A clever way to save space
Circuit breakers with integral auxiliary contacts

Reliability counts.
Why you can rely on a strong brand.

Next Generation: ControlPlex® Controller CPC20

The smart ConAG relay EXR10 solid state relay

Compact and robust 1658 resettable circuit breaker protects fans.
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Impressum
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Elektrotechnische Apparate GmbH

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Reliability counts.

Why you can rely on a strong brand.

Maybe this occurs to you as well sometimes: You feel like trying a new supplier, a new offer - this can sometimes be reasonable or attractive. But in some respects it’s important that you can 100% rely on a supplier. Experiments can be risky business when it comes to safety and reliability - values that no one wants to compromise.

Because of this, we often have repeat customers relying on the E-T-A brand for many years. They know E-T-A is synonymous with unrivalled reliable, high-quality engineering. Any product or system using E-T-A devices becomes better and more reliable. For seven decades E-T-A has protected the lives and values of our customers and we consider this the quintessential responsibility of our business. Anyone responsible for protective components simply cannot afford to choose a cheaper product and put safety on the line. In the end, there is much more at stake than a slight price difference.

This is why the E-T-A brand matters so much to us. We truly want to ensure that you can rely on E-T-A - always, everywhere and without hesitation. Whenever you make this decision. Choosing E-T-A becomes even easier with our expertise in engineering innovations and our globe-spanning network - we are always within reach for our customers. And we are a fair partner, without reservations or conditions. And one thing remains at the centre of it all: We protect the lives and values of our customers. And this is a fact: You can rely on the E-T-A brand.

Do you have any questions? Please get in touch. 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.
CPC20 bus controller, **Module 18plus** power distribution system and **ESX60D** electronic circuit protector

**Next Generation:**

**ControlPlex® Controller CPC20**

Digitisation of industrial work areas is evolving. Individual products, short lead times and international competition pose new challenges to industrial production. One reason could be the rising degree of digitisation in the production environment. A vital requirement is the consistent data availability throughout all levels.

**CPC20 bus controller offers comprehensive interfaces**

The new **CPC20PN** bus controller of the intelligent **ControlPlex®** product group is absolutely up to the task. Besides standard field bus connection, i.e. via Profinet (CPC20PN), it also offers optional communication via OPC UA and MQTT. The integral web server also allows quick and convenient data collection and analysis. This ensures unrivalled transparency in the DC 24 V power supply and quick detection of deviations in the current consumption of the various loads. It allows users to resolve deviations from standard conditions before a failure occurs. Condition monitoring leads to improved machine uptime and a stable production process. In the event of a failure, remote access to individual **ESX60D-S** electronic circuit protectors helps significantly reduce downtimes. The software can identify the causes of failures such as short circuit or overload by analysing the trip behaviour and can help the service staff with trouble-shooting.

Trouble-shooting in the event of a short circuit should start in or near the control cabinet, because it is most likely a supply line was damaged or that a component is defective. If the electronic circuit protector tripped because of an overload, search for the root cause of the failure should start at the connected load. This leads to faster failure detection and a quicker system re-start.

**Module 18plus for a flexible and modular design**

The modular design of the **Module 18plus** allows system flexibility which can be tailored to user’s requirements. The **Module 18plus** is directly connected with the **CPC20**. The system allows power distribution of up to 80 A. Supply is via the supply module. The output modules are protected by **ESX60D-S** protectors with
push-in terminals are directly assigned to the individual load circuits. This saves valuable wiring time and guarantees a clear layout of the DC 24 V power distribution.

The new ESX60D: space-saving and smart
The new ESX60D-S electronic circuit protector is a plug-in type and has room for two channels in a width of only 12.5 mm. These can be adjusted in a current rating range from 1 to 10 A via the CPC20 bus controller, allowing maximum flexibility and minimal complexity. Active current limitation enables the protection of any load. This is also true for long cable lengths, i.e. in plant engineering and construction, and their associated problems.

ControlPlex® Tools ensure fast integration
We supply all required software components that allow integration of the system in all standard project surroundings free of charge. This allows quick system installation and easy start-up.
If an MCB installed in private apartment trips, for instance if too many electrical loads were inadvertently connected to a power strip, the residents will notice that immediately. The lights go out; the TV set is muted and kitchen appliances stop operating. This may be annoying, but normally does not have any catastrophic consequences. The tripped circuit breaker can quickly be identified and reset in the fuse box.

In industrial manufacturing environments, this is completely different. A tripped circuit breaker can cause entire production lines to come to standstill. Therefore, quick trouble shooting and resolution are incredibly important. The snag: in such a surrounding, there can be hundreds of circuit breakers installed for equipment protection. The question is now: How to quickly identify which of them tripped? And the solution is: The circuit breaker gives either a visual or an acoustic signal and ideally, this alarm is also forwarded to the control room. This can work with auxiliary contacts. It is a second contact system, physically isolated from the main contact system of the circuit breaker. Its contacts open or close in the event of an overcurrent trip because it is coupled with the main contact system. Numerous alarms and sequential circuitries - such as parallel or series connections - can easily be implemented.

Therefore, many MCB manufacturers offer auxiliary contact modules. They can be mounted side-by-side with the MCB and can easily be coupled with the circuit breaker. However, the add-on module requires additional 9 mm of space. What can be done if space is limited? The solution is a circuit breaker with integral auxiliary contacts. For example E-T-A’s 2210-S thermal-magnetic circuit breaker. The auxiliary contacts are included in the standard device and do not require additional space, even though the 2210 circuit breakers feature a standard width of only 12.5 mm. Compared to MCBs with auxiliary contact modules, this equates to approximately a 50% reduction in space.

In apparatus and machine construction or in medical equipment, space often is at a premium. These applications often only require pure overload protection, E-T-A also offers purely thermal circuit breakers with integral auxiliary contacts. For example E-T-A’s 2-6400 offers two integral auxiliary contacts. Another best-selling product in the E-T-A range is type 104. It is as small as two sugar
cubes and is the smallest thermal circuit breaker in the world with integral auxiliary contacts.

The 104 has robust standard blade type terminals. It can also be specified with soldering pins for PCB mounting. The auxiliary contacts of type 104 indicate overcurrent tripping to the controller which can subsequently initiate any required action, for instance more disconnections.

Your benefits

- Compared to MCBs, the 2210 with integral auxiliary contacts requires 50% less space.
- The 2-6400 thermal circuit breaker features a very compact design, but holds two integral auxiliary contacts.
- E-T-A’s 104 thermal circuit breaker is the smallest thermal circuit breaker in the world with integral auxiliary contacts.
Using **ESS31-T** electronic circuit breakers in brewery systems

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## Safety for superior quality

The **Warsteiner Brewery** was founded in 1753 and is one of Germany’s largest privately owned breweries. Their flagship is the Warsteiner brand, one of Germany’s leading pilsner brands. We talked to Erik Fechner from the Engineering & Support / Projects & Maintenance Department about the protection of the brewery equipment with E-T-A’s electronic circuit breakers.

**Current:** How did you find out about E-T-A circuit breakers?

**Erik Fechner:** E-T-A Elektrotechnische Apparate GmbH is one of the leading companies for circuit breakers for equipment protection and circuit protectors. We talked to E-T-A for the first time at the 2016 Hanover Fair. Guidance and advice on site was very good and above all comprehensive. After we processed all information gained during our discussions at the fair, we had the opportunity to discuss all operational requirements with an E-T-A sales engineer who helped us to select the suitable product.

**Current:** Where do you install E-T-A’s circuit breakers?

**Erik Fechner:** We specified the ESS31-T electronic circuit breaker as our new factory standard. It will now gradually be introduced in all areas of our plant.

**Current:** What is your experience with E-T-A circuit breakers so far?

**Erik Fechner:** Our experience with the circuit breakers is very positive throughout. We particularly like the electronic trip curve including the active linear current limitation. In the event of a short circuit or overload, it responds faster than the switch mode power supplies we use. The supply voltage remains stable. Only the faulty load path is selectively disconnected. It significantly contributes to our system availability and reliability.

**Current:** Why did you choose the ESS31-T, i.e. an electronic circuit breaker with physical isolation, and not “only” an electronic fuse?

**Erik Fechner:** The determining factor was our internal requirement for physical isolation to reliably eliminate leakage currents. Conventional electronic fuses do not offer this safety feature.

**Current:** Thank you for your time.
"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.

Yoshihiko Kihara
In June 2017 Yoshihiko Kihara (41) joined E-T-A Japan to further develop “Transportation” market in a systematic and structured way. His major task, besides his regular sales tasks, is to identify new business opportunities as well as manage existing accounts in the automotive sector.

Yoshihiko Kihara graduated in Japan and he has a wealth of technical experience from his previous roles. His capabilities and personal qualification will certainly help him advise our customers technically as well as benefit from the international co-operation with his global colleagues.

Konrad Sörgel
In September 2017, Konrad took over the marketing management of the medical equipment, professional tools and apparatus engineering markets. Besides further developing these markets, he will also look at extending the product range.

Konrad studied business administration in Munich. Apart from comprehensive experience in international marketing in the industry, he also has sound technical understanding. With this background, Konrad will be able to develop appropriate solutions for the customers in his focus markets.

Philipp Teepe
In June 2017 Philipp Teepe became Business Field Manager for trucks and buses in the Transportation Division. He studied industrial engineering and management in Esslingen as well as B2B marketing in Berlin. He came to E-T-A with a wealth of experience in sales and marketing of automation solutions for machine and panel builders as well as electrical drives for utility vehicles and special vehicles.

It is Philipp’s goal to support E-T-A customers worldwide in the truck and bus market with custom protection solutions and innovative new products.
FAQ

What does »all pole breaking« mean?

In everyday life, we often use technical terms that we no longer think about because they have become common vocabulary. One of these expressions is “all pole breaking”. What are the relevant standards?

Concerning DIN VDE 0100², the PEN conductor in a TN-C system cannot be disconnected or switched off. Every active conductor must be disconnected. The exception is the neutral conductor in the TN-S system. However, disconnection of all active conductors including the neutral conductor is recommended for the TT system. Hence a four-pole disconnection is recommended, and the breaking pole for the neutral conductor must open late.

What is »all pole breaking« of DC voltage?
The DIN EN 50162³ requests complete isolation and all pole (L+ and L-) protection with ground-fault monitoring for unearthed systems. This means that both conductors must be disconnected from the supply system in the event of a failure. Single pole protection is sufficient if the L- is grounded. Ground connection must then be effected in only one spot.

What are the requirements of mechanical engineering in DC24V networks?
The Machinery Directive 2006/42/EG⁴ and the associated standard EN 60204-1⁵ request all pole breaking in the event of a failure. E-T-A’s ESS22-T double pole electronic circuit breaker with physical isolation meets these requirements and can be used for such applications in DC24V systems.

What are the relevant requirements for high voltage on-board electrical systems?
The LV 123⁶ defines the requirements and tests for high volt components in electric and hybrid vehicles. This delivery specification was drawn up by the German car manufacturers AUDI, BMW, Daimler, Porsche and Volkswagen and serves all for the approval of high voltage components. It was first issued in November 2009.

The LV 123, 8.5.2 clearly requests all pole breaking of the HV system of the DC HV circuits. At least one pole must be cut off mechanically by means of a contactor. The second pole may also be disconnected by means of a semi-conductor switch. The switchgear has to be installed in a way so as to ensure possible disconnection of the current flow in both directions.

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

ESS22-T: double pole electronic circuit breaker providing physical isolation

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¹ DIN EN 60335-1:2012-10; VDE 0720-1:2012-10 Household and similar electrical appliances - Safety - part 1: General requirements
² DIN VDE 0100 part 460/VDE 0100 part 460: Erection of high-voltage installations with rated voltages up to 1000 V - Protection; Disconnection and Switching
³ DIN EN 50162:2005-05; VDE 0150:2005-05 Protection against corrosion due to stray currents from direct current installations
⁵ EN 60204-1 Safety of machinery, electrical equipment of machinery, para 9.4.3.1
⁶ LV 123 Electrical properties and electrical safety of high voltage components in motor vehicles
Construction machinery and agricultural vehicles have special technological demands due to the harsh environmental conditions that they are operated in, including extreme temperatures, humidity, dust, shock and vibration. E-T-A’s EXR10 solid state relay proves itself with robust technology and design.

The EXR10 is a special timer relay that can easily be integrated into existing system designs – making it the ideal product for OEMs. This is particularly true if additional loads are connected at a later date that must be protected. Features like the freely selectable time slots for “ON delay” and “OFF delay”, the integral diagnostic function, low voltage detection, wire break detection and overcurrent and short circuit protection contribute to a high performance and enhanced uptime of machinery.

Other possible applications include:
- Overtravel function for the exhaust aftertreatment of diesel motors with configurable time slots
- Controlling frequency and intervals of fans for the reverse function
- Monitoring the load condition of various feed pumps to effectively prevent a dry run
- Fast detection of defective acoustic reversing signals through wire break detection
- Maintaining a stable connection set-up for the exchange of telemetric data even with the ignition key removed.
As a first-class manufacturer, Concorde develops their own vehicle concepts. The Centurion is the flagship of their model range and excels with its ultramodern interior, its sophisticated furniture design and its smart on-board electrical system.

The E-T-A PowerPlex® creates space for new ideas for example by eliminating conventional light switches. The illuminated PowerPlex® keypads immediately catch the eye and support the innovative vehicle concept. Thanks to the PowerPlex® mini modules, the LED illumination inside and outside the vehicle can easily be dimmed.

Loads with a high current consumption, for example the electric motors operating the step treads or the roller blinds, are protected and controlled with the PowerPlex® compact modules.

Tank level indication, visualisation of battery condition, and switching of loads is accomplished with E-T-A’s 7” touch display. This is already a standard in their premium models. Thanks to the new PowerPlex® web server, the owner of a Centurion can now use any smartphone to control and monitor the operating conditions of his vehicle.
Transportation safe and easy from a “one-stop” service

The KS Control GmbH located in Mintraching, Germany, near Regensburg is a major manufacturer of automation, control and inspection solutions. They design, build and sell production and control processes on behalf of their customers.

For this project, their dynamic design and sales team worked out synergies of an ultramodern production process by smartly linking automation, process control and robotics. The goal: safe transportation on construction sites in connection with a custom and reliable positioning of glass elements. KS Control has many years of experience in the automotive industry, foodstuffs and beverage as well as the electronic industry and therefore are a very innovative and creative partner for their customers. The «Glassworker GW625» project for the ERGOmount Systems GmbH is a remotely controlled glass lifter which can lift, transport and precisely position any objects with a smooth surface with vacuum suction cups.

E-T-A supplies two centralised distribution boxes, based on printed circuit board technology, collecting, arranging and distributing cable connections in a clear, space-saving lay-out. The interfaces to the loads feature a plug-in design to ensure fast and efficient mounting. E-T-A also supplies an enclosed protection pcb of the control elements providing ERGOmount a single source solution for the system.
Dri-Eaz’ mission is to help customers improve and restore indoor environments by providing the best portable products and solutions. Over the years, Dri-Eaz has brought the restoration industry a number of industry firsts, including the first inter-air drying system and the first industry-specific moisture detection instruments.

Professional devices (like air movers) demand professional overcurrent protection. Therefore Dri-Eaz chose E-T-A circuit breakers for use in air movers that are protected by thermal E-T-A reset-circuit breakers type 1658. While compact in design, this circuit breaker type 1658 is an extremely powerful and reliable overload protector. In case of an excessive overcurrent (e.g., a blocked motor) the breakers disconnect the air movers from the power supply and avoid motor damage. This assures Dri-Eaz customers a long lasting (durable) air mover. E-T-A type 1658 carries international approvals like VDE, UL and CSA which allows for product use all around the world.

Established in 1980 in Burlington, Wash., DRI-EAZ developed the first “Purpose-built” air mover which quickly revolutionized the restoration industry. E-T-A’s manual reset circuit breaker type 1658 provides reliable overcurrent protection of air mover motors.
Typical American:

»Coleslaw – delicious and typically American«

The word “coleslaw” stems from the Dutch word “koolsla” which actually is a salad made of cabbage.

In the USA, but also in England, Ireland and Australia, coleslaw is a very popular side dish. There are many, regionally different recipes for coleslaw, but what they all have in common is a dressing based on mayonnaise. Coleslaw perfectly goes with barbecue, fish and chips or all kinds of burgers.

Directions
Mix finely shredded cabbage with finely grated carrots in a bowl. Add grated caraway seed, put on a lid and rest for approx. 20 minutes.

Mix ingredients for the dressing: juice of lemon, mayonnaise, sour cream, cream and vinegar. Add salt, pepper and sugar to taste. Add to cabbage and carrots mixture and mix well to combine. Put bowl in the fridge and rest for at least 2 hours.

Add parsley before serving.

Preparation time: 30 minutes
Resting time: 2 hours

Ingredients
- 1000 g white cabbage
- 3 carrots
- ½ tsp caraway seed
- 1 lemon
- 150 g sour cream
- 100 g mayonnaise
- 100 g cream
- 1 ½ tbsp white vinegar
- 1 tsp mustard
- 2 tsp cane sugar or sugar salt, pepper, parsley (fresh or dried)
The REX system – your all-in-one solution

The REX12-System consists of three components - supply, overcurrent protection and power distribution - and revolutionises your DC 24 V level.

- Increases machine uptime – through clear failure detection, high transparency and remote diagnosis
- Flexibility is ensured – through ease of assembly or disassembly, modular design and convenient adjustment
- Saves 50 % time – through innovative and flexible connection technology
- Saves costs – since no further accessories are required
- Saves space - because each module is only 12.5 mm wide.

Talk to us! We look forward to consulting you.

www.e-t-a.de/cu_e1-18