

LESS IS MORE

E-T-A power entry modules help save costs.

IN THE DIGITAL LEAD

According to the F.A.Z.-Institut, E-T-A is one of Germany's digital innovation leaders

CPC20EN *ControlPlex*[®]

CONTROLLER

Internationally communicative

ControlPlex[®] RACK

Intelligent solution for power distribution and overcurrent protection

ARRIVED DOWN UNDER

MPR20 monostable electro-mechanical power relay



IN THE DIGITAL LEAD

According to the F.A.Z.-Institut,
E-T-A is one of Germany's innovation leaders



The pandemic has made us aware once again: without the digital world, our togetherness would simply no longer be possible. This supports our decision to clearly focus on digitisation. Not only with our products, but also our processes. So, no wonder we already have a large number of patents in the digital area.

The F.A.Z.-Institut, a subsidiary of the renowned »Frankfurter Allgemeinen Zeitung«, awarded E-T-A with the coveted certificate »Deutschlands digitale Innovationsführer (Germany's digital innovation leaders)«. According to this award, innovation leaders are companies and research institutions that distinguish themselves through two central characteristics:

- They are extremely innovative.
- Their innovations significantly influence the corresponding innovation field. They lead the innovation competition.

Based on the patent applications of 150,000 companies operating in Germany, the study paints a unique and highly differentiated picture of the type and technological orientation of innovations and their inventors. The researchers evaluated not only the number of patents, but also their relevance. We are very proud of this award and take it as confirmation of the course we have pursued for a long time. Because our products protect lives and values and are on the cutting edge with their features and capabilities. Also, to support your project and make it even safer.

Do you have any questions? 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

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IMPRINT

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CPC20EN *ControlPlex*® CONTROLLER

Internationally communicative

Automation production facilities are often planned differently based on regional requirements. This is due to historical developments and the different distribution of automation manufacturers.

The type of communicative bus systems used in plant engineering highly depends on the geographical region. EtherNet/IP is often used in international automation solutions. This bus system is used by large international companies, for example in the automotive and process industries. Therefore, the availability of different connection options for the intelligent protection and power distribution systems is particularly important. E-T-A fully meets this requirement with its new CPC20EN bus controller for connecting to EtherNet/IP bus systems.

Increasing system uptime with greater transparency

Stable production processes and

producing consistently high quality goods are important indicators of successful companies. The DC 24 V voltage level plays a central role here. A multitude of different components, e.g. sensors, pumps and valves are supplied by this voltage level and must be reliably protected.

The CPC20 bus controller ensures necessary transparency in the process. The circuit protector collects the measured values, displays them on the integrated web server and transmits them to the control systems. This gives the operator an overview of the current situation of his DC 24 V power distribution and allows him to troubleshoot at an early stage in case of

undesirable developments. An important indication is the current flowing through the circuit protector. It is continuously recorded. This means that deviations in current consumption can be detected very quickly.

Another tool is the adjustable limit value for each channel. If this is exceeded, a warning message is generated which is displayed directly on the circuit protector and transmitted to the superordinate control units. This gives maintenance personnel the opportunity to take action before a malfunction occurs and avoids system downtimes. Another tool is the oscilloscope function, which displays the load current in correlation to the load voltage and gives maintenance



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personnel data about the cause of the tripping. In addition, the ESX60D is fully parametrisable. Automatic parametrisation to the specified current rating simplifies device replacement and reduces stocking requirements.

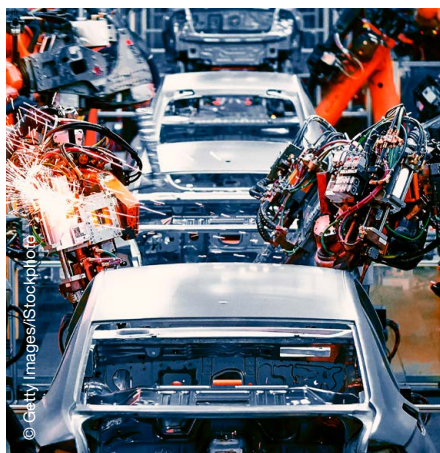
High flexibility thanks to the 18plus module

In addition to the CPC20 bus controller and the electronic circuit protectors, the

CPC20 **ControlPlex**® system includes the 18plus-CP power distribution module. This modular system offers customers high flexibility. Due to its plug-in design, the system can be easily adjusted to changing system configurations at any time. If system extensions are necessary and further loads are added, these can be protected by adding new circuit protectors. These are plugged into the prepared reserve

sockets; it is not necessary to switch off, or even mechanically modify, the power distribution. This saves time during reconfiguration and reduces interruption times. The 18plus power distribution system has a current carrying capacity of 80 A and meets all requirements in plant engineering.

EtherNet/IP™



© Getty Images/Stockphoto



CPC20 ControlPlex® system: 18plus power distribution module and ESX60D electronic circuit protectors

LESS IS MORE

E-T-A power entry modules help save costs.

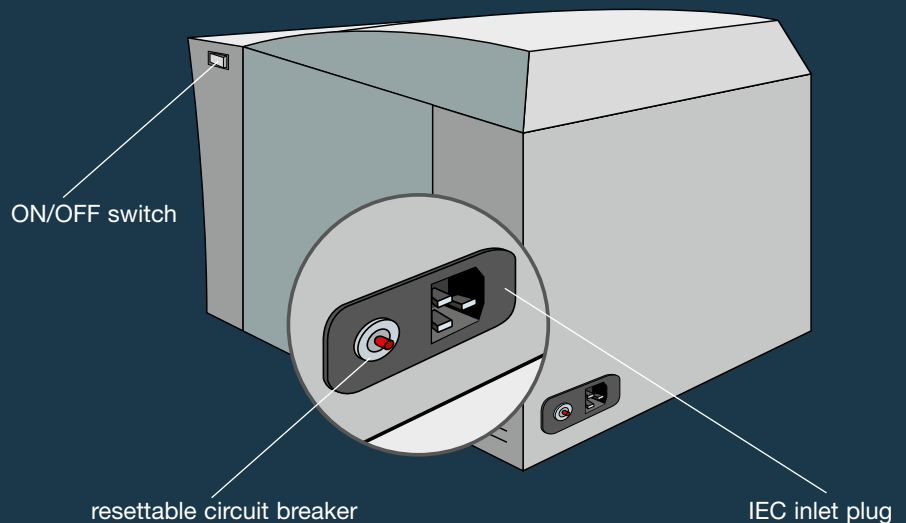
Systematically reducing components is a major reason for a successful cost-saving design. Obvious, yet often overlooked: at the power input of a machine or device, the designers can significantly reduce the number of components used by specifying power entry modules.

High-quality devices and machines for the office, measurement technology, information technology and medical technology are generally equipped with IEC 60320-compliant inlet plugs on the power input side for AC current. Due to a separately required power cable with a coupling element and plug for the installation socket, this solution, compared to products with permanently installed power cables, is more expensive, but offers many advantages.

Most of these devices are sold and used worldwide, so they must be adapted to country-specific power supply line requirements. In this example, it is easily done by including different power cables with push-in connectors for Germany, the UK or the USA. Power entry modules also make it possible to replace power cables within seconds if a cable breaks, thus eliminating the time-consuming step

of disconnecting old supply lines and reconnecting new ones.

For practical reasons, the power switches on devices and machines where operating personnel have to switch on and off frequently are usually designed on the front. In these cases, fuses with fuse holders are often used as overcurrent protection in conjunction with the inlet plug.



Make one out of five

Here, the number of individual components can also be reduced on the power input side. This solution includes an power entry module with integrated resettable circuit breakers, i.e. purely resettable circuit breakers without a manual on/off function. An example of this is E-T-A's brand new XR38 series.

E-T-A's XR38 series power entry module combines a C14 inlet plug and an E-T-A single or double pole resettable circuit breaker in a single component. The modules replace the IEC inlet plugs, fuses and fuse holders, that would otherwise be installed individually. In the case of a two-pole

fuse, this would be five components.

Unlike fuses, the circuit breakers used here can easily, safely and conveniently be switched on again after an overcurrent trip. Just one »click« is enough.

Customers have a choice of five resettable circuit breakers from the E-T-A portfolio. Based on the electrical equipment requirements, customers can choose the most appropriate circuit breaker for each case. In addition to four thermal circuit breakers, the 8330 single or double pole hydraulic-magnetic circuit breaker is available especially for medical applications.

Your benefits

- Reduced assembly and wiring effort (up to 90 %)
- Reduced material planning and storage costs
- Increased uptime:
The overcurrent circuit breaker can be easily, safely and quickly switched on again after tripping. Fuse replacement is eliminated.
- High reliability: In the event of a fault, multipole circuit breakers always disconnect the circuit across all poles, thus preventing the risk of electrocution to the user of the device.
- Reduced costs for procurement, inventory management, disposal and service compared to solutions with fuses.



Make one out of five: XR38 power entry module replaces a IEC inlet plug, two fuses and two fuse holders





PROTECTION SOLUTIONS

for the future

Stefan Fischer,
Head of electrical design
at WEBER company



For almost 100 years, the WEBER company in Kronach stood for perfection in mechanical engineering and convinced customers from all over the world with quality products in extruder and grinding technology. The Current spoke to Stefan Fischer, Head of Electrical Design, about its cooperation with E-T-A, the use of the protection solutions and planned future projects.

Current: Mr Fischer, for some time now, you have relied on the REX12-T electronic DC 24 V circuit protectors. What convinced you?

Stefan Fischer: In addition to a technically high-quality and modular protection solution, we were looking for a reliable partner to support us during, and also after, the design-in phase.

Current: How do you describe the cooperation with E-T-A?

Stefan Fischer: The cooperative partnership and technical understanding are unique in the market. This allows us to achieve our high quality goals.

Current: What made the difference?

Stefan Fischer: We analysed our application together with the specialists from E-T-A, selected the components and also examined them metrologically in the real application. The overall package tipped the scales in favour of a smooth series launch.

Current: Are you planning further joint projects with E-T-A?

Stefan Fischer: Yes, in addition to extruder technology, we are also planning to equip our grinding technology machines with this innovative protection technology this year.

Current: What added value do you expect from this project?

Stefan Fischer: In addition to the selective protection, we would also like to move towards Industry 4.0 in the DC 24 V area with E-T-A. The intelligent REX12D-T circuit protectors, together with the bus-capable **ControlPlex**[®] controllers offer maximum transparency and the basis for fast start-up and remote diagnostics.

Current: What concrete benefits does this offer Weber?

Stefan Fischer: Highest efficiency. This is how we want to safely master future market requirements to continue to keep the focus on the customer.

Current: Thank you for your time.



PERSONNEL

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.

Stefan Gleinig

Stefan Gleinig joined the Automation & Process Control division in October 2020 as an application developer for control and automation technology. In addition to his engineering degree in electrical engineering, he has a lot of practical experience in operating and control technology of industrial systems. The focus of his activities is in the field of **ControlPlex**[®] intelligent power distribution systems, which are connected to various fieldbuses such as PROFINET, EtherCAT, Ethernet/IP, etc. His main focus is PLC programming, system testing and creating visualisations and functional modules for demanding control tasks. Another focus is the technical support of our international customers and sales partners in using **ControlPlex**[®] systems in machine/plant construction and in the process industry.



Elena Sterk

Elena Sterk joined the company as patent engineer in June 2020. After graduating with a degree in patent engineering, she gained a lot of experience in the patent department of a large automotive supplier. At E-T-A she is the contact person for all questions about industrial proprietary rights. It is important to protect all E-T-A's developments with patents, designs, trademarks or by keeping the knowledge confidential. Her other main tasks include patent searches and analysis to ensure the freedom-to-operate.



FAQ

Frequently Asked Questions

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

Different applications have different technical demands on switchgear. A suitable selection of switchgear together with auxiliary and control contacts is not easy. In order to keep the selection and documentation as simple as possible for the user, we answer frequently asked questions about switch types, and electronic symbols in the following.

1.1 What switch types and electronic symbols can be distinguished?

Function and operating parameters define the switchgear to be used and the switching contact. IEC 60947 Part 1 provides an overview of switchgear and their requirements. For switchgear, IEC 60617 Part 7 specifies different electronic symbols for documentation in circuit diagrams and wiring schematics. As example, electronic symbols for three basic switch types are shown below.

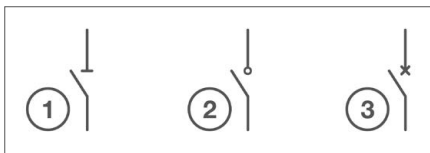


Fig. 1: Electronic symbols of different switch types

Figure 1-1 shows a disconnector to IEC 60947 part 3. The next electronic symbol in figure 1-2 is assigned to a load switch. Finally, figure 1-3 shows a high performance circuit breaker to IEC 60947, part 2. In most cases, there are mixed forms of these three basic switch types

SWITCHING CONTACTS, AUXILIARY CONTACTS, CONTROL CONTACTS... ... and how to use them.

1.2 What is the difference between physical isolation and insulation function?

Mechanical switching contacts disconnect an electrical circuit in the “open” switching status. Physical isolation means, that the circuit is disconnected by an insulator. In many cases, the insulator is air. Not all physical isolation meets the insulation function requirements.

1.2.1 What is a switch with insulation function?

A switch with insulation function is required for working in electrical systems in dead-voltage condition. It is the only switch that allows insulation of its terminals according to IEC 60947 Part 1. The position of the main contacts must be identifiable by a positively driven indication or the contacts. This means directly visible via a "switch position indicator" or recognisable via a positively driven detector. In addition, an insulating contact must meet the requirements for creepage distances and clearances according to IEC 60664 Part 1.

1.3 What is the difference between auxiliary contacts, mirror contacts and digital outputs?

According to IEC 60934 auxiliary and control contacts are moved by the main switch. Figure -2 shows such a configuration.

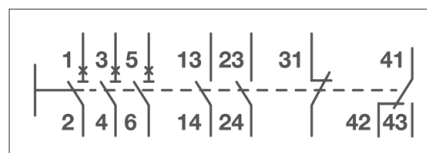


Fig. 2: Industrial relay contacts and their marking

The terminal marking for individual components is defined to IEC 60947, Part 1, Annex L. Please note that if input

and output are to be marked, the smaller number always corresponds to the input. In the case of the main contacts, it is a three-pole circuit breaker with insulating function. The main contacts are marked with individual numbers.

1.3.1 What are auxiliary and control contacts?

The auxiliary and control contacts have a single digit and a sequential digit for identification. The single digit is the function digit. The next digit is the tens digit. Single digits .3 and .4 are assigned to make contact elements. Single digits of type .1 and .2 are assigned to break contact elements. The change over contact elements 41, 42 and 43 are assigned according to their individual function.

1.3.2 What for are mirror contacts or positively driven contacts needed?

A mirror contact is a special form of auxiliary or control contact according to IEC 60947-4-1. It is an auxiliary break contact to a main make contact. The two contacts are coupled so that they are never both closed at the same time. A mirror contact enables reliable monitoring of the main contact. In the case of positively driven contacts, these are auxiliary contacts. An auxiliary break contact and an auxiliary make contact form a positively driven contact pair.

In the case of positively driven contacts, there are always only two auxiliary contacts. An auxiliary break contact and an auxiliary make contact form a positively driven contact pair.

ControlPlex® RACK

Intelligent solution for power distribution and overcurrent protection

Smart power management and plant protection for communication technology. The new External Alarm Interface enables the integration of external sensors.



Michael Bindner
Product Manager
Communications Systems

Consistent availability of the internet is essential - both privately and professionally. Without an internet connection, internal and external communication from email to voice over IP telephone breaks down. Especially in the backbone network, such failures have dramatic consequences for entire areas. Intelligent power distribution systems such as the **ControlPlex®** Rack are a core component in providing the Internet. They reliably supply the technology required for this, such as fibre optic routers, with power and protect them against overcurrent and short circuits in the event of a fault. In addition, the system offers smart control and monitoring technology.

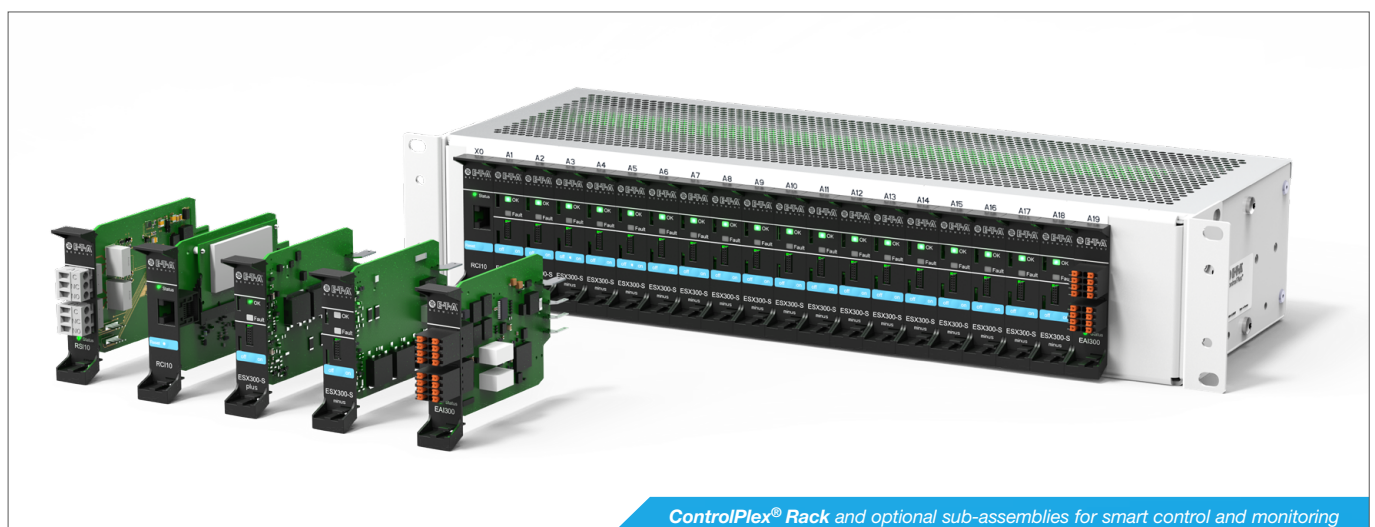
E-T-A's new EAI300 (External Alarm Interface) module expands the scope of the **ControlPlex®** Rack system by recording external sensor data and alerting the management system. The I/O module offers eight digital inputs, one analogue input and two digital relay outputs, that can be used to monitor temperature sensors, fire detectors or door contacts. This creates the best possible system transparency and allows fast intervention in the event of an alarm.

Another new feature is the programming of logical actions. This links operating states of the ESX300-S electronic circuit protectors with external encoder signals

and enables automated switching. A real world application example would be the automatic switching on of an additional fan in the IT cabinet as soon as the temperature sensor reports a critical value.

Thanks to the modular design of the **ControlPlex®** Rack system, these functions can now be used without occupying valuable height units in the system cabinet with additional hardware. The EAI300 can simply be plugged into free slots instead of ESX300-S electronic circuit protectors and is ready for use in plug-and-play mode.

Scan the QR code to access the product video



ControlPlex® Rack and optional sub-assemblies for smart control and monitoring

E-T-A SOLUTIONS for many products

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

Here are some interesting examples.

For more
information
please scan
QR code



ELECTRONIC SWITCHING FOR MAINTENANCE-FREE OPERATION

The Brandt Kühlfahrzeugbau company from Barntrup in North Rhine-Westphalia is known for reliable and intelligent solutions in the refrigerated vehicle construction industry.

The self-sufficient energy supply of the vehicle body, for example for moving the tail lift, is as important as the cooling of the body itself. Without a closed tail lift, the vehicle cannot drive.

In the past, the auxiliary batteries were recharged via a relay and fuse box while driving. However, the relay caused

annoying failures due to the continuous current and the relatively high on-board voltage during driving.

The EPR10 electronic power relay solved this issue. Thanks to its integrated overcurrent protection and the high protection class, the complete power distribution box could be omitted. This significantly reduces space requirements, system costs and installation effort. The extremely low drive current of only 4 mA and the almost unlimited number of switching cycles are also very beneficial. Therefore, the EPR10 now provides a reliable and maintenance-free power supply for the vehicle body.

"The EPR10 convinces with its compact design and high wear resistance and also reduces our assembly effort."

Nico Berthold, Electrics – Brandt Kühlfahrzeugbau



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KÜHLFAHRZEUGBAU

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SPACE-SAVING PROTECTION

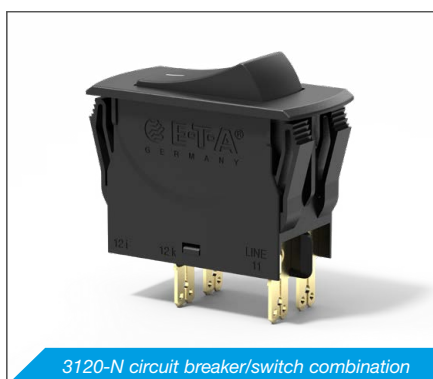
VITA Zahnfabrik - since 1924, this name has stood for quality and solution expertise like no other in the dental industry. To this day, the needs of dental technicians, dentists and patients are consistently a priority.

VITA products produce high-end prosthetics that can confidently compare to natural teeth. Whether plastic teeth, veneering materials, CAD/CAM blanks or pressable ceramics, furnaces or dental materials - VITA offers products that users from more than 150 countries trust.

VITA Zahnfabrik uses E-T-A's 3120 circuit breaker switch combination for overcurrent protection and switching on and off the VITA ZYRCOMAT 6100 MS sintering furnace. This protects man and machine from dangerous overload or short circuit.

The HighSpeed sintering unit from VITA is used for sintering dental ceramic framework materials based on ZrO₂ up to a temperature of 1600 °C. It guarantees users the highest reliability and quality.

They selected E-T-A's 3120 circuit breaker switch combination for several reasons. It combines the on/off switch with protection in a single device. This saves valuable space in the sintering furnace, and also saves wiring time and reduces the number of components used.



3120-N circuit breaker/switch combination



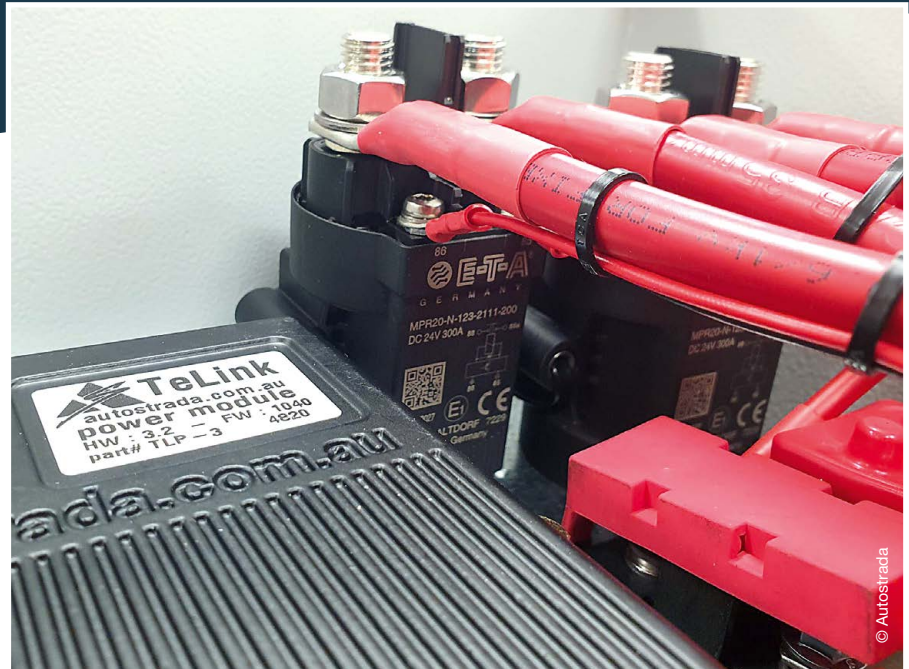
For more
information
please scan
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ARRIVED DOWN UNDER

MPR20 monostable electro-mechanical power relay

Autostrada Accessories is a Brisbane-based automotive electronics company that manufactures and supplies digital control systems, speed governors, motor and speed controllers for the OE and OEM markets, as well as large fleet operators such as utilities, mining and emergency services.



Autostrada's TeLink system uses E-T-A power relays integrated into the battery management and emergency control system.

One of Autostrada's key products, TeLink, is a digital control system that can be integrated seamlessly into a vehicle's CAN operating system. Additional functionality, safety, monitoring and control functions included. TeLink systems are used in a wide range of utility vehicles and basic supply vehicles, where efficiency and reliability are critically important.

Part of Autostrada TeLink is the provision for a dual battery operating system that supplies auxiliary power for all the vehicle's auxiliary and safety equipment such as motor and speed control, emergency start, communication systems, signal lamps, driving lights, working lights, etc.

The TeLink system uses E-T-A's MPR20 power relays integrated into the battery management and emergency control system. The

MPR20 isolates the auxiliary battery from the main battery in the battery management system during normal operation and connection of the auxiliary battery to the vehicle charging system via the TeLink control.

In addition, E-T-A's power relays are used to provide an "Emergency Battery Linking" function that allows the vehicle operator to overrule the auxiliary battery disconnection rules and connect the batteries. This provides additional starting power to start a vehicle when the main battery is discharged below the threshold value required to start the vehicle.

E-T-A's MPR20 was selected for the TeLink system because of its robust and compact design, its wide operating parameters and ability to carry large currents for a high number of switching cycles.

For more information please scan QR code



MPR20 Electronic power relay

CULINARY DELIGHTS

Delicacies from all over the world

»LAMINGTON«

Australian sponge cake

Lamington is an Australian sponge cake made from a sponge cake mixture with sugar, butter, egg and flour.

Preparation

Preheat the oven to 180 °C top/bottom heat, grease a baking dish and set aside. Tip: Use a square baking pan with high sides.

For the dough, mix the flour with the starch, sift twice and set aside. Separate the eggs and beat the egg whites with the pinch of salt and the sugar in a bowl until they form a firm white mass. Let the sugar slowly trickle in. Whisk the egg yolks briefly and carefully add to the egg white mixture until just combined. Fold the sifted flour mixture into the dough.

Mix the butter with the hot water until it has dissolved and add to the rest

of the dough. Carefully mix everything together again. Then pour the mixture into the prepared baking pan. Bake the dough at 180 °C top/bottom heat for 25 minutes. Let cool completely.

Topping

Mix the icing sugar with the cocoa and sift. Stir in the water, the melted butter and the vanilla bean. Cut the dough into cubes (approx. 6 x 6 cm). Fill a plate with coconut flakes and dip the dough cubes one by one into the sauce and roll them in the coconut flakes on all sides. Place on a sheet of baking paper to dry.

Dough

- 3 eggs
- 240 g extra fine sugar
- 240 g flour
- 1 pinch of salt
- 3 tsp boiling water
- 1 heaped tsp starch
- 1 tsp butter

Topping

- Pulp of a vanilla pod
- 4 tsp cocoa, unsweetened
- 240 ml hot water
- 2 tsp melted butter
- 200 g coconut flakes
- 240 g icing sugar



Typical Australian:
»Lamington«



20 YEARS ELECTRONIC OVERCURRENT PROTECTION

E-T-A invented it

Automation is no longer conceivable without electronic overcurrent protection - a groundbreaking innovation developed by E-T-A, the world market leader.

Even then, only E-T-A could offer all forms of protection. And today, when it comes to electronic overcurrent protection, you can only get a customised solution from E-T-A:

- Rail mounting
- Pluggable
- With or without physical isolation
- Single or multi-channel
- 12, 24 or 48 V

Do you have any further questions? Please contact us or visit:
www.e-t-a.de/e_schutz/

We are social! Find us.

