

Nothing burns.

Professional overcurrent protection
with thermal circuit breakers
for equipment protection

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Impressum

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■ Online in the fore

Did you notice the latest changes to the E-T-A website?

How did you receive the latest Current magazine? Online or offline? Per post or per e-mail with a link to our website? You can of course have it both ways. E-T-A has been very active online for quite a long time. No matter if it's on social media or our website.

Current magazine readers appreciate it very much. Any recipient can choose his or her preferred way of reading.

But now back to our website. If you visit www.e-t-a.de today, you will very quickly notice that our website was visibly enhanced. Its appearance was clearly modernised and the user-friendliness was significantly improved. These improvements ensure our customers, that means you, should always find the information necessary to choose the right product quickly and easily. Our website gives you exactly the head start you need in terms of overcurrent protection information for your work.

What can we do for you and your products? Please get in touch. Or do you have a certain project you wish to discuss with us? **We look forward to speaking with you.**



Dr. Clifford Sell

Director of

E-T-A Elektrotechnische Apparate GmbH

Visit the new
E-T-A website:
www.e-t-a.de

The **REX system** receives a field bus connection

Connected even better

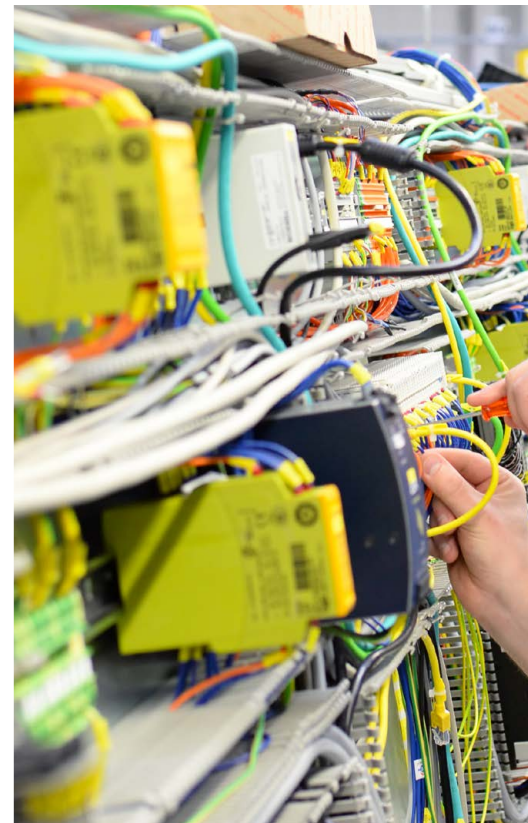
Uptime requirements in machine construction and process control have clearly increased over the past few years. This directly affects the DC 24 V level, the power distribution systems and their protection.

A reliable control voltage and the supply of connected sensors, actuators and other system components are a requirement for stable work processes and rising machine run times. This is accomplished with more transparency and information about the DC 24 V power distribution.

The new **CPC12** bus controller directly connects the **REX system** to PROFINET and EtherCAT field buses. This significantly expands the previous solutions that only connected to IO link and Modbus RTU. Integrating components on the control level directly corresponds to the project tool and allows users to work in his familiar programming environment. In addition, all standardised fieldbus mechanisms are available.

The **CPC12** bus controller has the same enclosure design as the **REX system** and can easily be interconnected with the connector arm. Bus controller supply is via separate line terminals – making it independent of the power supply of the circuit protectors. The controller has three RJ45 connection sleeves allowing device communication. Two of these connection sleeves are used for communicating with the PROFINET or EtherCAT field buses. The internal switch makes it easy for the device to be integrated into the field bus topology. Access to the integral web server is possible via the third RJ45 female connector. Thus, the user can access the bus controller directly and independently of the field bus. Depending on the defined operating

mode, it is possible to only passively query the bus controller values and the connected circuit protectors or to actively access the functions of the devices. This way, circuit protector information, such as status and measuring data, is not only available to the operator, but remote access from the office is also possible. This increases transparency of the DC 24 V power distribution and at the same time, it reveals changes in current consumption for the various loads. Detecting critical developments is ensured at an early stage, allowing corrective action very quickly when necessary. Maintenance and component replacement can be planned better and will not cause downtimes. This increases system uptime significantly. Remote access also allows

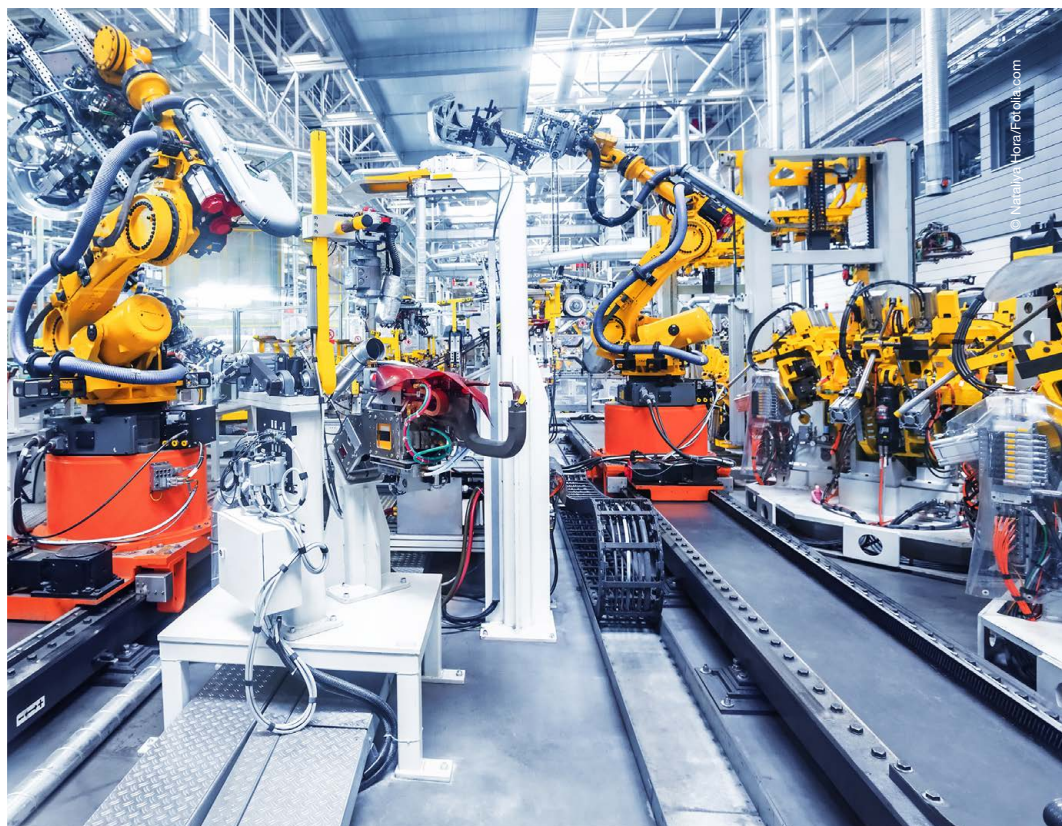


adjustments of the configuration. In the case of adjustable circuit protectors, this concerns e.g. the rated current, which can be adjusted via the system visualisation or the web server. This is also possible with an adjustable warning threshold. It alerts system operators and maintenance personnel in the event of rising rated current – indicating possible failures within the system.

The **CPC12** bus controller operates in connection with the **REX12D** power distribution and protection system. The supply module is connected on one side and the **REX12D** circuit protector is connected on the other side. This ensures the advantages of the **REX system** remain fully available.



Ensures optimal connection:
 The **REX system** with the **EM12D** supply module, the **CPC12** bus controller and the **REX12D** power distribution and protection system





Professional overcurrent protection with **thermal circuit breakers for equipment protection**

■ Nothing burns.

E-T-A offers thermal circuit breakers with many advantages compared to standard fuses.

You may have experienced something similar: Inadvertently, you fed too much paper into the paper shredder and the machine stops. The result: Due to the blockage, the motor draws a multiple of its rated current and heats up very quickly. If it is not disconnected from the supply voltage immediately, it will die of heat within a few seconds. Normally, you will switch off the paper shredder in such a situation. However: What happens if you don't? What, if you are distracted for a moment? Then, the integral overcurrent protection will ensure disconnection in time.

Reliable overcurrent protection not only increases the availability and endurance of electrical equipment, it also reliably protects operators against the hazards of overheated devices. The most frequently used overcurrent protection elements are fuses and circuit breakers. Like an

airbag in a car, they lead a hidden life most of the time. But if the situation gets dangerous, they have everything under control and disconnect hazardous overcurrents quickly and reliably. What are the advantages and disadvantages of both solutions?

Risk of wrong protection

Fuses have a high rupture capacity. Short circuits can be disconnected reliably. However, after a fuse has blown, it must be replaced. Frequently, the suitable replacement is not readily available in the event of a failure. If fuses with higher current ratings are inserted inadvertently or with slower trip curves, the devices or apparatus in question are not properly protected any more in the event of an overcurrent. In addition, if the operator replaces the fuse and the failure was not resolved, there will be a hazardous arc. Fuses are also subject to ageing. Due

to inrush current peaks and diffusion processes they grow faster and faster and eventually unpredictable. Fuses respond imprecisely in the event of moderate overcurrents up to two or three times rated current and are only suitable as overload protection to a limited extent.

Circuit breakers for equipment protection as an alternative to fuses

So what are the choices a design engineer can select as an alternative to a fuse? Today, design engineers are requested more and more to reduce the number of single components - the key to a cost-saving design. In addition, less components normally saves space and ultimately makes more compact product designs.

Circuit breaker/switch combinations help design engineers reduce components. They combine overcurrent protection and



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the functionality of an ON/OFF switch in a single component. With motors, transformers, magnetic valves or low voltage lines, the use of thermally tripping circuit breakers for equipment protection is recommended. Height and duration of the overcurrent, as well as the ambient temperature, determine the trip time of the circuit breaker.

Thermal circuit breakers widely tolerate inrush current peaks. In addition, they often have a bimetal strip tripping element. It is possible to precisely adjust the bimetal to the load being protected. Nuisance tripping can be avoided. After tripping due to an overcurrent, the circuit breaker can conveniently and reliably be reset to resume operation.

The user saves time and money and, at the same time, achieves maximum equipment availability.

Thermal circuit breakers for equipment protection – our top-selling products



1658
thermal resettable
circuit breaker



104
thermal resettable
circuit breaker



3120
thermal circuit breaker/
switch combination



1110
thermal circuit breaker/
switch combination



Holger Mefest,
Planning Carrier System
Technology at the
DB Systel GmbH

The Deutsche Bahn AG relies on **ControlPlex® Rack**

Reliable – precise – smart

DB Systel GmbH, headquartered in Frankfurt am Main, is a subsidiary of the DB AG in the Digitisation & Technology market. It handles IT and telecommunications infrastructure projects for Deutsche Bahn AG and pushes digitisation of the DB AG. We talked to Holger Mefest, who is responsible for planning the carrier system technology.

Current: What challenges are you facing daily?

Holger Mefest: For effectively managing the operational process of the Deutsche Bahn, a reliable communication network is essential. It is our goal to ensure the highest possible uptime.

Current: **ControlPlex® Rack** is an intelligent power distribution system with electronic circuit protectors and bus system. It is suitable for controlling, monitoring and protecting communications equipment. What are the system's benefits for you?

Holger Mefest: Smart protection concepts offer the opportunity to combine many additional functions into a single unit. The remote system control option allows decentralised check of the loads in the event of functional problems and reset if required. Downtimes and maintenance costs are minimised. The modular design enables system

expansions with the system running and retrofitting the system is possible even outside scheduled maintenance periods.

Current: Where does the **ControlPlex® Rack** make trouble-shooting easy in your plants?

Holger Mefest: Any faulty load can be disconnected quickly and selectively in the event of short circuit or overcurrent while faultless loads remain unaffected. Consumption data help identify and resolve problems before a failure occurs. The integral alarm management provides a range of status information

and increases the availability of the transmission technology.

Current: Do you use a management system for monitoring and controlling your plants?

Holger Mefest: Yes, the large number of systems we have could not be monitored without using a management system. **ControlPlex® Rack** supports the SNMP protocol. It enables easy integration into existing management systems as well as fault correlation with existing systems.

Current: Thank you for your time.



ControlPlex® Rack:
protects, controls and monitors
the communication systems
of the Deutsche Bahn

P E R S O N N E L

»People are
at the very
centre of our
daily work«

*Therefore we are excited to
introduce new colleagues,
new jobs, new contact people
at E-T-A on this page.*



Joe Kovar

In October 2019 Joe Kovar joined E-T-A in the US as Inside Sales Manager. He has a Bachelors in Business Management and Computer Science with a focus on International Business from Bradley University located in Illinois. Joe has a wealth of experience in inside sales management primarily in the electrical & data communications distributor space. His previous experience converting customer service individuals to inside sales reps will play a critical role in his newly created position at E-T-A. His focus will be on assessing, improving or automating current processes and functions to enable Inside Sales & Service to contribute more to the bottom line.



Tom Prange

In June 2019 Tom Prange joined E-T-A as North American Market Manager-Equipment. Tom received his Bachelors Degree in Business from Central Connecticut State University. His 25+ years product management background in electro-mechanical components included time with Wes-Garde Components, Arcoelectric (Bulgin) and Sorenson Lighted Controls. Product portfolio expansion, price rationalisation and focusing on fuse replacement within portable, semi-stationary and stationary applications will be his focus in 2020.



Sascha Hönig

Sascha Hönig joined our team as Project Manager Automotive in the Transportation Division on 1 September 2019. He completed his M.Sc. in mechanical engineering at the Technical University of Nuremberg and subsequently gained experience as a project manager for development projects in the field of electromechanics. Sascha Hönig takes over the processing of enquiries from large manufacturers in the automotive sector (car/truck/bus/conAg) and also manages the qualification of catalogue products for large OEM customers.



PERS
ONN
PERS
ONN

FAQ

»IP protection degree – protecting man and machine with enclosures«



Our FAQ column discusses topical and practical subjects to support you in your daily work. Do you have any questions you need answer to? Send it to us – we are looking forward to hearing from you. **E-Mail: faq@e-t-a.de**

E-T-A's major goal is not only to protect electrical equipment, but also to **protect people**. These people can be electrotechnical experts, but also unskilled people. **Our products' enclosures protect:**

- **people** against **access to hazardous parts** in the interior
- **equipment** against **ingress of foreign bodies** and **water** from outside

Depending on the application site - household or industrial switching station - and on the environmental conditions - clean room or motor compartment - the devices are selected according to the protection degree of their enclosures. In order to make installation and replacement as easy as possible for the user, we will answer some frequently asked questions about IP protection class in the following.

How do we indicate the degree of protection?

The degree of protection of devices is regulated by standards depending on the application. The DIN EN 60529 is the relevant standard for low voltage electrical equipment. For electrical equipment in road-bound vehicles, however, the ISO 20653 applies. Both standards use the **IP code**. The structure of the IP code is shown in **fig. 1**.

If one of the code numbers does not have to be indicated, it is replaced by »X«. The protection degree of a device can be found on the housing or in the data sheet. The protection degree can depend on the mounting method.

What do the numbers or letters in the IP code mean?

The IP code marks the degree of protection. The first digit marks the degree of protection of people against contact with dangerous parts or the degree of protection against the complete ingress of solid foreign bodies (**see table 1**).

The second digit indicates how the enclosure protects the interior against ingress of water (**see table 2**).

The **additional letter** marks the protection of people against access to hazardous parts. This letter is only indicated when

- the actual protection is higher than indicated by code 1
- only the protection against access to hazardous parts is indicated (**see table 3**)

Additional letters can be added to provide further information on a product.

The pertinent product standard must indicate the verification process of the letter in question (**see table 4**).

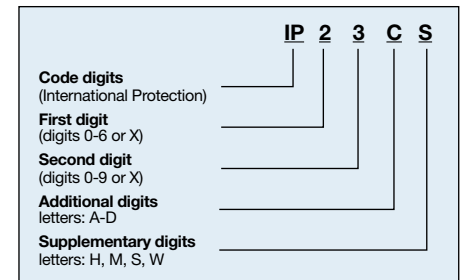


fig. 1: Structure of the IP code to EN 60529

ISO 20653	EN 60529	Protection against solid foreign objects	Protected against brush contact
0	0	-	-
1	1	with a diameter d > 50 mm	with the back of a hand
2	2	with a diameter d > 12,5 mm	with a finger
3	3	with a diameter d > 2,5 mm	with a tool
4k	4	with a diameter d > 1 mm	with wire
5	5	dust protection - ingress in non-harmful quantities	with wire
6k	6	dust-proof	with wire

Table 1: Decoding of digit 1 to EN 60529 and ISO 20653

ISO 20653	EN 60529	Protection against water ingress as
0	0	-
1	1	Drops falling vertically
2	2	Drops falling vertically, enclosure tilted by 15°
3	3	Water spray
4	4	Water splash
4k	-	Water splash with increased pressure
5	5	Water jets
6	6	Strong water jets
6k	-	High pressure water jets
7	7	Temporary immersion in water
8	8	Continuous immersion in water
9	9	High pressure and high temperature water jets
9k	-	High pressure or steam jet cleaning

Table 2: Decoding of digit 2 to EN 60529 and ISO 20653

EN 60529	Protected against brush contact	
A	with a diameter d > 50 mm	with the back of a hand
B	with a diameter d > 12,5 mm	with a finger
C	with a diameter d > 2,5 mm	with a tool
4	with a diameter d > 1 mm	with wire

Table 3: Decoding of the additional letter to EN 60529

EN 60529	
H	High voltage production means
M	Production means with moving parts is tested for harmful effects if water enters during operation.
S	Production means with moving parts is tested for harmful effects if water enters while standing.
W	Production means is suitable for operation at defined weather conditions through additional measures or procedures.

Table 4: Decoding of the additional letter to EN 60529



Ricardo Pimenta, Dipl. Ing. (FH)
Product Manager
Transportation Division

E-T-A expands its relay portfolio

Relays for all purposes

In order to come closer to this goal, E-T-A expanded its timer relay product group with a few new and attractive product versions. In addition, we now have a new product group in the portfolio for smart components and systems.

The **EXR10** and **ETR10** mini control units are flexible and reliable problem solvers in development and limited-lot production. Customers can configure their individually suitable device out of a wealth of options on the E-T-A website (short link and see QR code). In addition to typical functions such as ON and OFF delay, these relays also offer overcurrent protection, short circuit protection, undervoltage detection and current measurement.

The new **MTR10** model allows designers to easily select the pertinent time via the ordering number code. On site adjustment is not possible. The function and a firm time window are defined by the **MTR20** ordering number code. A screw on the top of the housing allows the user to adjust the timer relay response time within this time window.

The **MTR30** does not only offer an adjustment screw for a pre-defined time window, but also another switch with 10 positions. With this switch, the customer can choose between ten function/time window configurations and ideally requires only one timer relay for all applications.

The **SCS10** is the first product in a new product group which has a CAN interface. The compact automotive relay enclosure holds three inputs, a CAN interface, two semi-conductor outputs and a microcontroller. Combined with customer-specific software, the mini control unit becomes a genuine all-purpose tool. This product group is completed by two CAN modules. The **SCS20** and **SCS30**



E-T-A's comprehensive relay portfolio offers the right product for a range of applications



have six inputs each, a CAN interface, two H-bridges outputs and two signal outputs and are thus equipped for demanding tasks.



Scan the QR code and configure the possible hardware functions and relay functions for the solid state relays.

E-T-A solutions for many products

E-T-A offers tailor-made developments for all industries and products.

Here are some interesting examples.



E-T-A type: 104 resettable circuit breaker

Off with their fur

Lister GmbH, headquartered in Lüdenscheid, Germany, manufactures high-quality products for stockbreeding, animal care and farm and barn supplies. The extensive product portfolio of the traditional Sauerland-based company includes milk and industrial cooling systems, pasture fences and drinking troughs as well as electrical machines for professional animal shearing. E-T-A's 104 thermal circuit breakers provide overload protection in these machines ensuring fail-safe operation.

Countless sheep, horses and cattle, and also pets are shorn daily. There are various reasons: Excess or matted fur, vermin infestation, wounds or a poor heat balance of the animal. And not to forget: Exhibition and show animals also require regular shearing. Depending on the nature of the coat and the purpose of clipping, the clipper requirements vary greatly. For this reason, LISTER offers a wide range of professional shearing machines. The range includes horse, sheep and cattle clippers as well as specialised llama and alpaca clippers. Pet owners will also find appropriate clippers for dogs and small animals at LISTER.

LISTER uses E-T-A's **104** circuit breaker to protect the drive motor in its clippers. The super-small bimetal-operated circuit breaker reliably switches off the machines in case of extreme overloads preventing damage to the drive motors. After a trip, it can easily be reset, safely and quickly. Downtimes are limited to an absolute minimum. Despite its compact design - it fits into a conventional matchbox - the **104** has a contact-friendly snap-action mechanism and a reliable trip-free mechanism when the reset button is blocked. And thanks to international approvals (VDE, UL, CSA, CCC, KC) it can be used worldwide.

E-T-A type: 104 resettable circuit breaker



E-T-A type: REX12-T

■ Perfection in mechanical engineering made in Kronach

The **Hans Weber Company** from Kronach has manufactured extruders for plastics processing and automatic sanding machines for metal and wood for almost 100 years. Through many years of experience **Hans Weber Company** stands for perfection in mechanical engineering and has a reputation for having the highest quality and reliability with customers all over the world.

The medium-sized family-owned company places particular emphasis on the durability of its products and meets current market demands with innovative technologies. Close customer contact and the vast vertical range of manufacturing with in-house development at the Kronach location enable solutions specially tailored to customer requirements.

The **REX12-T** electronic circuit protector offers selective overcurrent protection by reacting faster to short circuit or overload than the supplying switch-mode power supply. Further **REX** components are the **EM12-T** power supply module for the plus and minus potential and the **PM12-T** potential expansion for the plus and minus multiplication. This series is characterised by its simple and quick installation and the maintenance-free and tool-free connection technology.

E-T-A supplies WEBER with the compact **REX** all-in-one

E-T-A type: REX12-T



Weber grooved-barrel extruders from the High Performance NE 40D Series for the production of PP/PE pipes modules



2216-S thermal-magnetic circuit breaker optimises power distribution systems

Optimal space utilisation in tramways

For protecting light rail vehicles, one of E-T-A's customers, *an international system supplier of equipment for rail vehicles*, uses very slim circuit breakers.



They provide reliability in the 24 V voltage level:
2216-S thermal-magnetic circuit breaker and 80plus socket

Light rail vehicles, such as tramways or city railways, use the DC 24 V voltage level for the on-board electrical system and most loads. A rising number of loads, like those for passenger convenience and information, lead to rising space requirements for protective elements. This presents system and vehicle manufacturers with enormous challenges in many projects, since maximising space utilisation for the passengers is their priority

Therefore, this manufacturer has used the **2216-S thermal-magnetic circuit breaker** with ratings up to 16A for a long time. The extremely slim circuit breaker, with an installation width of only 12.3 mm (including auxiliary contacts), saves at least half the space and weight compared to conventional circuit breakers.

Another important advantage is the plug-in design going into sockets with screwless PT connection technology. This reduces maintenance and service costs tremendously compared to screw-type terminals. With the **80plus socket**, the system manufacturer can also very easily integrate auxiliary contact loops and supply feeds suitable for the application with jumpers.

The **2216-S** complies with the relevant rail engineering standards which is not only a prerequisite for vehicle manufacturers and system suppliers, but also a major criterion for the successful use. Thanks to the versatile options available with the **2216-S** circuit breaker, system suppliers

2216-S thermal-magnetic circuit breaker and 80plus socket

and vehicle manufacturers can significantly improve their balance sheet of overall costs and the reliability for power distribution systems in tramways.

In addition, E-T-A also offers other rail-compliant circuit breakers for the use in tramways.

CULINARY DELIGHTS

A delicious vegetarian dish:

»Breaded celery slices«

*Breaded celery slices are a
very popular vegetarian dish.*

The special thing about this recipe is the grated cheese in the breading, which gives the whole dish a special flavour. The curd cheese with herbs for dipping as a side dish makes it just perfect.

Directions:

1. Wash celery, cut into 2 cm thick slices and peel.
2. Boil in salted water for 15 - 20 minutes and drain.
3. Mix grated cheese and breadcrumbs.
4. Season celery with salt and pepper, then turn in flour, whisked eggs and cheese-crumb mixture.
5. Fry in a pan with hot oil for approx. 3 minutes each side until golden brown.

Serve curd cheese with herbs as a side dish.

Enjoy!

Prep time: approx. 45 minutes.

Ingredients (for 4 servings):

- Celery (approx. 1 kg)
- 2 eggs
- 150 g grated Emmental cheese
- 50 g breadcrumbs
- pepper
- salt
- 40 g flour
- oil
- 250 g curd cheese with herbs





CPC20 ControlPlex® System Intelligent DC 24 V protection

Ready for industry 4.0

The intelligent **CPC20 ControlPlex®** System protects your DC 24 V power distribution against overload and short circuit.

- **Maximises your system availability** – through comprehensive diagnostic functions
- **Increases protection against voltage dips** – through selective protection of the loads
- **Enhances flexibility of your plant design** – through a modular terminal block system

Talk to us! We look forward to getting in touch.
www.e-t-a.de/cu_e1-20



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