

E-T-A Automotive Safety in Transit.





E-T-A: Safety first.



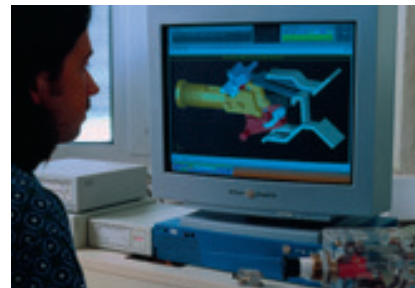
For over five decades the E-T-A registered mark has been recognised as a symbol of safety and reliability throughout the field of equipment protection. With headquarters in Altdorf, Germany, E-T-A is an international group of companies and a world leader in the design, development and manufacturing of circuit breakers for the protection of components, equipment and systems against the potentially catastrophic effects of electrical 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 group, 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 with 150 in research and development alone. 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 our own R & D activity we work closely with universities and are funding several advanced technology programmes addressing industry's needs for 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.

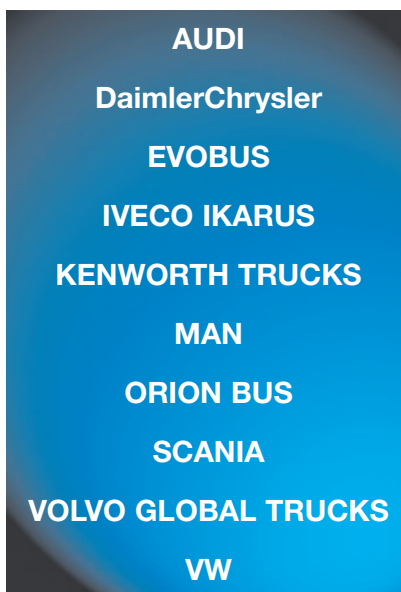




E-T-A specialises in circuit breakers for equipment protection and electronic protection solutions across many different sectors of industry. Our business is structured around our core competencies. Operating globally our business field managers and their teams, who are experts in their individual fields, are available to provide specialised applications advice to our customers wherever they are.

E-T-A: Serving the Automotive Industry.

From the protection of complete vehicle wiring systems to trailer couplings, tail lift motors or electric windows, E-T-A can offer the optimum solution. Circuit breakers installed a million times over have the confidence of such major international groups as Audi, Daimler Chrysler, Evobus, Iveco Ikarus, Kenworth Trucks, MAN, Orion Bus, Saab-Scania, Volvo Global Trucks and VW as well as many other users in every sector of the automotive industry. You can therefore be certain you can rely on E-T-A products.



Worldwide Support.

E-T-A's network of subsidiary companies and representatives provide sales and support in over 50 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, sensors or control devices you will be able to specify E-T-A products confident in the knowledge you will not be disappointed.

E-T-A: Specialists in circuit protection – experts in transportation.





Safety in transit.



E-T-A Automotive Circuit Breakers: Proven advantages.

The need for the correct protection of automotive electrical systems has never been greater. Electrical wiring is becoming increasingly complex to meet the demands of today's sophisticated vehicles and fire is an ever present hazard. E-T-A automotive circuit breakers are designed to minimise this danger by providing efficient and reliable protection against electrical overload and short circuits.

We have many years' experience of working closely with the world's leading automotive companies, who have specified our products for every conceivable type of vehicle. E-T-A circuit breakers are fitted as original equipment to cars, trucks, buses and coaches, trams, fire appliances, ambulances, off-road vehicles – even competition rally and racing cars. E-T-A products are designed to meet the size, weight and cost restrictions facing the automotive engineer, yet they will withstand the most severe operating environments.

Several E-T-A models are designed as quick and easy replacements for standard blade type fuses. Existing vehicles can therefore also enjoy the benefits of E-T-A protection:

- Unlike fuses, E-T-A circuit breakers will discriminate between motor start and prolonged stall conditions, enabling the correct protection of motors for duties ranging from seat control, window lift and wipers to commercial vehicle tail lifts and powered doors.
- Circuit breakers do not age and are not prone to corrosion or wear through shock, or current or voltage peaks.



- As circuit breakers do not have to be replaced after tripping, the risk of using incorrect ratings is reduced. The danger of inappropriate substitutes such as paper clips and foil is similarly avoided.

By selecting E-T-A as a partner you too can enjoy the proven advantages of our products and reduce vehicle downtime.



We offer a wide range of high performance circuit breakers and solid state remote power controllers providing professional protection for vehicles.

In addition our battery isolation switches make a valuable contribution to safety in the transportation of hazardous goods, prevent battery discharge by means of their integral voltage monitoring functionality and meet the requirements of the relevant standards. Compliance with international specifications is managed by our fully accredited test laboratory.

E-T-A solid state remote power controllers with integral overload protection and short circuit current limitation improve system reliability. As there are no contacts to wear when switching inductive and capacitive loads, correct operation of the on-board electrical system and the avoidance of damage under hostile conditions are ensured. Possible applications range from replacing conventional relays to supplementing CAN-bus controlled systems.

We also supply level sensors which have been optimised for the specific requirements of the automotive industry. For example, models which are designed to operate reliably under extreme conditions such as the hot, aggressive media in modern fuel cell drives, benefit from the experience we have gained over many years in this field.

Into the Future

We are continuously developing and extending our product range, responding to new requirements and meeting the safety demands of tomorrow with

imaginative new control systems solutions. Among these are concepts for new technologies in vehicle electrical installations such as fuel cells and a 42 V supply voltage. New developments in circuit protection will include solid state power controllers and bus connected products.

E-T-A is already addressing the challenges of the future. We are committed to developing reliable and cost effective solutions in partnership with our customers.



Reliable switching - an aid to safety.





E-T-A Automotive Circuit breakers for superior performance.

Automatic reset operation for inaccessible locations.

Sometimes protective devices have to be fitted in inaccessible locations. Fuses are ruled out on practicality grounds. The solution is a circuit breaker which resets automatically to reconnect the circuit after remedy of the fault. E-T-A offers two such models. Type 1610-92 disconnects the circuit in the event of a fault and resets after a short delay. This cycle continues until the cause of the overload has been eliminated (SAE type I). Type 1160 features a controlled reset mechanism – the contacts will remain open after an electrical fault has been detected and will automatically close only when power has been switched off for a short time (SAE type II).



Type 1160

Voltage rating:

DC 12 V

Current rating range:

5, 12, 15, 20, 30 A

Type 1610-92

Voltage rating:

DC 12 V

Current rating range:

5, 6, 8, 10, 15, 20, 25, 30 A

Typical applications:

- windscreen wipers
- electrically powered windows
- electrical seat adjustment





Automotive circuit breaker type 1610/1616 – compact and convenient.

Miniaturised thermal automotive circuit breaker type 1610 protects loads and electrical systems in passenger cars, buses, trucks and boats. It is designed to fit fuse holders to DIN 72581-3. Typical applications are in the professional sector where reliability and availability around the clock are of the essence. In public transport and freight haulage for instance, personnel without technical training may be confronted with electrical failures. Automotive circuit breakers help to avoid the danger of incorrectly rated or unsuitable substitutes being used.

Power sockets in cars is another typical application. Whether a trailer connection or just the cigarette lighter socket – the final load current may be in excess of the system design or there could be a fault. In either event the push button of the circuit breaker has only to be reset to restore functionality once the problem has been removed.

Voltage rating:

DC 12/24 V

Current rating range:

5 ... 30 A

Typical applications:

- complete vehicle electrical systems
- trailer connectors
- power supply for equipment of special vehicles





Automotive circuit breaker type 1170 - Full feature circuit breaker protection.

Type 1170 is a compact thermal circuit breaker with push-to-reset trip-free double contact mechanism. It represents a full feature solution for the most demanding applications, offering optimum protection of loads and electrical systems in road and rail vehicles as well as boats.

Among its benefits are a tease and trip-free snap-action mechanism with a fault rating of 400 A. The tease-free mechanism ensures switch-on without detrimental arcing. A colour coded manual release button provides current rating indication and the possibility for manual disconnection, whilst the trip-free mechanism ensures reliable operation even with the reset button blocked. The retaining clips of the circuit breaker ensure a good electrical connection. The 1170 is designed for use with standard automotive fuseholder blocks.

Voltage rating:

DC 12/24 V

Current rating range:

3 ... 25 A

Typical applications:

- complete vehicle electrical systems
- trailer connectors
- power supply for equipment of special vehicles





**Types 4130 and 2-5700 -
The ideal solutions for
harsh conditions.**



Single pole thermal circuit breakers 4130 and 2-5700 are the first choice for the protection of equipment intended for use in the harshest conditions. They are extremely robust, combining compact size with unrivalled performance benefits, ideally suited for specialised vehicles and earth moving or construction plant.

Both types are available with optional water splash cover to protection class IP66.

Type 4130

Voltage rating:

AC 240 V, DC 50 V

Current rating range:

20...70 A

Type 2-5700

Voltage rating:

AC 250 V, DC 28 V

Current rating range:

0.05...25 A

Typical applications:

- fans
- battery cables
- tailboards

**Type 3130 -
Combined switch and
circuit breaker in a single
component for maximum
versatility.**



Fewer components, less wiring, attractive styling – these are some of the benefits offered by the combined switch/circuit breaker type 3130. A choice of rocker colours, technical specifications and options is available, to ensure this product is the perfect solution for sophisticated high-end applications.

Voltage rating:

DC 12/24 V, AC 240 V, DC 50 V

Current rating range:

0.1 ... 20 A

Typical applications:

- switch panels for buses, coaches, recreational vehicles and caravans
- motorised hose reels for fire appliances
- auxiliary control panels for emergency vehicles





**High performance
circuit breakers
types 412, 413, 483, 4120
and 452**

**Unrivalled performance,
robust design.**



These circuit breakers offer a superior level of reliability and safety, unrivalled in the market. They are qualified for the most severe conditions, with exceptional shock and vibration resistance. They are ideally suited to the protection of heavy current main distribution cables, and the rigorous demands of construction and other off-road vehicles. Push/pull actuation avoids the danger of accidental disconnection of critical circuits.

For particularly critical applications where large cable sizes are used and there is the risk of short circuit, we offer the thermal-magnetic type 452. This combines the operational benefits of thermal actuation with the high fault rating capability of a fast magnetic circuit breaker.

Voltage rating:

DC 12 V, AC 115 V (400 Hz), DC 28 V

Current rating ranges:

- 1 ... 25 A (type 4120)
- 1 ... 35 A (type 483)
- 6 ... 35 A (type 412)
- 30 ... 90 A (type 413)
- 50 ... 100 A (type 452)

Typical applications:

- winches
- motors
- rally cars
- motors
- aircraft electrical systems





**Battery Master Switch
in accordance with ADR2005
BMS01**



E-T-A offers a choice of solutions for switching, protecting and monitoring vehicle batteries. The most recent member of this product family is the battery master switch BMS01. Vehicles fitted with the BMS01 will meet the requirements of ADR2005 – the European regulations covering the transportation of hazardous goods – with regard to the battery switch installation which is specified. The BMS01 is available for DC12 V and DC24 V.

Current rating
200 A

Typical applications:

- vehicles for the transportation of hazardous goods
- disconnection of electrical systems in all types of vehicle

**Smart Power Relay E-1048-8
For enhanced flexibility of
control systems.**



The E-T-A Smart Power Relay type E1048-8 featuring integral overcurrent protection and diagnostic functions will provide genuine flexibility for control systems and output current amplification with minimum inconvenience. Suitable for construction plant and specialised vehicles - often exposed to shock and vibration - as well as a wide range of normal duty applications, the E-1048-8 protects connected lines and loads against overcurrent and short circuit, offers a current-proportional voltage output for current measurement, and permanently monitors the circuits for wire breakage.

Voltage rating:
DC 12/24 V

Current rating range:
1/2/3/5/7.5/10/15/20/25 A

Typical applications:

- amplification of control electronics
- vehicles used in harsh environmental conditions
- installations where space is at a premium (three functions in one device: protection, measurement and relay)



E-T-A Worldwide Service Network



Europe

- Austria
- Belgium
- Bosnia & Herzegovina
- Bulgaria
- Croatia
- Czech Republic
- Denmark
- Finland
- France
- Greece
- Hungary
- Ireland
- Italy
- Luxembourg
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom
- Yugoslavia

America

- Argentina
- Brazil
- Canada
- Chile
- USA

Asia

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

Africa

- South Africa

Oceania

- Australia
- New Zealand

Photos:

Audi, DaimlerChrysler, Doppstadt, E-T-A, EvoBus, Kamag, Kenworth, Liebherr, Mitsubishi Motors, Tamrock, Transrapid International.

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