

Data Center

Uninterrupted efficiency, guaranteed reliability and continuous modularity. ABB solutions always work.

Data security is first of all electrical Maximizing security while providing efficiency and reliability.

When a device is “critical” in terms of functions performed and technological features, its power supply needs to be reliable, noise-free and free from significant interruptions. While this remark may seem obvious, it takes on added and tangible importance if we think of an operating room in a hospital, of a semiconductor manufacturing line, a petrochemical plant or a data center. In all these application fields and in many other fields that have the same continuity requirements, it is essential to turn to a reliable partner: a supplier of electrical devices and systems such as ABB, that has dealt with “critical power” in all respects and in all sectors for decades.

More power, more consumption

A growing number of private and public businesses, from banks to insurance companies, to telecommunications companies and Internet providers have their crucial point in the data center. Gathering, storing and managing data requires maximum operating reliability – digital devices do not tolerate power supply interruption – to prevent data losses that may have serious consequences. These delicate structures have high operating and maintenance costs. Servers are always on and air conditioning, normally set to 20 °C, requires one watt per watt used in computing functions. A data center absorbs on average 15 to 20 times as much energy as a normal office of comparable size. All this affects plant costs: When you build an office building, the electrical and mechanical portions usually equal to 15 percent of the investment, but in the case of a Data Center this value increases to 70 percent.

The ever-increasing demand for computing power also has an impact: with the new technologies between 20-22 kW of power is required for each single rack, compared to 4-5 kW normally needed in the past. Going forward, these environments will become one of the main consumers of power in the world. The priorities of this rapidly changing market can therefore be summarized as follows: security, service continuity, economic and environmental sustainability.

Greater competences, lower costs

The seemingly relentless increase in costs can be offset by a more organic vision. By addressing the Data Center from all the viewpoints, according to corporate strategies and their potential evolution, end customers and the designers that serve them – and that specialize in the electrical part, in air conditioning systems and in IT infrastructures – can make the most appropriate choices in terms of localization, dimensioning, electric and computing power, security. ABB has a solid know-how acquired in advanced markets, such as the United States, the United Kingdom and Switzerland, where each Data Center is already considered as a complex system that requires in-depth but at the same time multifunctional skills. Moreover, ABB has an excellent knowledge of the best practices applied in various projects worldwide and of the international guidelines adopted by the industry, in the absence of specific regulations.



ABB's solutions from A to Z

Intelligence in electrical networks: this is the distinguishing feature of the ABB offering of devices and systems that ensure efficient management of loads and complete control of the critical parameters of the installations.

For the Data Center applications, ABB provides everything you need: from transformers, to switchboards and low-voltage devices. The connection to the medium voltage network occurs through compact devices, thus reducing the space occupied. In distribution, intelligent systems specifically designed for this application, such as the iPDU (intelligent Power Distribution Units) switchboards and technologically advanced products – moulded case and air circuit breakers, surge protection, disconnectors, active filters, etc. – ensure continuity and reliability of supply, as well as energy quality. Other – but not secondary – features of the ABB offerings are energy efficiency performance and reduction of operating costs, which in a Data Center are largely related to air conditioning. The companies operating in the IT sector are promoting the most recent hardware and software technologies aimed at increasing efficiency while reducing the Total Facility Power to IT Equipment Facility Power ratio, by optimizing the Data Center PUE (Tab. 1).

This is guaranteed by the advanced HPAC (High Precision Air Conditioning) systems. For these ABB provides high-efficiency electric motors and frequency converters, in addition to extensive experience in the correct dimensioning of the systems in the design phase. The modularity of ABB distribution and system engineering solutions is perfectly suited to the evolution of the customer's business and corporate strategies. Through building automation you can also seamlessly manage and supervise the auxiliary

systems of the computer room and other office areas. It also worth noting that ABB can also operate as a supplier of essential components for manufacturers of battery-based UPS (Uninterruptible Power Supply) units that ensure power supply for 15-30 minutes in case of emergency, and of power generating units that ensure long-term continuity.

PUE: Power Usage Effectiveness

DCE: Data Center Efficiency

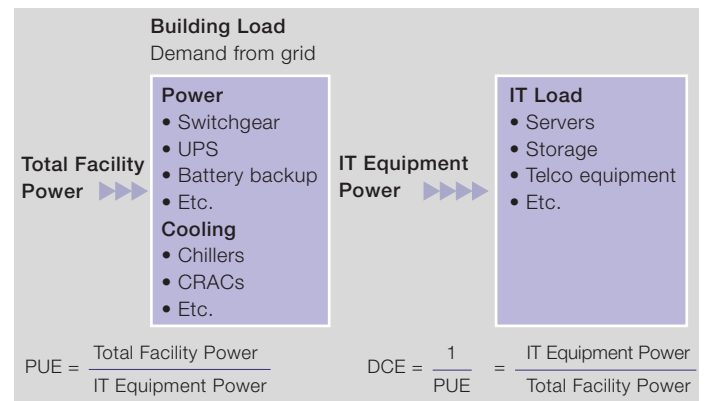


Table 1

Source: The green grid

ABB Service

Cost effective packages can be provided from our Service, specifically designed to meet the individual needs of the client. These includes:

- Retrofits and upgrades
- 24/7 emergency call out service
- Planned Maintenance
- Training
- Spares Management



A solution package for the Data Center

Primary distribution

Dry-type transformers

Efficiency, reliability, the key words that support the concept of the hi-T Plus dry type transformer. A class H insulation dry type transformer with reduced losses that make this product ideal for applications with high harmonic content networks, or in cases where it is fundamental to withstand additional losses generated by unforeseen harmonics without life impact.

Medium voltage air insulated switchgear

UniGear is medium voltage LSC2B PM switchgear, arc proof with a metal enclosure, suitable for indoor installations. The switchgear is easy to install, it is modular and is built up by installing each unit side by side. These switchgears are designed and tested according to IEC62271-200. Different solutions are available in accordance with the purpose and the service requirement, among which:

UniGear 500R – up to 12 kV – 31.5 kA x 3s – 2000 A (4000 A of Busbar current)

This panel has been designed and tested in addition according to ENATS 41-36 standards. It has a dedicated three-position line disconnecter (connected, isolated and earthed) and a well proven vacuum circuit-breaker Vmax in removable version. Thanks to the reduced footprint (all the panel types are only 500mm wide, including 2000A version), it is suitable for most applications e.g. industry, utilities, transport and commercial, especially where space saving is essential.

UniGear double busbar systems up to 24 kV – 31.5 kA x 3s – 4000 A

The double busbar systems provide full system redundancy (physical isolation between source busbar systems), each unit comprises two line disconnectors and one circuit breaker. They are the best solutions when uninterrupted and reliable service conditions are required. All panel types are offered complete with ABB relays which include the capability to support IEC 61850 communication protocol.

Power quality

- Harmonics filtering.
- Power factor correction.
- AVC (Active Voltage Conditioner)

ABB MNS System

Power Distribution & Motor Control Center with over 25 years of experience and over 1.2 million MNS cubicles installed world-wide. MNS is proven in terms of reliability, quality and safety. MNS high flexibility combined with standardized modules results in perfect scalability to meet ever changing Data Center infrastructures.

Power center MNS-R

MNS-R is the solution proposed by ABB worldwide for high-performance Power Centers. Rated current up to 6300A (continuous) and short-time current up to 100kA; direct connection option with busbar trunking systems either from above or from below. Safety is ensured by the internal arc resistance up to 75kA x 0.5s and by the physical separation between power cables and auxiliary cables. In terms of construction, these are characterized by the possibility of having multiple air circuit breakers per column, thus considerably reducing the space occupied. All the MNS-R switchboards are modular, enabling future extensions on both sides and minimizing installation time. The circuit breakers can be equipped with the communication modules, in order to enable remote control and the capturing of data to be sent to higher control and supervision systems.

Motor Control center MNS-iS

In the field of Motor Control Centers, ABB through its thirty factories worldwide offers the revolutionary MNS-iS, i.e. the intelligent MCC. This is characterized by a number of innovative solutions and provides various advantages, including: presetting for connection with ECS & DCS systems, compact and modular switchboard to meet any changes in installation requirements. The on-switchboard intelligence provides various information on the loads being used by Condition Monitoring to optimize maintenance while reducing the costs due to downtime and increasing service continuity. MNS-iS Condition Monitoring, due to the data from the various system components and to the continuous information gathered on the status of assets, introduces proactive maintenance, thus performing maintenance operations only when they are really necessary.

Protection relays

- Complete range of relays for protection, measurement and control.
- Protection of power distribution system, motor, generator, transformer and capacitor battery.
- SCADA/EMS available with each relay for data communication and control.
- Annunciator systems.

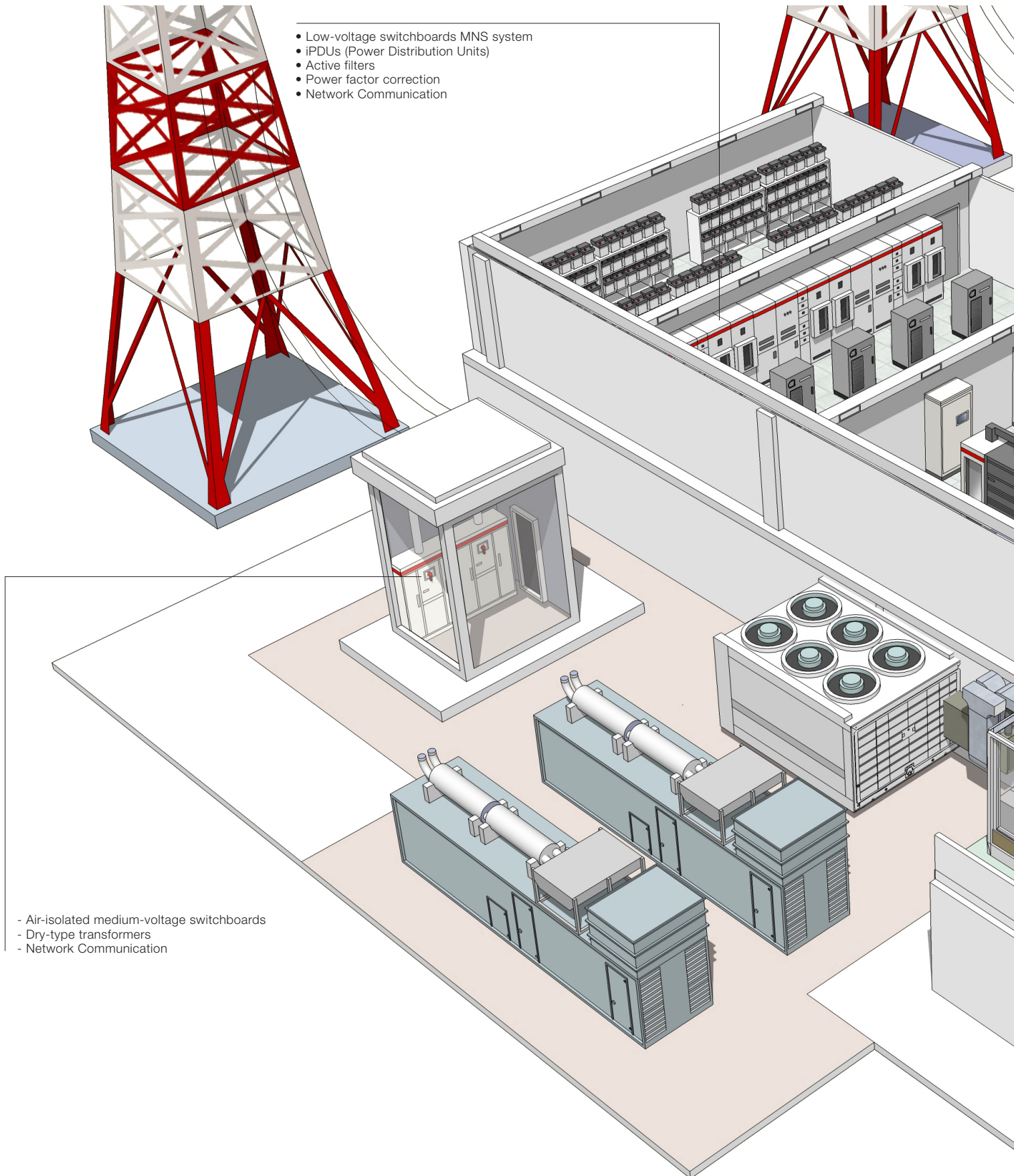
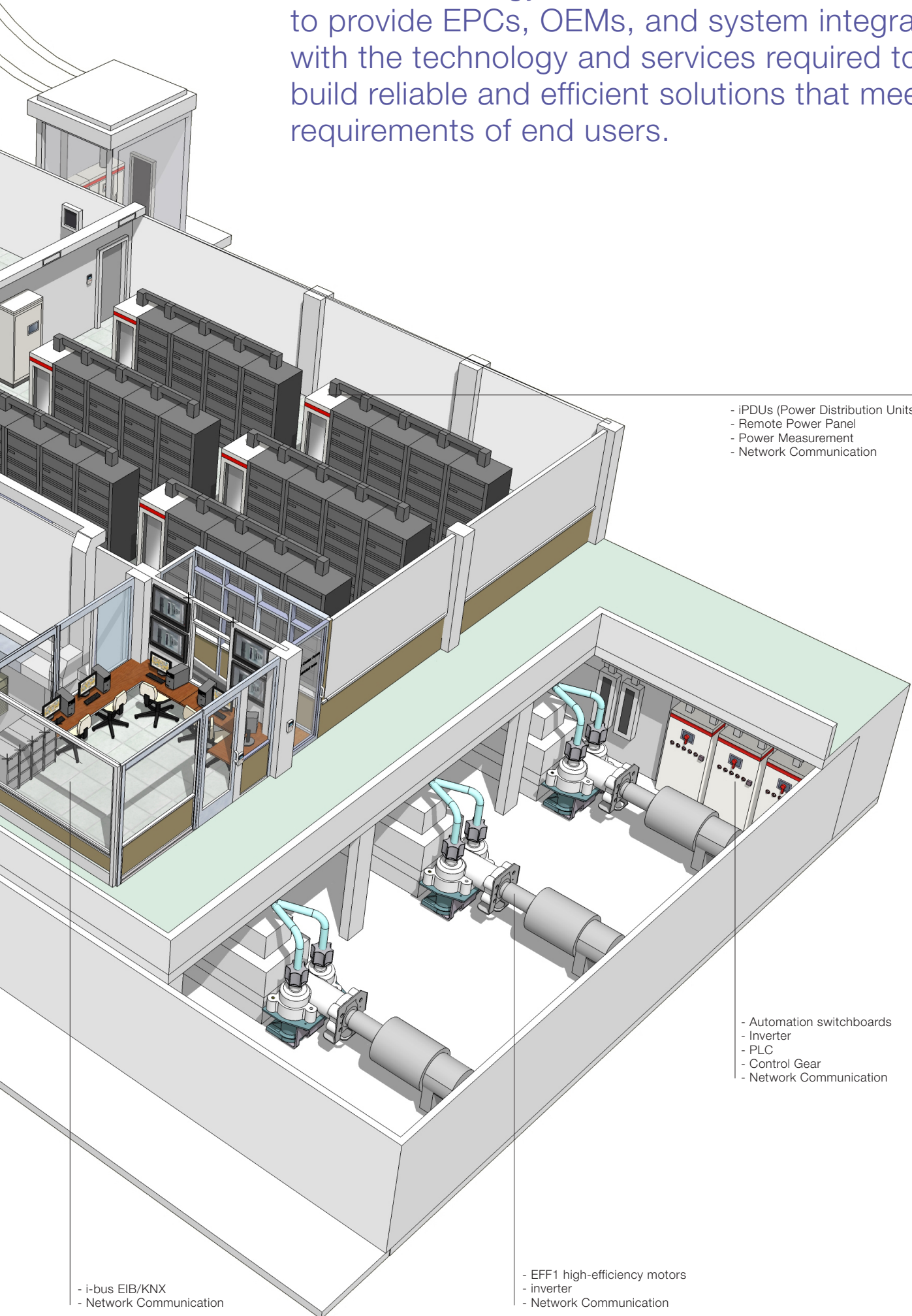


ABB is specifically committed to reducing CO₂ emissions, e.g. through highly efficient control solutions for HVAC loads and motors.

The ABB strategy for Data Center solutions is to provide EPCs, OEMs, and system integrators with the technology and services required to build reliable and efficient solutions that meet the requirements of end users.



- iPDUs (Power Distribution Units)
- Remote Power Panel
- Power Measurement
- Network Communication

- Automation switchboards
- Inverter
- PLC
- Control Gear
- Network Communication

- i-bus EIB/KNX
- Network Communication

- EFF1 high-efficiency motors
- inverter
- Network Communication

Secondary distribution

iPDUs (Power Distribution Units)

Over many years ABB has worked to develop a range of PDU designs that meet the ever changing needs of the modern day Data Center. A family of PDU's from 400amp to 800amp have been developed to fulfill the needs of Single Incomer, Dual Incomer, Dual Incomer with By pass and Static Transfer Switches applications with full wrap around facilities.

To complement the Incoming arrangements ABB proposes a full range of outgoing plug-in circuit modules, from 18 way SPSN fuse modules to mcb's to MCCB's, 3 or 4 pole. The flexibility of the design allows the end user to mix and match different types of outgoing modules.

As a result the ABB PDU's offer:

- Scalable and modular designs with maximum flexibility, whilst at all times providing optimum personal protection.
- No intrusive maintenance required, as Routine maintenance is undertaken when the PDU is live.
- Busbars that are Lloyds approved and 'maintenance free'
- Availability for thermographic imaging of the PDU.
- Upgrades, modifications or extensions may be added without the necessity of shutting down the complete PDU.
- BMS monitoring with communications and EPO facilities as required.

Electrical parameter monitoring and remote supervision

ABB offers a complete and exhaustive range for electrical parameter monitoring. Keeping the system operation under control continuously and in real time enables the user to prevent any malfunctioning and to schedule preventive maintenance. Another significant and urgent aspect for the user is energy consumption management and monitoring.

With the ANR network analyzer you can keep all the electrical parameters under control with high operating accuracy, while performing a detailed harmonic analysis viewing the wave form on the graphic LCD display.

HVAC solution

Frequency converters and high-efficiency motors

The increasingly widespread use of frequency converters in the HVAC sector has now replaced the outdated fan motor control through mechanical devices, such as valves, fan gates, etc.

Managing an electric motor without an inverter is like driving a car with the engine running at full speed and using only the brake, no matter what speed the vehicle is traveling. Among the value and advantages provided by a variable speed drive, energy consumption is definitely one of the most important, especially in HVAC applications.

To obtain a solution capable of achieving savings of even more than 30%, you need to be able to adjust the speed of the motor based on the actual needs of the application,

With ANR you can also implement a serial communication network with Modbus RTU protocol and send all the measured data and recorded alarms to a single collection point for analysis through a supervision system. Using the Modbus RTU standard protocol ensures complete compatibility with other ABB devices equipped with communication, such as the Tmax and Emax circuit breakers.

With more specific reference to the data center, the use of "intelligent" releases provides the greatest advantages in two fields: maintenance and energy management of the systems.

For instance, data provided by the devices can be used to plan maintenance based on the condition of the system and thus prevent any malfunctioning and inefficiencies. Moreover, circuit breakers can be automatically opened and closed depending on the active and reactive power absorbed and on other factors (such as time of day and resulting different energy rates). You can therefore plan strategies for reducing consumption, total energy costs and for allocating loads among various power supply sources.

Building Automation

i-bus EIB/KNX

ABB i-bus EIB/KNX is the intelligent system that meets the most complex application requirements in building automation. By adjusting heating temperature and light and energy consumption of the electrical devices to the real requirements, significant energy savings can be achieved without affecting comfort or quality of life. Every day ABB provides a million products to companies operating in the commercial and residential building sector and is the leading manufacturer of low voltage devices, automated control systems and BASs (Building Automation Systems) that provide significant savings in three main areas:

- Temperature control, saving up to 30%
- Lighting control, saving up to 50%
- Building automation, saving up to 60%

preventing any waste related to the functioning of the motor directly connected to the low voltage network.

The best result in terms of energy saving can be achieved by combining a high-efficiency motor with a frequency converter (more commonly known as "inverter").

The high-efficiency motors offered by ABB provide output above 95%, high performance, markedly lower consumption, and longer lifecycles.

The inverters inserted between the power supply and the motor enable the alignment of performance to load demand to prevent waste. Inverters also help to cut maintenance costs, lower noise levels in a facility and correct the power factor to a costs value near 1 (typically 0.98).

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