current

Customer Magazine of E-T-A Elektrotechnische Apparate GmbH

E-T-A ENGINEERING TECHNOLOGY

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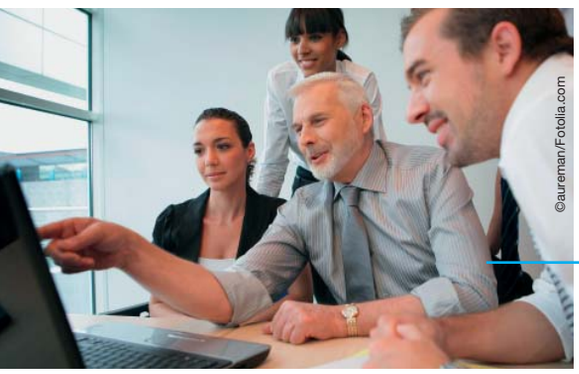

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Impressum

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Testing - a matter of trust

E-T-A products are not only trusted in international markets, but are also trusted by many global approval authorities. One of them is UL - Underwriters Laboratories. UL is an independent organisation founded in 1894, which tests products and provides safety certifications. Companies must invest in having their products tested to specific UL standards. Once the products are tested and meet the specific requirements they are allowed to carry the UL approval logo.

E-T-A established a certified UL and CSA test laboratory in 2008. This allows E-T-A to conduct various defined tests in its own test laboratory without being witnessed by a UL inspector. UL trusts our results to the same degree as they trust the results of their own laboratories. E-T-A underwent rigorous audits to qualify for this certification and the test laboratory is re-audited annually for renewal.

With this certification, E-T-A is allowed to carry out cost- and time-consuming tests including: trip time tests, temperature rise, endurance, overload, short circuit, dielectric strength, etc. During the 2013 audit E-T-A's test competence was extended to include carrying out approval tests for electronic circuit protectors (UL2367) and circuit breaker tests for use in control cabinets and industrial plants (UL508, UL60947 etc.).

We are honoured by UL's trust and confidence. But that is not all – it also offers benefits to our customers. You can rely on E-T-A as a partner whose test competence is completely trusted. It also makes UL testing much faster and eliminates the need for time-consuming follow-up tests.

E-T-A is your fast and reliable partner when it comes to protection and power distribution. Are you currently working on a project that requires E-T-A's support? Talk to us! We look forward to discussing your application.

Philip Poensgen

Executive Committee
E-T-A Elektrotechnische Apparate GmbH

At a glance – the features of the ESR10 Maxi 50 A

- 50 A solid state relay with integral protective function minimises space requirements and the number of connection points.
- ISO Maxi standard relay enclosure for the use in vehicles.
- Free selection of installation site as reset of the protective function does not require manual access and the switching function is silent.
- Long endurance and a great number of switching cycles even with inductive loads.
- Available for both positive and negative control.

Minimum size - maximum performance

In cars, and all kinds of vehicles, there are an increasing number of electrical loads, which also means an increase in the amount of electrical energy required. Even though the future holds multi-voltage electrical systems (12 V and/ or 24 V and 48 V in one vehicle), today 12 V electrical networks are considered state of the art in passenger cars. In the event of an unchanged system voltage, the current flow will increase with rising performance requirements. This is exactly why E-T-A designed the ESR10 automotive solid-state relay in an ISO Maxi standard relay enclosure.

***ESR10 Maxi** - the new 50 A solid-state relay specifically designed for 4-pole standard ISO 7588 automotive relay sockets*

More information? Just scan the QR-Code!

The ESR10 Maxi solid-state relay is an extension of E-T-A's Smart Power Relay product group that includes the E-1048-8D. However, the use of new PCB and semi-conductor technologies allow it to be used in applications with higher continuous loads, while still maintaining a very compact size. It is available with short-circuit protection or with short-circuit protection and an overcurrent trip curve. Similar to E-1048-8D, the ESSR10 is available with positive (on-board system voltage) and negative (ground) control available.

The ESR10 Maxi is the only semi-conductor relay on the market in an ISO Maxi standard relay enclosure allowing up to 50 A of continuous current even at an ambient temperature of 85°C and also offering overcurrent protection as an option. To use the ESR10 Maxi in higher current applications, several relays can be connected in parallel. Compared to relay-fuse combinations, there are 50% less connection points which reduces the possible sources of failure and the time needed for production and testing.

Because it is exclusively solid-state, the ESR10 will reset without a sound and has wear-free switching functionality that increases the life span of the device and reduces after-sales and service costs. The solid-state technology also makes the ESR10 tolerant to vibration, shock and dust. These tolerances make the ESR10 Maxi suitable for vehicles used in adverse environmental conditions and also as the battery main relay with protection function for motorcycles.

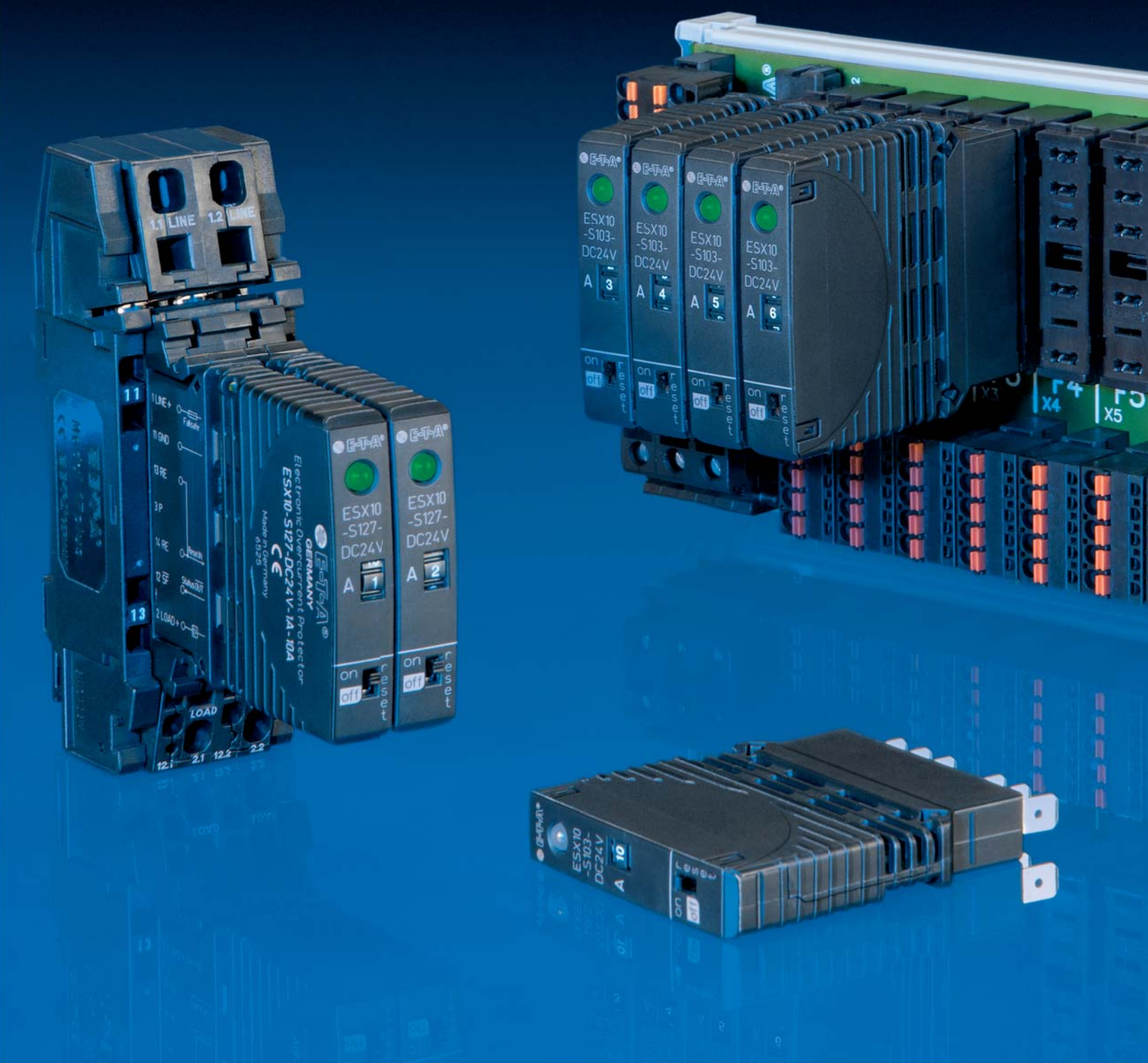
Manual access to the ESR10 is not required because it is remotely resettable after an overload. This allows engineers to design the devices into inaccessible areas within the vehicle. This is especially helpful in 12 VDC sub-networks of utility vehicles (i.e. speciality vehicles and truck platforms) where the relays do not even need to be accessible for service and maintenance personnel.

The reduction of CO_2 emission is very important in passenger cars and utility vehicles. The ESR10 supports these initiatives because of its low holding current and the low current consumption. CO_2 emissions are also reduced because the overall weight of the vehicle is lighter due to the accurately rated protective function that allows smaller cable cross sections.

Powerful, robust and long life span - solid state relays are suitable for special application conditions.

At a glance – the features of the ESX10-S

- Rotary switch for current rating selection from 1 A...10 A and a single trip curve for all loads - simplifies electrical design and logistics
- Selective short circuit and overload disconnection - and the DC 24 V control voltage remains stable
- Integral current limitation - protects the contacts of safety switchgear
- Reliable disconnection - even with high cable attenuation
- Plug-in type for flexible power distribution systems Module 17plus and SVSxx
- International approvals - for global use



Thumb wheel and current limitation

ESX10-S Electronic Circuit Protector

In manufacturing plants components must work in critical situations as well. The performance, safety and availability of the system depend on it. A critical part of this is efficient power distribution and selective protection of the DC 24 V circuits.

*Current ratings adjustable from 1 A through 10 A: child's play with the thumb wheel of the **ESX10-S***

The universal all-purpose thumb wheel
The ESX10-S electronic circuit protector makes protection of all DC 24 V components such as PLCs, bus modules, valve clusters and operation terminals as easy as possible: The rotary switch (thumb wheel) of the ESX10-S provides current rating selection in 1A increments from 1A through 10A with a single electronic characteristic curve covering all possible applications and loads.

This provides a highly flexible electrical design, during start-up or extension of the system and also helps to reduce component inventory levels. The plug-in type devices fit into E-T-A's 17plus flexible power distribution system. The compact size of only 12.5 mm helps to significantly save space compared to MCBs that have extra auxiliary contact modules.

The ESX10-S offers selective overcurrent protection for all DC 24 V control voltage loads. It features overload disconnection at 1.2 times rated current and provides a quick failure indication after 3 seconds, even in applications with high cable attenuation. The integral current limitation up to 1.4 times rated current guarantees selective disconnection that only disconnects the defective current path in the event of overload or short circuit. This prevents a voltage dip in the DC 24 switch-mode power supply and avoids long downtimes caused by lengthy trouble-shooting. The worst-case-calculation of critical circuits is now an easy exercise:
Max. current = 1.4 x rated current. That's it.

The visual status indication is incredibly user-friendly. Anyone who has waited at a traffic light can intuitively and correctly interpret the four conditions "red, yellow, green, off".

Within the BMW Group, global standardisation and compatibility of its control technologies is of the utmost importance. The ESX10-S103, which is used in bodyshell work, has a potential-free auxiliary contact and fits into the 17plus socket or the SVS02 power distribution systems with group signalling. Apart from group signalling, single signalling is also very important due to BMW's interlinked production cells in its assembly sector of production. It allows targeted maintenance and a quick restart of production after a short circuit occurs. The ESX10-S127 offers both signalling options through its electronic status output. Additionally, it is possible to remotely reset the circuit protector without having to open the control cabinet.

More information? Just scan the QR-Code!

Selective protection for powerful packing

Schubert Gerhard GmbH, located in Crailsheim in Baden-Württemberg, is a market leader of digital packaging and bottling systems. In the centre of "Packaging Valley", they design, produce and sell the most flexible top-loading packaging machines in the world. The company was founded by Gerhard Schubert in 1966 and sells its industry-specific solutions to major companies worldwide, e.g. in the food, drink and tobacco industry. The Current talked to Walter Kalb, Design Engineer, about the use of E-T-A's electronic circuit protectors.

Packaging systems for foodstuff and beverages from Gerhard Schubert GmbH

Current: You use E-T-A's ESX10-TB electronic circuit protector. Besides the standard current rating range 4 A, 6 A, 10 A and 12 A you have recently started using a new specific high-current version rated 16 A. What is the application?
Walter Kalb: In our plants we use special servo-modules for controlling the digital drives. These are compactly designed systems serving several load circuits with one supply unit. These systems allow connection and operation of up to 12 servo modules at one 24-V DC supply unit modularly in a row.

Current: Why do you require such a high rating (up to 16A) in your application?
Walter Kalb: In this specific application, we do not only operate drive control and sensors at the circuit protectors, but also magnetic brakes. These have a particularly high current demand. They are energised in operation, i.e. released, to reliably block in the event of a power failure and reliably brake the drives. Thus the total current can reach 16 A.

Current: Do you use the circuit protectors in all machines?
Walter Kalb: Yes, in all machines where several drive controls are operated in parallel on one supply unit.

Current: Your machines are being used worldwide. Do you require special approvals?
Walter Kalb: We always require the usual CE conformity and the UL approvals for the North American market.

Current: Do the electronic circuit protectors meet these requirements?
Walter Kalb: The ESX10-TB-101 circuit protector meets all our requirements because of its available current ratings from 0.5A through 16A and the approvals it carries. The ESX10-TB-101-DC24V-16A even allows operation of modular controllers for normal duty and at the same time it provides selective protection in the event of a failure.

Current: Thank you for your time.

Electronic circuit protector ***ESX10-TB...***

More information? Just scan the QR-Code!

Jian Jun Bao

In August 2013, Jian Jun Bao, also known as Nick Bao, joined E-T-A as General Manager of Greater China. Jian Jun Bao majored in telecommunications, and graduated from Shanghai University of Technology in 1992 and started his first job as a development engineer in the Research Institute in Shanghai. He previously worked for the subsidiaries of Krone, Dehn+Söhne and Smiths Power in sales management. He has a technical and sales background in telecommunications and low voltage systems, is experienced in sales development, supervising production as well as operations in China.

His main focus in E-T-A China is primarily to reform the local organisation. This includes market penetration and development, from the technological, innovative and the geographical point of view. Jian Jun Bao's experience and leadership of E-T-A's local organisation, both technically and in sales, will improve and ensure local support and service for our international and local customers in China.

Tobias Prem

On 1st September 2013 Tobias Prem took over his new postion as a Product Manager of electronic overcurrent protection, power distribution systems and solid state relays in the Industry, Energy and Equipment (IEE) Division. He brings a wealth of experience to the job, gained during the years he worked as an applications specialist, which will help him to support the successful use of our devices at key customers.

His major task will be providing technical and sales support for various applications for our components and systems in the Machine Building and Steel Industry.

He will also work on business strategies for our innovative new developments and targeted enhancements of the existing product range together with our international customers and sales partners.

Our FAQ pages are meant to intensify the dialogue between manufacturer and customers. We discuss topical subjects from practice as briefly and yet as detailed as possible 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.

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Approvals in USA and Canada

What does UL mean?
UL is the abbreviation for Underwriter Laboratories. It is North America's major test and certification institute. The UL approval mark is our products' admission ticket to the North American market.

Who is UL?
UL was founded in 1894 with the primary goal to minimise fire hazard. Today, UL is a privately held company with headquarters in Northbrook, Illinois. UL has more than 10,000 employees globally in 39 countries and keeps a total of 131 laboratories with a wide range of applications. In 2012 they carried out 92,000 product tests. Altogether, there are approximately 22,000,000,000 active UL approval logos for 69,000 manufacturers in 104 countries.

What is a UL standard?
Today, there are 1490 UL standards. They are typically developed by UL and used for product approvals. They fundamentally differ from the European or international standards. UL has committed itself to adjust its own standards gradually to the international standards. This standardisation is happening and the process is still ongoing, for instance there is now an IEC 60730 and a corresponding UL 60730.

What does CSA mean?
CSA is an abbreviation for the Canadian Standards Association, which is a national approval authority in Canada. CSA and UL have co-operation contracts and within this framework they are able to test and certify in accordance with each other's standards. CSA is a non-profit association.

What is a CSA standard?
Many electrical engineering CSA standards were adopted by UL for historical reasons. This is still true for many standards today. Because of the adjustment to international standards (IEC standards in electrical engineering) unfortunately, there are currently different standards at UL and CSA for the same product.

How is UL approval testing carried out?
Before granting the UL approval mark, the products in question must be tested in accordance with the requirements of the UL standards. Compliance with UL requirements is ensured by regular inspections at all production facilities (follow-up service). One key aspect is the use of the released materials. All changes made to a product or in the production process are subject to approval.

What approval logos are applicable to E-T-A products?
Basically two UL approval marks are important for E-T-A, which are considered equal.

1. UL Recognized Component
This is the standard approval logo for components such as circuit breakers for equipment protection which are subjected to certain conditions in use (back-up fuses, covers etc.). Restrictions are registered in the approval.

Logo for US approval
(only to UL standard)

Logo for US and Canada approval
(to UL standard and Canadian CSA standard)

2. UL Listing
The approval mark for devices which meet the requirements of the applicable standard(s). The distinction between components and devices is not consistent in all respects. Hence some products carry both approval marks. Some customers consider the UL listing to be of higher value.

LISTED

Logo for US approval
(only to UL standard)

LISTED

Logo for US and Canada approval
(to UL standard and Canadian CSA standard)

What does CTDP mean?
UL's Client Test Data Program (CTDP) allows accredited laboratories to carry out approval tests in accordance with UL standards. E-T-A's laboratory is an accredited laboratory to run certain tests and is a CTDP member. Conditions for this accreditaton (personnel, test means, rooms, quality management) are reviewed during an annual UL audit.

No battery, but selective – can this work?

Dipl. Ing. Werner Rümpelein, Business Field Manager in the Division Communications & Systems at E-T-A

In power plants, it can be challenging to selectively and reliably protect communications technology against overcurrents. The unique supply requirements of the plants often cannot be met with standard circuit breaker technology.

*Intelligent power distribution system **ControlPlex®** Rack protects telecommunications technology in the control cabinet against system failures.*

This is the case in telecommunications applications in power supply companies, e.g. electricity, water or gas suppliers. In these applications, communications equipment is operated with AC/DC and DC/DC inverters installed in the control cabinet without additional battery buffers. This is done at minus 48V or minus 60V DC - the standard voltage in telecommunications. Due to the low available electric power capacity of the inverters used, a conventional circuit breaker cannot reliably disconnect in the event of a failure, or - at worst case - it would not disconnect at all. A circuit breaker requires a multiple of the rated current for a fast disconnection. Another problem is the continuous voltage dip at the AC/DC or DC/DC converter output. This can lead to a failure of the entire control cabinet installation and there is an enormous fire hazard due to the still flowing maximum current rating of the converter.

The solution to all these problems is E-T-A's ***ControlPlex®*** Rack intelligent power distribution system. It combines a modular power distribution system in a 19“ rack, which can have up to 9 ways redundantly or 19 ways non-redundantly, with the hot-swappable ESX300-S electronic circuit protector. In the event of a failure the ESX300-S electronic circuit protector limits the load current to a value presenting no problems for an AC/DC or DC/DC converter. It will reliably and selectively disconnect the faulty circuit within milliseconds without a voltage dip. This considerably increases system availability and reduces the risk of fire.

Another benefit of the intelligent ***ControlPlex®*** Rack is the integral interface in every circuit protector. Via a bus system and an additional control interface sub-assembly, it allows monitoring, remote control and measuring data recording with a management system. This offers a wealth of new possibilities such as a fully automated, parameterisable ON and OFF operation as well as a consistent recording of energy consumption and failure data.

*Electronic Circuit protector **ESX300-S***

More information? Just scan the QR-Code!

E-T-A solutions for many products

E-T-A offers tailor-made solutions for a wide range of industries and products. Here are some interesting examples.

Application: Voice communication system racks
E-T-A type used: ***Power-D-Box®***

Voice communication and information solutions in safety-critical areas in aerospace, railway, shipping, defense and transportation are the major field of business for the globally leading manufacturer Frequentis AG, located in Vienna. They use E-T-A's new ***Power-D-Box®*** 19BGT-S509 for standardising the power supply in the rack of a voice communication system. The ***Power-D-Box®*** was customised for this application. 150A each of two redundant DC 24 V power supplies are distributed to 13 load circuits A and B and are protected with E-T-A's 2210 (up to 16A) and 8340 (up to 50A) circuit breakers. The wide range of trip characteristics and the available current ratings allow protection of the individual loads. In addition this solution is now planned to be used in other applications including the flight control sector.

Application: Nut Roasting Machines
E-T-A type used: 3120 and 2-5700

MVS Metallverarbeitung Sondermaschinen GmbH, located in Garching near Munich, has over 25 years of experience producing high-quality nut roasting machines called Mandelprofi for indoor and outdoor purposes. The best-selling product in their range is an elegant table unit called mini electric (type MPM/E) which is suitable for a multitude of usages because of its compact design and its versatility, e.g. in shopping malls, railway stations and festival halls. For overcurrent protection in these devices, MVS uses E-T-A's 2-5700 and 3120 circuit breakers. The 2-5700 protects the heaters and the 3120 circuit breaker protects the mixer motors of the roasting machines. The 3120 circuit breaker also serves as the ON/OFF switch for the mixer unit. Both E-T-A circuit breakers carry international approvals allowing them to be used in applications all over the world.

Applications

Application: Photovoltaic system on the roof of a family home
E-T-A type used: PVSEC-...

The Schäfer family, living in Reith near Langenlois, has made another step towards CO_2-free energy generation by installing a 4.5 kWp on-roof solar installation. The photovoltaic system complements the existing heat pump with deep drilling and now provides high energy efficiency. For disconnection of the PV generator according to the ÖVE directive R11-1 they installed the E-T-A's PVSEC-... firefighter switch. All DC cables installed in the house can be switched to zero potential.

The PV system as well as th heat pump were installed by SCHNAUER Energie-, Solar und Umwelttechnik GmbH & Co KG, located in Krems in Austria. They specialise in renewable energy and design and install highly efficient systems. They have 34 people on the payroll and serve customers in Vienna and many Austrian regions.

Application: Electrotaxi
E-T-A type used: HVDC-Relais

TUM CREATE is a successful co-operation between the Singapore Nanyang Technological University and the Technical University Munich (TUM) and is sponsored by the Singapore National Reseach Foundation. EVA is an electric vehicle designed particularly for the requirements of taxis in tropical mega-cities. The technical data and the innovative features are impressive. They include battery technology allowing a 15-minutes fast re-charge and a cruising range of 200 km. Prototypes of E-T-A's HVDC relay are fitted in the vehicle. They connect the HV battery to the HV electrical network. Compared to other technologies, E-T-A's HVDC Relays offer very efficient suppression of arcs without the use of protective gas. In addition the relays have a preferential direction of current flow. The relays have already impressively proven their suitability for the use in vehicles.

PowerPlex® – The time has come
Sailing into the future

*Minor differences play a major part in global competition. All over the world, shipbuilders and manufacturers of special and recreational vehicles rely on **PowerPlex**® and benefit from this decision.*

There are many reasons for choosing ***PowerPlex***®, including smart power distribution, control and power management in electrical installations:

- **A wealth of combinations:** maximum flexibility of the system through modular design
- **A range of configurations:** be free to choose and create your own application-specific logics
- **Tailor-made visualisation:** countless possibilities to design your individual user surface
- **Ease of telemaintenance:** cost-effective opportunity of remote maintenance

*The overall concept of **PowerPlex**® satisfies all users who find standard solutions no longer attractive.*

OY Nautor AB, located in Jacobstad, Finland, is one of the most renowned shipyards for luxurious sailing yachts. They have manufactured the famous Nautor's Swans since 1966. Four years ago, the Swan 60 represented the corner stone for a new model philosophy - future and origin in one and the same model. In addition to using the latest-state-of-the-art materials, Nautor used ***PowerPlex***® to install the entire on-board electrical system for the first time. The intelligent bus system extended the on-board functionality, enhanced reliability and helped reduce the weight by 30 percent compared to conventional wiring. Another deciding factor for Nautor to choose ***PowerPlex***® was the entire system installation. From the configuration to the visualisation of the touch panels, it can be done independently by their staff in the shipyard.

Setting the sails: Nautor's Swan 60. It helped Nautor to sail into the future with traditional strengths.

Weitere Infos? Einfach QR-Code scannen!

Typically Finnish
»Kirjolohikeitto – Finnish Salmon Soup«

The Finnish salmon soup is a very typical dish in Finland, which - by the way - is one of the most sparsely populated countries in Europe. The Finnish people enjoy their Lohikeitto during every season. They love it especially the day before the midsummer's eve.

»Kirjolohikeitto« – the Finnish salmon soup is a light dish and easy to prepare.

A very famous version is the salmon soup is served in the Café Esplanat at the Esplanadi in Helsinki. Many families also have their own traditional, but very individual, recipes handed down from generation to generation.

The soup is easy and quick to prepare and is ready within half an hour.

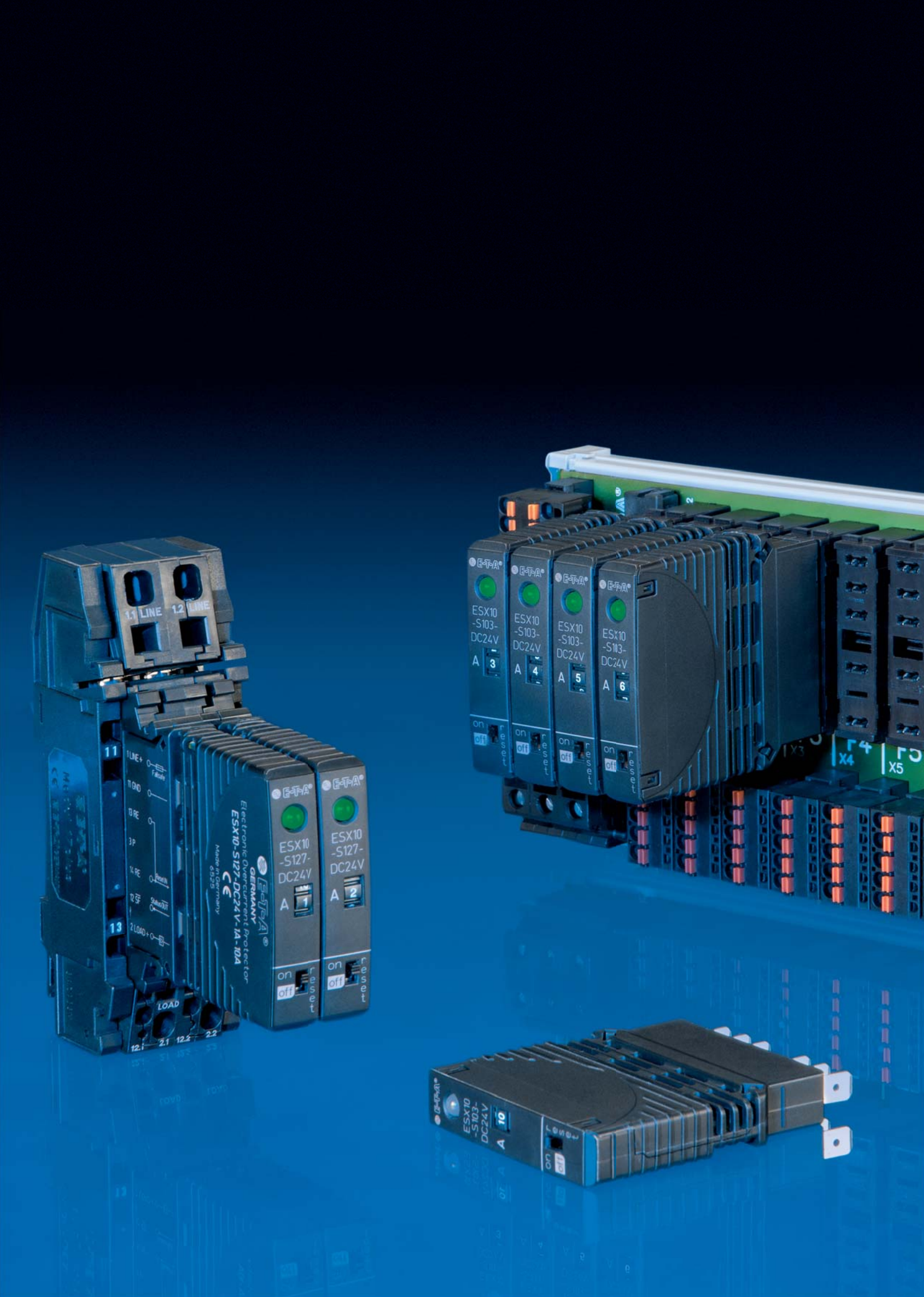
Peel onions, potatoes and carrots and cut into cubes. Fry the onions and carrots lightly in some butter. Add potatoes, the bay leaf and the pimento. Add water and cook potatoes until they are done. Finally add the vegetable stock, dill and single cream. Put the medium-sized salmon pieces into the stock and let them simmer for about five minutes. Serve garnished with additional fresh dill.

Often the soup is prepared with rainbow trout instead of salmon. Then the fish is a bit more tender.

Then the only thing left to do is:
„Hyvää ruokahalua“ or **„Enjoy your meal“**.

Ingredients

- 600 g salmon fillet or salmon trout
- 600 g waxy potatoes
- 1 litre milk
- 1 litre vegetable stock
- 2 medium-sized onions
- 2 carrots
- 1 tbsp butter
- 1 bay leaf
- salt and pepper
- 1 bunch of dill, chopped
- pimento
- single cream


1.1 LINE
1.2 LINE
ESX10
-S127-
DC24V
ESX10
-S103-
DC24V
ESX10
-S113-
DC24V
on
off
reset
LOAD
X4
X5