

Everything under control

Professional automation with **ControlPlex**[®]



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»Baked sweet filled pancakes«

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Impressum

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Elektrotechnische Apparate GmbH

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■ We are listening.

The dialogue is part of our design process.

It is a long and exciting road from the first idea to the successful launch of a new product. Even for a large design team like E-T-A's it is a journey with many stops and stations. From the first product idea to a real money-maker in one of our numerous markets - like electronic overcurrent protection. We rely on clearly defined processes and multiple technical tools and modern methods.

One thing is always at the top of the list: the dialogue with you, our customers. Because we are listening. We know a successful product cannot be designed in a vacuum. Our products always have the clear goal of solving a customer problem. It can sometimes be a very obvious one, sometimes it is also hard to identify and thus hardly manageable.

At any rate, we want to make your life and your work easier. And nobody can judge our efforts better than you. This is why we talk to you. We use a range of communication mechanisms at different stages of the design process.

The central issue might be to verify a product idea or it might be to determine global demand. But the reason may also be to include you in our considerations during the prototype stage to learn more about the actual application of the product in practice. This can be done by our sales people, or at trade shows or even during meetings with design engineers. This depends on the status of the project and your availability. Because we understand: we add the most value when we understand the market and its needs.

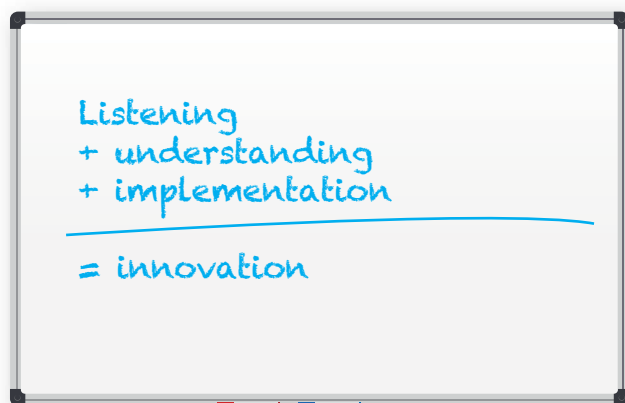
We greatly appreciate your support with this. Do you have any questions? Talk to us! Or do you know of a certain project you wish to discuss with us? **We look forward to speaking with you.**



Dr. Clifford Sell

Executive Committee

E-T-A Elektrotechnische Apparate GmbH



*This is our equation to offer you customised solutions,
tailored to your needs.*

E-T-A portfolio for the protection of DC 24 V supplies

Reliable protection at all times

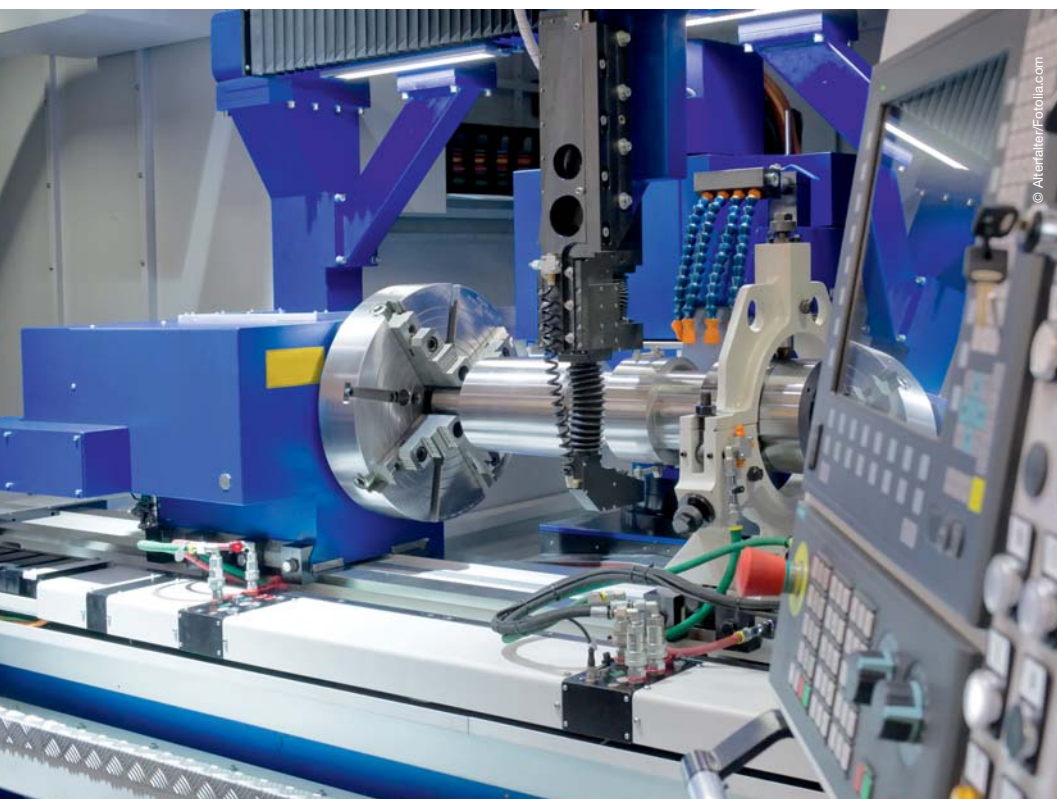
In the machine building industry, factory automation and process control, in all applications on the DC 24 V level our customers rely on switch mode power supplies. Standard protection of these power supplies is provided by electronic circuit protectors or circuit breakers made by E-T-A.

E-T-A portfolio for electronic overcurrent protection on the DC 24 V level



Electronic overcurrent protection ensures selectivity. It offers a significant increase in machine or plant uptime. This particular type of protection is required because the compact DC supplies do not deliver enough current to trip conventional thermal-magnetic circuit breakers in the event of a short circuit.

E-T-A offers a comprehensive portfolio of protection devices for the DC 24 V control voltage level. The E-T-A range is categorized into three typical industries and can be specified exactly in accordance with the application. Besides the protection elements, E-T-A also offers switch mode power supplies and the necessary back-up fuse.



What are the major differences between industries in terms of electronic overcurrent protection?

Machine building industry

Machine and panel builders focus on functionality and profitability, but a flexible design solution is also important. Modular and compact solutions are characterised by scalability and are extremely cost-effective. Besides a flexible and compact design, transparency is also becoming an ever more important request of machine and panel builders. The **REX12-T** is ideal for applications in machine construction and offers unrivalled cost-effectiveness combined with flexibility and a compact design. It can be included in the system **without any additional accessories.**

Factory automation

E-T-A's **ESX10** electronic circuit protector is an overcurrent protection device that can master any challenges in factory automation. The ESX10 not only offers active linear current limitation, but also streamlines the planning of DC 24 V applications. These solutions limit the maximum output current before disconnection. Overloading the switch mode power supply is eliminated. The

modules are only 12.5 mm wide and are available as a plug-in type or otherwise DIN rail mountable. They offer all standard MCB trip curves (A, B, C and even D characteristics).

In the event of a short circuit, the linear limitation ensures that the maximum current will not be higher than 1.8 times rated current. This feature allows selective protection of all typical DC 24 V loads. Selective protection increases system availability significantly. Only the faulty path is disconnected. All other loads remain fully functional. Comprehensive approvals to UL, CSA and ATEX complete the technical performance of the **ESX10** product group and offer a wide range of possible applications to the user.

Process control

In addition to the requirements of the two aforementioned industries, E-T-A also offers hybrid solutions for the process control and automation industry. The **ESS** type circuit breakers unite electronic overcurrent protection with physical isolation via a bimetal. This adds up to the overall safety. In the event of a failure the breakers, which carry VDE and UL approval, will disconnect electronically before also

opening the contacts mechanically. From a technical perspective, this is equivalent to the disconnection of an MCB. Physical isolation prevents possible residual voltages or currents from flowing through the disconnected path into the field. In addition, hazardous reverse polarity voltages caused by defective loads in the field, can be completely eliminated.

Off is off is off.

Your benefits

Electronic overcurrent protection is the ideal solution for protecting switch mode power supplies. It reliably prevents voltage dips.

Electronic overcurrent protection

- Enhances system availability and offers clear failure detection
- Reduces downtimes with quick failure resolution
- Simplifies planning with clear sizes and ratings
- Saves costs and time



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Professional automation with **ControlPlex®**

Everything under control

Do you need status and load information for each channel at the field level in your system? If you want to switch channels on and off and reset them after tripping, if you need additional information to help reduce machine downtimes, then **ControlPlex®** is your solution.

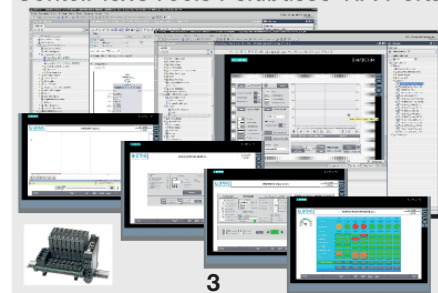
E-T-A offers tools allowing you to install the **ControlPlex®** system quickly and easily into control surroundings. **ControlPlex®** tools are software packages for the various automation technology systems. They hold components for the control unit as well for visualisation. These software packages can be distinguished by the connection and design surroundings and allow you to use the **ControlPlex®** system quickly.

ControlPlex® offers a wealth of advantages and benefits to equipment operators and maintenance staff. For instance, it reduces wiring efforts, replaces the use of analogue sub-assemblies and transformers and indicates the the existing load current for each channel. A pre-warning can be generated through the load current measurement which allows early detection and signalling of dangerous malfunctions. Maintenance work can be done at a time

when production will not be disrupted. Expensive production downtimes caused by overload and system shutdown will be prevented. The status indication demonstrates, at a glance, if everything is in good order. In the event of trip, the details will help trouble-shoot the issue. In a conventional system, these details could only be obtained by much more time-consuming efforts. It would either require service personnel or the use of additional



ControlPlex®Tools Feldbusse TIA-Portal





Hans-Peter Brunner,
Project Manager at the
HEITEC AG

Use the advantages of intelligent overcurrent protection with **ControlPlex® Tools** without additional efforts in your automation system

■ Intelligent load protection

The HEITEC AG, located in Erlangen, is a market leader in factory automation and offers solutions, products and services including planning and design of overall automation solutions. Hans-Peter Brunner is the Project Manager for automation technology at HEITEC and, in his role, is in touch with the many different industries and applications. However, there is one thing connecting the various applications. The necessity to protect the individual loads.

Current: In your experience, what is most commonly used to protect loads in the industry today?

Hans-Peter Brunner: In most projects I've seen, the various load circuits are protected against overload and short circuit by MCBs. Each load circuit, or a functional group, is monitored by a PLC input. There hasn't been much of a change in this sector over the past 20 years.

Current: What are the major benefits of using **ControlPlex® Tools**?

Hans-Peter Brunner: **ControlPlex® Tools** can very easily and quickly be integrated into an existing project. All

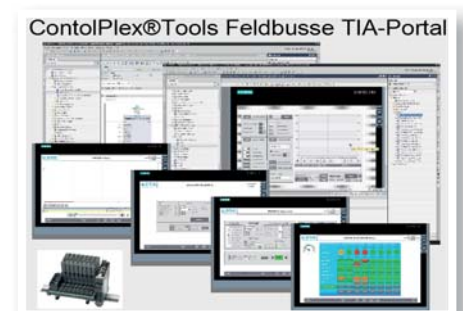
data and configuration options are available without additional efforts. This helps save time and, as a result, money.

Current: Why should machinery or system operators use a **ControlPlex® Board System**?

Hans-Peter Brunner: There are many reasons. For instance, the equipment and line protection can be adjusted during the run-time. Also, wiring time is significantly reduced for a large number of circuit protectors. In addition, inputs for error messages are no longer required at the PLC. And last but not least, it allows preventive maintenance so overloads in the load network can be detected in time. **ControlPlex®**

allows easy and efficient modification of production equipment to new products, right in line with Industry 4.0.

Current: Thank you for your time.



Overview CP-TOOLS-FB-TIA

PERSONNEL

"People are
at the very
center of our
daily work"

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



Yongjun Chang

In July 2015 Yongjun Chang (41) joined E-T-A to support our South Korean sales activities. His primary focus is to attend to our existing customers and acquire new customers in the new and promising South Korean market. Yongjun Chang is a graduated mechanical engineer from the MyongJi University in South Korea. He has a wealth of experience from working in sales and business field management in the automation industry in both Korean and international companies.



Hannes Büttner

In April 2016 Hannes Büttner assumed the position of Business Field Manager for the mobile homes and special vehicles market in the Watercraft & Special Vehicles Division. He graduated in technical business administration and has a deep understanding of products and markets based on this previous role as a **PowerPlex®** application specialist. Hannes' major focus will be consulting new an existing customers on the best possible **PowerPlex®** solution.



Oliver Kratsch

Oliver Kratsch joined the German sales force as a regional sales manager in Hanover in October of last year. He was trained as an electronics installer for systems engineering and has a wealth of experience in German and international technical service. It is Oliver's goal to offer the best possible service and advice to the customers in his sales territory with regard to the E-T-A product range. His sales territory includes parts of Hesse, North-Rhine Westphalia, Thuringia, Saxony-Anhalt and Lower Saxony.



FAQ

Hype or promise?

»How will industry 4.0 change the markets?«



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

»A persistent tendency towards digitization presently causes substantial changes in nearly all industrial branches.« (Prof. Dr. Alexander Wurzer, University of Strasbourg). This statement shows the broad effects that industry 4.0 - briefly I4.0 - has on industries already today. The Current FAQ will shed some light on this development.

Are there already standards for I4.0?

There are indeed some initial I4.0 standards. However, they are not really connected and partially compete with each other.

The reference architecture model for I4.0 – briefly RAMI4.0 – offers a platform where all I4.0 components can communicate with each other via the existing IT infrastructure and the internet, following predetermined rules. The relevant standards are DIN SPEC 91345, IEC 62890, IEC 62264 and IEC 61512. There is a similar German initiative to use the product data standard eCl@ss for the not yet established semantics in the CPS of I4.0 USA that looks to enhance the Ethernet standard IEEE 802.1 in terms of real-time capability. DIN agreed to cooperate with the Industrial Internet Consortium (IIC) in the US to develop »Use Cases«. At the same time there are strategic working groups under German direction at ISO and IEC.

How will I4.0 change the markets?

According to an estimate from the VDE trend report, I4.0 will fully arrive in Germany by 2025 and will strengthen Germany's competitiveness as an industrial location. This is the opinion of nearly 75% of the respondents according to a VDE survey. As international competition in technological leadership becomes even stronger, Germany will have to make investments in time to compete in the international innovation race.

Will I4.0 only apply to production facilities?

I4.0 will finally also be a requirement for additive production where parts are printed directly from the CAD model. This is true for many areas such as automotive components (in racing) and aircraft parts.

Household appliances such as fridges or washing machines and others will be networked and controlled with a smart phone - this is also I4.0.

Do we already have a special education for I4.0?

Yes. Saarland University is one of the first universities to offer a new degree programme "Systems Engineering" since the 2015/2016 winter term. It is based on the central ideas of I4.0 and teaches essential basics required to design and control technical systems.

Do we already have E-T-A products for I4.0?

E-T-A is well prepared for I4.0. Over the years, we have developed a series of intelligent devices for control, system diagnostics, power distribution and overcurrent protection in our portfolio.

Industry (control voltage DC 24 V):

- **ControlPlex® DINrail** with REX12D-T (IO-Link)
- **ControlPlex® Board** with SVS201-CP (Profinet, Profibus-DP, IO-Link)

Telecommunications and datacom (-DC 48 V, -DC 60 V)

- **ControlPlex® Rack** with RCI10 (Ethernet SNMP),

Vehicles and boats (DC 12 V, DC 24 V)

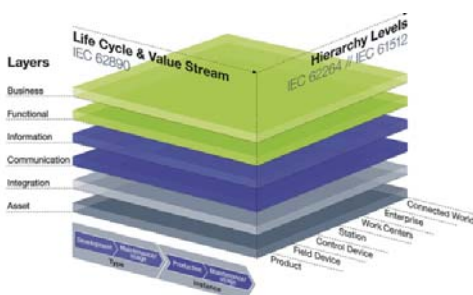
- **PowerPlex®** control systems (CAN SAE J1939)



ControlPlex® DINrail



ControlPlex® Rack



*The reference architecture model for I4.0 – briefly **RAMI4.0***



Linga Schütz,
B. Eng. Product Management
E-T-A Transportation Division

The ideal power relay for utility and special vehicles

Which power relay for which application?

Utility Vehicle and Specialty Vehicle manufacturers use power relays to switch high loads. But not all power relays are equal.

Electro-mechanical power relays have proven their worth as isolation switches at the main battery in agricultural and construction machinery as well as in trucks and buses. High charge and discharge currents are typical here. The bidirectional **MPR10** electro-mechanical relay is the right solution for these applications. It is a bistable power relay that does not require a holding current in the ON condition. Therefore these relays help to save energy and fuel. At the same time, they measurably reduce vehicle CO₂ emissions. CO₂ emissions are further reduced because of the light weight of the **MPR10** compared to conventional power relays. Even with changing ambient temperatures and harsh environmental conditions, the **MPR10** remains hermetically sealed and fail-safe.

The **HPR10** hybrid power relay offers extra functionality, including timer functions. It is mainly used in buses and special vehicles for controlling signalling equipment and illumination. The **HPR10** offers programmable ON or OFF delays and allows direct and flexible control of components. Additionally, the **HPR10** provides undervoltage detection. This function allows disconnection of limited, important convenience functions as soon as the battery voltage in the vehicle falls below a critical threshold.

Pumps, cooling units or fans in utility vehicles are switched very often. For this kind of application E-T-A's **EPR10** Electronic Power Relay is the best option. Unlike electromechanical relays, it offers a wear-free switching operation that increases the number of possible



E-T-A power relays enhance uptime and safety of utility vehicles and special vehicles



*The new single pole power relays developed by E-T-A for switching loads up to 300 A: the bistable **MPR10** relay (left), the hybrid **HPR10** version (center) and the electronic **EPR10** relay (right)*

operations to more than 10 times that of a mechanical equivalent. This reliability significantly reduces maintenance costs and downtimes. And further, the **EPR10** does not need a heat sink. This reduces the required installation space by up to 80 %.

E-T-A types: REF16-S and SVS25

E-T-A solutions for many products

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

Here are some interesting examples.

Step on the gas

KAWASAKI Gas Turbine Europe GmbH is a major global player in the gas turbine generator sets industry. Kawasaki offers its customers a complete range of products and services.

The power range of the customer-specific supply solutions from one source ranges from 1,700 kWe to 30,000 kWe or from 3,700 kWth to even 75,000 kWth.

Kawasaki fully relies on the **REF16-S** electronic circuit protector for the protection and distribution of DC 24V systems. They operate it on the **SVS25** power distribution system.

Kawasaki replaced its previous protection solution and the entire DC 24 V sub-distribution with this complete system. The E-T-A power distribution solution offers not only selective protection, but also reduces

wiring efforts and provides space-saving benefits. This allows Kawasaki to save cost, time and space in its control cabinets.

Space reduction is achieved with integral push-in output terminals on the compact **SVS25** distribution board. 10 each plus and minus supply terminals are made available per load output in the narrowest of spaces. The **SVS25** track-mountable power distribution system distributes the voltage potentials supplied by a DC 24 V switch mode power supply to 8 slots and selectively protects the connected loads with the 12.5mm wide **REF16-S** pluggable circuit protector.



E-T-A type: REF16-S



E-T-A type used: E-1048-8D

■ A gigantic shovel

Komatsu Mining Germany is the European production facility for Komatsu, a Japanese company manufacturing super large hydraulic mining shovels for international use.

Komatsu is the second largest manufacturer of construction vehicles in the world. The Düsseldorf factory produces real excavator giants with an operating weight of up to 750 tons. The front shovel capacity is 42 m³. Komatsu has used E-T-A's robust and reliable **E-1048-8D** Smart Power Relays in these excavators for many years.

Mining excavators must meet extremely high requirements. The robust vehicles have to reliably work without restrictions around the clock. Because of this,

Komatsu was looking for an extremely reliable solid state relay to safely switch a transfer pump for the hydraulic oil in the vehicle.

What tipped the scales in favour of the **E-1048-8D** in E-T-A's relay portfolio was that it is completely maintenance-free and it has an integral protective function. Other arguments that convinced Komatsu's design engineers were the high resistance values in terms of shock and vibration.



E-T-A type: E-1048-8D



Magnetic-hydraulic **8345 circuit breaker** in detachable chairlifts

Safety for ropeway technology

Doppelmayr is the world market leader in cable railways and holds approx. 65 % of the global market with innovative and customer-specific solutions for cable railway technology.



Doppelmayr ropeway technology is in service all over the world.

They have production facilities in Austria, Switzerland, Russia and China as well as sales and service offices in more than 35 countries, giving them close proximity to the customer. Unparalleled convenience and safety characterise their ropeways - both in summer and winter regions as well as in urban public transport. Flexibility, know-how and pioneering innovations are the pillars of Doppelmayr's superior quality for user-friendly customised solutions.

Detachable chairlifts travel at slow speeds in the stations, providing convenient and safe loading and unloading of guests.



E-T-A circuit breakers provide safety during the heating phase.

Whether travelling in a quad, 6- or 8-seater chairs, passengers are protected by the light-weight, wind-resistant bubble. The chairs feature heated seats and automatic restraining bars, both which enhance convenience and safety.

For ultimate reliability, they use E-T-A's circuit breakers to protect the collectors and the ropes in the station. Plastic channels guide the current collectors on the incoming chairs onto the two power rails which are laid between the grip opening line and the grip closing line. Here the energy for the seat heating is absorbed. The power flows from the power rails via the current collector on the grip to the terminal box under the seat. From there it is used to warm the heating mats in the seat pads while the chair is in transit through the bottom station. The power flow stops once the chair leaves the station and the chair has then been heated sufficiently to provide the passengers with warm seats throughout their trip. Doppelmayr turned



8345 thermal-magnetic circuit breaker

to E-T-A as their long-standing partner for its line protection requirements. Due to the demanding environmental conditions and the switch mode power supply, E-T-A selected a magnetic-hydraulic circuit breaker with the suitable characteristic curve, which is tolerant to temperature drifts. International approvals (UL, EN and GB) allow global use and were a convincing argument, besides the well-proven quality, for buying an E-T-A product.

E-T-A's **8345 circuit breaker** meets the high environmental requirements of the alpine application area and unites a space-saving design with innovative technology. The fine grading of current ratings allows Doppelmayr to specify the ideal circuit protection solution for all ropeways or chair models.

CULINARY DELIGHTS

Typical Austria:

»Baked sweet filled pancakes«

The »Topfenpalatschinken« is a typical Austrian dish made of thin pancakes that are filled with sweet cheese (= Topfen), which can be served either as a main dish or as a desert.

The baked filled pancakes taste particularly good when they are sprinkled with orange liqueur before dusting them with powdered sugar.

Directions

Stir eggs, egg yolk, milk and salt for the dough. Mix in flour with egg whip. Melt some butter in a pan and bake 8 to 10 thin pancakes.

For the filling drain the cheese in a sieve. Wash lemon, dry and grate the peel. Press out the juice. Whip butter, lemon peel and powdered sugar with the electric mixer until creamy. Separate the egg, mix egg yolk, cheese, blanchmange powder and lemon juice with the butter mixture. Beat egg whites with a pinch of salt until they are stiff. Fold in beaten egg whites and raisins into cheese cream.

Heat oven to 180 degrees (fan oven 160 degrees, gas level 3). Spread cheese cream onto pancakes, roll them up and place them into a buttered casserole

(approx. 20 x 28 cm). Bake in the oven for 12 - 15 minutes.

Mix all ingredients for the topping, pour over the pancakes and bake for another 15 minutes. Dust with powdered sugar.

Ingredients for 8 servings:

Dough

- 2 eggs
- 2 egg yolks
- ¼ l milk
- salt
- 140 g flour
- butter for frying and for the casserole

Filling

- 250 g low fat curd cheese
- ½ lemon (untreated)
- 50 g soft butter
- 40 g powdered sugar
- 1 egg
- 1 tbsp blanchmange powder
- 2 tbsp rum raisins

Topping

- 180 ml milk
 - 225 g crème fraîche
 - 50 g sugar
 - 1 packet vanilla sugar
 - 5 egg yolks
- Powdered sugar for the icing



Typical Austria:
»Topfenpalatschinken«



Thermal circuit breaker/switch combinations

Two in one:



Type 1410



Type 3120



Type 1110



Type 3140

Protecting and switching all in one device!
E-T-A offers a range of thermal overcurrent circuit breakers with ON/OFF functionality

- **Reduced disposition and storage costs**
Replaces switches, fuseblocks and inserts for blade fuses
- **Tremendous time savings**
Never change a fuse again - just reset it!
- **Reduced mounting and wiring time**
Only a single component! Also with push-in technology!
- **Space-saving design**
Integral overcurrent protection even with installation in limited space
- **Increased overall reliability**
Less single components mean less error sources.

Contact us! We look forward to talking to you.

www.e-t-a.de/cu_e4-16



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