



Pure Power

New solutions with
intelligent power distribution,
power relays and high voltage relays

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reliable performance
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No chance for dust and water

It's all in the seal

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Decentralised power for the automotive industry

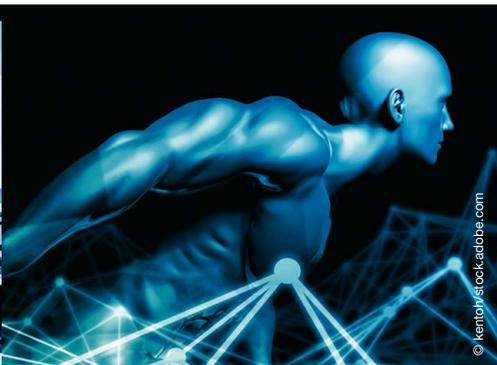
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Impressum

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Elektrotechnische Apparate GmbH

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■ Together through turbulent times

E-T-A products - reliable performance and supply

A few months ago, nobody would have imagined how radically our lives, and the entire world, could change from one day to the next. Do you remember the days before the crisis started? It has never been more important to be surrounded by some reliable constants.

Of course, protecting health was, and continues to be, the top priority at E-T-A. No matter if it was our employees, our customers or our partners. We did everything, at all times, to avoid unnecessary hazards for anybody at E-T-A. At the same time, we were fully aware that many of our customers strongly depended on E-T-A's products. This was true for many industries, but in particular it applied to medical engineering.

Therefore, we pulled all the stops to ensure timely delivery of these products. We are really proud that we managed to meet this goal.

We sell protective devices for respirators, ambulances and automation technology. Our products protect our customers' lives and assets. And they make your products even safer and more customer friendly. This is our mission and you can count on us to pursue this at all times.

We take our pandemic rules very seriously and are doing our utmost to prevent a second wave. This is a joint responsibility. This is what we owe to all of us and to compromised groups in particular. What can we do for you and your products? Please get in touch. Or do you have a certain project you wish to discuss with us?

We look forward to speaking with you.



Dr. Jennifer Sell

Director of

E-T-A Elektrotechnische Apparate GmbH



It's all in the seal

■ No chance for dust and water

Resettable circuit breakers are the professional protection solution for overcurrent. However, if they get dirty over time or start corroding, they no longer able to reliably fulfil their task. In the event of harsh or extreme environmental conditions, an appropriate seal is important.

Most of the time, circuit breakers stay inconspicuously in the background. But if a situation becomes dangerous, they immediately have everything under control and disconnect overcurrent in a flash. A requirement for circuit breakers to functional smoothly is that they do not get damaged during operation. Harsh environmental conditions put breakers at risk. Without a suitable seal, dust and liquids find ways to ingress into the circuit breakers' interior. Subsequently, bimetals start to corrode, contacts get dirty and latching mechanisms work very sluggishly. It is difficult to know if the breaker will reliably trip when the next overcurrent occurs.

Major risk zone: actuating area

In most cases, the following is true: The actuating area of a circuit breaker has the

highest risk. If it is not properly sealed, dust and liquids such as rain, detergents or blood (in medical equipment) can penetrate into the circuit breaker. This is because all actuators, like toggles or reset buttons, have an air slot on the rear. Even if it is very small, it allows dust and liquids to enter freely. Therefore, E-T-A offers a range of optional water splash covers for many of its circuit breakers. They are typically made of PVC or silicone and can either be snapped or screwed on (see fig.1). Some circuit breaker series are even available with seals pre-mounted in the factory.

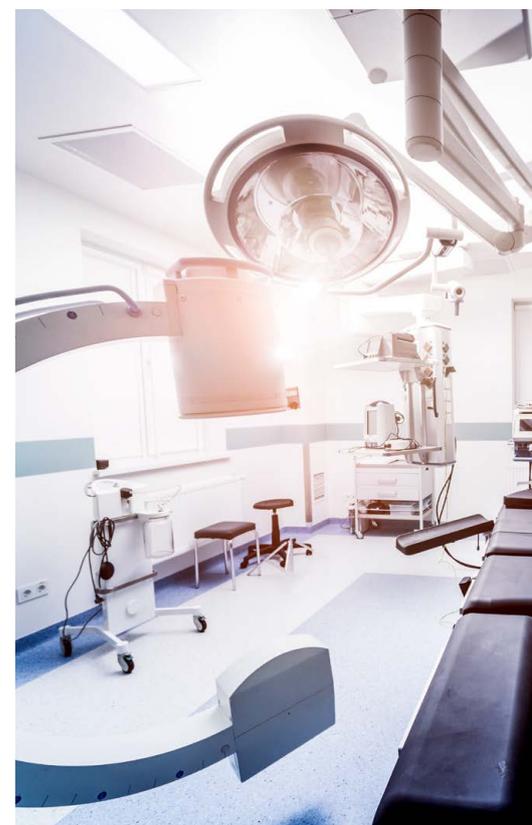
Additional sealing of the mounting hole

Another weak spot is the circuit breaker mounting cut-out. If this hole is not also sealed, dust and liquids can penetrate into the interior of equipment and machinery

and cause considerable damage. As a solution, E-T-A offers seals which protect both the circuit breaker mounting cut-out and the actuating area. As an example, look at the 3120 snap-in model with accordion-style seal (see fig. 2). When installing the circuit breaker, an all-round rubber lip is firmly pressed against the housing, thus reliably protecting the mounting hole against ingress of water or dust. We can achieve protection degrees of up to IP65 with this solution. If this value is not sufficient, a seal with screws is required. Only mounting with screws is suitable to provide reliable double protection (actuating and installation area) with ratings of IP66 or IP67.

Rear-side protection of the terminal area

Even with a very good seal for the circuit breaker actuation and installation area it



may not serve its purposes, if dust and liquids can penetrate into the breaker's interior via other ways during operation. In these cases, an additional terminal shroud is required to protect the circuit breaker's

terminal area. Generally, dust and water can also penetrate from this side. In this case, E-T-A offers a choice of sealing solutions, for instance for the 1110 circuit breaker/switch combination (see fig. 3).



fig. 1: 1658 circuit breaker with optional splash cover (sealing of actuating area)



fig. 2: 3120-N circuit breaker with accordion-style seal and snap-in mounting (sealing of actuating area and mounting hole)



fig. 3: 1110 circuit breaker with rear terminal shroud





New solutions with intelligent power distribution, power relays and high voltage relays

■ Pure Power

Modern utility vehicles need modern components in their on-board electrical systems. Trends such as efficiency, environmental-friendliness and digitisation are driving the commercial vehicle industry and have impacted on-board electrical system requirements. E-T-A is constantly developing components with this in mind and offers new solutions in the field of power and high-voltage relays, as well as intelligent power distribution. Boost your vehicles' performance by using our new products

Electro-mechanical power relays

Electro-mechanical relays are well-proven technology with many advantages. They are reliable and when used as battery master switches tolerate high



MPR20 monostable power relay

overload currents for a short time during the starting procedure. And they do not consume energy when not powered. Another advantage of mechanical relays is the high insulation resistance, the circuit is physically isolated. The classic solution in many applications is still a monostable relay. These are relatively inexpensive, can easily be activated and provide clear switching status during operation and power failure. Many users consider this as a safety feature even if it strongly depends on the application in question.

The rising importance of power consumption and the growing number of loads and in turn power relays in utility vehicles, made design engineers think again. With a classic monostable

300 A relay, the coil power often equals 10-15 W power loss. However, E-T-A's **MPR20** is equipped with energy-saving electronic circuitry that reduces the power consumption by a factor of 10 to less than 1.4W. Electrical energy must also be created in a utility vehicle. Thanks to the low power consumption, monostable relays can significantly contribute to fuel savings. For trucks and buses long operating hours, fuel savings of up to 20 Euros per year per relay are possible.





High voltage relays

The **HVR10** is the first hybrid high voltage relay for buses and utility vehicles launched by E-T-A. It combines extraordinary switching performance of ultramodern semi-conductor technology with the reliability of physical isolation in a compact design. A breaking capacity of 2 MW (2000 A @ 1000 V) and the ability to suppress the switching arc over the entire



current range up to 2000 A via electronic circuitry, thus minimizing wear and tear, are only two unique selling points of this high-voltage relay. E-T-A has worked on high voltage applications since 2012. Most of the time, this was customer-specific design work. We are very pleased that this new product is available to all our customers. We are looking forward to talking to you also about tailor-made high voltage products or power distribution systems.

Intelligent power distribution with CAN connection

More intelligent and complex systems and the electrification of loads currently play a decisive role in developing on-board electrical systems. The **SCS200** is the right solution for these requirements.

It is an intelligent power distribution system, allowing decentralised control and monitoring of loads via the CAN bus. The design features pcb-based power distribution in a compact IP67 enclosure. The **SCS200 modules** are plug & play solutions that allow you to reduce wiring and save space. Comprehensive diagnostic capabilities (integral load protection, load current and voltage measurement, output status) and the integrated CAN connection of the **SCS200** enable preventive maintenance and load management.



HVR10 high voltage- relay



SCS200 power distribution system



ESX10-T electronic circuit protectors in labelling machines made by Langguth GmbH

■ That sticks

Langguth GmbH from North Rhine-Westphalia manufactures labelling machines. Whether wet and hot glue processes, adhesive labelling or individually adjustable labelling technologies - the portfolio is large. Customers are from the food and chemical industry. Current talked to Design Engineer Andreas Leurs about using E-T-A's electronic circuit protectors.

Current: You call yourself the “labelling family”. What does it mean?

Andreas Leurs: Langguth GmbH has been a family-owned company since its foundation in 1932. Currently, Irene Langguth and her son Thorsten Langguth manage the company. With around 110 employees, there is a family atmosphere within the workforce. And labelling is our field of expertise - not only in Germany, but also globally.

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

Andreas Leurs: When looking for a solution to solve problems we experienced with electronic fuses used for DC24V positioning drives, we came across E-T-A. The active current limitation provided by E-T-A's products and the ability to switch high capacitive loads allow us to reliably protect the drives without nuisance tripping.

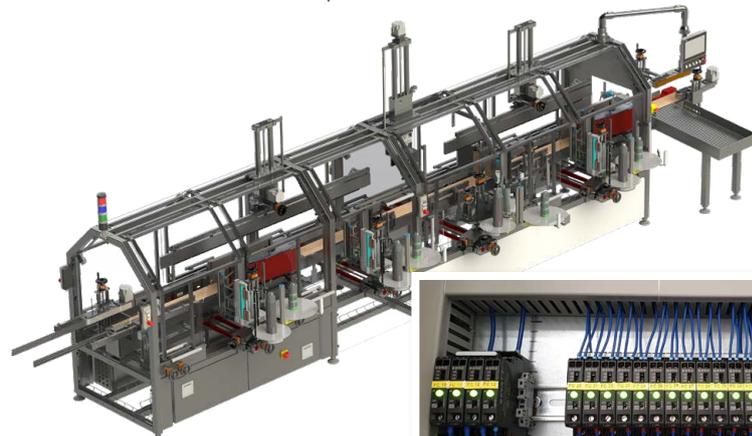
Current: Where do you install E-T-A circuit breakers in your equipment?

Andreas Leurs: We use E-T-A's circuit protectors in the control unit of safety installations, but also to protect equipment sensors and the 24V positioning drives.

Current: What is your experience with the ESX10-T electronic circuit protectors?

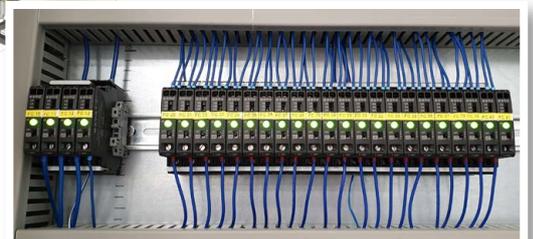
Andreas Leurs: We think it is an advantage to flexibly select over current ratings to meet our requirements. It helps us reduce inventory. In addition, the ESX10-T offers reliable protection without nuisance tripping when switching high capacitive loads.

Current: Thank you for your time.



Picture above: Langguth labelling machine

Picture on the right: ESX10-T electronic circuit protector installed in a control cabinet



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.*



Tamara Rogalski

Tamara joined E-T-A as a Junior Business Development Manager at the end of 2019. Her professional education and previous experience provided her with a strong understanding of business development, specifically in value proposition design. Tamara is responsible for the agricultural vehicles, construction machinery, and specialty vehicles business fields. She sees great importance to the exchange with the corresponding industries. Her goal is to further develop these business fields globally and to work together with customers on new and innovative solutions.



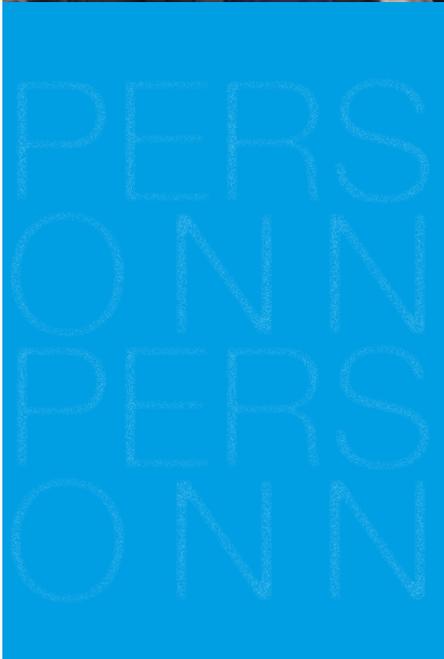
Shinobu Yata

Since January 2020, Shinobu Yata (55) has managed E-T-A's sales activities in Japan as Managing Director of the E-T-A subsidiary in Japan. He previously worked for a major North American business and brings a wealth of experience in sales management in Japan focusing on high-end products requiring technical support and explanation. His main task at E-T-A is to manage our local organisation in Japan and push our activities in the Japanese market in accordance with our strategy.



Sebastian Greck

Sebastian joined the Equipment Division as Product Manager in November 2019. After studying precision engineering and microtechnology at the University of Applied Sciences in Munich, he worked as an application and test engineer. Most recently, he worked as a product manager for a Japanese mechanical engineering group in their European subsidiary in Nuremberg for 8 years. He is looking forward to actively participating and shaping the market success of the equipment products. As an Agile Coach he contributes significantly to the agile implementation of the 2020-2025 strategy in the EQU division.



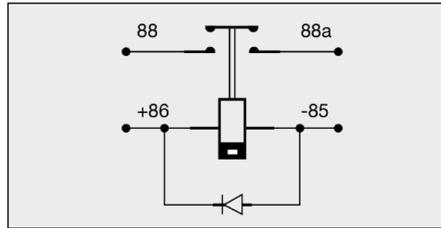
FAQ

»Controlling DC relay drives – protection against switching overvoltages«



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

E-T-A manufactures and sells relays for a range of applications. Our mechanical **power relays**, for current ratings up to **300 A**, have an electromagnetic drive. Such relays are able to carry a **few thousand Amps** for a short period of time in a utility vehicle without being damaged. The below picture shows a relay drive and the pertinent circuitry:



Electronic symbols to IEC 60617-7, terminal denomination as per DIN 72552:

88: input make contact (N/O) 88a: 1 output make contact (N/O)
+86: input drive -85: output drive

fig. 1: Monostable power relay

Monostable or bistable electromagnetic relays, please also see FAQ Q3-2019, offer advantages such as

- Insulation of drive and contact system
- Physical isolation in the event of open load contacts
- Small or no losses in ON condition
- High ampacity

Control input of such a drive is via semi-conductor switches in controlgear or relays. The semi-conductor switches used carry or interrupt the current through the drive. In the event the current flow is interrupted, the semi-conductor switch must be protected against the induced overvoltage of the drive. This is done by an **interference protection circuitry**.

How do I build up a relay drive circuit?

The electromagnetic drive consists of the resistance of the coil winding R_s and its inductance L_s .

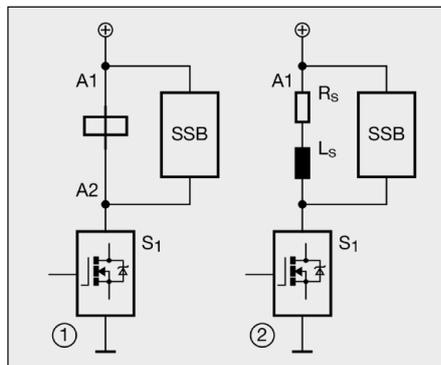


fig. 2: Relay drive, electronic symbols to IEC 60617-7, terminal denomination as per IEC 60947-1

If the **switch S1** interrupts the current flow, the stored energy in the drive will continue to push the current through the coil. This magnetic energy and kinetic energy must be reduced. One possibility to achieve this is to **connect the interference protection in parallel to the drive**. It offers the drive a, so-called, **freewheel path** to dissipate the energy.

How to correctly protect the relay drive and my control unit

The **simplest solution** for a degaussing circuit of a relay drive or an interference protection circuit is to **connect the drive in parallel**. If the user requires **external wiring**, this should always be done in accordance with the **characteristic data indicated by the relay manufacturer in the data sheet**.

In addition to protecting the coil and the control unit, the type of wiring has an influence on the relay's switching speed and service life. The picture below shows some wiring options.

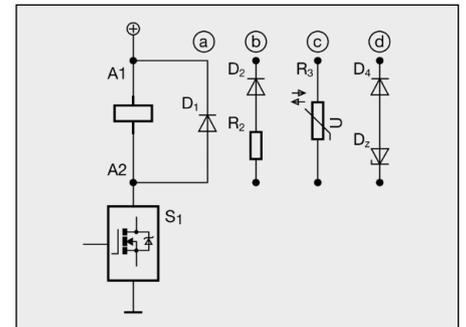


fig. 3: Relay drive

Electronic symbols to IEC 60617-7, terminal denomination as per IEC 60947-1, appendix L

Circuitry a is a **diode freewheel**. The diode freewheel is often supplemented by a **resistor R2** in circuitry b to speed up switching operations a bit. A **varistor R3** in circuitry c is commonly used or otherwise **z-diodes Dz** or TVS diodes as shown in circuitry d.



Witali Juferow,
E-T-A Market Manager
Automotive industry - Process control

Flexible and compact: **Module 18plus**

Decentralised power for the automotive industry

Industry 4.0 – automation, digitisation, decentralisation. These subjects are currently being discussed and implemented in car production. Plants are expected to become ever more flexible, modular and efficient. This can be accomplished with decentralisation, which saves time, space and costs.

Generally, a DC24V control voltage is generated centrally and distributed via long cables with large cross sections. Cable attenuation can cause difficulties, e.g. voltage loss or trip failures of the MCBs. In the event of expansive applications, for instance in materials handling technology, it is much more efficient to decentralise power generation and protection which can reduce cable lengths and cross sections.

E-T-A facilitates this development with innovative and modular products which can easily be adapted to the varying requirements of the different production sectors within the automotive industry. We can also create customer-specific system solutions - we will work with you from the first idea to initial samples to the final series application. (fig. 1)

Here is a typical example of a decentralised DC24V power distribution system using the **Module 18plus** (fig. 2), which we designed in partnership with a well-known German car manufacturer. The system allows direct connection of plus, minus and functional earth to one terminal each. This supports quick wiring and system transparency.

The **Module 18plus** terminal block accommodates a range of plug-in type circuit breakers. The portfolio ranges from thermal-magnetic to electronic devices.

Intelligent plug-in circuit protectors, like the **ESX60D-S**, communicate

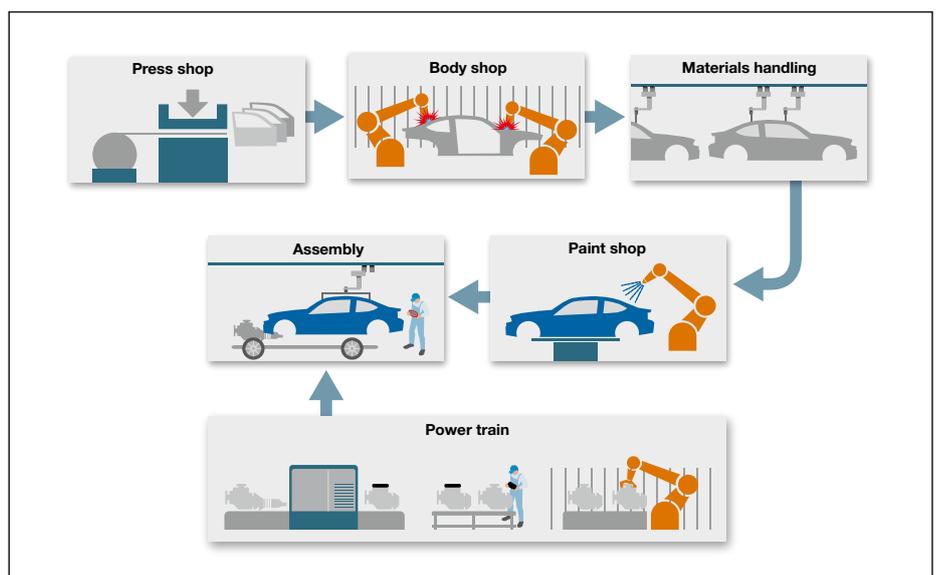


fig. 1: Automotive production cycle - including press shop, bodywork and final assembly



fig. 2: Decentralised DC24V power distribution system with socket system **Module 18plus**



fig. 3: **ESX60D-S** plug-in type circuit protector

via PROFINET with the control unit. This provides the plant operator with additional information on preventive maintenance or quick trouble-shooting. (fig. 3) **In the end, the plant is expected to run continuously.**

E-T-A solutions for many products

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

Here are some interesting examples.

E-T-A type: HPR10 hybrid power relay

■ Sought and found

A well-known manufacturer of (electric) buses was looking for a solution to avoid totally discharged batteries which would increase customer satisfaction. The search came to an end when he found E-T-A's **HPR10** power relay with battery monitoring function for utility vehicles.

Conventional vehicle batteries are only able to ensure continuous availability of some convenience items in a car (ventilation, illumination, refrigerators etc.) for a limited amount of time. Many of these loads are not part of the regular vehicle equipment. Therefore, the car manufacturers' influence is limited.

It may happen that there is no longer enough voltage available to start the car. Sometimes even the battery is damaged.

E-T-A's **HPR10** power relay is a tailor-made solution. As soon as the voltage drops below a certain value for several minutes, the power relay disconnects the loads from the battery via its integral electronic control unit. The battery stops being discharged. This ensures the battery can still provide sufficient starting power. Upon demand, the driver can trigger a signal to ignore the undervoltage detection for a short time and start the vehicle. As soon as the vehicle is running again, the battery is re-charged and the voltage level of battery goes back to normal.



E-T-A type: HPR10 hybrid power relay



E-T-A type: REX12D-T

■ Strong fabric made of finest fibres

Reifenhäuser Reicofil GmbH & Co. KG is the leading global supplier of complete spunbond, meltblown and composite lines.

They are plant manufacturers relying on innovative power and expertise along the entire value supply chain to provide their customers with reliable nonwoven fabric production.

Meanwhile, Reifenhäuser Reicofil built more than 250 plants according to customer requirements and installed them all over the world. The nonwovens are built for hygienic applications, for medical equipment, agriculture or industry for a wealth of different products. Among other things, the nonwovens

are used for hygiene articles, surgical drapes, tea bags, bedding, and mouth and nose protection masks which are currently in high demand.

Reifenhäuser Reicofil uses E-T-A's **REX12** electronic overcurrent protection with **IO link** to protect its machines. Due to its compact design, the modular construction with potential terminals and the innovative connection technology, the system provides a clear advantage compared to conventional solutions. It offers the user an accurate overview of the DC 24 V power supply via data logging and transmission of measuring values and status information to the superordinate control unit.



E-T-A type: REX12D-T



3120 thermal circuit breakers in espresso machines made in Barcelona

A Spanish Rolls Royce

The Spanish company Ascaso manufactures and sells high-end espresso machines



Noble and robust: Espresso machines of the Spanish manufacturer Ascaso

E-T-A Aparellaje Electrico SL successfully designed our well-proven **thermal 3120 circuit breaker** into Ascaso products, a renowned Spanish manufacturer of espresso machines (www.ascaso.com).

Ascaso has 57 years of tradition and experience in the world of espresso machines. All their machines are designed and produced in Barcelona.

Ascaso's espresso machines excel because of their superior quality and they literally shine through their outstanding design. The machine body, for example, consists only of robust metal parts (stainless steel and brass), plastic components are not used. The Ascaso machines are often referred to as the "Rolls Royce" among espresso machines.

Ascaso is proud of its special corporate culture, which is based on the motto "TEAM: Together + Everyone + Achieves + More". The similarity with E-T-A's corporate philosophy is unmistakable.

Ascaso has purchased the **3120-F551-P7T1-W01D-20A** since 2018 to protect and switch its high-quality filter holder machines. Safety and reliability are essential for the functioning of such valuable machines. In addition, the size and the proven design and the flexibility of E-T-A for individual requirements convinced the customer right from the start. The technical support and delivery provided by our colleagues in Spain to the customer works excellently. Ascaso is highly satisfied with the cooperation with the sales team and the local support.



Ensures safety and reliability:
E-T-A's 3120 thermal circuit breaker

CULINARY DELIGHTS

Typically Spanish:

»Andalusian Gazpacho or cold tomato cream«

Gazpacho is a cold Andalusian tomato dish which is great to eat during the hot summer months in Spain.

It is very refreshing, has many vitamins and few calories and can be served as a starter or in small portions as a tapa.

Directions:

Wash and clean tomatoes and the bell pepper carefully, cut into pieces and put into blender. Peel cucumber and add to blender together with the peeled garlic clove. Add olive oil, vinegar and salt and mash in the blender for at least 30 seconds until you have a homogeneous liquid. Pass the gazpacho through a sieve into a cold bowl and chill at least 1 hour before serving.

Just before serving the gazpacho, garnish with some Iberian ham, hard-boiled egg and pieces of cucumber.

Enjoy and que aproveche!

Garnish:

Iberian ham, 1 hard-boiled egg, 1 cucumber, all cut into small cubes

Ingredients:

- 4 - 5 big ripe tomatoes
- 1 green or red bell pepper
- 1 garlic clove
- 1/4 cucumber
- 6 tbs olive oil
- 1 tbs white wine vinegar
- 1 pinch of salt



*Typically Spanish:
Andalusian Gazpacho*



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CPC20 ControlPlex® System Intelligent DC 24 V protection

Ready for industry 4.0

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

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

Talk to us! We look forward to getting in touch.
www.e-t-a.de/cu_e2-20



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