

ABB MNS Low Voltage Switchgear Efficient, safe, and sustainable







Introduction

Welcome to our eGuide about ABB MNS Low Voltage switchgear, a proven solution for the future of energy distribution. In an ever-evolving world where energy distribution is becoming increasingly complex and digitalized, advanced solutions like ABB MNS switchgear are essential to meet the growing demands for efficiency, safety, and sustainability.

ABB MNS stands out by offering high flexibility, safety, and efficiency through cutting-edge technologies and customized solutions. These features make it the ideal choice for demanding applications across various industries. This eGuide provides a comprehensive overview of the innovations, benefits, and practical applications of ABB MNS switchgear. You will learn about its flexibility, safety, and efficiency and gain insights into successful applications in industries such as data centers, chemicals, oil and gas, process industries, power generation and more.

Power with Purpose



Benefits of ABB MNS Switchgear

ABB MNS switchgear is more than just an investment in modern technology – it is a commitment to reliability, safety, efficiency and sustainability. With versatile digital functions and robust designs, MNS switchgear sets new performance horizons in energy distribution and motor control. Here are the main reasons why customers should choose MNS, based on ABB's value propositions:



Performance oriented:

MNS switchgear is designed to ensure continuous performance, even under the most challenging conditions. With extensive testing and arc protection technologies, ABB provides exceptional safety for people and processes. The modular design allows for easy scalability and adaptation to changing power requirements.



Sustainability embedded:

MNS switchgear integrates ABB Ability™ for real-time energy and continuous condition monitoring. This enables users to optimize operations, track sustainability metrics, and reduce energy and maintenance costs. ABB's environmentally friendly manufacturing processes and transparent environmental product declarations EPD Type III highlight the commitment to sustainability.



Peace of mind:

With the world's largest installed base of energy distribution switchgear and motor control centers, ABB MNS offers the assurance that your systems are supported by a global network of top experts. ABB is committed to delivering a superior customer experience with worldclass products from state-of-the-art manufacturing facilities.



Setting new standard in sustainability



Enabling a more sustainable and resource-efficient future

As a technology leader in electrification and automation, ABB is at the core of accelerating the energy transition. Every day, we empower customers across the globe to optimize, electrify, and decarbonize their operations.

Our sustainability agenda is fully in line with this mission. Guided by recognized best-practice standards and guidance, and embedded across our business, it aims to enable a low-carbon society, preserve resources and promote social progress for a net-zero future. Our actions are underpinned by our culture of integrity and transparency, extending across our value chain.



Enabling low-carbon society

To enable a low-carbon society, we are taking action across our value chain. With our technologies, we empower customers to avoid emissions and ramp up renewables. To cut our own greenhouse gas emissions, we follow targets that are aligned with the Net-Zero Standard of the Science Based Targets initiative (SBTi). To go further, we work with our suppliers and partners.





Preserving resources

To preserve the earth's resources for future generations, we are moving to circular business models that eliminate waste and keep products and materials in use. Our Circularity Approach covers all stages of the product life cycle, from design and sourcing, through production and use, all the way to responsible end-of-life services.

To support our customers in meeting their circularity commitments, we have in place retrofit, take-back, and recycling solutions and services that extend or give a second life to our products. Some examples include the recycling of large motors and the retrofitting of windmills, ships, and robots. With this support, we ensure some of the world's most complex and critical infrastructure lasts longer and operates in the most efficient way.

We are assessing our Circularity Approach against the latest regulatory developments and key sustainability standards that address circularity and product performance.



Promoting social progress

We believe in an inclusive energy transition to a net-zero future, with lifted-up communities, workers, and societies. We respect and promote human rights and dignity, and strive to create safe, fair, and inclusive working environments where our people can thrive. Community engagement is at the center of our Sustainability Agenda.

ABB EcoSolutions

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Our ABB EcoSolutions[™] product portfolio helps customers and partners make more sustainable decisions. Each product's circularity value and environmental impact are fully transparent. We are continuously partnering across the value chain to innovate and expand our EcoSolutions portfolio.

ABB EcoSolutions products meet our circularity criteria in each stage of the product life cycle, as defined in ABB's circularity framework, and have Type III Environmental Product Declarations (EPDs). Product circularity values and EPDs are easily accessible through a QR code. Our EPDs meet high requirements for transparency and accuracy, and they are externally verified by a third party (compliant with ISO 14025 Type III).

ABB's circularity criteria include:

- designed to last and made with more sustainable materials
- made with processes designed to avoid waste and increase sustainable packaging materials
- designed to increase resource and process efficiency while in use, be upgradable and optimize equipment lifetime
- supported by take-back services for refurbishment, reuse, or recycling of products and components, and accompanied by instructions for responsible end-of-life treatment.





About sustainability and ABB MNS

ABB is enabling a more sustainable and resource-efficient future. Environmental product declarations for our switchgear solutions provide independent third-party verification of ABB's use of renewable energy and waste reduction in our operations.

With ABB MNS, you gain a long-lasting solution that gives you the ability to monitor energy usage in real-time, providing you with valuable insights to make informed sustainable choices.

It can connect to ABB Ability™, which will use the data you collect about your energy usage and turn it into insights. You can then use these insights to make better decisions to optimize your operations, schedule predictive maintenance, and improve sustainability while reducing your carbon footprint. A global multi-year sustainability program has been rolled out in our facilities

to enable a low-carbon society. The main pillars of our program are:

- Waste Management: optimize waste sorting, waste reduction, and waste reuse
- **Paperless Factory:** use e-drawings to minimize printing, optimize the usage of recycled paper
- Energy Initiatives: purchase green energy, move to 100% EVs, on-site green energy generation with solar power supply.

Read more in our White paper:

ABB's third-party verified Environmental Product Declarations



Key advantages of MNS Switchgear

MNS switchgear offers unparalleled reliability and safety, setting new horizons in energy distribution through extensive testing and innovative protection technologies. With a robust build, broad type testing, and 1.7 million installed sections worldwide, MNS switchgear is proven to perform reliably even in the harshest conditions. Designed safety features, such as passive arc protection, ensure the safety of both personnel and equipment, making it a trusted choice for critical applications.

Safety Elements

• Arc testing:

ABB MNS switchgear is certified according to IEC 61439-2 and IEC TR 61641, ensuring it meets the highest standards for arc fault protection. The rigorous arc testing simulates real-world fault conditions, confirming the switchgear's ability to contain and mitigate the effects of internal arc faults, thereby safeguarding personnel and equipment from serious hazards.

• Modular design:

The modular design of MNS switchgear provides exceptional flexibility, allowing for seamless adaptation and expansion as operational needs evolve. This design facilitates easy maintenance and upgrades, minimizing system downtime and ensuring that the switchgear can be tailored to meet specific requirements without compromising reliability or safety.



• Temperature monitoring of critical connections:

MNS switchgear integrates advanced sensor technology to continuously monitor the temperature of critical electrical connections. By detecting abnormal temperature rises early together with ABB Ability Condition Monitoring of Electrical Systems CMES, it prevents the development of hazardous conditions such as electrical fires or arcs, significantly enhancing the safety and reliability of the overall system.

• Seismic and vibration resistance:

Designed to withstand seismic activity and vibration stresses, MNS switchgear ensures reliable performance even in environments prone to such disturbances. This robustness makes it suitable for deployment in regions with seismic risks or in industrial settings where vibration is a constant concern, providing peace of mind that the system will remain stable and operational under challenging conditions.

• Maintenance-free busbar system:

The busbar and frame structure of MNS switchgear are engineered for a maintenance-free operation, significantly extending the service life of the equipment. This design not only reduces the total cost of ownership but also ensures long-term reliability by minimizing the need for regular maintenance interventions, thereby enhancing the overall safety and dependability of the system.

• Monitoring and maintenance:

MNS switchgear provides access to a variety of digital functions. Integration with ABB Ability[™] CMES allows online monitoring of your energy distribution or motor control center. This means you get immediate insights into the condition of your systems and can respond quickly as needed. Online condition monitoring and predictive maintenance not only enhances operational safety but also helps increase efficiency and reduce costs.

• Flexibility and scalability:

Whether you operate a small facility or a large industrial project, MNS switchgear is flexible and scalable. Thanks to its modular design, you can easily expand



or adapt your system to meet changing requirements, making MNS a futureproof solution that grows with your business. The versatility of the MNS platform allows to fit all sort of applications with its multiple variants such as the front and rear access and withdrawable, plug-in or fixed module versions.

• Capacity and efficiency:

ABB's standardized manufacturing processes across global facilities ensure that MNS switchgear production is both rapid and efficient. Our facilities can collaborate seamlessly to meet the highest demands, enabling quick delivery times without sacrificing quality. This standardized approach allows us to consistently produce high-capacity, reliable switchgear that meets stringent timelines, ensuring your operations remain powerful and future-ready.

The evolving landscape of low voltage switchgear

The world of low voltage switchgear is undergoing a transformation. With rapid technological advancements and increasing demands for reliability, safety, and sustainability, plant operators, electrical engineers, and facility managers are facing new challenges. This evolution is driven by the trend toward digitalization and the integration of smart technologies. Companies must adapt to meet growing needs and regulatory requirements.

ABB MNS switchgear is setting the standards in this field. With a strong focus on safety, flexibility, and efficiency, ABB provides solutions that maintain operations even under the most challenging conditions while ensuring adaptability to changing power requirements.

Moreover, sustainability is playing an increasingly important role. ABB pursues a comprehensive sustainability agenda focused on reducing CO2 emissions, protecting natural resources, and promoting social progress. Products like MNS switchgear are designed to make a positive impact through the use of environmentally friendly materials and sustainable manufacturing processes. With the adoption of smart and digital technologies, MNS switchgear also helps the plant operators to monitor energy flow and reduce maintenance to support our customers on the road to zero emission.

For plant operators and maintenance teams, this means relying not only on proven technology but also on innovative solutions that meet future demands. This allows reducing downtime, improving grid stability, and increasing efficiency in installation and maintenance.



In summary, the world of low voltage switchgear is continuously evolving.

Optimizing operational expenditures

Another significant benefit of MNS switchgear is the potential for substantial cost savings. Digital switchgear allows for continuous monitoring of system conditions and enables predictive maintenance planning. This reduces unplanned downtime and significantly lowers maintenance costs. Additionally, optimizing energy consumption with actions that can be derived by the insights received from ABB Ability[™] real-time energy monitoring, reduces operating costs. Overall, these savings help minimize the total cost of operating your facility.

The compact or fixed variants of MNS switchgear maximize space efficiency, allowing you to achieve high performance in a smaller footprint. This reduces the need for larger installations, lowering both initial setup costs and ongoing expenses related to space management. By making the most of available space, you can also free up room for other operational needs, contributing to overall cost efficiency.

Together, these factors help minimize the total cost of ownership, making MNS switchgear a smart choice for optimizing your facility's operational expenditures.



5 The MNS Low Voltage Switchgear platform

ABB offers a variety of switchgear solutions tailored to the needs of different industries. The MNS platform includes flexible and scalable solutions suitable for a wide range of applications.

Highlighted Solutions:

MNS Low Voltage Switchgear presents a complete range of solutions from accessibility to the cable compartments to module installation providing the solutions for all kind of requirements and applications.

From accessibility perspective there are two versions available. Details of both versions can be found on the right-hand side of this page.

MNS Front

Up to 6300A and 100kA

Access to modules and cable terminals from the front of the switchgear. Installation back to wall.

- 1. Module connectivity versions
 - Withdrawable
 - Plug-in including compact
 - Fixed
- 2. Busbar Configurations
 - L and U turn configurations
 - Back to back
 - Duplex
- 3. Power Delivery Units (PDU).

MNS Rear

Up to 7300A and 100kA

Access to cable terminals from the rear and to modules from the front

Module connectivity versions

- Withdrawable
- Fixed.

From module installation, MNS offers 3 main types:

Withdrawable

The most flexible solution enabling quick replacement of modules, reducing downtime and facilitating quick fault isolation and repair. It also allows enhanced maintenance or inspection without de-energization of the entire switchgear, at the same time it reduces safety risks. It provides the highest levels of segregation between different components up to form 4B setting the maximum level of safety for operators and equipment.

Withdrawable configuration is the choice for extremely demanding requirements where there are multiple operations a day like motor control in critical applications industries such as Chemical, Oil and Gas, Power Generation or Mining.

Fixed

Offers the most cost-effective and reduced footprint solutions for infrastructure applications where the delivery of power is less dynamic with reduced number of switching. It's reduced dimensions help optimizing the need of space in electrical rooms.

Plug-in

It's hybrid configuration between withdrawable and fixed brings benefits from both worlds. Replacement of modules can still be done in a reduced amount of time while offering high packing density for applications with limited space and supports easy expansion and adaptation.

The special Compact version provides an optimal solution for very limited spaces. Plug-in configuration fits perfectly but not limited to high demanding applications like process industries such as pulp & paper, steel mills, cement and many others.



Digitalization in energy distribution and motor control center

Digitalization is revolutionizing energy distribution and motor control center technology by optimizing operations and promoting sustainability. In energy distribution, digital technologies play a central role in collecting and analyzing its data. This enables precise monitoring of energy demand, which turn in increases efficiency and reduces costs. A prime example is the MNS Digital, which ensures seamless energy distribution through its integrated digital solutions, thereby optimizing overall operations.

Digitalization with MNS Low Voltage Switchgear



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Optimized energy distribution:

The ABB MNS uses smart and digital technologies such as ABB's Emax2 air circuit breaker, Tmax XT breaker, feeder monitors like FC610 and other products to enhance energy distribution. Continuous monitoring and analysis of operational data help identify energy usage patterns and optimize inefficient processes. This leads to information that can be converted into actions providing a significant increase in energy efficiency.



Cost reduction:

The digital features of MNS, such as the ABB Ability[™] Condition Monitoring for Electrical Systems (CMES) and its functions for predictive maintenance, allow companies to plan maintenance activities precisely. This minimizes unplanned downtime and significantly reduces unnecessary maintenance activities and its associated costs and risks.



Increased operational safety:

The MNS switchgear integrates temperature monitoring solutions for early detection of abnormal changes in critical electrical connections. Advanced safety features such as passive arc protection and modular designs, enable safe and flexible adaptation to different operating conditions ensuring the protection of personnel and equipment.



Sustainability:

By adopting on-premise CMES or connecting the MNS switchgear with more ABB Ability[™] solutions, companies can monitor and analyze their energy consumption. This provides valuable insights for making sustainable decisions and reducing the carbon footprint. In addition, Type III third-party independently verified EPD provides full transparency into product sustainability information.



With digitalization and the advanced solutions of the ABB MNS Digital, companies can reach a superior level of personnel and equipment safety and not only increase their operational efficiency but also improve the sustainability of their energy distribution. MNS offers a flexible and scalable platform that can adapt to the ever-changing demands of the energy sector, making it a future-proof solution.

Importance of data analysis

Analyzing operational data is crucial for gaining valuable insights and making informed decisions. In the context of energy distribution, data analysis helps monitor energy consumption and identify patterns indicating optimization potential. ABB MNS plays a central role here. With integrated functions for condition monitoring and predictive maintenance, MNS continuously provides valuable data that can be used to improve operational efficiency and sustainability.

Data analysis in detail:

Monitoring energy consumption:

Continuous data collection and analysis allow companies to track their energy consumption in detail and implement targeted measures to increase efficiency. MNS Digital enables precise monitoring and analysis of energy consumption data, identifying and optimizing inefficient processes with monitoring options like Emax 2 circuit breaker, FC610 feeder controller or any other energy meter.

Monitoring motor and motor operation:

Especially in process industries with their large motor control center (MCC), the continuous monitoring of motors and motor operation ensures that deviation from normal operation is detected early and operation and maintenance teams can act before major interruption occurs. Redundant communication to control systems enables high availability. With ABB Ability CMES and connected motor controller such as UMC100.3 or M10x series of devices conditions of the MCC as well as the connected motors are continuously monitored.



Predictive maintenance:

Analyzing operational data in energy distribution or motor control centers allows early detection of potential problems and planning maintenance measures before costly failures occur. With the ABB Ability[™] CMES condition monitoring function of the MNS switchgear the next maintenance is predicted and informed, companies can continuously monitor the condition of their equipment and plan maintenance activities proactively.

Informed decisions:

Real-time data provides a solid foundation for informed decisions that improve both operational efficiency and sustainability. Data are collected and analyzed on-premise through the ABB Ability CMES to offer detailed insights, supporting companies in making better decisions. With advanced cloud-based applications the customers can utilize power of future enhanced data analysis.

ABB Ability[™] solutions for secure online monitoring

With ABB Ability[™], you have complete overview of your energy distribution and motor control center at your fingertips. Those advanced solutions provide secure access to all relevant data from your switchgear. You can monitor the condition of your equipment, plan maintenance activities, and make operational adjustments to maximize efficiency. ABB Ability™ also helps you creating digital twins of your systems for more accurate planning and optimization.

Benefits of ABB Ability[™] CMES:

- Online monitoring: Constantly updated data on the health condition of your switchgear.
- Predictive maintenance: Early detection and resolution of issues before they lead to failures.

Benefits of ABB Ability™ Energy Manager:

- Optimized energy consumption: More efficient operation of your systems and reduced operating costs.
- Digital twins: Creation of digital models of your systems for more precise planning and optimization.

Choosing ABB MNS switchgear offers numerous benefits in addition to reliability and safety. With extensive digital options, scalability, and the potential for significant cost savings, MNS switchgear is a futureproof solution for any energy distribution system. Integration with ABB Ability[™] on-premises allows online monitoring and optimization of your systems, leading to more efficient and sustainable operations.

If you are looking for a reliable, safe, and efficient solution for your energy





Success stories and industry solutions

ABB MNS switchgear has proven its worth in numerous industries, significantly contributing to improved operational efficiency, safety, and sustainability. Here are some successful application examples and key insights:

1. Data Centers

A standout example is the Telia data center in Finland. In this state-of-theart data center, ABB's electrical solutions ensure reliable power distribution, which is crucial for operations. Telia benefited from the high efficiency of ABB switchgear, which minimizes energy consumption and improves the carbon footprint. The solutions used, including MNS low voltage switchgear and other ABB products, ensure maximum redundancy and safety. ABB's technology enabled Telia to operate a scalable and energyefficient data center that meets the demands of the digital society.



2. Chemical, Oil, and Gas Industry

MNS Low Voltage Switchgear is the leading technology in chemical, oil, and gas industry. An example is the implementation of MNS in an oil and gas facility that had to replace its motor control centers following a devastating arc flash incident. MNS ensures reliability and safety for operators including arc fault containment and not only restored the damaged switchgear but also integrated temperature monitoring systems and ABB Ability[™] Condition Monitoring for Electrical Systems (CMES). This platform enables online monitoring and predictive maintenance, avoiding future failures and optimizing operating costs. The successful implementation of these solutions demonstrated how ABB can significantly enhance safety and efficiency in the chemical, oil, and gas industry.



Overview of MNS solutions for industries

Data Centers

In process industries, where operational efficiency and safety are critical, MNS ABB offers customized solutions in data centers, with the focus on availability and switchgear provides the robust performance needed to support continuous redundancy. ABB has the capability to deliver large projects across all geographies production. The switchgear's ability to withstand harsh conditions and with its own manufacturing operation ensuring high quality and identical its modular design make it highly versatile, accommodating the complex product delivery. With MNS switchgear reliable power distribution, continuous requirements of industries such as chemical, oil and gas, and food and beverage monitoring of energy flow and critical temperature of the switchgear, protection production. The integration with ABB Ability™ enables real-time monitoring and control, the growing energy demand can be met safely and efficiently. and predictive maintenance, which helps reduce downtime, optimize energy Chemical, Oil and Gas Industry consumption, and ensure that critical processes remain uninterrupted, ultimately In the chemical, oil, and gas industry, safety requirements are particularly contributing to increased productivity and reduced operational costs.

high. ABB has shown with innovative solutions like arc protection and temperature monitoring that operational safety and efficiency can go hand in hand. Continuous monitoring through ABB Ability™ allows potential problems to be detected early and maintenance work to be planned predictively, leading to a significant reduction in downtime.

Power Generation

MNS switchgear is an ideal solution for the power generation sector, where reliability and continuous operation are paramount. It is designed to manage high electrical loads with exceptional efficiency, ensuring stable power distribution even in the most demanding environments. With features like arc protection and temperature monitoring, MNS switchgear enhances the safety and reliability of power generation facilities, reducing the risk of costly outages and ensuring uninterrupted energy supply. Its modular design allows for easy scalability, making it adaptable to both existing and new installations, whether in thermal, hydro, or renewable energy plants.

Process Industries

Marine and Offshore

MNS switchgear is engineered to meet the unique challenges of marine and offshore environments, where space constraints, safety, and reliability are of utmost importance. The compact design of MNS switchgear makes it an excellent fit for the limited spaces on ships and offshore platforms, while its robust construction ensures it can withstand the harsh conditions of the marine environment, including saltwater exposure and vibration. The system's advanced protection features, such as arc fault containment and temperature monitoring, ensure the safety of both crew and equipment.





The ABB Team – Your partner for success

At ABB, it is our talented and dedicated team that makes the difference. From the initial consultation to ongoing support after installation, our experts are there to ensure your projects are successful.

The ABB team comprises highly qualified professionals with extensive experience in energy distribution and switchgear technology located all around the globe. Our engineers and technicians are not only experts in their field but also passionate about developing the best solutions for our customers. They bring a deep understanding of the technical requirements and challenges our customers face and offer customized solutions tailored to those needs.

Every project is unique, and at ABB, we know that one-size-fits-all solutions rarely meet the requirements. That is why we place great importance on customizing each project. From the initial planning phase to implementation, our teams work closely with customers to ensure each switchgear is perfectly aligned with specific requirements and goals. Through detailed analyses and tailored designs, we ensure that our solutions are not only efficient and reliable but also optimally integrated into the existing infrastructure.

ABB's support does not end with installation. We offer comprehensive customer service and support to ensure your switchgear always function optimally. Our commitment to excellent service includes:



Planning and consultation:

Our team works closely with you to understand your requirements and develop the best solutions.



Installation and commissioning:

We support you throughout the installation process to ensure a smooth and efficient setup.



Training:

Our experts provide training to ensure your staff can operate the new systems safely and efficiently.



Maintenance and support:

With our comprehensive maintenance and support services, we ensure that your systems are always up to date and functioning optimally. We offer regular maintenance, quick diagnostics, and repairs, as well as continuous support to minimize downtime and maximize the lifespan of your equipment.

Even after commissioning, we remain a reliable partner by your side. Our aftermarket support includes spare parts, upgrades, and modernizations to ensure your systems keep up with the latest technologies and continue to perform at a high level. Our service contracts provide additional security and ensure that you have access to our experts whenever you need support.





Your trusted ally for growth

At ABB, we are proud to be more than just a provider of cutting-edge technology; we are a true partner for our customers. Our goal is to support you at every stage of your project and provide you with the tools and knowledge you need to succeed. We believe that with the right support and the best solutions, our customers can overcome any challenge.

The ABB team stands for professionalism, experience, and commitment. Our customized solutions and comprehensive customer service make us a trusted partner in energy distribution. With ABB by your side, you can be confident that your projects are in the best hands and that you will receive the support you need to achieve your goals. From the initial consultation to ongoing support, we are here to ensure your success.

Conclusion

In this eGuide, we have highlighted the numerous benefits and innovations of ABB MNS switchgear. This switchgear is at the forefront of digitalization, offering future-proof solutions for efficient and reliable energy distribution.

ABB MNS switchgear sets new standards with their high flexibility, safety, and efficiency. Through online monitoring with ABB Ability™, companies can enhance their operational efficiency, reduce costs, and make sustainable decisions. The comprehensive testing procedures and protection mechanisms of the MNS switchgear ensure the highest reliability and safety. Successful applications across various industries demonstrate how ABB provides customized solutions that meet the specific requirements of each sector.

Highly qualified professionals offer comprehensive support from planning to commissioning and beyond. ABB MNS switchgear is an investment in the future of energy distribution. They provide advanced technologies, reliability, safety, and extensive support.

With ABB as your partner, you are well-equipped to tackle the challenges of modern energy distribution and optimize your operations. Together, we shape the future of energy distribution – safe, efficient, and sustainable.

MNS Power with purpose.



Let's talk about your project.

new.abb.com/low-voltage/products/switchgear

Additional information

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