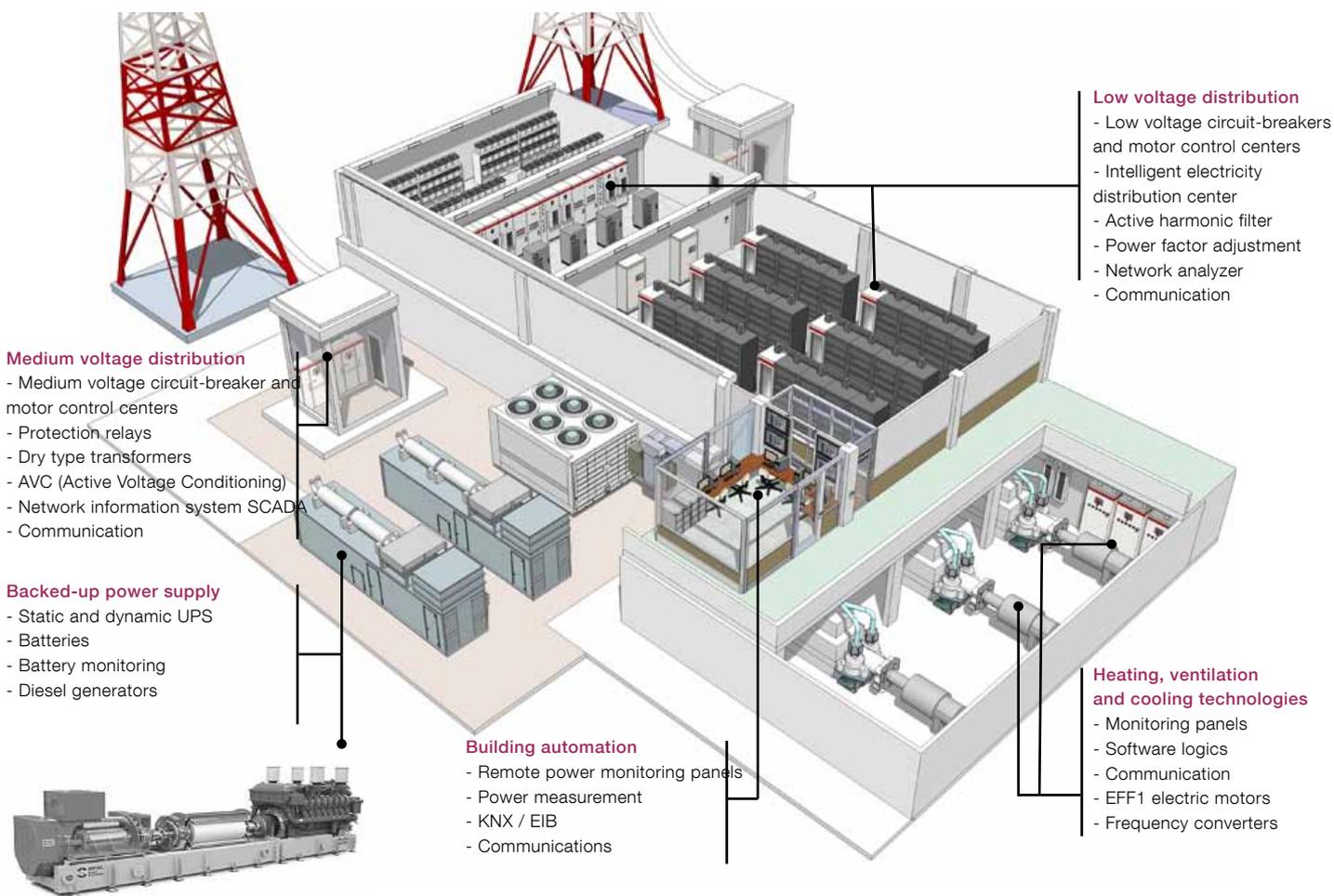




ABB Oy, Service

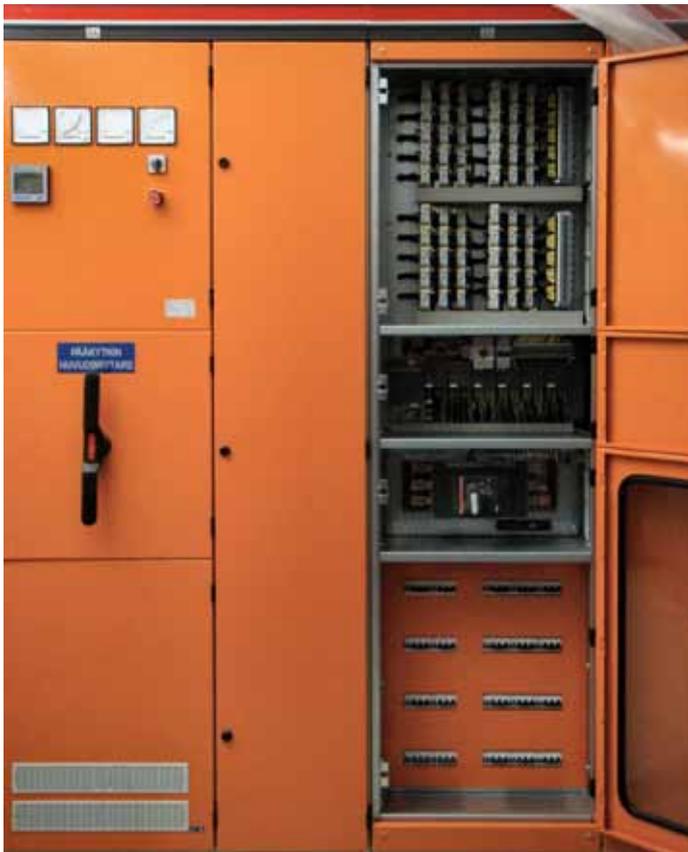
MNS PDU^{Pro} Intelligent Power Distribution Unit



MNS PDU^{Pro}

Intelligent Power Distribution Unit

For demanding electricity distribution needs in max. 1000 V systems



Benefits

ABB MNS PDU^{Pro} Intelligent Power Distribution Unit offers many benefits to the user

- State-of-the-art personal safety
- Top operational reliability
- State-of-the-art availability
- Cost-effective overall solution
- Expandability during use
- Minimum need for maintenance
- Maintainable during use
- Real-time energy and load measurement (per phase and/or feeder)
- Radial structure allows construction without traditional busbars
- MNS PDU^{Pro} centers are manufactured at ABB's plant in Finland

In large-scale data centers in continuous use, equipment has to be replaced, added or removed from time to time, due to network extensions or updates, or changing needs. With PDU^{Pro}, changes can be made and several system parts handled while other circuits are in use. Changes can thus be made without interrupting the operation of the system.

Applications

ABB's PDU^{Pro} unit can be used in the following applications, in which electricity distribution is critical:

- data centers,
- server rooms,
- hospitals and
- leading financial institutions.

Why MNS PDU^{Pro}?

Benefits of MNS PDU^{Pro}

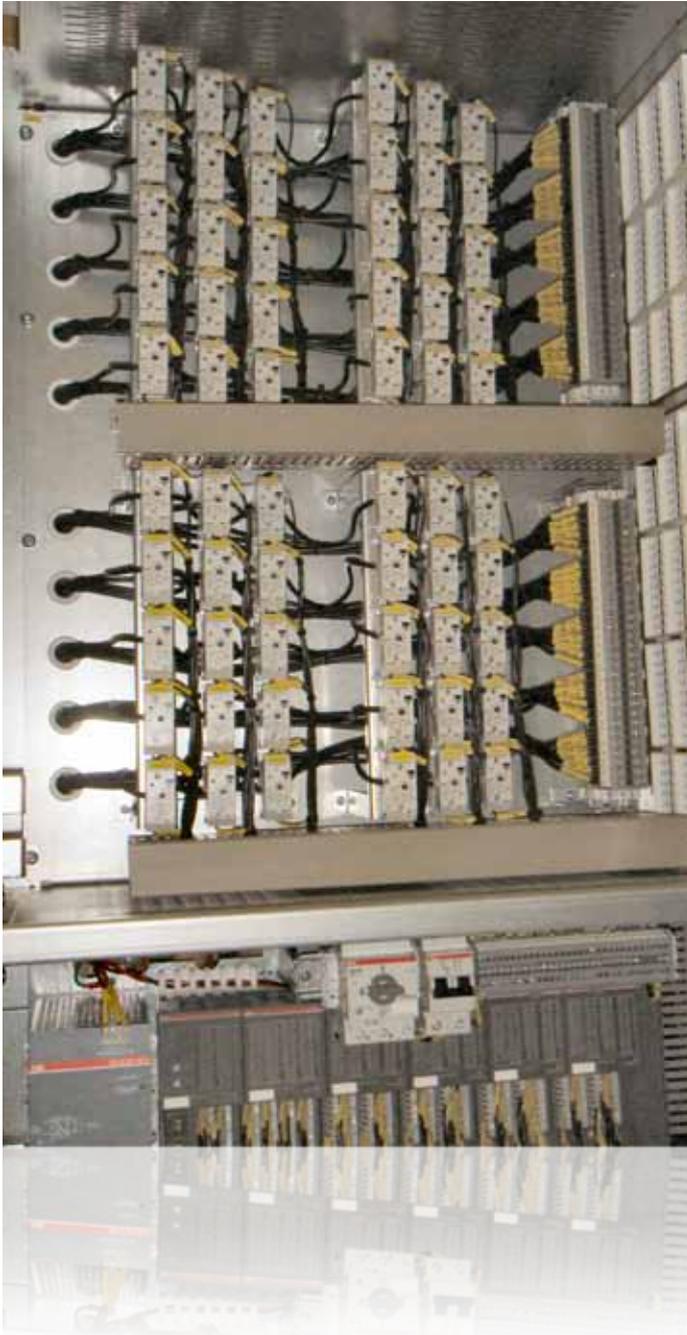
- **Provides optimum personal protection**
 - Enables safe personnel movement in the server room.
 - Vertical busbars of the switchgear make up an arc free and fault free zone improves personal and equipment safety.
- **Lowest maintenance, improved production process continuity**
 - Very low maintenance required.
 - A routine maintenance is undertaken when the PDU is live.
- **Real-time energy consumption metering allows managing and controlling the largest cost item of the data center's Opex**
 - Server and customer-specific energy consumption metering brings flexibility to service pricing enabling energy cost allocation according to the matching principle if needed.
 - Can be integrated fully with most energy (EMS) and building management (BMS) systems enabling remote monitoring and controlling.
- **Real-time measurement allows controlling load and capacity as well as identifying production bottlenecks**
 - Enables fast and flexible implementation of load changes.
 - Helps and facilitate also the planning of future investments enabling more effective long-term asset management.
- **Scalable and modular designs with maximum flexibility**
 - Upgrades, modifications or extensions may be added without the necessity of shutting down the complete PDU.
 - The structure of the MNS switchgear ensures compatibility regardless of switchgear type enabling flexible conducted extensions and modifications.
- **Flexible, task-specific system design and implementation together with ABB's experts ensures a functionality reliable solution**
 - Customer-based product development ensures high quality.
 - Local ABB's experts support available starting from system design ending to a life cycle services.

Features of MNS PDU^{Pro}

- Tested according to strict international standards.
- Safe methods for replacing or adding equipment during use.
- A flexible system for data centers; possibility to extend the system according to customer base.
- Withdrawable feed circuit breakers, as well as plug-in type (630 A) and withdrawable (800 A) molded case circuit breakers in the front panel, facilitating maintainability.
- Faults can be tracked easily, thanks to output field specific alarms.
- Current measurements specific to field, output or phase can be provided as an option in order to control and measure server loads and/or energy consumption.
- As an option, possibility to connect to the bus specific to output/phase using the I/O S500 series or specific to field by means of a multipurpose meter.
- Thanks to MNS PDU^{Pro} structure, thermal imaging of the switchgear is easy.
- Switchgear short-circuit withstand strength up to Icw 70 kA.
- Front panel short-circuit withstand strength up to Icw 70 kA.
- Phase-specific measurement.
- Area-specific kwh measurement.
- Bus connection from measurements.
- Busbar equipment 630-800 A, wires to minibus 160-200A, output max equipment 32-40A
- MNS switchgear can be connected regardless of type, equipment or the country of manufacture.

The reliability of ABB's PDU^{Pro} units is based on careful testing exceeding the requirements of many international standards (concerning units critical from the point of view of electricity supply).

Structure of MNS PDU^{Pro}



The structure of the PDU^{Pro} unit allows the controlled handling of critical unit elements during use without endangering the safety of personnel. Users and real estate management teams can carry out proactive maintenance measures instead of reactive ones. Unit investments can be made in stages, thanks to its structure, when extending the unit according to the customer's growing needs.

Description of the principle of MNS PDU^{Pro}

- The field is part of a larger switchgear package
- A plug-in front panel feeds another vertical buses
- Conductors are divided from the vertical bus to a Smiss Line minibus
- Smiss Line MCB can be safely detached from the minibus without voltage failures
 - No loss of service continuity

PDU^{Pro}, vertical busbars

- The vertical busbars were constructed using a fault-free busbar model (Fault Free Zone)
- Polycarbonate covers are installed between the vertical busbar phases in order to provide an arc-free zone
- The conductors from the vertical feed busbars have been installed making sure that they do not touch or squeeze each other – the danger of mechanical damage to the conductors have been eliminated.

Fuses

- Rack/server-specific fuses are used in order to limit any disturbance to a small area.
- The fuses are located behind transparent, lockable doors enabling safe use and easy monitoring.
- All fuses can be replaced and more fuses added separately during normal production, without loss of service continuity in the other outputs.

Monitoring, alarms, trend and communication

The PDU^{Pro} unit, customized according to the customer's needs, can include a complete monitoring, trend and communication solution. As an option, the possibility to connect to the communication bus using the I/O S500 series can be provided. Thanks to measurements and communication, it is possible to integrate the unit with most ENMS (Energy Network Management System) and BMS (Building Management Monitoring Systems) systems. Remote monitoring and control is also possible.

Active harmonic filter

The PDU^{Pro} unit can be provided with active harmonic filters, communication ports and measuring instruments. The filter is installed close to the load reducing the requirements placed on the overlying busbars and equipment.

Made in ABB

Stands

Data centers often have elevated floors. ABB's PDU^{Pro} unit is available with an optional stand with adjustable legs and slab support.

Manufacture, testing and certification

The MNS PDU^{Pro} unit, currently manufactured in Vaasa, is the result of 15 years of experience in manufacturing solutions for the most demanding protected electricity distribution environments. The quality of our products stems from long-term cooperation, testing and certification.

ABB's MNS system is a type-examined switchgear assembly (TTA), which complies with the requirements of the IEC 60439-1 & IEC 61439-1/-2 standards

The fulfillment of all IEC 60439-1 & IEC 61439-1/-2 standards requirements guarantees a basic level of personnel and system protection. ABB's MNS exceeds these requirements.

The MNS low voltage switchgear has been comprehensively type-tested in accordance to standards. ABB guarantees the best possible safety by continuing tests in accordance with its ongoing development program. The tests are based on the most critical applications and testing standards for the whole product or performance range.

In addition to the above specifications, ABB uses the IEC/TR 61641 Technical Report in testing arc flame situations that are due to internal faults. The fulfillment of the requirements of the IEC/TR 61641 Technical Report is tested by connecting the switchgear and feeding it in accordance with a normal service agreement. The flame arc is initiated inside the switchgear. The ignition points are selected according to the IEC/TR 61641 with a view to maximizing the strain imposed on the assembly. Five personal protection criteria are monitored in the test, and ABB ensures their fulfillment in accordance with the Safety Plus certificate.

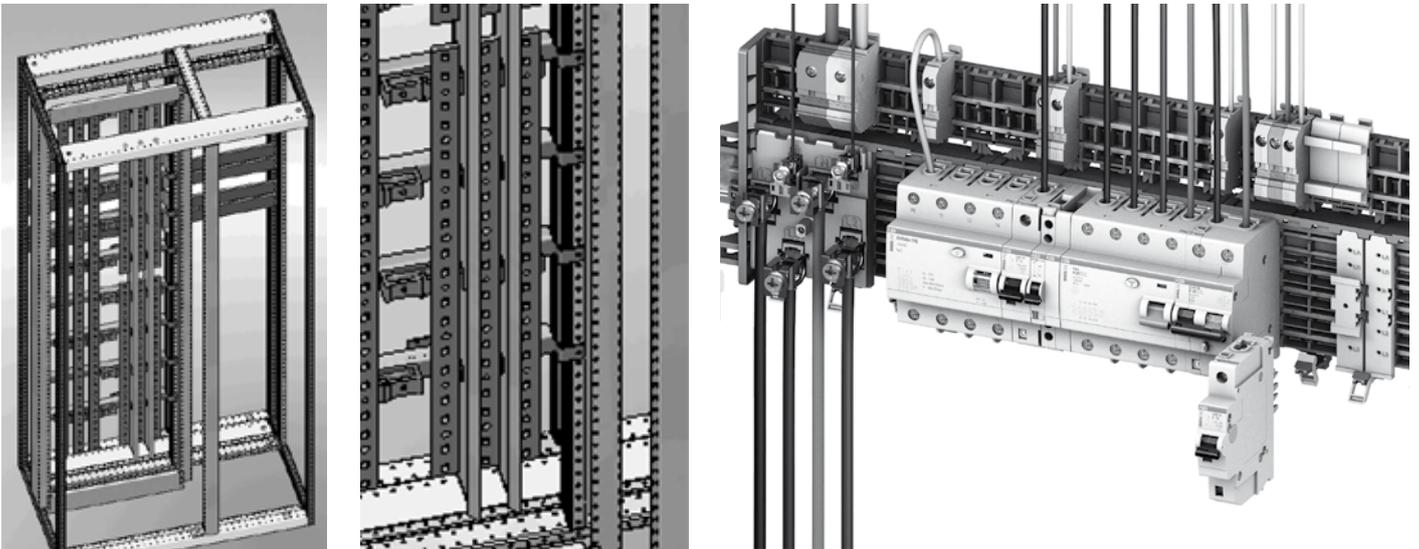


ABB holds quality assurance, environment and health and safety certificates matching the ISO9001, ISO14001 and ISO18001 standards.

Technical Description

Technical Data

Standards	Type-tested switchgear assemblies (TTA)*	IEC 439-1, CEI 439-1, EN 60 439, DIN VDE 0660 part 500, BS5486, UTE 63-412	
Test certificates	Germanischer Lloyd, Hamburg (shipping) ASTA, Great-Britain (resist. to accidental arcs acc. to IEC 1641 and IEC 298, Appendix A Federal Ministry for Regional Planning, Building and Urban Development, Bonn (shelters) DLR German Research Institute for Aerospace e. V. Jülich, Earthquake Test for Security Areas in Nuclear Power Stations		
Electrical data	Rated voltages	Rated insulation voltage U_i Rated operating voltage U_e Rated impulse withstand voltage U_{imp} Overvoltage category Degree of pollution Rated frequency	1000 V 3~, 1500 V- ** 690 V 3~, 750 V- 8 kV III 3 up to 60 Hz
	Rated currents	Busbars: Rated current I_e Rated peak withstand current I_{pk} Rated short-time withstand current I_{cw} Distribution bars: Rated current I_e Rated peak withstand current I_{pk} Rated short-time withstand current I_{cw}	up to 6300 A up to 250 kA up to 100 kA up to 2000 A up to 176 kA up to 80 kA
Mechanical characteristics	Dimensions	Cubicles and frames Heights Widths Depths Basic grid size Hinged frame for accommodation of electronic subracks	DIN 41488 2000, 2200 mm 400, 600 , 800, 1000 , 1200 mm 400, 600 , 800, 1000, 1200 mm E = 25 mm acc. to DIN 43660 DIN 41494, sheet 1, ASA C 83.9
	Surface protection	Frame Internal subdivision Transverse section Enclosure	Hot galvanized or Alu-zinc coated Hot galvanized or Alu-zinc-coated Galvanized Paint finish RAL 7035, light grey
	Degrees of protection	According to IEC 529 or VDE 0470 part 1	IP 00 up to IP 54
	Plastic components	Halogen-free, self-extinguishing, flame retardant, CFC-free	DIN VDE 0304 part 3
	Internal subdivision	Device compartment - device compartment Busbar compartment - cable compartment Busbar compartment - device compartment Device compartment - cable compartment Compartment bottom plates	
Extras	Paint finish	Enclosure	Special colours (standard RAL 7035)
	Busbar system	Busbars	Insulated
	Special qualification	Test certificates	see test certificates listed above

* Definition TTA: Switchgear assembly corresponding, to a large degree, with the original type or system of switchgear assembly type-tested in accordance with these standards.

** Depending on the electrical equipment.

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