

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

IEC/EN 61439

Shift to Future –
xEnergy switchboard systems
for panel builders.

EATON

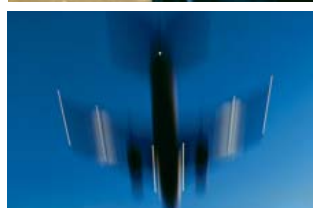
Powering Business Worldwide

A partner for whatever the circumstances may be.

Technology leader Eaton consolidates its importance in the field of panel building: thanks to design-verified switchgear assemblies that are able to "grow" and keep up with increasing future requirements.

Eaton Corporation, headquartered in Cleveland, Ohio (USA), pursues a diversified business strategy and is considered to be the unrivalled technology leader in many business fields. Its Electrical Sector alone is the worldwide leader for products and services related to power distribution, safe power supply and industrial automation. Proven brands such as Cutler-Hammer®, F&G®, Moeller®, Powerware®, Holec®, MEM®, Santak® and MGE Office Protection Systems™ enable Eaton to provide customer-oriented PowerChain Management® solutions for power systems in computer centers, hospitals, industrial plants, hotels, stores, food industry and sewage treatment plants.

A successful full-line provider
Eaton is active on a global scale as a specialist for switchboard systems. A significant share of its success is based on the explicit principle of being a full-line provider. No matter what the area of application may be, you will get everything from power distribution boards and busbars to individual components from a single source. And Eaton, being the technology leader, always aims at offering today what's going to be standard tomorrow. That's what currently happens with the new IEC/EN 61439 standard, just to mention one example.



Eaton – 5 areas of success

- as a worldwide leading provider of products and services in the fields of electrical control-gear, power distribution, uninterrupted power supply (UPS) and industrial automation
- as a worldwide market leader in terms of design, manufacture and sale of entire series of drive systems and components for medium and heavy-duty commercial vehicles
- as a worldwide leading supplier for civil air transport and military aviation as well as for the aerospace industry, with a comprehensive technology portfolio including hydraulic systems, fuel supply systems, motion-control and engine systems
- as an important supplier of critical components allowing to reduce emissions and fuel consumption and to improve the stability and performance of cars, light trucks and commercial vehicles
- as a worldwide leading manufacturer of reliable, highly efficient hydraulic systems and components for mobile and industrial applications for many different business sectors from mining to the entertainment business



xEnergy: Controls systematically. Saves in three ways. Thinks ahead.

With Eaton, you have a business partner who supports your expertise in every respect. With Eaton xEnergy, you have a switchboard system that provides you with a wide variety of options for reliable power distribution and individual solutions to meet your customers' needs.

The xEnergy system range thinks ahead. This means it is designed to meet constantly increasing requirements. Geared towards a maximum of efficiency in implementing your individual projects, Eaton xEnergy provides optimum conditions for building-infrastructure up to 5000 A.

Every single function module in this switchgear assembly is perfectly prepared and syste-

matically planned – from the switchgear and fitting system technology to enclosures and software tools.

Systematic switching = Shaping the future

You too should opt for this technically sophisticated and cost-effective unit of switchgear and protective devices, fitting systems and switchboard systems. It helps you to optimally switch and control power, in

other words to dominate it. The system is module-based and offers smart combination options.

And there is a wide range of benefits for you. They do not only include the optimal added value in your own panel building business and the certainty that – with Eaton – you will always be building state-of-the-art and safety-tested panels. They will also help you to save time, money and space.

Safe yesterday. Standard today.
Pioneer in protective technologies of tomorrow.

Eaton's early-warning systems: More safety for your switchboard.

Machines and systems simply have to work. No matter whether it is in industrial or functional buildings – unscheduled standstills are always costly and annoying. The best thing to avoid undesirable down-times is to take appropriate precautions.

For reliable operation

Trust in proven technologies! A design-verified switchgear assembly ensures safe power

distribution and a smooth workflow.

For the protection of people and systems

Wherever power is involved, safety is paramount. Eaton has always been a pioneer in the protection of people and systems. Apart from our proven protective switchgear, there are additional innovations to still increase the high level of safety for staff while operating a system. Be it in the power supply for tunnels, paper mills or data centers – uninterrupted power supply through ARCON® is key for the protection of people and machinery.

This is because an arc-fault will be extinguished by Eaton's arc-fault protection system before it can deploy its destructive impact on the power supply system. Eaton provides additional safety through internal compartment separation up to Form 4 and passive arc-fault protection. The result: Systems that ensure a maximum of operational availability and security and a minimum of down-times.

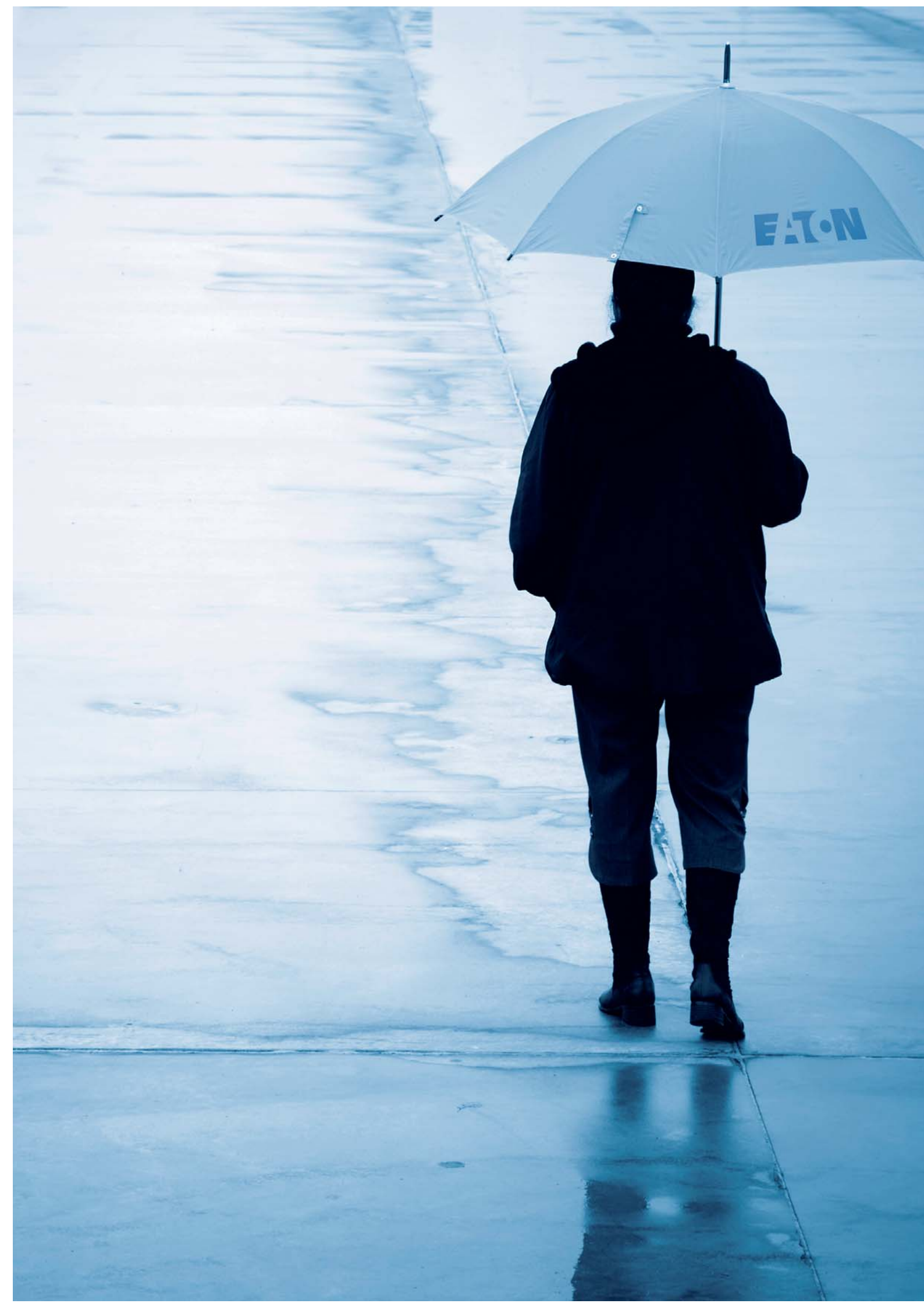
Power management for the future

Power is precious. It should be used in a resource-efficient and careful way. The new metering and communication modules

are a valuable contribution to a responsible way of using energy resources.

Proven components in this field:

- xEnergy removable and xEnergy withdrawable technology
- IZM Open-type circuit breakers
- NZM Compact circuit breakers
- ARCON® arc-fault protection system



EATON



Be it for healthcare or data centers, for industrial or sewage treatment plants: Panel builders put their trust in Eaton.

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 standstills.

With xEnergy, Eaton offers a design-verified switchboard system for ultimate protection of people and systems and a maximum of trouble-free operation. Available in five basic versions, this system made of solid sheet steel will "grow" in line with the respective requirements and can be expanded and combined at the users' discretion. In other words: xEnergy is the ideal product for any requirement.

Service done within seconds
Be it in hospitals or industrial plants, data or shopping centers or in sewage treatment plants: Unscheduled down-times can turn out costly. All the more it is important to Eaton to adapt the user-friendliness of the system to the respective requirements. With an XF system using fixed built-in components, it can still take hours to fix a problem that caused a standstill, so the fields of their application need to be carefully selected depending on

how long standstills may last. Yet, while a replacement in an XR system based on plug-in modules takes no more than a few minutes, it can be even be done within a few seconds in a high-end XW system. It is thanks to fully withdrawable units (drawers) and the possibility of replacing them under live-line working conditions that standstills are once and for all a thing of the past, so the professional skills required can be reduced to a minimum.



Benefits

- A design-verified, modular and therefore flexible system
- Verified/safe assemblies of switchgear and enclosures
- Combination with a large number of components
- A solution for all kinds of application (from power distribution to motor control centers)
- Time-saving
- Optimal safety
- Delivery as flat-pack or as a pre-assembled switchboard cabinet
- Software tools and training for easy planning and implementation
- Long service life, even under harsh operating conditions

5 variants, with maXimum benefits.



XP Power Sections

- Incoming supplies, outgoing and couplings with circuit breakers
- Internal separation up to form 4
- Cable connection from the top or bottom
- Incoming supply system for drill-free cable connection



XF Fixed

- Power outgoing with circuit breakers and fuse switch disconnectors up to 630 A
- Internal separation up to form 4
- Individual outgoing, such as controlgear, motor starters, small power outgoing etc.



XR Removable

- Power outgoing with circuit breakers and strip type switch-disconnector-fuse, up to 630 A
- Empty modules for individual applications
- Plug-in modules and strip type switch-disconnector-fuse can be replaced under live-line working conditions
- Internal separation up to form 4
- Easy maintenance and reduced down times



XG General

- Power factor corrections
- Fitting systems for sub-distribution with devices for modular installation
- Control technology with SASY 60i and xStart
- Individual fixed units on a mounting plate



XW Withdrawable

- Power outgoers with circuit breakers up to 630 A
- Outgoers for motor starters up to 250 KW
- Empty drawers for individual applications
- Easy and uniform handling for all drawer sizes
- Drawers can be replaced under live-line working conditions
- Internal separation up to form 4
- Unambiguous position indicator for operating, test or de-energized status
- Easy maintenance without the need of using any special tools for replacement jobs
- Minimum down times



Convincing both inside and out.

xVTL power distribution and controlgear enclosures accommodate switchgear up to 2500 A. Their housing made of sheet steel protects both against damaging influences and electric shocks caused by touching live parts.



xVTL low-voltage main distribution board

- Incoming supplies, outgoing and couplings with circuit breakers
- Outgoers with SL fuse switch disconnectors up to 630 A
- Incoming supply system for drill-free cable connection
- Internal separation up to form 2
- Cable connection from the top or bottom



xVtl sub-distribution board

- Installation systems Profi+ and EP
- Fitting modules for NZM, NH- fuse load disconnecter switches and strips, for screw fuse bases, devices for modular installation and individual devices



xVtl control distribution board

- Control technology with Sasy 60i and xStart
- Individual, fixed installation units on a mounting plate
- Ventilation and air-conditioning
- Automation technology



IZM

The variable circuit breaker up to 6300 A

Its module width will increase depending on the rated current, while height and depth of the switchgear will remain the same. Increased operational availability thanks to its robustness and the ability to communicate, cost-optimized planning thanks to modular design, suitable for worldwide use, with xEnergy and xVTL.



NZM

The compact circuit breaker up to 1600 A

Available in four breaking capacity levels, compact and space-saving, suitable as a main circuit breaker for machinery controlgear, incoming supply switches in installation distribution boards or outgoing switches in power distribution boards, for xEnergy and xVTL, for worldwide use.



A smart system to distribute, switch power, and to protect at the same time.



Power Xpert® FMX Medium-voltage power distribution based on SF₆-free vacuum technology

An innovative and compact switchboard system with fixed circuit breakers for applications up to 24 kV, suitable for use in distribution networks of power providers as well as for industrial and public utility companies. FMX sets new standards in terms of convenient connecting, compactness, operational safety and user-friendliness.



Xiria Ringkabelstation Medium-voltage power distribution based on SF₆-free vacuum technology

For a high level of operational safety in applications up to 24 kV. The hermetically closed housing with primary system components and mechanisms keeps Xiria maintenance-free. It is available in two basic panel versions (for ring cable connections as well as for the protection of network transformers and related cable connections) for unrestricted use in fully automated networks.



Power Xpert® XP Busbar systems in copper and aluminum

Busbar systems in copper and aluminum. The sandwich-type design of XP makes it suitable for a wide variety of applications from 500 to 6300 A. It manages any challenge an electrical installation may face, ensures a significantly reduced power loss compared to using cables, saves energy and reduces emissions.



CS Wall-mounted enclosure made of solid sheet steel

It is used where effective protection against direct contact with live parts is required, available in 45 enclosure sizes.



CI
Modular insulating-material enclosure

For harshest environmental conditions, as individual enclosures, wall-mounted or floor-standing distribution boards, design-verified function units for all standard applications.



xBoard
Distribution and enclosure systems

A tested system, suitable for power distribution up to 1250 A in industrial as well as in functional or residential buildings.



SASY 60i
Modular busbar system

For effective power distribution in the switch-board cabinet. In combination with the latest motor protectors and circuit breakers, it forms a consistent solution for switching, controlling and distributing power. UL-certified.



PIFT
Plug In Fuse Terminal

Revolutionizes the fuse-related technology in distribution board building. With its wide range of different types, its modular setup and its uncomplicated options for expansion and conversion, it offers the required flexibility. It is convincing thanks to the extremely high level of short-circuit strength of up to 120 kA with AC500V, optional fuse monitoring and an integrated switch-on lock.



PKZ
Motor and system protective circuit breaker

A synonym for quality and innovation, with an exchangeable tripping block, if required.



PKE
Motor-protective circuit breaker

Easy to equip with auxiliary switches, "tripped" indicators and other components for a minimum of planning efforts.



DIL
Contactors

Designed for individual solutions classified according to customer segments.



IEC/EN 61439

Eaton implements the new series of standards for low-voltage switchgear assemblies as early as NOW – and makes it significantly easier for panel builders to do their job.

To ensure the safety of low-voltage switchgear assemblies, many and the most varied characteristics of the individual components need to be harmonized and defined in a generally applicable standard. So far the IEC/EN60439 series of standards covered this requirement. As of 2014, it will be replaced by a new standard. But Eaton builds its switchgear in line with the new standard as of now.

Innovations at a glance

The new standard makes a difference between the manufacturers – as usually practiced – between the original manufacturers on the one hand and the panel builders on the other hand. These two parties involved in building a switchboard system have to separately provide evidence of conformity to show that the part each one is responsible for meets the requirements of the standard.

This actually means that the panel builder now has to pay a lot more attention to providing the evidence of conformity for his part of the technical execution.

- The distinction between “type-tested assembly TTA” and “partially type-tested assembly PTTA” no longer exists in the new standard.
- Evidence of conformity with the standard is provided through design verifications, they include tests, calculations and the verification of whether the design rules have been respected – i.e. that from now on the systems will be design-verified. Panel builders who already build TTAs now do not have to expect many changes.
- The panel builder can – depending on the type of system – choose between three different ways of providing evidence of conformity:
Verification by testing,
Verification by design rules or
Verification by calculation.
All of them are equally valid, as defined by the standard.

- The term “TTA Switchgear assembly and controlgear assembly according to IEC/EN 60439-1” will be replaced by:
“Power switchgear and controlgear assembly according to IEC/EN 61439-2, design verification by testing”.
- If the panel builder carries out changes in the original system of a switchgear and controlgear assembly that are not covered in the design verification, these changes must be specified in a separate design-verification document.
- The new standard also includes requirements of the standard for empty enclosures, such as resistance to corrosion, resistance to heat of enclosure parts made of insulating material and protection against mechanical impacts.

xEnergy, in conformity with the standard

As an original manufacturer, we will continue to provide evidence of conformity for the system in the future as well. In order to make it easier for the panel builder to provide evidence of conformity for his part of the responsibility, a large number of applications have been split up into standardized modules and the design verification by testing has been carried out for them to provide the evidence of conformity. These modules, assembled in accordance with the corresponding instructions, will enable you to carry out your projects in a cost-effective way and in compliance with the requirements of the standard.

Service / Software / Support

Eaton actively supports the "Services in Automation" initiative of ZVEI (Association of the German electrical and electronics industry). For the services we offer, this means: The services are tailored to the customer's needs, they are easy to identify, they guarantee that the competences required for the services offered are available and that the results and performance data are defined together with the customer.

Service



Design-verified quality

Eaton is DIN ISO 9001 certified. The quality of Eaton products is reliable. For switchboard systems, Eaton trusts in a modular design principle consisting of accurately fitting function modules, design-verified in accordance with the IEC/EN 61439 standard. The system modules can be arranged to comply with specific national requirements such as DIN VDE, CEI, NF or UNE.



So Eaton offers all relevant protective switchgear assemblies in the respective degree of protection up to 5000 A. In addition, design verification of the entire unit of switchgear, fitting system technology and cabinet in accordance with IEC/EN 61439 provides for a high level of safety.

This modular system allows for easy expansion to meet increasing future requirements.

Delivery according to customer's needs

Eaton offers the entire product range in flat-packed versions, functionally packed as assembly groups, or as cabinets pre-assembled to customer specifications. Short delivery times make it easy to react to enquiries or modifications requested by the customer.

- Easy configuration and ordering thanks to tools that support the setup of parts lists
- Fast delivery ex warehouse thanks to lean logistic processes
- Easy handling of individual parts thanks to convenient packaging units
- Safe and time-saving assembly based on Eaton assembly instructions

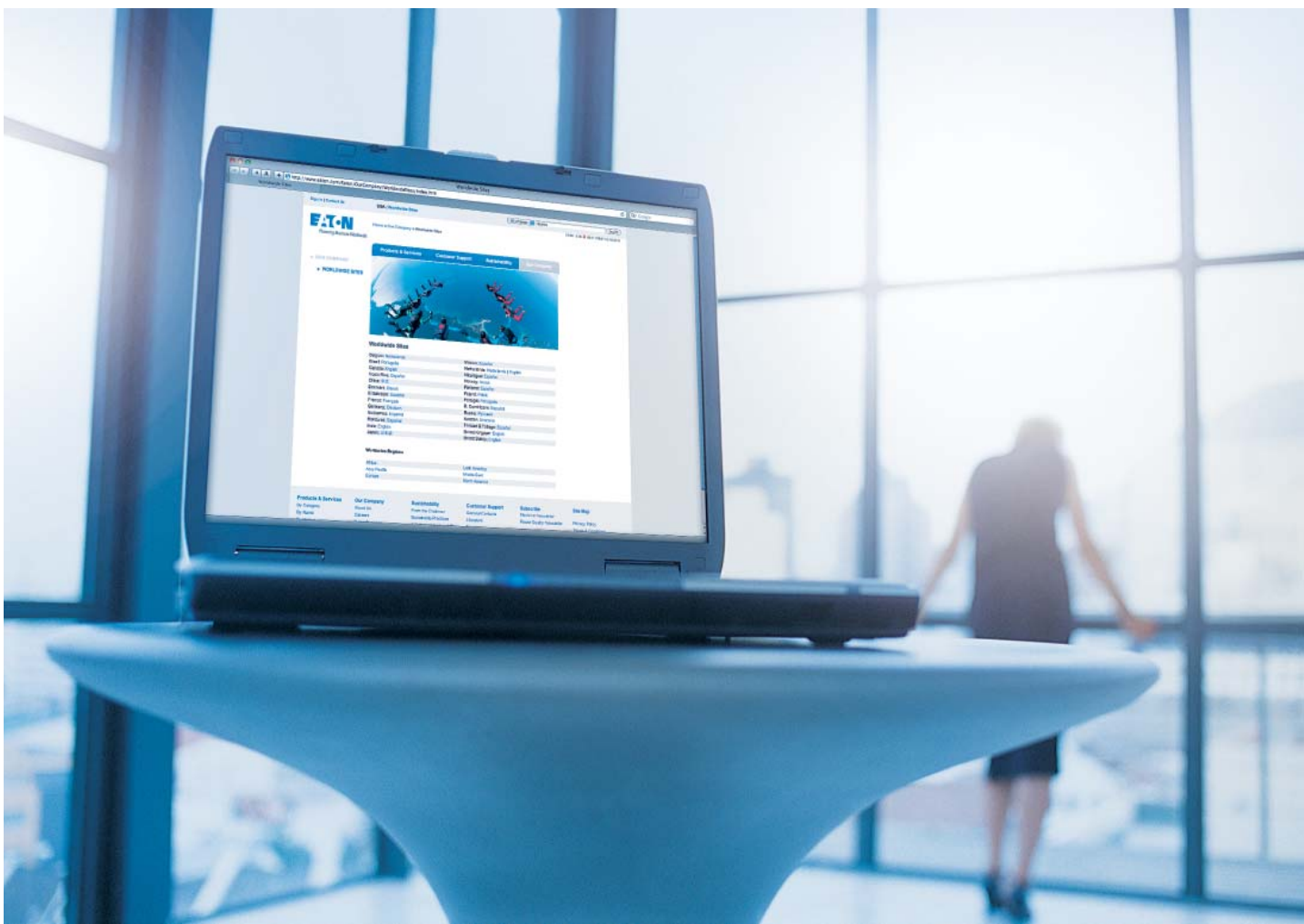
The system offer is optimized for the incorporation of internationally available Eaton switchgear and protective devices and it is completed by configuration and planning tools. The right tool for every project stage and safe power distribution!

Technical support



Eaton's technical support is both competent and reliable. New customers are offered optional training on how to build a design-verified switchgear assembly.

The advantage of realizing the first switchgear assembly directly with the panel builder is an opportunity to communicate the optimal workflow.



Software

Eaton provides you with the appropriate tools. Software tools for planning, documentation and calculation not only support planning engineers, but also panel builders or installers. Eaton's toolbox is perfectly designed for network and system planning right through to ordering. Using Eaton's tools including the system-specific data ensures a safer, faster and more efficient way of processing orders.

CurveSelect

The program for characteristic curves of protective devices is available free of charge and allows the user to display setup-specific tripping curves of several protective devices simultaneously – both in terms of time and electric current values.

The tool makes it easy for the user to analyze the interaction of NZM and IZM circuit breakers, PKZ motor-protective circuit breakers, ZB overload relays and circuit breakers as well as h.b.c. fuses.

Freely defined curves (FreeStyleCurves = FSC) enable the user to directly compare the

- selected motor protector and motor starter characteristics,
- incoming supply switches and up-stream medium-voltage protection
- intended expansions and existing protective equipment.

CurveSelect supports you in planning and documenting your system.

xSpider

A graphic-oriented draft system for dimensioning low-voltage networks equipped with Eaton protective switchgear. xSpider is available for free download.

The software includes a database with all protective switchgear (MCBs, MCCBs, ACBs, fuses, motor starters). MatSelect is a database for the management of product and material data in both user-defined and standardized classification systems.

Configurator for xEnergy

For a quick and easy configuration of the xEnergy switchgear assembly you want. Sets up an offer in no time and generates the parts list at the push of a button.



Eaton Partner program

The key to your success with xEnergy switchboard systems is the Eaton Partner program. Joining the program is well worth it: Not only will you receive a wealth of insider information, you will also be the first to get informed about facts and innovations regarding xEnergy.

A few seconds after you register under www.xenergy-partner.de you will become an xEnergy Partner Net will welcome you personally and all the benefits of the Eaton Partner program will instantly be available to you.

For more information visit us at www.xenergy-partner.com



EATON

xEnergy
Licensed Partner

Benefits

- Listing as a Licensed Partner on the Eaton website
- Access to BAs, AWAs (building and assembly instructions), Configurator, certificates and technical data sheets
- Continuously up-dated product information
- Software downloads
- Installation instructions
- Information material for your customers, such as catalogues and flyers
- Certificates of conformity and guidelines regarding IEC standards



XW – The new solution for xEnergy.

Benefits for the panel builder:

- Switchgear assemblies with design verification according to IEC/EN 61439
- Tested and safe assembly of switchgear and enclosures
- A cost-effective and flexible solution for all applications
- Delivery as flat-pack or pre-assembled
- Software tools and training for easy planning and execution
- Plain modular system
- Optimum safety
- Professional support

www.eaton.com

Eaton is a diversified and globally active technology leader and service company in the business fields of Electrical, Fluid Power, Truck and Automotive.

Eaton's Electrical Sector is a global leader in distributing, controlling and switching power, and a global supplier of products and services for uninterrupted power supply and industrial automation.

Eaton's Electrical Sector includes brands such as Cutler-Hammer®, MGE Office Protection Systems™, Powerware®, Holec®, MEM®, Santak and Moeller.

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