

Eaton – Safe power distribution able to
meet the most stringent requirements.

www.eaton.eu

xEnergy Safety

The all-insulated distribution board.



Product information Ci 2019



Powering Business Worldwide



The all-insulated Ci distribution enclosure.

Requirements regarding electrical power distribution are constantly increasing.

Eaton's products are not only the answer to these requirements, they also offer top reliability and flexibility for the customer.

A consistent system for up to 1600 A

Eaton's all-insulated Ci power distribution enclosures have been designed to meet the most stringent requirements and offer a consistent system for up to 1600 A. These all-insulated distribution enclosures provide an IP65 degree of protection and are insensitive to almost any environmental impact such as dust, moisture and water.

Timeless optimized protection

This type of enclosures made of high-quality polycarbonate offers additional protection against mechanical impacts and caustic substances. Thanks to their total insulation, Ci distribution enclosures provide for a timeless and optimized protection.

Cover equipped with 4 spring-loaded fittings

Thanks to a cover equipped with 4 spring-loaded fittings, the Ci system provides special protection against extreme switching-arc. Where necessary, it ensures pressure-relief by allowing the pressure to escape by lifting the cover a few millimetres and closing it again immediately.



An easy system

All three types of enclosures are based on the same system components: This reduces the storage place required for the system and makes their handling significantly easier.

Safety comes first

Total insulation is the safety measure that outperforms various other safety precautions by far because there is no touch voltage possible. Carrying voltage over to other parts of the system is therefore impossible.

High system availability

Reliable system availability is increased because short-circuits between live parts and protective conductors or mounting plates due to the slipping of a tool, for example, can be excluded.

Economic efficiency for all parties involved

For the system planner:

Any of the common applications can be covered through as few as five enclosure sizes and four different depth levels.

For the panel builder:

Sophisticated connecting technology allows grouping and arranging the enclosures in every direction without using any special tools. Four installation technologies are available to complete the system: Mounting plates, module rails, carrier rails and bus-bars.

For the system integrator:

Supply lines can be inserted from any side, and cables can be interconnected in the socket.

A tough system

For all seasons

Eaton has a global reputation as a specialist in high-quality switchgear systems and is technology leader in the field of power distribution. As a successful supplier of complete systems, Eaton not only offers distribution systems for universal use, but also solutions developed to meet the requirements in harshest conditions and stands out through tested safety, reliability and optimal protection against extreme impacts. Eaton's xEnergy Safety Ci insulated enclosures have become the globally leading and established standard in particularly challenging environments.



In extremely polluted and harsh environments such as:

- Steel works
- Foundries
- Mining
- Woodworking industry
- Metalworking industry
- etc.

Advantages

- System for up to 1600 A
- Switchgear and enclosures are designed to provide perfect compatibility
- Lifting of the cover in case of a switching-arc without losing the protective function



In places requiring a system insensitive to moisture and caustic substances:

- Food industry
- Automated washing lines
- Refineries
- Sewage plants
- Water works
- Chemical industry
- etc.



In places where safety requirements tolerate no compromise:

- Tradeshows and exhibition halls
- Hospitals
- Railway stations
- Airports
- etc.



Convincing product features:

- High IP65 degree of protection
- Total insulation
- Polycarbonate
- Distribution system based on a 25 mm grid
- Modular system
- Cover resting on 4 spring-loaded fittings
- Stable carrier-frame profiles
- Captive, foamed sealings
- Wedge-type connectors made of insulating material to interconnect the enclosures
- Transparent covers
- Consistent system for up to 1600 A

Advantages to get excited about:

- A distribution system for universal use
- Highest standard in terms of safety for people and operation
- Many combination options based on a reduced number of modules
- Easy to expand when necessary
- Degree of protection is guaranteed regardless of an operator's level of care and attention
- Entirely encapsulating insulation-material for high protection against corrosion
- No special tools required
- No carrying over of voltage to adjacent enclosures
- Easier maintenance and system control
- Complete solution for low-voltage distribution from a single supplier

Tried and tested in the most extreme environments.

Enclosure made of high-quality polycarbonate – IP65 degree of protection

High-quality polycarbonate makes CI insulated enclosures especially shock-proof and resistant to acrid smoke.

Total insulation offers a maximum of safety as it is a protective feature that is always “active” and does not wear out.

Top operational safety

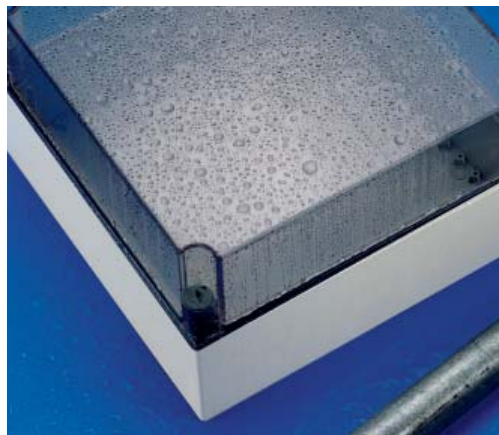
Thanks to transparent smoky covers a short glance will do to check the correct operating status of the incorporated switchgear. Of course there are non-transparent covers available as well, or even covers with an integrated cylinder lock.

Protection against 6 detrimental factors or hazards

- Dust
- Moisture
- Water
- Caustic substances
- Mechanical impacts
- Extreme short-circuits



Suitable for environments particularly exposed to dust and pollution



High level of protection against moisture and water jets



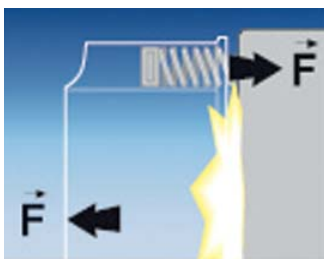
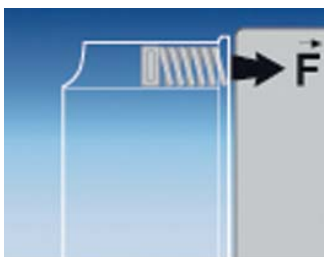
Particularly shock-proof and resistant to mechanical impacts



Resistant to acrid smoke and caustic substances

Maximum safety thanks to pressure relief

The cover resting on 4 spring-loaded fittings ensures pressure relief in case of a switching-arc.

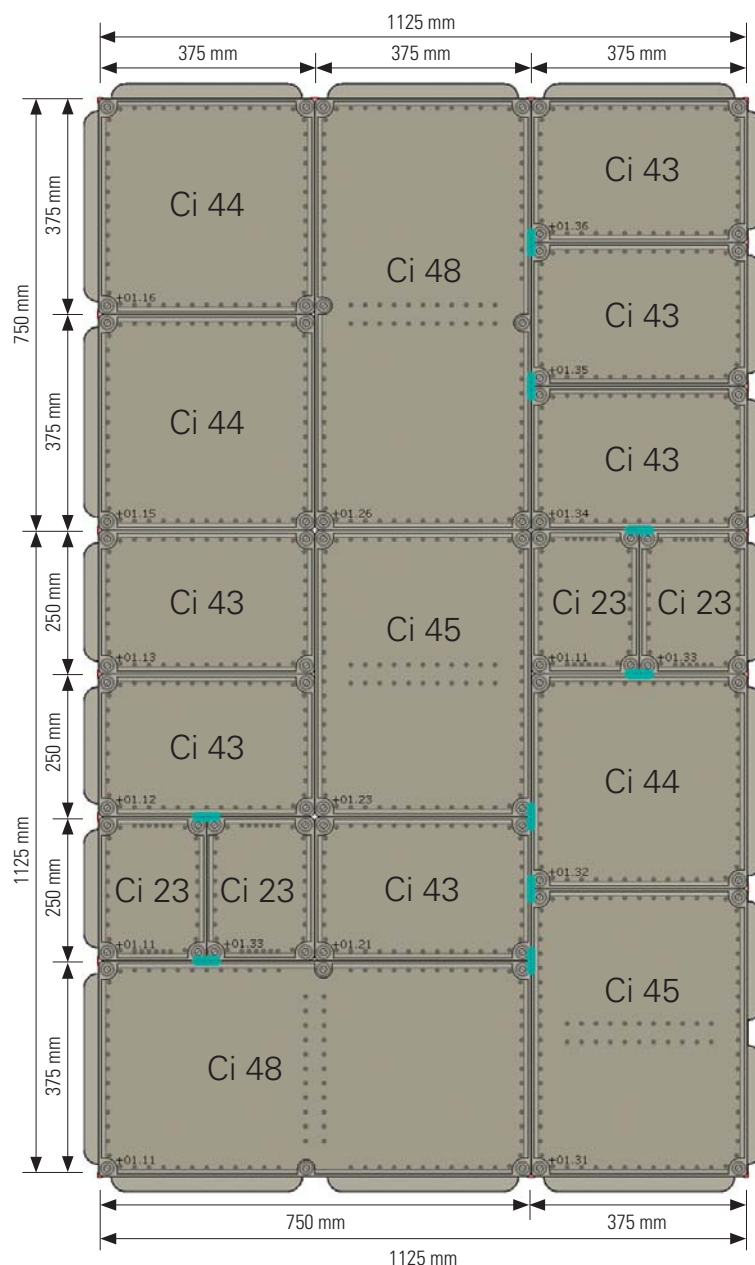


Modular distribution system

Thanks to the uncomplicated possibilities of combining 5 different enclosure sizes, the modular design of the Ci insulated enclosure series offers a maximum of flexibility to optimally use the space available. A unique component is the flange spreader. It serves as an adapter and allows adding

smaller enclosures to larger ones without any problem.

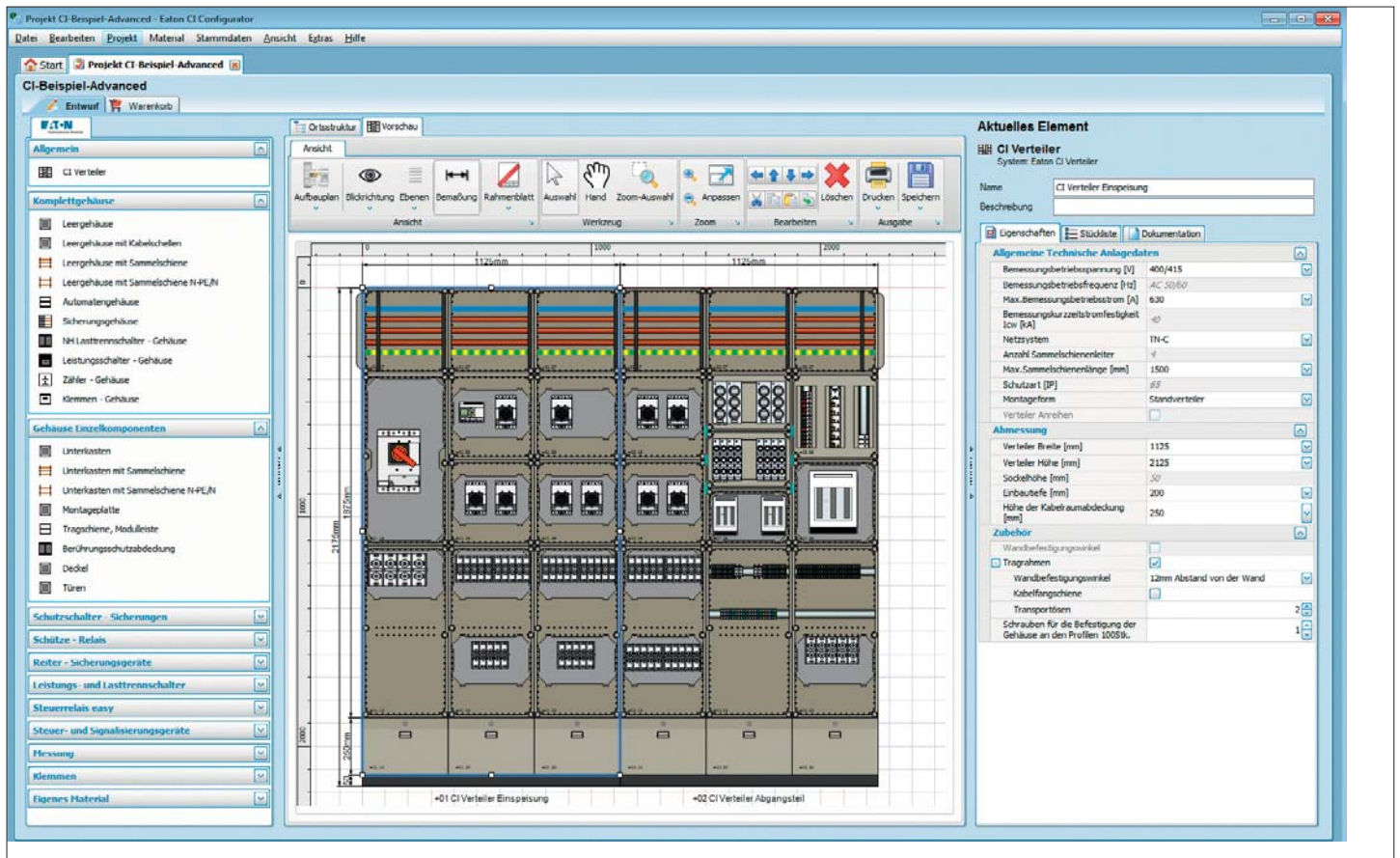
The Eaton xEnergy Safety Configurator makes it incredibly easy to configure a system because it automatically adds the correct number of flange spreaders to your project.



Advantages

- Symmetrical and asymmetrical flanging of enclosures is possible either one next to the other or one below the other
- This makes sure the space available in each individual project can be optimally used

Easy configuration.



With the xEnergy Safety Configurator especially designed for the Ci distribution system you can successfully plan your system with just a few mouse clicks – it's quick and easy, correct and it won't forget any details. The Configurator is based on the know-how of experts and makes the configuration of your system as user-friendly as possible.

xEnergy Safety Configurator

The Configurator is free for Eaton customers and is useful for a quick selection and arrangement of the different distribution system components.

Easy to use:

On the right side you can select the required distributor objects, the respective templates will offer you the correct distributor articles which you can then correctly combine with the preselected distributor frame in the graphic window at the centre thanks to a Drag & Drop function.

This programme is based on our system know-how and continuously checks the plausibility of your planning steps as you proceed.

- Professional front view of all distribution boards and equipment installed
- Identification of operating supplies and locations
- Explorer with easy navigation and modification of equipment
- Clear overview of costs: The required components will be displayed in the basket.
- The Configurator will show you the weights, metal surcharges, prices, minimum quantities to be ordered.
- The Configurator enables you to provide informative details: Export of parts lists including the system-related accessories, set-up pictures in different views for offers to your customers, CAE systems or workshop assembly. The Single Line output supports simple documentation tasks.

Everything is displayed on the monitor

- Interfaces to Microsoft™ Excel,
- Project management
- DXF vector graphics for importing data into CAE systems
- Version check and update via Internet
- Import of specific prices and discounts is possible
- Export of parts lists and set-up pictures
- Cross-project copying functions
- Calculation of metal surcharges

Safety made to measure.

Distribution enclosure

Size	Ci23	Ci43	Ci44	Ci45	Ci48
Dimensions [mm]	187,5 x 250	375 x 250	375 x 375	375 x 500	375 x 750

Distribution enclosure



Installation depth [mm]	125/150	125/150/200	125/150/200/250	200/279	200/250
	Ci23-125 098208	Ci43-125 017527	Ci44-125 012452	Ci45-200 001896	Ci48-200 078896
	Ci23-150 012781	Ci43-150 022273	Ci44-150 017198	Ci45-250 194554	Ci48-250 083642
		Ci43-200 027019	Ci44-200 021944		
			Ci44-250 026690		

Size	Ci23	Ci43	Ci44	Ci48
Dimensions [mm]	187,5 x 250	375 x 250	375 x 375	375 x 750

Distribution enclosure with cable fitting



Installation depth [mm]	125/150	125/150/200	125/150/200/250	200	200/250
	KST32-125 069774	KST34-125 076893	KST44-125 088758	KST45-200 194549	KST48-200 098250
	KST32-150 072147	KST34-150 074520	KST44-150 091131		KST48-250 010450
		KST34-200 079266	KST44-200 093504		
		KST43-125 081639	KST44-250 095877		
		KST43-150 084012			
		KST43-200 086385			
Connection sets for add-on assembly				Cross-strut kits	Flange spreader
					
BS2-Ci 090750				STB3-Ci 219217	FT-Ci 02319
BS3-Ci 097869				STB4-Ci 034223	
BS4-Ci 014815					

The complete range of almost 500 well co-ordinated products for the xEnergy Safety programme is available in our Eaton online catalogue.

Stand-alone enclosures

Size	Ci23	Ci43	Ci44	Ci45
Dimensions [mm]	187,5 x 250	375 x 250	375 x 375	375 x 500

Stand-alone enclosures E



Installation depth [mm]	125/150	125/150/200	125/150/200/250	200/279
	Ci23E-125 019570	Ci43E-125 093133	Ci44E-125 031436	Ci45E-200 001891
	Ci23E-150 021943	Ci43E-150 095506	Ci44E-150 033809	Ci45E-250 194552
		Ci43E-200 097879	Ci44E-200 036182	
			Ci44E-250 038555	

Size	Ci23	Ci43	Ci44	Ci45
Dimensions [mm]	187,5 x 250	375 x 250	375 x 375	375 x 500

Stand-alone enclosures E Covers RAL



Installation depth [mm]	125/150	125/150/200	125/150/200	200/279
	Ci23E-125-RAL7035 194609	Ci43E-125-RAL7035 194611	Ci44E-125-RAL7035 194614	Ci45E-200-RAL7035 194617
	Ci23E-150-RAL7035 194610	Ci43E-150-RAL7035 194612	Ci44E-150-RAL7035 194615	Ci45E-250-RAL7035 194553
		Ci43E-200-RAL7035 194613	Ci44E-200-RAL7035 194616	

Size	Ci23	Ci43	Ci44	Ci45
Dimensions [mm]	187,5 x 250	375 x 250	375 x 375	375 x 500

Stand-alone enclosures X



Installation depth [mm]	125/150	125/150/200	125/150/200/250	200/279
	Ci23X-125 010408	Ci43X-125 019900	Ci44X-125 031765	Ci45X-200 098469
	Ci23X-150 015154	Ci43X-150 024646	Ci44X-150 034138	Ci45X-250 194555
		Ci43X-200 029392	Ci44X-200 036511	
			Ci44X-250 038884	

Base parts

Size	Ci23	Ci43	Ci44	Ci45	Ci48
Dimensions [mm]	187,5 x 250	375 x 250	375 x 375	375 x 500	375 x 750
Base parts					
					
					
Depth [mm]	120	120	120	120	120
	U-Ci23 060282	U-Ci43 065028	U-Ci44 067269	U-Ci45 001894	U-Ci48 083880
	U-Ci23E 038793	U-Ci43E 064896	U-Ci44E 069642	U-Ci45E 001893	
	U-Ci23X 057909	U-Ci43X 062655	U-Ci44X 067401	U-Ci45X 098470	

Covers

Size	Ci23	Ci43	Ci44	Ci45	Ci48
Dimensions [mm]	187,5 x 250	375 x 250	375 x 375	375 x 500	375 x 750
Covers Transparent and RAL					
					
for installation depths [mm]	125/150	125/150/200	125/150/200/250	200/279	200/250
	D125-Ci23 014830	D125-Ci43 017203	D125-Ci44 019576	D200-Ci45 001895	D200-Ci48 078901
	D150-Ci23 024322	D150-Ci43 038560	D150-Ci44 040933	D250-Ci45- 194550	D250-Ci48 083647
	D125-Ci23- RAL7035 194618	D200-Ci43 074155	D200-Ci44 076528	D200-Ci45- RAL7035 194627	D200-Ci48- RAL7035 194628
	D150-Ci23- RAL7035 194619	D125-Ci43- RAL7035 194620	D250-Ci44 081274	D250-Ci45- RAL7035 194551	D250-Ci48- RAL7035 194629
		D150-Ci43- RAL7035 194621	D125-Ci44- RAL7035 194623		
		D200-Ci43- RAL7035 194622	D150-Ci44- RAL7035 194624		
			D200-Ci44- RAL7035 194625		
			D250-Ci44- RAL7035 194626		

Mounting plates

for size	Ci23	Ci43	Ci44	Ci45	Ci48
Mounting plates					
Material thickness [mm]					
1.5	MM-Ci23 193444	MM-Ci43 193445	MM-Ci44 193446	MM-Ci45 193447	MM-Ci48 193448
1.5/2.0	M-Ci23 193438	M-Ci43 193439	M-Ci44 193440	M-Ci45 193441	M-Ci48 193442
3	M3-Ci23 019709	M3-Ci43 029201	M3-Ci44 031574	M3-Ci45 003036	M3-Ci48 036320
4	IM4-Ci23 086081	IM4-Ci43 088454	IM4-Ci44 090827		IM4-Ci48 093200

Accessory carrier rails

for enclosure dimension [mm]	187,5	250	375	Spacers	
DIN carrier rails					
Height [mm]	7.5 or 15	7.5 or 15	7.5 or 15	25 or 50	10 or 15
	CL2 029064	CL3 033810	CL4 038556	HS25-CI 002291	ADT200-190 002289
	CL2-15 031437	CL3-15 036183	CL4-15 040929	HS50-CI 002292	ADT125-110 002290

Flange plates

for enclosure dimension [mm]	187,5	250	375	125
Flange plates				
	FL2-X 086052	FL3-X 093171	FL4-X 024355	FL1-X 078933
	FL2-2 017898	FL3-1 088425	FL4-2 014863	
	FL2-3 020271	FL3-2 090798	FL4-3 017236	
		FL3-3 022644	FL4-4 019609	
			FL4-5 021982	

Accessories for external add-on

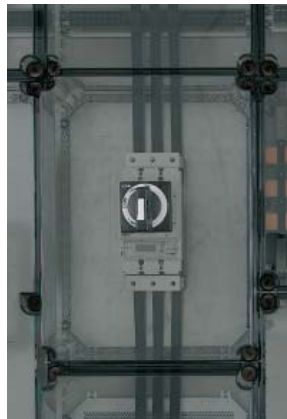
Spacers	Hinges for covers	Profiles for wall-fixing	Bracket for wall-fixing
			
ZRF3 067734	DSCH-Ci 034224	W16/32-Ci 193455	BL-Ci 036168
ZRF4 070107			BL-Ci-VA 038541

Perfection in every detail.



1. Total insulation

The benchmark for ultimate safety: Total insulation is not subject to wear and tear and is therefore absolutely maintenance-free. Also, insulating is safer than grounding.



2. Closure bolt of the cover

The closure bolt of the cover features an "Open/Closed" display and can generally be lead-sealed. An incorporated spring provides for venting the cover following short-circuit disconnections of circuit-breakers: The cover rises, allows the pressure to escape and closes again. So, this ensures maximum safety for both operators and systems.



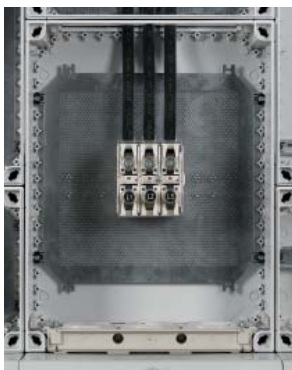
3. New enclosure sizes

More flexibility for interior fittings regarding deep combinations with circuit breakers, thanks to new enclosure size Ci45 with max. installation depth of 279 mm or with new polycarbonate hood NZM-RTR, this allows an installation depth of 360 mm, e.g. for Circuit-breaker NZM4 with remote operator.



4. Busbar system SASY 60

The full integration of the 60 mm system allows the use of standardized identical parts from the assortment of Eaton. The system can be built of 3 or 4 or 5 poles up to 630 A.



5. Micro-perforated mounting plates

For quick device mounting: Mounting plates made of galvanized sheet steel with special microperforation enable a much faster assembly of small devices, since time-consuming processes such as measuring, marking, drilling and tapping are completely eliminated.



6. Plug-in terminal technology KSK

Faster contacting of cables up to 4 mm² thanks to modern plug-in technology.



7. Stable profiles of the carrier frame

CC-profiles in a stable and corrosion-resistant finish always ensure a safe fit of the system, whether it is a wall-mounted distribution enclosure, a floor-based or a floor-standing enclosure with a cable area casing and a base plinth.



8. Cross-strut kits

Barrier-free access makes it easy to arrange rigid cop-per bars or cables of large diameters in the distribution enclosure.

The right enclosure for your specific application.



Ci insulated distribution enclosures

When time is what matters most.

The bottom of the enclosures is open on two sides to allow for vertical cable insertion. This helps to save mounting time. For horizontal cable insertion the vertical side panels can be knocked out. Cable insertion into the distribution enclosure is done through flanges with metrical pre-punched openings or through cable fittings varying in number and size.



Stand-alone enclosures Ci, E

When flexibility is what matters most.

Metrical pre-punched openings to be knocked out of the enclosure bottom provide for an integrated cable insertion option from all sides. In addition, there are extensive areas allowing to be knocked out on all side panels. This is how a stand-alone enclosure can be transformed into a distribution enclosure, which helps to reduce stock requirements.



Stand-alone enclosures Ci, X

When smart appearance is what matters most.

The smooth and even side areas of the enclosure bottom prevent the development of filthy corners. Examples of application for this type of enclosure are the operators' level in the (serial) machine building industry, small-size control systems and photovoltaics.

An example of application.



Ci enclosures as a ready-to-connect network and system protection

When safety is what matters most.

To guarantee the stability of public networks, the VDE-AR-N 4105 standard includes a set of rules for decentralized power supply out of renewable energy sources - which is no problem for Eaton's ready-to-connect Ci enclosures.

Düsseldorf Relies on Eaton Technology for Subway Line

Intelligent energy distribution with SmartWire-DT

Once more it's Eaton that's on track. Wherever energy efficiency, sustainability and also quality are key factors, Eaton is precisely the right partner. This has now also been realized by the Düsseldorf city council who are using several Eaton products for the expansion of its city rail network.

Diversified industrial manufacturer Eaton has announced the decision of the city of Düsseldorf to use Eaton technology to implement the low-voltage main power distribution systems including intelligent energy monitoring required for the expansion of its city rail network. Over the next two years, five new stations will gradually be completed in the inner city and a new subway line added to the existing network. In all, Eaton will supply eight low-voltage power distribution systems for the stations of the so-called Wehrhahn line, and these will primarily be designed for underground but also partly for above ground installation.

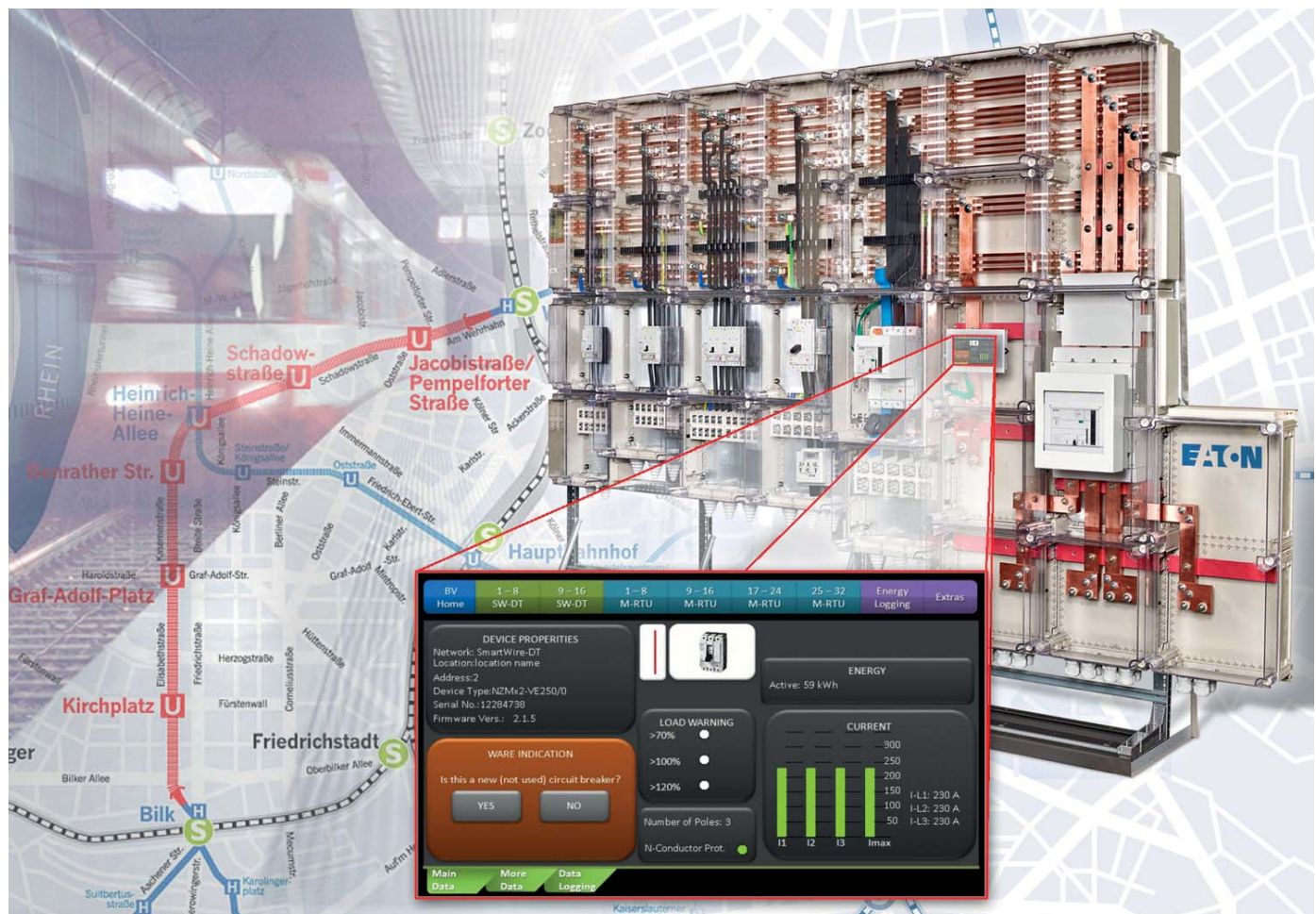
"For the city of Düsseldorf, energy efficiency and sustainability were decisive factors in the development of the project," explained Christoph Schink, the Eaton power distribution sales engineer who is handling the project. "The town planners were therefore not only looking for a solution that has been tried and tested in underground rail applications over many years, but also for an intelligent system that allowed the effective monitoring and evaluation of energy consumption and the switching of all loads. We are delighted that we were able to offer a suitable concept using our technologies."

Eaton's solution is based on the modular Gi mounting cabinet system, that is particularly ideal for harsh and climatically demanding environments involving extreme temperatures (-40 °C to +80 °C). The Gi insulated enclosures have been designed for fully insulated mounting and are type tested to IEC 60439-1.

Each low-voltage power distribution system will be designed with protection class 2 and IP 65 protection, and for a maximum rated operational current I_e of 1,600 A. NZM circuit-breakers will be provided with an integrated motor operator for simple switching from the control center between the mains supply and rail electricity.

Both the circuit-breakers and also all PKE motor-protective circuitbreakers, as well as the XMC energy measuring and communication module, are linked together using Eaton's innovative SmartWire-DT connection and communication system. As this not only allows data exchange but also provides the power supply to the connected components, the current consumption of the individual loads can be logged and evaluated without any difficulty. The XMC module makes the relevant measuring data available for calculating energy consumption (phase and N conductor currents, rms voltages, active, reactive and apparent power output, power factor). The brains of the system are implemented in the XV200 HMI/PLC which serves as the PLC, visualization device and operator unit. It evaluates the information and can monitor the operating states of escalators, ticket machines and station lighting systems. Functions can be activated or shut down selectively in the event of an emergency or in order to optimize consumption.

The building shells of the tunnel section and the stations are currently under construction. However, the installation of the first low-voltage power distribution system at the Graf-Adolf-Platz station is already planned for the middle of the year. The gradual expansion and integration of the stations with Eaton technology shall be completed by the scheduled commissioning of the Wehrhahn line in 2015.



All components from a single source

Overview Technical data Ci

**xEnergy
Safety**

IEC/EN 61439-2					
Resistance to corrosion	Cyclic damp heat as per IEC 60068-2-30 Salt spray fog test as per IEC 60068-2-11				
Glow-wire test	Glow-wire test: Base: 960 °C/Cover: 850 °C/Busbar support: 960 °C Barriers: 650 °C				
Resistance to UV radiation	Resistant to UV as defined in ISO 4892-2, 500 h.				
Lifting	4-row floor standing distribution board and additional weight of 500 kg with support frame and lifting aid; assembled and secured as per the latest applicable instruction leaflet.				
Impact test	IK10 (IK09 for side walls and flange inserts)				
Degree of protection of enclosures	IP65				
Clearances and creepage distances	With Eaton circuit-breaker, main busbar, and K terminal. $U_{imp} = 8 \text{ kV}$, Pollution level 3, overvoltage category III				
Protection against electric shock and continuity of protective circuits	Protection class 2, totally insulated				
Dielectric properties	Dielectric strength $U_i = 1000 \text{ VAC} / 1500 \text{ VDC}$				
Short-circuit withstand strength	With Eaton feeder unit/outgoer circuit-breaker, copper band and K terminal. Rated conditional short-circuit current $I_{cc} = 50 \text{ kA}$. Assembled according Eaton building instruction.				
Busbar system (mm)	60	60	60	50	50
Rated operational current	160 A	400 A	630 A	1000 A	1600 A
Rated short-time withstand current, $t = 1 \text{ s}$; I_{cw}	15 kA	33 kA	37 kA	50 kA	50 kA
Rated peak withstand current I_{pk}	49 kA	61 kA	78 kA	105 kA	105 kA
Meets the product standard's requirements.	Distance between busbar supports $\leq 375 \text{ mm}$ bei System 50 und $\leq 290 \text{ mm}$ bei System 60.				

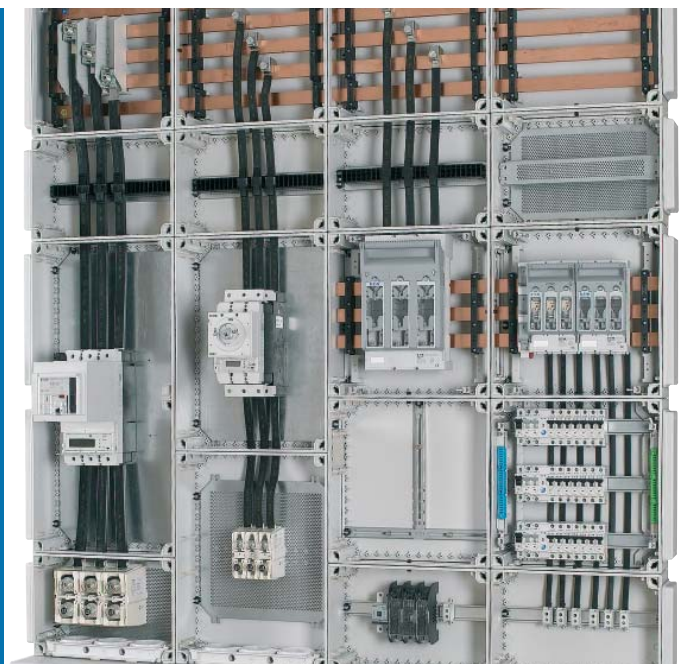
For design verifications at the part level, please refer to the xEnergy Safety documents provided by Eaton.



To be able to guarantee the safety of low-voltage switchgear assemblies, the most varied properties of the individual components need to be compatible and are defined in a universally valid standard. It is the **IEC/EN 61439**. Eaton builds its switchgear according to these rules and regulations applicable to low-voltage switchgear assemblies and

makes the job of panel builders significantly easier. As the xEnergy Safety Ci insulated distribution system is composed of a large number of individual, but standardized and tested modules, systems composed of such modules can be built in a cost-effective way, in top quality and in compliance with the standard. Quite often there are additional tests carried out in independent test laboratories which go beyond the requirements of the standard. This enables us to also provide solutions for very special, customer-specific product applications.

For many of the most common applications, the Ci programme offers fully pre-equipped enclosures available as complete functional units.



Eaton is a power management company with 2018 sales of \$21.6 billion. We provide energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. Eaton is dedicated to improving the quality of life and the environment through the use of power management technologies and services. Eaton has approximately 99,000 employees and sells products to customers in more than 175 countries.

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