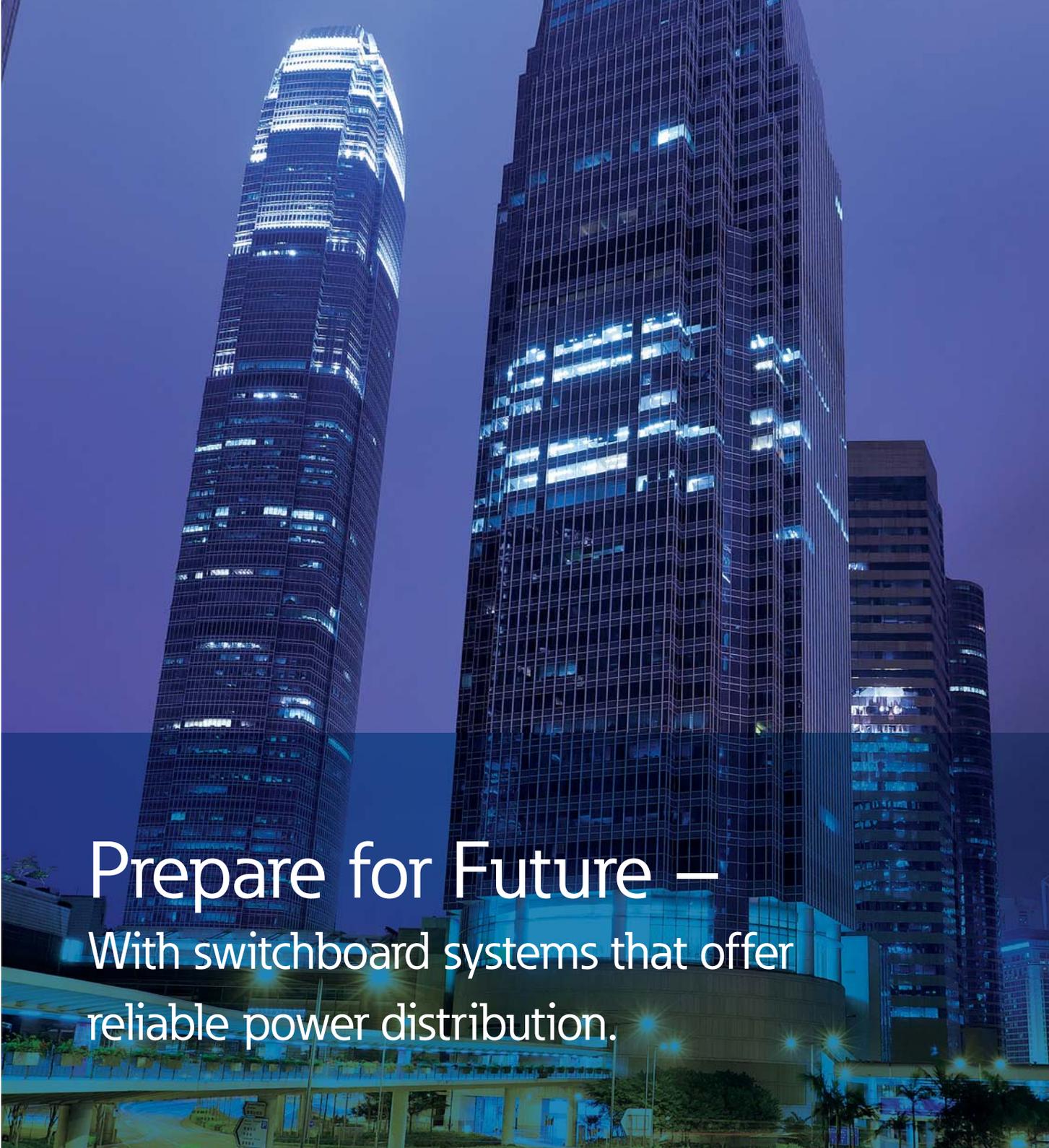


Eaton – convincing in terms of safety, performance and operational availability.



Prepare for Future –
With switchboard systems that offer
reliable power distribution.

EATON

Powering Business Worldwide



Energizing a world that demands more.

We deliver:

- **Electrical solutions** that use less energy, improve power reliability and make the places we live and work safer and more comfortable
- **Hydraulic and electrical solutions** that enable machines to deliver more productivity without wasting power
- **Aerospace solutions** that make aircraft lighter, safer and less costly to operate, and help airports operate more efficiently
- **Vehicle drivetrain and powertrain solutions** that deliver more power to cars, trucks and buses, while reducing fuel consumption and emissions

Discover today's Eaton.

Powering business worldwide

As a global power management company, we help customers worldwide manage the power needed for buildings, aircraft, trucks, cars, machinery and businesses.

Eaton's innovative technologies help customers manage electrical, hydraulic and mechanical power more reliably, efficiently, safely and sustainably.

We provide integrated solutions that help make energy, in all its forms, more practical and accessible.

With 2015 sales \$20.9 billion, Eaton has approximately 97,000 employees around the world and sells products in more than 175 countries.

Eaton.com

EATON

Powering Business Worldwide



At home, wherever your field of application may be.

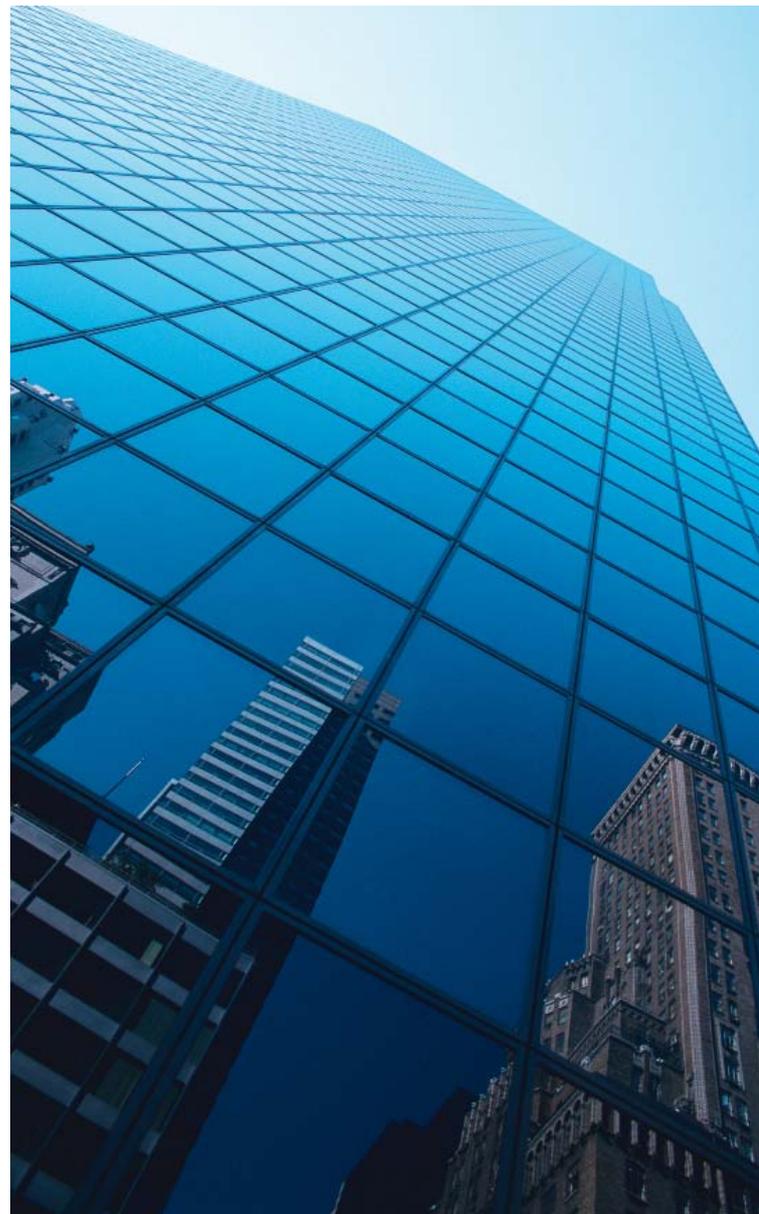
From medium-voltage to wall sockets – the expert in safe power distribution feels comfortable in every field of application. Eaton switchgear assemblies do a perfect job wherever they are used.

Efficient power distribution, from medium voltage right down to the final low voltage power point, requires knowledge and understanding of the whole power system. Strategic thinking, intelligent system design, power integration, system coordination and control are all key to Eaton's product strategy. Eaton has the knowhow and the experience necessary to design, engineer, manufacture switchboard systems with ease of, installation, system diagnosis, preventive maintenance and upgrading of switchboard systems. No matter whether you need an individual electrical application or an integrated system, Eaton has the best solution to increase your electricity related performance, to cut your operating costs and to maximize the operational availability, safety and overall capacity of your system.

MV & LV – everything is covered by Eaton

Our experience as complete solution provider makes a difference in every application. Where medium and low voltage switchgear are used in the same installation whether that be a commercial building, shopping center, hospital, airport or hotel, Eaton has the right solution that:

- protects against interruption in supply,
- optimizes energy costs and cuts operating expenses
- increases the level of capacity utilization of the facility



Eaton helps avoid undesirable risks.

The risks of a failure or shutdown in a low-voltage switchgear system are everywhere. Eaton's innovative solutions can help mitigate against them.

Eaton, is a recognised global specialist in switchgear systems controlling and protecting power to mission critical applications in data centres, airports, hospitals, commercial buildings, warehouses, industrial plants, food processing, pharmaceutical, automotive, sewage treatment plants and many more. Eaton's customized solutions provide safe, efficient and reliable systems to meet any application.

More than any other provider of switchboard systems, this expert in safe power distribution knows all about the importance of operational availability and the consequences of down-time. Wherever these hazards are most threatening, Eaton is there to prevent them with its innovative systems.



Sewage treatment plants

- Additional staff required for failure management
- Additional external services to remedy failures (cost of consulting and analysis, contractors to repair the facilities etc.)
- Additional expenses for materials (coagulants, sludge disposal, energy etc.)
- Exceeding of threshold values with negative consequences for wastewater fees, among other things
- Increased strain on the receiving waters or even damage to fauna (incl. fish mortality)
- Maybe endangering a downstream drinking water purification plant
- Bad publicity for poor quality of wastewater purification

Commercial buildings / Shopping centers

- Failure of IT systems, telephone systems, payroll time clocks, escalators, passenger elevators, cash systems and security cameras
- Locking of passage ways and exits (incl. underground parking) due to automatic door locks
- Insufficient functionality of air conditioning and shading systems etc.
- Lighting reduced to emergency level
- Risk of mass panic, accidents or shoplifting

Water treatment plants

- Delays in the mechanical, physical and chemical treatment
- Additional costs of staff and supply bottlenecks
- No guarantee possible for complying with the drinking water ordinance
- Insufficient purification, sterilization, deferrization, softening and desalination of the water
- Health damages
- Consequential damages on machinery (e.g. heating systems)

Food industry

- Dependence on emergency power supply
- Emergency plan for communication and human-resource allocation
- Products spoilt due to failures in heating or cooling systems
- Losses due to disappearance, staff costs and low income or even total ruin
- Delay or complications in the production and export of goods
- Problems with meeting the respective quality requirements



Hotels

- Complications in accounting, orders and reservations handling due to failures in IT systems
- Vulnerability of security systems due to failures
- Risk of fire where fire detectors are connected to the electronic system in the building
- Delays at check-out due to failing credit card readers
- Problems with locking/unlocking room doors when chip cards don't work



Hospitals

- Necessity of using fuel-operated emergency power generators
- Increased manpower requirements
- Batteries for bridging short periods of time until generators take over
- Trust in the functioning of uninterrupted power supply (UPS)



Data centers

- Failure in complex operating processes
- Breakdown costs in the millions
- Overtime work to restore the applications
- Consequential damages due to overheating caused by insufficient power supply for cooling systems (between 35 and 50 percent of the total energy costs)
- Operation in the backup data center with unimaginable risks (air conditioning, energy, access, security, energy efficiency)



Supply-chain companies / Logistics

- Total operating blackout due to failures in stock programs (nothing can be found)
- Impossibility of meeting delivery deadlines and taking in new orders
- Decreasing income but dramatically increasing costs
- Overtime work to remedy damage and cost-intensive temporary problem-solving measures



3 good reasons for using xEnergy.

Energy is a switchboard system with a wide range of applications providing reliable power distribution and control customised to your specific requirements. It offers the extra benefit of protection for both personnel and equipment.

The xEnergy system is available in a range of models and types. They may differ in their design but they all offer excellent safety, availability and performance.

Safety

xEnergy also provides a maximum level of protection for personnel and equipment. The xEnergy system has been third party tested to the new IEC/EN61439 standard, together with internal arc testing to the IEC/TR61641 providing protection up to category 6 of the standard. Third party verification testing provides reassurance and peace of mind knowing that the entire system has been safety tested and that the state-of-the-art design has been verified by test. xEnergy provides the flexibility to use Fixed, Removable or Withdrawable units within the system. This flexibility allows the convenience to choose the level of complexity to maintain and replace the switchgear modules. This also minimizes the number of accidents, the number of faults and the duration of training required for operators and maintenance personnel.

Availability

Eaton's xEnergy offers a design-verified switchgear assembly which provides a maximum level of trouble-free operation. The right choice of either the fixed, removable or fully withdrawable technology keeps down time to an absolute minimum and many times shorter than conventional systems. The choice allows the right technology depending on the level of risk of downtime to be used to optimise the overall system availability. Whether it is a requirement to bring the system into operation within a few minutes or seconds and under live-line working conditions, Eaton's xEnergy is the right solution.

Performance

The xEnergy system is forward thinking. It is designed for increasing future requirements. Its module based design allows for smart combinations and expansions. Each function module of this switchgear assembly is perfectly prepared and consistently designed – from the fitting system technology and enclosure to the software tools. It provides optimum conditions for switchgear and controlgear applications up to 6300 A.



Safety management for low-voltage switchgear

Eaton has a clear safety management focus: we resolve any existing safety issues and provide diagnostic information to minimise the risk to people and equipment. Since 2011, Eaton has been issuing the Yellow Eaton Safety Standard (YESS) Award to companies that set safety as a clear priority.



More information:
www.eaton.eu/SafetyManagement

More security to your switchboard

Eaton provides solutions that greatly improve switchgear and staff safety solutions that significantly cut the risk of an operational failure and any related costs potentially threatening the survival of a company. Eaton has always been a pioneer in personnel and plant protection. Our established protective circuit breakers and many innovations in this field are further improving safety for operating personnel. In applications from tunnel power supplies to the paper industry and data centres, a secure and reliable power supply is essential for protecting people and machinery. We provide assemblies that offer maximum availability and safety with minimum downtime.



Benefits

- **Minimum downtimes**
- **Continuous temperature monitoring**
- **Internal Arc tested to TR/IEC61641**
- **Maximum safety for plant and personnel**
- **Easy maintenance, no need for any special tools**
- **High levels of ingress protection upto IP55**

Protection against the effects of internal arcing is an issue for both personnel and equipment protection. Without the appropriate tested designs a potential unsafe situation as shown above could occur endangering the life of operators or maintenance personnel. The xEnergy system has been third party tested IEC/TR61641 providing protection up to category 6 of the standard. Additional protection up to the highest category of 7 can be incorporated by using Eaton's ARCON arc quenching system. Additional safety during maintenance can be provided by Eaton's Arc Reduction Maintenance System incorporated within the main Air Circuit Breaker.

Eaton Partner program



Eaton has a global partner programme of certified panel builders that guarantee high quality and excellent safety standards. Our partners can provide the ideal switchgear for every application, in line with your priorities.



Innovatively improving safety

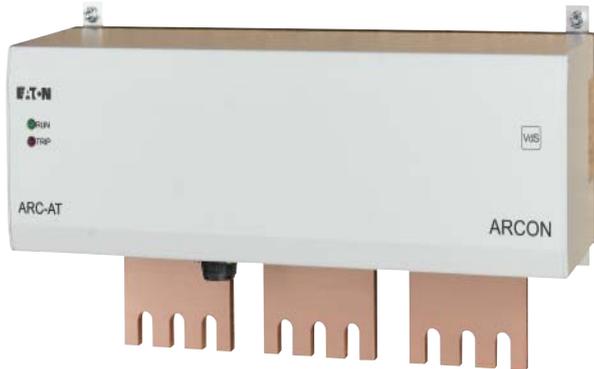
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In applications from tunnel power supplies to the paper industry and data centres, an uninterruptible power supply is essential for protecting people and machinery.

We provide assemblies that offer maximum availability and safety with minimum downtime.

ARCON® Arc Fault Protection



Arc faults represent some of the risks to a reliable supply of electrical energy. Even today, they still occur in electrical power distribution systems, despite all the precautionary measures that are given due consideration and implemented in advance. They are mainly caused by human error when work is carried out on the switchboard, as well as by contamination, over-voltages or similar occurrences. This type of event occurs more often than is expected, and the damage caused can have serious consequences for both personnel and equipment.

Using Eaton's ARCON system restricts the effects of the arc fault to a minimum. After the cause of the fault has been rectified and the quenching device has been exchanged, the system can be made ready for operation in the shortest possible time in order to ensure the required availability.

Temperature monitoring



Over temperature within a switchboard can be the cause of insulation breakdown and eventual arcing faults that can lead to a catastrophic failure of the switchgear and possible injury to personnel. Occasional random checking of temperature by the use of thermography is not the ultimate solution. The Eaton Diagnose System makes a permanent continuous thermal monitoring of the low-voltage main distribution boards possible. Any emerging problems can be detected as they originate and can therefore easily be remedied before a dangerous incident occurs. Preventive maintenance is always better and ultimately less costly than maintenance after a potentially serious incident.

Another advantage of the Eaton Diagnose System is that sensors can also be installed in areas of the switchgear that are otherwise difficult to access or not accessible at all. As covers no longer need to be dismantled for thermal scanning, personal safety and system availability increase because the system is continuously being monitored under live conditions. The only time the power needs to be disconnected is when a potential problem is detected by the Eaton Diagnose System.

Arcflash Reduction Maintenance System™



Adding individual solutions to Eaton's IZMX circuit breakers provides both more protection for systems and more safety for personnel in case there is a failure. This system guarantees added safety for maintenance personnel. When this feature is enabled in the maintenance mode, the instantaneous trip setting of the IZM breaker is reduced to such a limit that the amount of energy (radiation, pressure, temperature) released in the event of a dangerous arc

flash is dramatically reduced increasing the safety level of any personnel in the vicinity of the equipment.

This accelerated switch-off happens even faster than the switch-off of a non-delayed short-circuit trip. This function is activated either directly on the circuit breaker through an external switch, or automatically, via an external contact, or via the communication bus.

Earthquake protection



Earthquake protection is a top priority at Eaton. The xEnergy system is a robust construction which has undergone seismic testing to the most stringent standards. xEnergy switchgear systems have been designed in such a way that they are optimally equipped for being used in hazardous areas.

Due to the swaying movements occurring during earthquakes, corner joints are the most sensitive-to danger zones in the control cabinet. The xEnergy enclosure only requires the addition of a corner stiffening bracket kit to pass these test requirements.

Fully tested and documented in accordance with IEC 61439



The xEnergy system has been fully verified by test in accordance with the new IEC61439 standard and has also been tested and verified for internal arc to the TR/IEC61641 standard. Third party testing by DEKRA adds to the authenticity of the xEnergy and the ratings assigned. Third party testing

provides the security and assurance that the xEnergy is fit for purpose and complies with all the relevant requirements of the standard. It provides peace of mind when installed on any application ensuring safe, reliable, available power to the installation.

xEnergy has been successfully tested in accordance with the following international standards

- IEC 60068-3-3: Level AG2 and AG5
- UBC-Code: zone 4
- IEEE Std. 344: class 1E (OBE @ AG2 and SSE @ AG5)
- IEEE Std. 693: moderate level (0,25g) and high level (0,5g)

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Eaton has approximately 97,000 employees and sells products to customers in more than 175 countries.

For more information, visit www.eaton.eu.

