distribution kit RSTI-TRF0x		
		ELBC-810	25 to 500	EPDM with semi-conductive layer, in combination		
				with distribution kit		
Thermoplastic-insulate	ed cables 15/17.5/	24 kV according to IEC	60502-2			
Single-core cable,	Nexans	K480TB/G	35 to 300	EPDM with semi-conductive layer		
PE and XLPE-insulated	Euromold	K484TB/G	50 to 630	EPDM with semi-conductive layer		
N2YSY (Cu) and		K489TB/G	800 to 1200	EPDM with semi-conductive layer		
N2XSY (Cu)	NKT	CB 24-630	25 to 300	Silicone with semi-conductive layer (optionally with metal housing)		
		CB 24-1250/2	35 to 500	Silicone with semi-conductive layer		
		CB 36-630	35 to 400	Silicone with semi-conductive layer		
NAZASI (AI)		CB 36-630(1250)	240 to 800	Silicone with semi-conductive layer		
		CB 42-1250-3	630 to 1000	Silicone with semi-conductive layer		
		CSE-A 24630	25 to 630	EPDM with semi-conductive layer		
	TE connectivity	RSTI-58xx	25 to 300	Silicone with semi-conductive layer, with capacitive measuring point		
		RSTI-595x	400 to 1000	Silicone with semi-conductive layer, with capacitive measuring point		
		ELBC-58xx	35 to 300	EPDM with semi-conductive layer		
	Cellpack	CTS 630A 24 kV	25 to 400	EPDM with semi-conductive layer		
		CTS 1250A 24 kV	400 to 630	EPDM with semi-conductive layer		
	Südkabel	SET 24	25 to 240	Silicone with semi-conductive layer		
		SAT 24	95 to 630	Silicone with semi-conductive layer		
Three-core cable	Nexans	K480TB/G	35 to 300	EPDM with semi-conductive layer, in combination		
PE and XLPE-insulated	Euromold			with distribution kit		
N2YSY (Cu) and	NKT	CB 24-630	25 to 300	Silicone with semi-conductive layer (optionally with		
N2XSY (Cu)				metal housing), in combination with distribution kit		
or		CB 24-1250-2	35 to 500	Silicone with semi-conductive layer, in combination		
NA2YSY (AI) and			25.1.200	with distribution kit		
NAZXSY (AI)	IE connectivity	RSII-58xx	25 to 300	Silicone with semi-conductive layer, with capacitive measuring		
			25 to 400	Point, in combination with distribution Kit KSTI-TKFUX		
		CLDC-024	55 10 400	with distribution kit		

Components Panel connection

Permissible cable types (continued)

Cable type	Cable sealing end			Remark
	Make	Туре	Cross-section	
			mm²	
Thermoplastic-insulate	ed cables 36 kV acco	ording to IEC 60502-2		
Single-core cable,	Nexans	M480TB/G	35 to 300	EPDM with semi-conductive layer
PE and XLPE-insulated	Euromold	M484TB/G	50 to 630	EPDM with semi-conductive layer
N2YSY (Cu) and		M489TB/G	800 to 1200	EPDM with semi-conductive layer
N2XSY (Cu)	NKT	CB 36-630	35 to 300	Silicone with semi-conductive layer (optionally with metal housing)
or		CB 36-630(1250)	240 to 630	Silicone with semi-conductive layer
NA2YSY (AI) and		CB 42-1250/3	95 to 1000	Silicone with semi-conductive layer
NA2XSY (AI)		CSE-A 36630	50 to 630	EPDM with semi-conductive layer
	TE connectivity	RSTI-68xx	35 to 300	Silicone with semi-conductive layer, with capacitive measuring point
		RSTI-695x	400 to 1000	Silicone with semi-conductive layer, with capacitive measuring point
	Cellpack	CTS 630A 36 kV	35 to 400	EPDM with semi-conductive layer
		CTS 1250A 36 kV	400 to 630	EPDM with semi-conductive layer
	Südkabel	SET 36	70 to 300	Silicone with semi-conductive layer
		SAT 12	185 to 630	Silicone with semi-conductive layer
		SAT 24	95 to 1000	Silicone with semi-conductive layer
		SAT 36	400 to 500	Silicone with semi-conductive layer
Three-core cable	Nexans	M480TB/G	35 to 300	EPDM with semi-conductive layer, in combination
PE and XLPE-insulated	Euromold			with distribution kit
N2YSY (Cu) and	NKT	CB 36-630	35 to 300	Silicone with semi-conductive layer (optionally with
N2XSY (Cu)				metal housing), in combination with distribution kit
or		CB 36-630(1250)	240 to 630	Silicone with semi-conductive layer, in combination
NA2YSY (AI) and				with distribution kit
NA2XSY (AI)	TE connectivity	RSTI-68xx	35 to 300	Silicone with semi-conductive layer, with capacitive measuring
				point, in combination with distribution kit RSTI-TRF0x

Commercially available bar systems

Bar type	Bar connectior	ı			Remark
	Make	Туре	Conductor material	Max. rated current	
Solid-insulated bar	MGC Moser Glaser	Duresca DE	Copper	1250 A / 2500 A	Outer sheath made of polyamide (polyamide tube)
		Duresca DG	Copper	1250 A / 2500 A	Outer sheath made of CrNi steel or aluminum (metal sheath)
	Preissinger	ISOBUS MB	Copper	1250 A / 2500 A	Outer sheath made of epoxy resin (with heat shrinkable tube, if required)
	Ritz	SIS	Copper	1250 A / 2500 A	Outer sheath made of epoxy resin (with heat shrinkable tube, if required)

Standards

Standards, specifications, guidelines

Type of service location

The switchgear can be used as indoor installation according to IEC 61936 (Power installations exceeding 1 kV AC)

- Outside lockable electrical service locations at places which are not accessible to the public. Enclosures of switchgear can only be removed with tools
- In lockable electrical service locations. A lockable electrical service location is a place outdoors or indoors that is reserved exclusively for housing electrical equipment and which is kept under lock and key. Access is restricted to authorized personnel and persons who have been properly instructed in electrical engineering. Untrained or unskilled persons may only enter under the supervision of authorized personnel or properly instructed persons.

Terms

"Make-proof earthing switches" are earthing switches with short-circuit making capacity according to IEC 62271-102 and EN 62271-102.

Dielectric strength

The dielectric strength is verified by testing the switchgear with rated values of short-duration power-frequency withstand voltage and lightning impulse withstand voltage according to IEC 62271-1 (see Technical data).

The rated values are referred to sea level and to normal atmospheric conditions (1013 hPa, 20 °C, 11 g/m³ humidity according to IEC 60071).

The gas insulation at a relative gas pressure of 90 kPa permits switchgear installation at an altitude of up to 4000 m above sea level without the dielectric strength being adversely affected. This also applies to the cable connection when plug-in sealing ends are used.

A decrease (reduction) of the dielectric strength with increasing site altitude must only be considered for panels with HV HRC fuses.

For site altitudes above 1000 m, a higher insulation level must be selected. It results from the multiplication of the rated insulation level for 0 to 1000 m with the altitude correction factor K_a (see illustration and example).

Table – Dielectric strength

Rated voltage (r.m.s. value)	kV	7.2	12	15	17.5	24
Rated short-duration power-	freque	ncy wi	thstanc	l voltag	e (r.m.s	. value)
 Between phases and to earth 	kV	20	28	35	38	50
 Across isolating distances 	kV	23	32	39	45	60
Rated lightning impulse withstand voltage (peak value)						
 Between phases and to earth 	kV	60	75	95	95	125
- Across isolating distances	kV	70	85	105	110	145

Altitude correction factor Ka



(Only for panels with HV HRC fuse)

For site altitudes above 1000 m, the altitude correction factor K_a is recommended, depending on the site altitude above sea level. Curve m = 1 for rated short-duration power-frequency withstand voltage and rated lightning impulse withstand voltage according to IEC 62271-1

Example:

3000 m site altitude above sea level (K_a = 1.28), 17.5 kV switchgear rated voltage, 95 kV rated lightning impulse withstand voltage

Rated lightning impulse withstand voltage to be selected = $95 \text{ kV} \times 1.28 = 122 \text{ kV}$

Result:

According to the above table, switchgear for a rated voltage of 24 kV with a rated lightning impulse withstand voltage of 125 kV is to be selected.

Standards

NXPLUS C 24 switchgear complies with the relevant standards and specifications applicable at the time of type tests. In accordance with the harmonization agreement reached by the countries of the European Union, their national specifications conform to the IEC standard.

Standards

		IEC standard / EN standard	Title
Switchgear		62271-1	High-voltage switchgear and controlgear: Common specifications for alternating current switchgear and controlgear
		62271-200	High-voltage switchgear and controlgear: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV
Switching devices	Circuit-breakers	62271-100	High-voltage switchgear and controlgear: Alternating-current circuit-breakers
	Disconnectors and earthing switches	62271-102	High-voltage switchgear and controlgear: Alternating current disconnectors and earthing switches
Voltage detecting	systems	62271-213	Voltage detecting and indicating system (VDIS)
		62271-215	Phase comparator used with VDIS
HV HRC fuses		60282	High-voltage fuses: Current-limiting fuses
Surge arresters		60099	Surge arresters
Degree of protection		60529	Degrees of protection provided by enclosures (IP code)
		62262	Degree of protection provided by enclosures (IK code)
Insulation		60071	Insulation co-ordination
Instrument transfo	ormers	61869-1	Instrument transformers
		61869-2	Current transformers
		61869-3	Voltage transformers
		61869-6	Low-power instrument transformers
		61869-10	Low-power passive current transformers
		61869-11	Low-power passive voltage transformers
Clean Air		63360	Fluids for electrotechnical application – Specification of gases alternative to SF ₆ to be used in electrical power equipment
		62271-4	High-voltage switchgear and controlgear: Handling procedures for gases for insulation and/or switching
Installation		61936-1	Power installations exceeding 1 kV a.c.
Environmental cor	nditions	60721-3-3	Classification of environmental conditions
Operation		EN 50110	Operation of electrical installations

Standards

Standards, specifications, guidelines

Operation of electrical installations

- According to IEC 62271-200 or IEC 62271-1, the rated continuous current refers to the following ambient air temperatures:
- Maximum of 24-hour mean + 35 °C + 40 °C
- Maximum
- The current carrying capacity of the panels and busbars depends on the ambient air temperature outside the enclosure.

Internal arc classificationsn

- Protection of operating personnel by means of tests for verifying the internal arc classification
- Internal arcing tests must be performed in accordance with IEC 62271-200
- Definition of criteria:
- Criterion 1: Correctly secured doors and covers do not open, limited deformations are accepted
- Criterion 2: No fragmentation of the enclosure, no projection of small parts above 60 g
- Criterion 3: No holes in accessible sides up to a height of 2 m
- Criterion 4: No ignition of indicators due to hot gases
- Criterion 5: The enclosure remains connected to its earthing point.

Resistance to internal faults

Due to the single-pole enclosure of external components and the gas insulation of switching devices, the possibility of faults in gas-insulated switchgear is improbable and a mere fraction of that typical of earlier switchgear types:

- There are no effects due to external influences, such as
- Pollution layers
- Humidity
- Small animals and foreign objects
- Maloperation is practically excluded due to logical arrangement of operating elements
- Short-circuit-proof feeder earthing by means of the circuit-breaker or the three-position switch-disconnector.

The escaping gases are discharged upwards through a pressure relief duct.

Aseismic capacity (option)

NXPLUS C 24 switchgear can be upgraded for regions at risk from earthquakes.

For upgrading, earthquake gualification testing has been carried out in accordance with the following standards:

- IEC/TS 62271-210 "Seismic qualification for metal enclosed and solid-insulation enclosed switchgear and controlgear assemblies for rated voltages above 1 kV and up to and including 52 kV"
- IEC 60068-2-57 "Test Ff: Vibration Time-history method"

The tested ground accelerations conform to the following required response spectrums:

- IEC/TS 62271-210 Severity level 2, (ZPA) = 1 g (Figure 2)
- IEEE 693-2018 High performance level required response spectrum, 1.0 g (Figure A.1).

For operation in regions at risk from earthquakes, the operator must ensure compliance with the national directives and legal stipulations.

The test verifications are valid for switchgear installations on even and rigid concrete or steel structure (possible building influences, such as superelevation factors, are not considered).

The operator must ensure compliance with application-specific seismic requirements.

Color of the panel front

RAL 7035 Light grey.

Standards, specifications, guidelines

Climate and environmental influences

The parts under high voltage of the primary circuit of NXPLUS C 24 switchgear are completely enclosed and insensitive to climatic influences.

- All medium-voltage devices are installed in a gas-tight, welded stainless-steel switchgear vessel which is filled with Clean Air
- Live parts outside the switchgear vessel are provided with single-pole enclosure
- At no point can creepage currents flow from high-voltage potentials to earth
- Operating mechanism parts which are functionally important are made of corrosion-resistant materials
- Bearings in the operating mechanism are designed as dry-type bearings and do not require lubrication.

NXPLUS C 24 switchgear is suitable for application in indoor installations under normal service conditions as defined in the standard IEC 62271-1.

 Temperature 	–5 °C to +55 °C
	–25 °C to +55 °C $^{1)}$ (Option)
• Relative air humidity	Mean value over 24 hours ¹⁾ : \leq 98 %
	Mean value over 1 month: ≤ 90 %
 Condensation 	Occasionally
	Frequently (degree of protection min.
	IP31D, with anti-condensation heater
	in the low-voltage part ²⁾
 Site altitude 	4000 m

Furthermore, the high-voltage part of NXPLUS C 24 switchgear can be used in environmental conditions of the climatic category 3C2 according to the standard IEC 60721-3-3.

NXPLUS C 24 has been subjected to a climatic test according to IEC 60932, Level 2, and is suitable for service conditions according to "Design Class 2". This test also meets the requirements of IEC 62271-304 for "Design Class 2".

Recycling

The switchgear can be recycled in ecological manner in compliance with existing legislation. Auxiliary devices such as short-circuit indicators have to be recycled as electronic scrap. Batteries have to be recycled professionally. The insulating gas Clean Air can be safely released into the ambient air.

Protection against solid foreign objects, electric shock and water

NXPLUS C 24 switchgear fulfills according to the standards

IEC 62271-1	EN 62271-1
IEC 62271-200	EN 62271-200
IEC 60529	EN 60529
IEC 62262	EN 50102

the following degrees of protection:

Degree of protection IP	Type of protection
IP65	for parts of the primary circuit
	under high voltage
IP3XD	for switchgear enclosure
IP31D	for switchgear enclosure (optional)
IP32D	for switchgear enclosure (optional)
IP34D	for switchgear enclosure (optional)
IP4X, IP41, IP42, IP44	for switchgear enclosure (optional)
Degree of protection IK	Type of protection
IK07	for switchgear enclosure

For secondary devices in the low-voltage door, the stipulations of the IP degree of protection apply according to the definitions for the switchgear enclosure.

1) Secondary devices (e.g. protection devices, meters, measuring transducers, etc.) must be suitable

for the given service conditions

2) Heater in the low-voltage compartment and operating mechanism box of the circuit-breaker

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Medium-Voltage Switchgear



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