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### Impressum

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**Editor:**  
E-T-A Elektrotechnische Apparate GmbH  
Industriestraße 2-8, 90518 Altdorf  
Phone: +49 9187 10-0 · Fax +49 9187 10-397  
E-Mail: info@e-t-a.de · www.e-t-a.de

**Responsible:**  
Thomas Weimann

**Layout:**  
E-T-A Communication Department

**Photos:**  
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# Where it is fun to work

## Why E-T-A is a Great Place to Work

You buy E-T-A products because you know our products provide superior quality that you can rely on even in critical situations. This is very important to us, because our products protect our customers' lives and values. And this makes us very proud.

Above all, this is the work of an entire team. We not only consider ourselves a major B2B brand, but we also consider E-T-A an attractive and reliable employer with many talented employees who do their best for customers every day.

Therefore, we are particularly proud that this was officially confirmed by Great Place to Work®, the globally renowned research and consulting institute. This year, we received the coveted award as one of the best employers in Germany.

This award is even more valuable to us as it is primarily based on the results of our employee survey distributed among all German E-T-A employees. In this survey, 85% of all E-T-A employees agreed with the statement »All in all, I can say this is a very good place to work«. This puts E-T-A well above the average compared to other companies.

We consider this an incentive for the future, because we want to remain a great employer who provides you, our customers, with custom products and solutions for your applications.

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. Clifford Sell*

*Director of*

*E-T-A Elektrotechnische Apparate GmbH*

*E-T-A is one of Germany's  
best employers in 2019.*

**Great  
Place  
To  
Work®**

**2019**

**Beste Arbeitgeber™  
Deutschland**

3120-N circuit breaker/switch combination

## Ready for adverse conditions

E-T-A now offers the 3120 thermal circuit breaker/switch combination with significantly enhanced functionality.

Is a reliable and cost-effective design important to you? E-T-A's 3120 circuit breaker/switch combination helps significantly reduce mounting and wiring time as well as material planning and inventory costs. The 3120 is the flag-ship of our circuit breaker/switch combination product group and is well-proven in applications all over the world a million times over. It is a single or double pole thermal circuit breaker with a bimetal trip element and also serves as ON/OFF-switch for devices and machines. After tripping due to overcurrent, the 3120 can be easily, reliably and quickly reset. Time-consuming fuse replacement is eliminated.

We carefully listened to our customers' comments, and included their

requirements when designing the new 3120-N product group (»N« signifying new design). We managed to combine enhanced actuator functionality and a state-of-the-art industrial design.

### Improvements for manufacturers of equipment (OEMs)

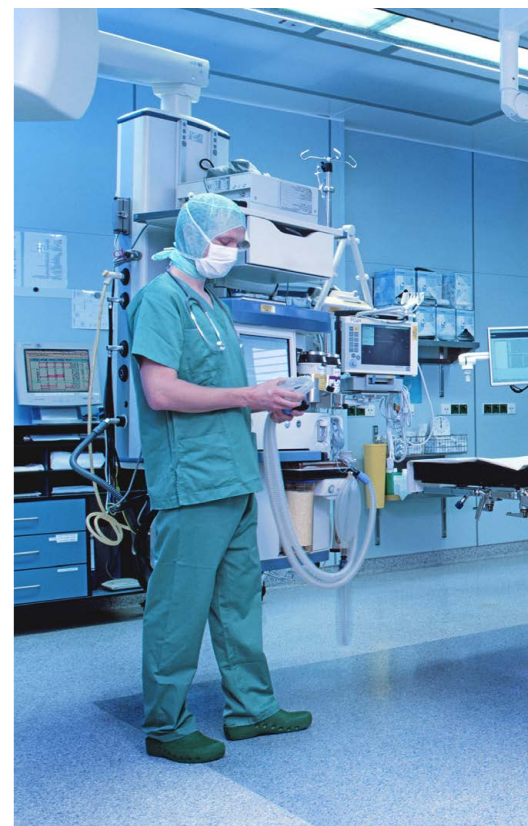
Protection against dust and water is extremely important for manufacturers whose products are exposed to harsh environmental conditions. The 3120-N offers the first accordion-style seal (protection degree IP 65) to seal the rocker actuator version. We highlighted this type in our most recent Current edition in detail. Now we have also solved the problem for the push button version where in conventional circuit breakers, only the actuating area is shielded. An

all-round rubber lip is integrated that also protects the mounting cut-out in the panel. So the 3120-N is excellently sealed.

All versions of the new 3120-N – including those with accordion-style seal and PVC seals – feature time-saving snap-in mounting technology. No additional mounting hardware is required. In addition, the clamping arms were reinforced to provide a tighter fit in the panel.

### Improvements for the operators

Reliable ON and OFF circuit breaker operation is a top priority for machine operators. It is immediately apparent that the push buttons are much larger making the 3120-N much easier to operate, even with gloves. We also included an actuator







**Circuit Breaker/  
Switch Combination 3120 N:**

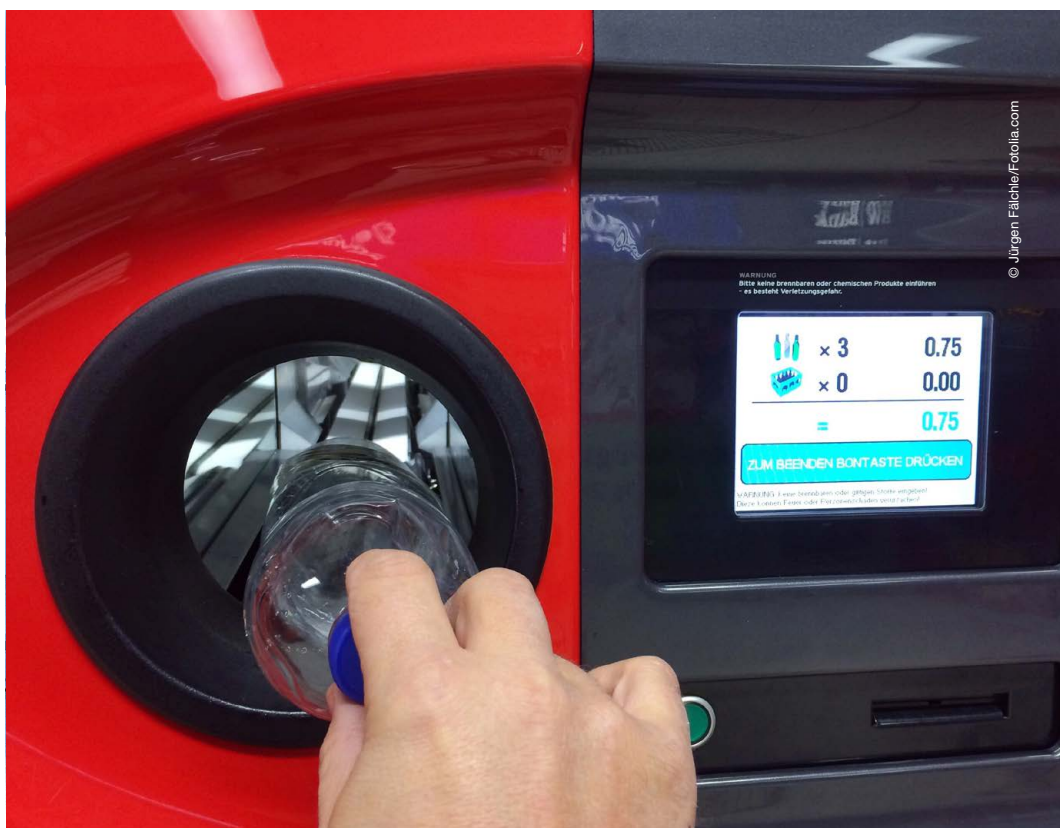
Improved functionality by sealing the operating area and optimised mounting

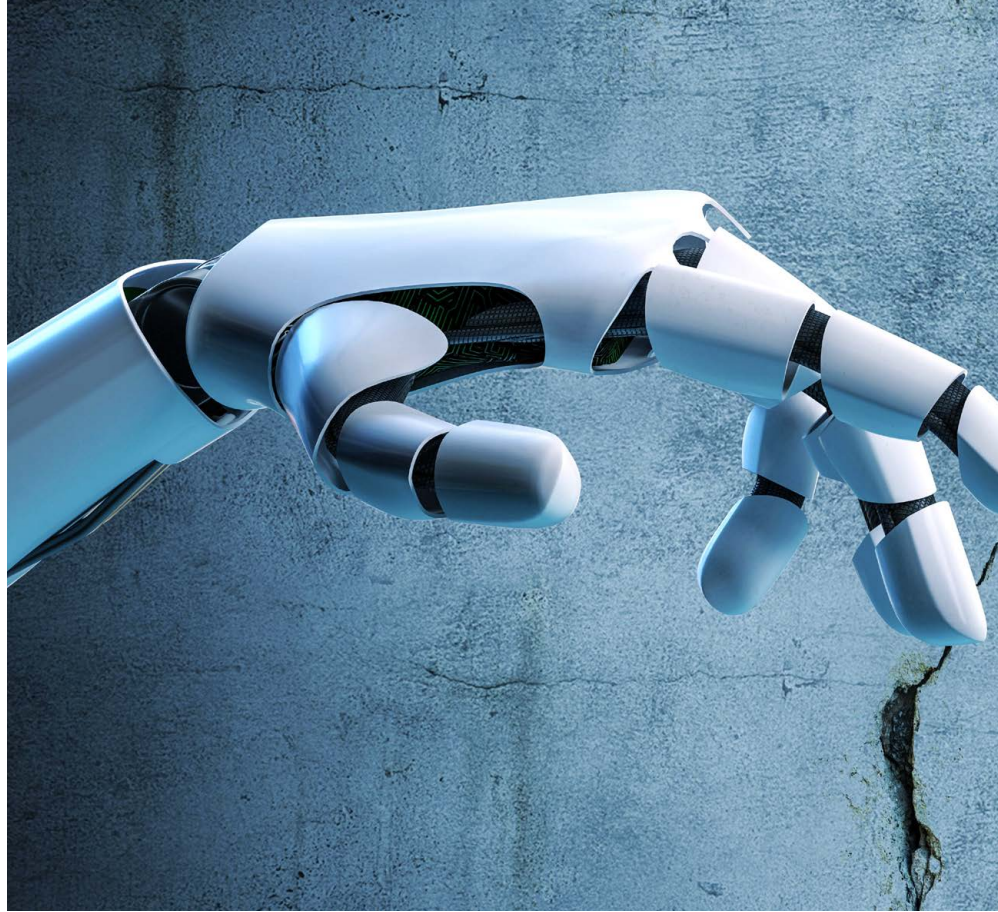
guard as a standard in all push-button-operated versions.

The optimised rocker actuator with actuator guard is significantly easier to switch on and off. Since the necessary raised edge of the housing around the rocker actuator no longer surrounds the entire actuator area, the operator can clearly see the switching status.

**Benefits of the features described above and of some additional product features of the new 3120-N at a glance:**

Features	Your benefits
Sealed operating area and panel cut-out	High machine uptime
Easily accessible rocker	Easy actuation
Large push buttons	Easy actuation
Snap-in mounting for all versions	Time-saving and easy installation
High snap-in forces	Tight fit in the panel
State-of-the-art tamper printed legends	Legible and durable marking
LED technology	Durable and energy-efficient illumination





*Electronic circuit breakers offering physical isolation*

## ■ Modern electronics meets classic mechanics

Meeting the requirements of international standards is imperative in DC24V protection solutions for centralised and decentralised control voltages. DIN EN 60934 and UL1077 recommend using a physically isolating protection solution also for DC24V load circuits. Our extended portfolio of electronic circuit breakers combines an optimised electronic trip curve with physical isolation.

### Reduced downtimes and power consumption

The **ESS30-S** electronic circuit breaker, also called a »Low Energy Breaker«, features a modern switching concept, keeping power loss created during operation as low as possible. With a width of only 12.5 mm, we were able to reduce power loss by 30 % compared to the **ESS20**. This is a unique advantage in decentralised power distribution systems.

Another feature of the circuitry is its integral current limitation that limits overcurrents to 1.2 times rated current. On one hand, inrush current peaks are tolerated and on the other hand, undesired overcurrents can selectively be disconnected. This

reduces nuisance tripping and increases system availability.

The selected current ratings, from 0.5 A to 10 A, combined with current limitation results in an easy foundation for planning electric systems: **trip current = max. current = 1.2 times rated current**

This simply means: The effects of short circuits and overcurrents in a load circuit can easily be calculated in advance – and can be taken into account in the planning stage

### Physical isolation provides safety

In addition to electronic disconnection, the **ESS30-S** also provides physical

isolation. The integral mechanical circuit breaker is directly linked with the electronic component (fig. 1).

In the event of a failure, the electronic circuitry disconnects overcurrents within 500 ms while the physical isolation follows after 5 s. Faulty return supply after trip or manual disconnection to the 24V control voltage level is eliminated. Hazardous system conditions are reliably eliminated.

This allows the **ESS30-S** to offer the advantages of selective electronic protection and also meets the requirements of the relevant standards for »Supplementary Protectors« defined in IEC60934 and UL1077.





## Your benefits

- **»Low Energy Breaker«:** economical, flexible and compact.
- **Physical isolation** in line with IEC60934 and UL1077 approvals.
- **Integral current limitation:** High system availability, reduced downtimes. Easy planning and calculation.

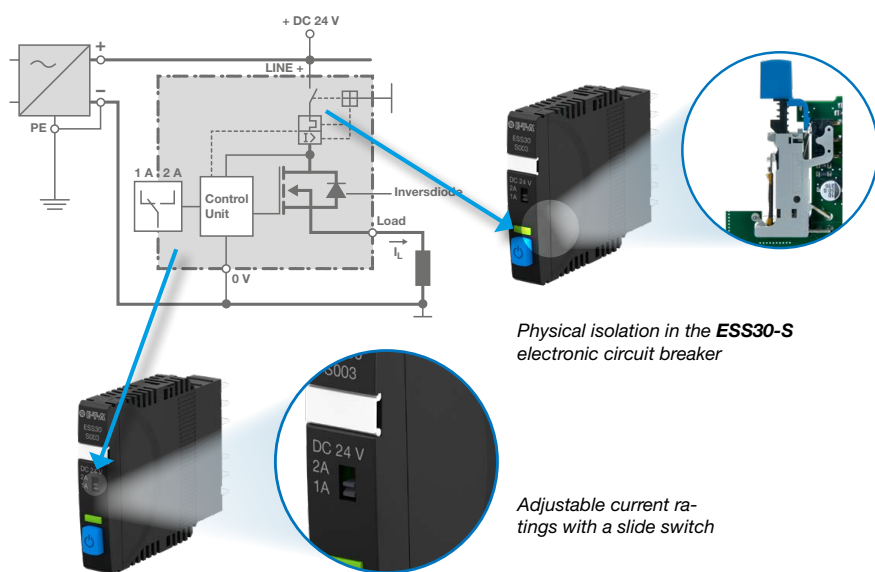


fig. 1

The versions with ratings up to 3.6 A carry a NEC Class 2 approval to UL1310. So you can save costs when setting up a »class 2 circuit« because the use of expensive, specialised switch mode power supplies is not required.

### Flexibility thanks to plug-in design and adjustable current ratings

The plug-in design of the **ESS30-S** offers flexibility when installing a DC 24 V protection solution. Wiring the load circuits

can be done with the **Module 18plus** modular power distribution system (fig. 2).

The **Module 18plus** is a complete power distribution system designed for rail mounting offering power distribution up to 80A for 24VDC control voltages. The push-in terminals allow easy and direct connection of all cables without any tools. The new adjustable version of the **ESS30-S** provide even more flexibility. Users can select the current ratings 1A/2A or 3A/6A

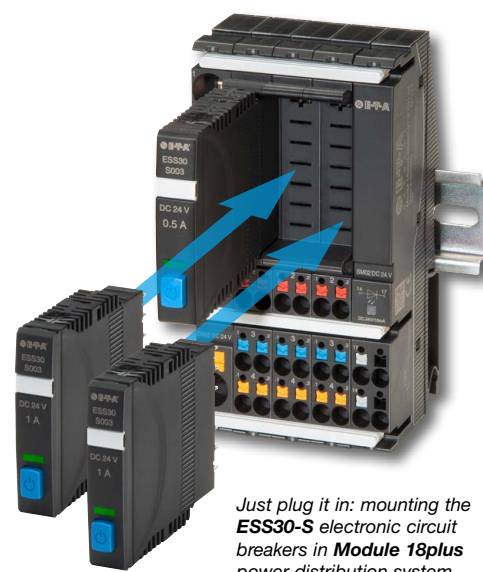


fig. 2

with a switch on the front face of the breaker. Adjusting to various load requirements is possible at any time without having to stock additional breaker versions. The **ESS30-S** is suitable for both centralised and decentralised control cabinets.



*Labotect relies on E-T-A circuit breakers*

## Everything to protect lives

For more than 45 years, **Labotect** in Rosdorf near Göttingen in Germany has designed, produced and sold medical products for assisted reproduction of cell structures. Incubation technology is one of the key areas of their range of activities. By controlling temperature, CO<sub>2</sub> and humidity, incubators create the perfect ambient conditions for an optimal biological cell growth process. We talked to Mr Wegner, who works in electrical design, about using E-T-A's circuit breakers in these machines

**Current:** Why are circuit breakers for equipment protection so important for your products?

**Mr Wegner:** Our incubators are laboratory apparatuses which are mostly approved as medical equipment. They must meet the requirements of the EN 61010-1 standard. This standard requires overcurrent protection to prevent fire from spreading

**Current:** What advantages do E-T-A's circuit breakers offer compared to your previous solution?

**Mr Wegner:** In our large incubators, we use toroidal transformers to generate operating voltages. If a transformer is switched on in an unfavourable phase condition, the magnetising current can be a multiple of the rated current. This may

cause blade fuses, rated in accordance with the working current of the apparatus, to trip. E-T-A's thermal circuit breakers tolerate these high inrush currents and ensure reliable operation in the work area.

**Current:** Is the installation process important for you?

**Mr Wegner:** Absolutely! Besides maintenance-free operation, we expect circuit breakers to be easily mounted and have a compact design. And more importantly: E-T-A's circuit breakers also include appliance inlets, line filters, switches and protective elements..

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



**3120 thermal circuit breakers protect incubators made by Labotect.**



# 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.*



## Nick Chuah

In May 2018 Nick Chuah joined E-T-A's subsidiary in Singapore to manage its sales activities in South-East Asia and Korea. His main task at E-T-A is to manage our local organisation in the pertinent countries and to push our activities in the local markets. This will allow us to serve our international customers in the region with E-T-A products, solutions and customer service.



## Marco Schmidt

In April 2019, Marco became a Junior Product Manager in the Automation & Process Control Division for electronic overcurrent protection, power distribution systems and solid state relays. He brings a wealth of experience to the job, gained during the years he worked as an applications specialist, which will help our innovative devices and system solutions to be successfully used by our key customers. His major tasks include successfully launching new products within our product range with our international customers and sales partners.



## Gary Hayes

In October 2018, Gary Hayes joined the Transportation Division in the US as Strategic Account Manager, Truck & Bus. He received a B.Sc. in Chemical Engineering from the University of Minnesota with emphasis in Economics and Management. Gary has assumed many Product Engineering and Sales Management roles in the commercial vehicle industry; specialising in electrical products and electronics. Gary's previous experiences as account manager of global vehicle OEMs will help drive continued E-T-A sales growth in the truck and bus markets. His ultimate focus will be business development with new and existing strategic customers.



# FAQ

## »Switch types, electronic symbols and where to find them«



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](mailto:faq@e-t-a.de)**

The wide range of different switchgear makes it necessary to select and label the switchgear for traceable system documentation. In order to keep this as simple as possible for the user, we answer some frequently asked questions about switch types and electronic symbols in the following.

### What types of switches and electronic symbols do we distinguish?

The IEC 60947, part 1, standard gives an overview of switch types. The IEC 60617, part 7, standard illustrates electronic symbols for documenting wiring diagrams and circuit diagrams. In the following example, we show the electronic symbols for three basic switch types.

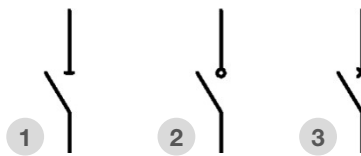


fig. 1.1:  
electronic symbols of different switch types

Fig. 1.1-1 shows a disconnecter to IEC 60947 part 3. The next electronic symbol in fig. 1.1-2 is assigned to a load switch. Finally, fig. 1.1-3 shows a circuit breaker to IEC 60947, part 2.

### What is a disconnector?

A disconnecter is required for working on electrical systems in dead-voltage condition. It allows the physical isolation of its terminals with open contacts. The position of the main contacts must be visible or be indicated via a signal contact.

The disconnecter is intended for opening and closing circuits in the event of negligible currents according to IEC 60947, part 3. The disconnecter is also used for carrying currents under normal operating conditions and for time-dependent carrying of currents under unusual operating conditions such as a short circuit.

### What is the function of a circuit breaker?

According to IEC 60947, part 2, a circuit breaker at nominal rating is able to switch on, carry and switch off currents. It is also able to switch on, carry and switch off overcurrents in specified extraordinary circumstances.

### Symbols for industrial relays?

Symbolising switching relays and contactors is a unique challenge. Fig. 1.2 shows the usual depiction of a switching relay.

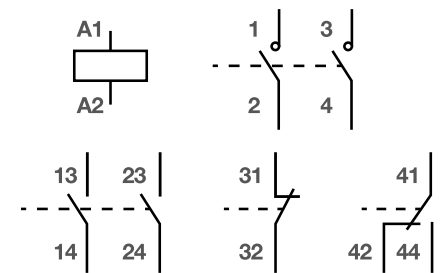


fig. 1.2:  
Industrial relay contacts and their marking

The electronic symbols are in accordance with IEC 60617, part 7. Terminal marking of components is defined in IEC 60947, part 1, appendix L. The smaller number corresponds to the input and the larger to the output. The terminals of the electromagnetic operating coil are marked as A1 and A2. The main contacts of the relay are designed as make contacts. Marking is with individual figures.

Auxiliary contacts have a single digit and a sequence digit. The single digit is the function digit. The sequence digit is the decimal digit which is counted upwards continuously. Single digits .3 and .4 are assigned to break contact elements. In our example, the digits 13, 14 and 23, 24 signify the auxiliary make contacts. Single digits of type .1 and .2 are assigned to break contact elements. The break contact is therefore marked with 31 and 32. The changeover contact element markings 41, 42 and 43 result from their function.





**Dietmar Koops,**  
Product Manager Transportation

E-T-A's **HPR10** power relay provides overvoltage and undervoltage detection

# Voltage monitoring on board

Two main voltages levels are trending in vehicles today: A 12 V on-board electrical system in passenger cars and a 24 V on-board electrical system in European utility vehicles.

Demand for higher voltage levels in systems, such as the 48V system and the high-voltage system (up to 1000 V) for electric mobility is on the rise.

Older electrical components (loads) were somewhat more tolerant of voltage levels. They simply did not work at undervoltage. Overvoltages were a bit more problematic so sometimes a lamp would burn out. Modern electronic components, however, may come into an undefined software condition and cause malfunctions. In addition a control unit destroyed by overvoltage costs a lot more than a simple filament bulb.

**But E-T-A has the solution.** Our intelligent HPR10 power relay can measure voltage levels and protect the on-board electrical system in time both in the event of overvoltage and undervoltage conditions and disconnects the loads. Defined levels per relevant standards (see specification below) can be programmed with custom designed levels as limit values. All these functions can conveniently be selected with the help of our online configurator tool.

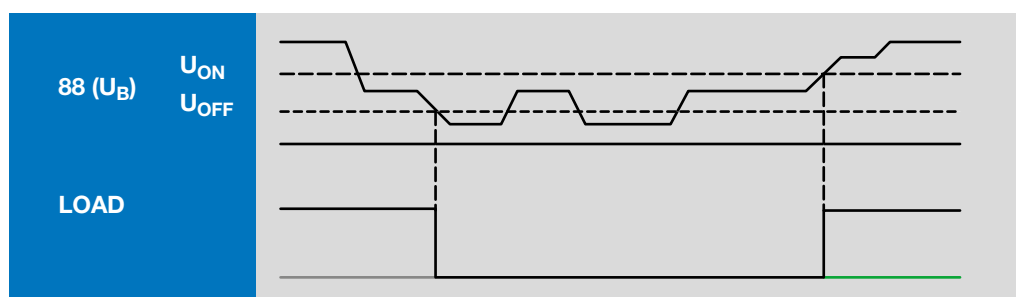


The solution: **HPR10** smart power relay

Table:

12 V on-board electrical system	< 0 V	> 0 V < 8 V	≥ 8 V < 16 V	≥ 16 V < 18 V	≥ 18 V ≤ 32 V	> 32 V < 36 V	≥ 36 V 58 V	
24 V on-board electrical system	< 0 V	> 0 V < 9 V	≥ 9 V < 11 V			≥ 11 V ≤ 14,3 V	> 14,3 V < 16 V	≥ 16 V 20 V
	negative voltages are not allowed	undefined condition	level with limited functionality	limited undervoltage range	correct voltage range with full functionality	overvoltage with limited functionality	extreme overvoltage only in the event of a failure, e.g. »load dump«	

Undervoltage detection and reset voltage



Sources: LV124, LV112, ZVEI, VDA

## 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: 8345



E-T-A type: 106

**E-T-A types: 8345 and 106**

## Fully automated cleaning

**Adlatus Robotics**, located in Ulm, Germany, designs and produces self-propelled cleaning robots. These autonomous service robots can fully operate automatically upon request, be controlled via touch interface or smartphone, autonomously replace waste water with fresh water and automatically recharge their batteries.

The robot's sensors and intelligent processing of sensor data enables the equipment to confidently capture objects which are very difficult to detect. The robot's navigation system provides reliable movement even in huge supermarkets with complex shelf structures.

Adlatus Robotics relies on two E-T-A circuit breaker types for their high-end robots. They use the **8345** to protect the overall system. Its magnetic or hydraulic-magnetic trip characteristics

ensure reliable disconnection even with the smallest overcurrents. It meets the requirements of the circuit breaker standard EN 60934 (IEC 60934).

E-T-A's **106** series protects the control unit of the cleaning robot. The single pole, thermal circuit breaker in a miniaturised design offers reliable switching behaviour and a trip-free mechanism. It also meets the requirements of EN 60934 (IEC 60934).





*E-T-A type: 3120-F circuit breaker/switch combination*

## Blades sharp as a knife

**Guspro Inc.** based in Canada manufactures high-quality skate sharpening machines. The first sharpening machine was sold in 1987. Today, Guspro is the world market leader in this segment with its brand Blademaster which is the number 1 sharpening machine for the North American National Hockey League (NHL). Guspro uses E-T-A's **3120** circuit breaker/switch combination as the on/off switch for the machines. It also protects the drive motors in the event of overloads. It also protects the drive motors in the event of overloads.



*E-T-A type: 3120-F*

The first regular skaters were probably Dutch. About 800 years ago in the Netherlands, messengers with iron blades on wooden shoes glided over the frozen channels to deliver urgent messages to aristocratic recipients. The aristocracy liked this technique and ice-skating quickly became a pastime for nobility. Today, ice hockey, speed skating and figure skating are Olympic sports and ice skating is a popular sport all over the world. Ice skates are available in a wide variety of designs. What they all have in common, however, is they become dull over time and must be sharpened. The intent and weight of the "skater"

play an important role. Guspro ice skate sharpeners master every conceivable cut. For example special hollow grindings in transverse direction for a particularly high stability and optimal power transmission. Guspro uses the **3120-F** circuit breaker/switch combination with rocker actuation, both with and without a PVC protective cap, in its mobile sharpening machines. It serves as the main ON/OFF switch for the sharpening machine and also protects it in the event of overcurrents. In the event of a failure the 3120 provides double physical isolation from the supply voltage so damage from overheating is prevented from the start.



3120 circuit breaker scores at PHC Corporation (PHC)

## Health care with precision

The Japanese company **PHC Corporation** manufactures products for the healthcare, medical, IT and biomedical sciences industry.



3120 circuit breaker type with thermal trip characteristics



A specific segment of PHC's product portfolio requires circuit breakers, which were traditionally selected from Japanese manufactures. Due to product discontinuations of Japanese brands, PHC was willing to evaluate foreign manufacturers. E-T-A's **3120** rocker-actuated circuit breaker was successfully tested in the test lab as well as evaluated in field tests. PHC selected our **3120** which earned a lot of respect and gained trust with the OEM and their users in the recent years because of its technical reliability and the production quality.

The key benefit of the **3120** for PHC is the thermal characteristic of the chosen **3120** configurations, which exactly meet the behaviour of the protected loads. In particular, the compressors are reliably

protected but nuisance tripping during start-up is also avoided. This accurate specification was not possible with competitive devices. E-T-A convinced PHC with the experience in the medical equipment industry worldwide and the corresponding product approvals that are essential in this industry.

E-T-A supplies PHC with the **3120** thermal circuit breaker. For PHC, the »Monozukuri« spirit is vital in all business matters. The literal translation is »Japanese manufacturing«, but figuratively it combines a synthesis of technological capabilities, know-how and the spirit of Japanese production practices. E-T-A is happy to contribute to PHC's vision statement of "Healthcare with Precision".



Ultra-Low Freezer VIP ECO made by PHC



# CULINARY DELIGHTS

*Typically Japanese:*

## »Beef Steak Japanese Style – a nice alternative for barbecue season«

*Japanese Beef Steak is very close to western steaks except for the sauce. The sauce is a soy sauce based sauce, a little bit like Teriyaki sauce, but maybe less sweet. In summer, the steak can also very well be cooked on the grill.*

### Instructions

1. Slice garlic thinly and set aside.
2. Mix sugar, Soy Sauce, Sake, water in a bowl to make sauce. Set aside.
3. Sprinkle salt and pepper on the steaks.
4. Heat frying pan at medium high heat and add oil. Add sliced garlic and cook until browned. Remove garlic from the pan.
5. Add steaks to the same pan and cook about 2 minutes per side or however you like. Add the sauce, coating the meat with the sauce, and remove the meat from the pan. Reduce the sauce for a minute.
6. Place the steaks on a dish, pour the reduced sauce over them, then top with the garlic for garnish.

### Ingredients for 4 servings:

- 1-2 cloves garlic
- 1 tbsp sugar
- 2 tbsp soy sauce
- 2 tbsp Sake
- 2 tbsp water
- 2 New York steaks, 1" thick
- salt and white pepper
- oil

**Enjoy!**







# 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/cude2-19](http://www.e-t-a.de/cude2-19)



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E-T-A Elektrotechnische Apparate GmbH  
Industriestraße 2-8 · 90518 ALTDORF  
GERMANY  
Phone: +49 9187 10-0 · Fax +49 9187 10-397  
E-Mail: [info@e-t-a.de](mailto:info@e-t-a.de) · [www.e-t-a.de](http://www.e-t-a.de)