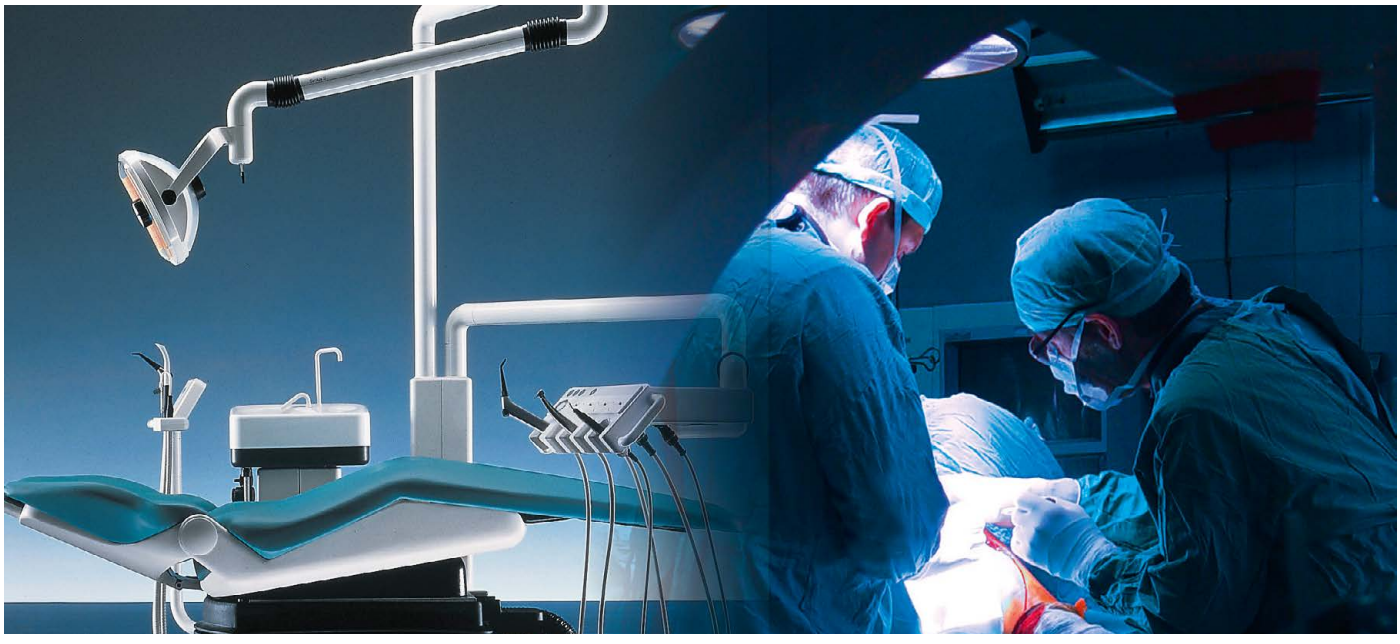
E-T-A®
ENGINEERING TECHNOLOGY

Protection - Switching - Monitoring
in Medical Equipment



Our goal »Setting the pace for circuit protection« represents many decades of experience in the field of circuit protection.

E-T-A, setting the pace
for circuit protection.

For over seven decades the E-T-A registered mark has been recognised as a symbol of safety and reliability throughout the field of equipment protection. With headquarters in Altdorf, Germany, E-T-A is an international group of companies and a world leader in the design, development and manufacturing of circuit breakers for the protection of components, equipment and systems against overload and short circuit. Today the E-T-A product range is one of the widest available with a solution for almost every application.

Research & Development.
As a privately owned company, we are committed to maintaining a high level of research and development investment to ensure we remain at the forefront of circuit protection technology. E-T-A has over 1300 highly qualified personnel worldwide. Our products combine innovative, leading-edge designs with proven low cost of ownership, and exceptional safety and reliability. They are fully approved by internationally respected authorities including VDE, UL and CSA.

In addition to its own R & D activity E-T-A works closely with universities and is funding several advanced technology programs addressing the industry needs of tomorrow.

Our commitment to environmental protection and conservation of natural resources has been widely acclaimed and is a high priority throughout the E-T-A organisation, including our other manufacturing sites in the USA, Tunisia and Indonesia.

State-of-the-art production.
E-T-A products are manufactured in ultramodern production facilities, meeting highest quality requirements. As a matter of course, E-T-A has certifications in place to ISO 9001:2001 and TS 16949.

Worldwide support.
E-T-A's network of subsidiary companies and representatives provide sales and support over 60 countries around the world. Product specialists will assist in the selection of the correct solution for your application. Whether you require individual circuit breakers, a complete system solution, battery management or control devices you will be able to specify E-T-A products with confidence in knowing you will not be disappointed.

E-T-A products in medical equipment

Safe and reliable operation of electronic medical equipment and apparatus is a basic requirement for successful work in operating rooms, wards and during emergency doctors' calls. Safety is paramount and must not be compromised. This is particularly true for the protection of equipment and apparatus against effects of short circuit and overload.

As the world market leader in circuit protection E-T-A offers a wide range of products which are ideally suited for use in medical equipment. The portfolio includes thermal and thermal-magnetic as well as electronic circuit breakers. They all meet highest requirements and have been specified by industry leaders around the world in a diverse collection of medical applications.

The advantages of circuit breakers compared to blade fuses are obvious: unlike blade fuses circuit breakers can easily and quickly be reset after tripping. Replacement of "blown" fuses and the search for suitable replacements are eliminated. This provides ease of handling and significantly reduces costs over the entire life of the equipment the circuit breaker is protecting.

In addition circuit breakers only trip in the event of an actual overcurrent as trip characteristics do not change over the typical life. Circuit breakers do not age as opposed to blade fuses which trip faster and faster over time, thus blowing without a genuinely hazardous situation. Reliability is critical in medical equipment and false alarms must be prevented.

E-T-A circuit breakers meet top quality requirements. They carry internationally recognised approvals, e.g. from VDE (Germany), UL (USA), CSA (Canada) and CCC (China). As a matter of course they also meet the requirements of the standard for medical electrical equipment EN 60 601-1.

List of applications

E-T-A circuit breakers are used in a wide range of applications of medical equipment all over the world. Manufacturers of laboratory apparatus, rehab and therapy equipment as well as of mobility aids have been relying on E-T-A products for many years.

Typical applications include:

- Anaesthesia apparatus
- Dentist's chairs
- Electric scooters
- Electric wheelchairs
- Endoscopes
- Incubators
- Laser machines
- Laboratory centrifuges
- Laboratory thermostats
- Operating microscopes
- Patient lifts
- Respirators
- Stairlifts
- Sterilisers
- Suction devices
- Surgical operating lamps
- Treadmills
- Ultrasonic test instruments
- Wheelchair lifts
- X-ray apparatus

Heart-lung machine of the Japanese company Senko-Ika fitted with E-T-A type 3120.

ICP spectrometer of the British company Thermo Scientific fitted with E-T-A type 2210.

Steriliser of the Italian company W & H fitted with E-T-A type 106.

Patient positioning systems of the German company ODEVIS fitted with E-T-A type ESX10-T.

Fluid warming device of the US company Thermedx fitted with E-T-A type 3120.

Thermal
reset circuit b reakers

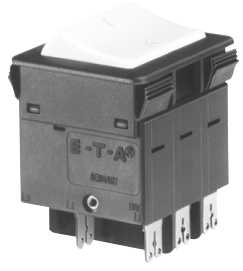
Trip time of thermal circuit breakers depends on the overload current. The higher the current, the faster the bimetal will reach its predetermined tripping temperature. Therefore they are ideally suited to the protection of motors, transformer windings and low voltage power distribution circuits in medical equipment. E-T-A thermal circuit breakers can quickly be reset manually after tripping. With tease-free and trip-free trip mechanisms thermal circuit breakers provide extremely reliable and robust interrupting capacity and ensure reduced downtime and increased longevity of medical apparatus and equipment.

Thermal circuit breaker and
switch combinations

Circuit breaker switch combinations are thermal overcurrent circuit breakers which can also be used as main ON/OFF switch for machinery and equipment. Unlike standard solutions consisting of switches, blade fuses and fuse blocks, they significantly reduce installation and wiring time and at the same time help to save space. The number of required components decreases and overall reliability increases. E-T-A offers a choice of 1 to 4-pole versions with rocker or push button actuation in a wide range of colours and shapes. Illumination and water splash protection are optionally available.

Thermal circuit breaker and switch combinations

Type 3120-N



Type 3130

Type 3120-N

Thermal reset circuit breakers

Type 106

Type 2-5700

Type 4130

Magnetic and hydraulic-magnetic circuit breakers

E-T-A circuit breakers with magnetic trip respond very fast. In the event of a short circuit the faulty circuit is disconnected nearly without delay. Thus, they are ideally suited to the protection of printed circuit boards and semiconductors against short circuit. All hydraulic-magnetic models offer a choice of fast acting magnetic operation or hydraulically delayed switching characteristics. Start-up currents of motors, for instance, will be tolerated. The magnetic part responds without delay to high overload and short circuit currents and disconnects the faulty circuit within milliseconds. Special benefit: Both systems are rather unsusceptible to high temperatures at rated load.

Magnetic and hydraulic-magnetic circuit breakers

Type 808

Type 8340-F

Type 8345

Electronic overcurrent protection

In large medical equipment 24 V DC switch-mode power supplies (SMPS) are used more and more frequently, replacing conventional transformer power supplies. The requirements of SMPS regarding overcurrent protection are quite different – at high loads caused by short circuit or overload an SMPS will automatically reduce its output voltage. E-T-A's electronic circuit breakers and protectors provide the ideal solution for this challenge. Thanks to integral current limitation they ensure reliable selective load disconnection. In the event of an overcurrent in a load circuit only the faulty circuit will be disconnected without affecting the 24 V DC switch-mode power supply. Selective disconnection ensures that important parts of the system stay in operation.

Electronic overcurrent protection

Type ESS20

Type ESX10-T

Type ESS22-T

E-T-A
Worldwide Service Network

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- Hungary
- Ireland
- Italy
- Luxembourg
- Macedonia
- Montenegro
- Netherlands
- Norway
- Poland
- Portugal
- Russia
- Serbia
- Slovakian Republic
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom

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- Argentina
- Brazil
- Canada
- Chile
- Mexico
- USA

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- China
- Hong Kong
- India
- Indonesia
- Japan
- Korea
- Malaysia
- Philippines
- Singapore
- Taiwan
- Thailand

Africa
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- Tunisia

Oceania
- Australia
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