

## Professional overcurrent protection for devices and machines



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Professional ov

## A company with a vision

### Welcome to E-T-A

Founded in 1948, E-T-A pioneered the development of precision performance circuit breakers for equipment protection and is now the market leader in the field of overcurrent protection and power distribution. We produce a wide range of circuit breakers and electronic circuit protectors, solid state relays and remote power controllers, power relays and system solutions for global markets in our production facilities in Germany, Tunisia, Indonesia and the USA.

One thing is always at the heart of our endeavours: E-T-A products provide protection. In everything we do, with each and every unit we supply that our customers install in their applications, we protect man and machine against the effects of overload and short circuit.

For this purpose we offer mechanical and electronic solutions, single components or

entire systems, standardised or customer-specific. We ensure that the current, without which our modern life is simply unthinkable, remains manageable. We ensure that it does not cause any damage in the event of a failure.

### The protection of lives is at the core of our endeavours.

This is also a matter of value protection. We ensure that the equipment and systems where our solutions are installed do not get damaged by the consequences of overcurrent. We ensure permanent function, smooth production and eventually the profitability of the target products, no matter if they are medical devices, professional tools, garden tools or other high-end machines and appliances.

We know that you want to offer your customers the best possible solution. You'll manage even better by using E-T-A's superior quality solutions. We hope we can support you with our products and make the world a little safer.

**Please do not hesitate to get in touch.**



*Dr. Clifford Sell*  
Director  
E-T-A Elektrotechnische Apparate GmbH

# overcurrent protection

# Product Overview

## Thermal circuit breakers for equipment protection

1658



Thermal resettable or  
autoreset circuit breaker  
Single pole version

- AC 240 V / DC 28 V
- 5...30 A
- VDE, UL, CSA

page 16-17

1115

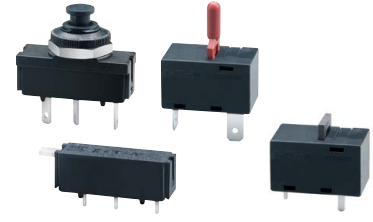


Thermal resettable circuit breaker  
Single pole version

- AC 250 V / DC 32 V
- 1...16 A
- TÜV, UL

page 16-17

1410



Thermal circuit breakers for equipment  
protection  
Single pole versions

- AC 240 V/DC 28 V (VDE)  
AC 250 V/DC 50 V (UL)
- 0.63 ... 10 A
- VDE, UL, CSA

page 18-19

104, 105, 106



Thermal circuit breakers for equipment  
protection  
Single pole versions

- AC 240 V / DC 48 V
- 0.05...10 A
- VDE, UL, CSA, CQC

page 20-21

1140



Thermal resettable circuit breakers  
Single pole and double pole versions

- AC 240 V / DC 48 V
- 1-pole: 3.5...16 A  
2-pole: 0.05...16 A
- VDE, UL, CSA

page 20-21

2-5000, 2-5700, 2-6400



Thermal resettable circuit breakers  
Single pole versions

- AC 250 V/DC 28 V (VDE)  
AC 250 V/DC 50 V (UL)  
(exception: 6400 no DC approval UL)
- 0.05 ... 25 A(2 -6400: 16 A)
- VDE, UL, CSA, CQC

page 22-23

4130



Thermal resettable circuit breaker  
Single pole version

- AC 240 V / DC 50 V
- 20...80 A
- VDE, UL, CSA

page 24-25



## Thermal circuit breaker/switch combinations

### 3120-N



Thermal circuit breaker/  
switch combinations  
Single pole and double pole versions

- AC 240 V / DC 50 V
- 0.1...20 A
- VDE, UL, CSA, CQC

page 28-29

### 3130



Thermal circuit breaker/  
switch combinations  
Single, double and three-pole versions

- AC 240 V, 3 AC 415 V / DC 50 V
- 1-pole: 0.1 ... 20 A
- 2- and 3- pole: 0.1...16 A
- VDE, UL, CSA

page 30-31

### 1410-F



Thermal circuit breaker/  
switch combinations  
Single pole version

- AC 250 V
- DC 60 V (0.63 ... 5 A)
- DC 50 V (0.63 ... 8 A)
- 0.63 ... 10 A
- UL, CSA

page 32-33

### 1110



Thermal circuit breaker/  
switch combination  
Single pole version

- AC 250 V / DC 50 V
- 0.05...16 A
- VDE, UL, CSA

page 34-35

### 3140



Thermal circuit breaker/  
switch combination  
Three and four pole versions

- 3 AC 415 V / DC 50 V
- 0.1...16 A
- VDE, UL, CSA, CQC

page 36-37

## Appliance inlet modules

### X3120-A



Appliance inlet module for  
circuit breaker/switch combination  
3120-N

- AC 240 V
- C14 inlet filter
- VDE, ENEC, UL, CSA, CQC

page 40-41

### X3120-B



Appliance inlet module for  
circuit breaker/switch combination  
3120-N

- AC 240 V
- C20 appliance inlet
- VDE, ENEC, UL, CSA, CQC

page 40-41

### X3130:



Appliance inlet module for  
circuit breaker/switch combination  
3130

- AC 240 V
- C14 appliance - inlet
- VDE, UL, CSA, CQC

page 40-41

## Thermal-magnetic circuit breakers

2210



Thermal-magnetic circuit breaker  
Single to four pole versions

- AC 250 V, 3 AC 433 V / DC 65 V
- 0.1...25 A
- VDE, UL, CSA, CQC, GL

page 42-43

3120-M



Thermal-magnetic circuit breaker  
Single pole and double pole versions

- AC 240 V / DC 50 V
- 0.1...16 A
- VDE, UL, CSA, CQC

page 42-43

## Hydraulic-magnetic circuit breakers

8330



Hydraulic-magnetic circuit breakers  
Single pole and double pole versions

- AC 250 V / DC 80 V
- 0.1...30 A
- VDE, UL, CSA

page 44-45

8340-F



Hydraulic-magnetic circuit breakers  
Single to four pole versions

- AC 240 V, 3 AC 415 V / DC 80 V
- AC: 0.02 ... 30 A / DC 0.02 ... 50 A
- VDE, UL, CSA, CQC, CPL

page 44-45

8345



Hydraulic-magnetic circuit breakers  
Single to four pole versions

- AC 240 V, 3 AC 415 V, AC 277/480 V / DC 80 V
- 0.05...125 A
- VDE, UL, CSA, CQC

page 44-45

# E-T-A in medical equipment

Reliable electrical medical equipment and machines is the basic requirement for successful work in the operating rooms, on the wards or also in the laboratories. Safety and quality must not be compromised. This is particularly true for the protection of devices and machines in the event of overcurrents.

E-T-A's circuit breakers reliably disconnect hazardous overcurrents. They help to increase the availability and life of medical equipment, and they also reliably protect doctors, nurses and patients against the hazards of overheated devices.

E-T-A offers well-proven resettable circuit breakers, but also a comprehensive

range of so-called circuit breaker/switch combinations to allow a compact design of medical equipment.

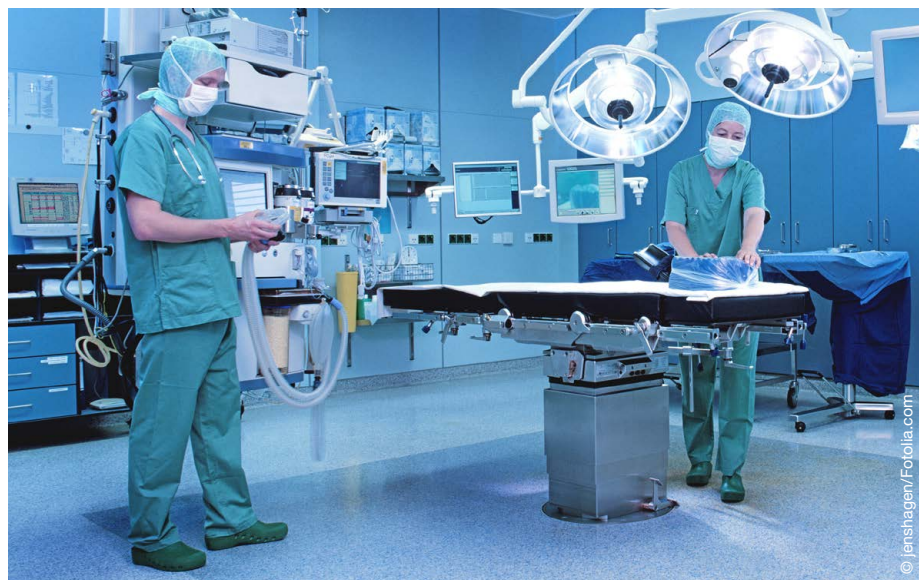
These are overcurrent circuit breakers that also serve as an ON/OFF switch of apparatus and machines. Compared to standard solutions, which consist of ON/OFF switches and blade fuses, they reduce mounting and wiring time, but also material planning and inventory costs.

E-T-A circuit breakers carry international approval marks and meet the requirements of the EN 60601-1 standard for medical electrical equipment. Therefore many of E-T-A's circuit breaker/switch combinations are available as

»2-pole switching, 2-pole protected«. They can be used, in compliance with the relevant standard with functional earth connection.

**The following are typical applications of E-T-A circuit breakers in medical equipment:**

- heart-lung machines
- incubators
- dentist's chairs
- dialysis equipment
- patient lifts
- lasers
- sterilisers
- laboratory centrifuges
- anaesthesia work stations
- X-ray apparatus





# E-T-A in equipment control

A long life-span, limited downtime and reliability are the major requirements in equipment control today. End customers no longer tolerate any downtimes. E-T-A circuit breakers disconnect overcurrents before they can cause any damage. Unlike blade fuses they can easily and quickly be reset afterwards. This helps to significantly reduce downtimes.

In order to support Design Engineers with component reduction, E-T-A also offers power entry modules for equipment control applications as add-on modules for the well-proven resettable circuit breakers or the circuit breaker/switch

combinations. They combine up to four functions within a single component: an IEC-compliant appliance inlet (C14 or C20), a line filter, a switch and resettable overcurrent protection. The latter two functions are provided in these modules by E-T-A's 3120 and 3130 circuit breaker/switch combinations. This will not only reduce material planning and inventory costs, but also mounting and installation costs significantly.

E-T-A's circuit breakers carry international approval marks, making them appropriate for global use.

## Typical applications of E-T-A circuit breakers in equipment control:

- vending machines
- ice cream machines
- ticket machines
- nut roasters
- reverse vending machines
- throwing wheels
- pool cleaners
- gas heating and hot water systems
- speaker systems
- gambling machines



# E-T-A in professional tools

Short lead times and short design cycles characterise work processes in the trade industries today. Downtimes on a construction site due to failed tools are a nightmare for the workmen, but they also can be really expensive. Therefore, and rightly so, trade and repair businesses today have high expectations in terms of reliability and functional stability of electrical tools.

E-T-A circuit breakers reliably protect professional tools in the event of an overload against damage caused by overheating. After a trip they can easily and quickly be reset. A time-consuming replacement of blown fuses is eliminated. Downtimes are reduced to a minimum.

In addition, E-T-A circuit breakers will trip in the event of a hazardous overcurrent. The trip characteristic of circuit breakers does not change over their entire life span, unlike blade fuses that age over time and get faster and faster in their trip characteristic. Subsequently they often cause nuisance tripping and the customers are dissatisfied.

Many of E-T-A's circuit breaker/switch combinations are also available with zero voltage release modules. These reliably prevent machines from inadvertent start-up when voltage is restored after a power failure. Therefore the operators are reliably protected against injury caused by uncontrolled re-start of machinery - exactly as requested by the Machinery Directive.

## Typical applications of E-T-A circuit breakers in professional tools:

- core drilling machines
- chop and mitre saws
- box column drills
- tile cutters
- floor grinders
- power generators
- wood chopping machines
- welding machines
- knife grinding machines
- chainsaws





# E-T-A in household appliances and garden tools

It can happen very quickly: The electrical carpet brush gets jammed because fringes of the carpet or foreign particles get caught in the power nozzle. E-T-A circuit breakers will recognise this situation without fail.

In the event of the brush being jammed for a longer period of time, the circuit breaker will reliably disconnect the brush to prevent any damages caused by overheating. After cleaning the brush, the vacuum cleaner can easily and quickly be switched back on again. The annoying work of replacing the fuse is not necessary.

Following this principle, E-T-A's circuit breakers protect all household appliances and garden tools. Particularly in this industrial sector, the customers expect superior quality, true reliability and long-lasting service life from the brand suppliers.

In such a highly competitive market segment, each manufacturer strives to offer first-class quality. E-T-A circuit breakers help you to avoid unwanted product rejects and support the vital basis for a permanent success of your products: satisfied customers.

**Typical applications of E-T-A circuit breakers in household appliances and garden tools:**

- vacuum cleaners
- coffee or corn grinders
- kitchen appliances
- electric lawn mowers
- garden shredders





# E-T-A in industrial kitchenware

Frenzied activity breaks out in a commercial kitchen when an appliance switches off automatically and cannot be reset immediately. If a blown fuse is the reason, it has to be replaced by a new one immediately. But what to do, if a suitable replacement fuse is not readily available?

This is just one of the scenarios why many manufacturers of professional kitchen appliances install E-T-A's resettable circuit breakers instead of fuses. After a trip they can quickly and easily be reset. The result: no replacement fuses, no frenzy! Instead

we see satisfied customers who enjoy having no unwanted downtimes of their equipment. Downtimes can have very unpleasant consequences also for the manufacturer.

Product rejects and warranty claims do not only damage the reputation, but may also cause time-consuming and costly field service requests. All this might be due to a minor reason which can be remedied with the help of a circuit breaker in no time. Therefore, a fractional additional investment regarding the basic equipment of your products

may very well be worth its while in the long run. Particularly in terms of professional equipment and appliances, a manufacturer's reputation is of major importance.

## Typical applications of E-T-A circuit breakers in industrial kitchenware:

- electric fryers
- kneading machines
- flight type dishwashers
- chicken rotisseries
- conveyor pizza ovens



# E-T-A in lighting engineering

This is just a nightmare on stage: Suddenly all the lights go out. Any theatre performance, concert or show is not only badly affected, but almost certainly suffers from a sudden interruption, if not an undesired end.

The root cause of the trouble might be a single blown blade fuse. The responsible technician on site probably has a number of replacement fuses on hand, but will he have the correct current rating?

If he now replaces the fuse with the wrong rating or tries to improvise any other workaround, he might run a high

risk. This might cause more damage to the equipment than a simple interruption of an event.

However, if you use E-T-A's circuit breakers, this problem can be avoided from the start. In the event of a failure they reliably trip and after a trip they are resettable within seconds.

Whoever chooses E-T-A's circuit breakers prevents any tedious replacement of fuses in the equipment for good. This will not only save the show, but all participants - artists and audience - will remain safe.

## Typical applications of E-T-A circuit breakers in lighting engineering:

- stage projectors
- light towers
- transformers for lighting systems
- lighting control desks
- outdoor lighting





# E-T-A in office equipment

No company can afford such delays nowadays: The postal machine fails in the mail room shortly before the mail is due for collection. How can this happen? Without any apparent reason.

The fuse has blown. But these inexpensive protection elements are subject to ageing.

This makes a fuse's trip behaviour faster so that it will blow earlier. Very often, it would not have been necessary to ensure proper protection of the device.

Resettable E-T-A circuit breakers offer permanent solution: they do not age and reliably trip only when there is actually a hazardous overcurrent. No nuisance tripping!

As soon as the problem is resolved, the circuit breaker can be reset and the device is back to full use. No repairs, no spare parts required - troubles and time pressure avoided!

## Typical applications of E-T-A circuit breakers in office equipment:

- paper shredders
- postal machines
- multifunctional photocopiers
- large format printers
- binding machines





E-T-A in  
the equipment  
industry

- Thermal circuit breakers
- Appliance inlet modules
- Thermal-magnetic circuit breakers
- Hydraulic-magnetic circuit breakers



## Professional overcurrent protection

Operating errors, mounting or maintenance errors or ageing effects can cause overcurrents in devices and machines. If these are not disconnected early enough, they are on an irreversible road of destruction. Cables, wires and windings are heated up until they finally burn through.

In a worst case scenario loads may even catch fire. And that's the end of it. Devices and machines are out of order and have to be repaired if this is at all

possible or economically reasonable. E-T-A circuit breakers help to prevent this from the start.

Like an airbag in a car they lead a hidden life most of the time. But if the situation gets dangerous, they have everything under control and disconnect hazardous overcurrent quickly and reliably.

**E-T-A is known for decades of superior quality in combination with a great innovative power.**



Thermal reset circuit breakers

# 1658, 1115

- Cost-effective overcurrent protection
- Limited downtime
- Extremely space-saving design



Thermal circuit breaker **type 1658**



Thermal circuit breaker **type 1115**



# Thermal resettable circuit breakers 1658, 1115 – for cost effectiveness

**Single pole thermal resettable circuit breakers for threadneck or snap-in mounting with current ratings up to 30 A.**

In the event of an overcurrent trip, the actuator (push button or rocker) will automatically snap into the OFF position. After a short cool-down period the circuit breaker can manually be reset.

Types 1658 and 1115 have a reliable trip-free mechanism and a snap action mechanism that prevents contact wear and increases the endurance.

Type 1658 is also available in an autoreset version: The breaker resets automatically after a trip due to overcurrent within a few seconds.

## Your benefits:

- **Cost-effective overcurrent protection**  
The tripping element is a competitively priced snap-action type bimetal. Therefore the series 1658 and 1115 are particularly suitable for high volume applications, offering an economically attractive alternative to conventional blade fuses.

- **Limited downtime**

Resettable circuit breakers can easily and conveniently be reset after they trip. Time-consuming replacement of blown fuses is eliminated. Downtimes are reduced to a minimum.

- **Space-saving design**

Its ultra-slim design makes the 1115 ideally suited to replacing closed vertical fuse holders.

## Application in the industries

- Household appliances and garden tools
- Professional tools
- Office equipment
- Industrial kitchenware
- Equipment Control

## Accessories:

- Water splash covers
- Marked washers ("press-to-reset")



## Approvals:



## Thermal resettable circuit breakers Single pole versions

### 1658

- AC 240 V / DC 28 V
- 5 ... 30 A
- VDE, UL, CSA

### 1115

- AC 250 V / DC 32 V
- 1 ... 16 A
- TÜV, UL

Reliable protection in many applications:  
Resettable circuit breakers 1658 and 1115

Thermal resettable circuit breakers

# 1410-L1/- L2/-L4, 1410-G1

- Cost-effective overcurrent protection
- Limited downtime
- Extremely space-saving design



Thermal circuit breaker **type 1410-L1**



Thermal circuit breaker **type 1410-L2**



Thermal circuit breaker **type 1410-L4**

# Thermal resettable circuit breakers

## 1410-L1/-L2/-L4, 1410-G1 – where space is at a premium

Single pole thermal resettable circuit breakers for threadneck panel mounting, integral or pcb mounting with current ratings up to 10 A.

If the circuit breaker trips in the event of a failure, the actuator (push button or reset slide) will move into the OFF position. As soon as the protection mechanism is cooled down, the user can manually reset the circuit breaker.

These circuit breakers have a “hot wire” tripping element which ensures a very fast disconnection in the event of overcurrents. It is temperature-insensitive. Fluctuations in the ambient temperature therefore only marginally influence the trip times

The 1410 series (1410-L1/-L2/-L4 and 1410-G1) has a snap action mechanism preventing contact wear and ensuring a long life-span.

### Your benefits:

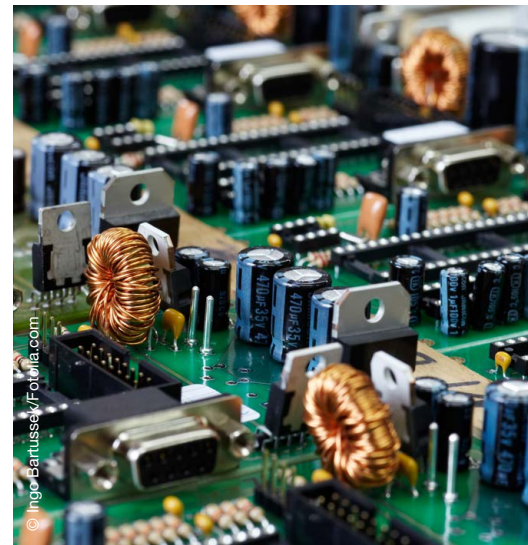
- **Cost-effective overcurrent protection**  
A hot wire serves as a very economical tripping element. Therefore the 1410 series (1410-L1/-L2/-L4 and 1410-G1) provides an upgrade also in terms of economic aspects compared to the standard blade fuses, especially in high volumes.
- **Limited downtime**  
After a failure and a trip the user can reset the circuit breaker easily, reliably and - above all - quickly. Cumbersome replacement of blown fuses is eliminated. Downtimes are therefore only very short.
- **Extremely space-saving design**  
The 1410-L1/-L2/-L4 and 1410-G1 series is hardly bigger than a sugar cube. This leaves room for creativity and ideas in terms of space design, even in constricted spaces.

### Application in the industries

- Household appliances and garden tools
- Lighting engineering
- Equipment control

### Accessories:

- Water splash covers



### Thermal reset circuit breakers

#### Single pole versions

#### 1410

- AC 240 V/28 V DC (VDE)  
AC 250 V/DC 50 V (UL)
- 0.63 ... 10 A
- VDE, UL, CSA



Thermal circuit breaker type 1410-G1

### Approvals:



Overcurrent protection - compact and cost-effective:  
1410 thermal resettable circuit breaker



Thermal resettable circuit breakers

# 104, 105, 106 1140

- Limited downtime
- Space-saving design
- Ease of adjustment to protected loads



Thermal circuit breaker **type 104**



Thermal circuit breaker **type 105**



Thermal circuit breaker **type 106**

# Thermal resettable circuit breakers

## 104, 105, 106, 1140 – for unrivalled versatility

Single pole and double pole thermal resettable circuit breakers for threadneck panel, integral or pcb mounting with current ratings up to 16 A.

In the event of an overcurrent the push button snaps into the OFF position. As soon as the trip element has cooled down, the circuit breaker can manually be reset by pushing the button.

The 1140-G is also available as »double pole switching, one pole protected«.

Types 104, 105, 106, 1140 have a reliable trip-free mechanism and a snap action mechanism preventing contact wear and increasing the breakers' endurance significantly.

### Your benefits

#### ● High availability

When a resettable circuit breaker trips, it can be reset after remedy of the failure without any problems. Replacement, as with blade fuses, is eliminated. Thus downtimes of the equipment are clearly reduced.

#### ● Space-saving design

Due to their miniaturised design, the 104/105/106 circuit breakers as well as the 1140 model can also be installed in compact equipment such as power nozzles of vacuum cleaners.

#### ● Ease of adjustment to protected loads

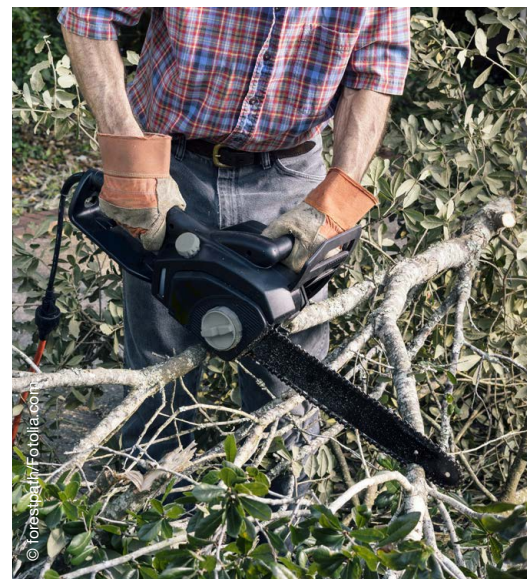
The trip element of these breakers is a calibrated bimetal strip. It allows a precise adjustment of the characteristic curve of the circuit breaker to the trip limits of the load being protected. Nuisance tripping is minimised.

### Application in the industries

- Professional tools
- Medical equipment
- Equipment Control
- Household appliances and garden tools
- Industrial kitchenware

### Accessories:

- Water splash covers
- Hexnuts and knurled nuts



### Thermal resettable circuit breakers 104, 105, 106

- Single pole versions
- AC 240 V / DC 48 V
- 0.05...10 A
- UL, CSA, VDE, CQC

### 1140

- Single pole and double pole versions
- AC 240 V / DC 48 V
- 1-pole: 3.5...16 A
- 2-pole: 0.05...16 A
- UL, CSA, VDE



Thermal circuit breaker type 1140-G1 (double pole)

### Approvals:



Custom-fit, economic protection:  
104, 105, 106, 1140 resettable circuit breakers



Thermal resettable circuit breakers

2-5000

2-5700

2-6400



- Limited downtime
- High reliability
- Ease of adjustment to protected loads



Thermal circuit breaker **type 2-5000**



Thermal circuit breaker **type 2-5700**



# Thermal resettable circuit breakers

## 2-5000, 2-5700, 2-6400 – for a robust design

### Single pole thermal reset circuit breakers for threadneck or flange mounting with current ratings up to 25 A.

If the circuit breaker trips in the event of a failure, the push button actuator will move into the OFF position. After a very short cool-down period the circuit can manually be reset without any problems.

The 2-5000 and 2-5700 models are also available with a manual release functionality, e.g. for isolation during repair work.

The 2-6400 circuit breaker is also available with auxiliary contacts (change over contacts) upon request. They allow realisation of alarm functions.

All the above mentioned breakers feature a reliable trip-free mechanism. In addition, a snap action mechanism prevents contact wear and increases endurance. This makes these breakers even more robust.

### Your benefits

#### ● Limited downtime

It is very easy and convenient to reset the circuit breakers after a trip. Time-consuming replacement of defective blade fuses is eliminated. Downtimes of equipment are reduced.

#### ● High reliability

When replacing blade fuses, you run the risk of inadvertently using fuses with a current rating that is too high. Reliable protection is then no longer possible. When using E-T-A circuit breakers, you can eliminate this risk completely.

#### ● Ease of adjustment to protected loads

These products operate with a calibrated bimetal strip as a tripping element. It ensures a very narrow tripping characteristic. The working principle also allows a very precise adjustment of the trip curve of the circuit breaker to the load. Nuisance tripping is prevented.

### Application in the industries

- Equipment Control
- Industrial kitchenware
- Household appliances and garden tools
- Professional tools

### Accessories:

- Water splash covers
- Busbars



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Thermal circuit breaker type 2-6400

### Thermal reset circuit breakers 2-5000, 2-5700, 2-6400

#### Single pole versions

- AC 250 V/DC 28 V (VDE)  
AC 250 V/DC 50 V (UL)  
(exception: 6400 no DC approval UL)
- 0.05 ...2.5 A (2-6400: 16 A)
- VDE, UL, CSA, CQC

### Approvals:



Protection with accessories and extra features:  
resettable circuit breakers 2-5000, 2-5700, 2-6400

Thermal resettable circuit breaker

# 4130

- Limited downtime
- High reliability
- High current ratings



# Thermal resettable circuit breaker 4130 - for powerful performance

Single pole thermal resettable circuit breaker for threadneck mounting with ratings up to 80 A.

In the event of an overcurrent the breaker trips and the push button will snap into the OFF position. As soon as the cool-down period is over, the breaker can manually be reset by pushing the button.

The 4130 thermal resettable circuit breaker offers a positively trip-free mechanism. In addition, it features a snap action mechanism preventing contact wear and enhancing typical life.

## Your benefits

### ● Limited downtime

Resettable circuit breakers can reliably and conveniently be reset after a trip. »Blown fuses« and replacement fuses are a thing of the past. And so are long downtimes.

### ● High reliability

Replacing blade fuses always holds the risk of confusion and dubious workarounds. Protection can then no longer be guaranteed. With E-T-A circuit breakers, these problems are a thing of the past.

### ● High current ratings

Type 4130 combines high current ratings with an extremely compact design. Therefore the ideal circuit breaker model for protecting loads in applications like ride-on sweepers or lifters.

## Application in the industries

- Equipment Control
- Industrial kitchenware
- Professional tools

## Accessories:

- Water splash covers



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## Thermal resettable circuit breaker 4130

### Single pole version

- AC 240 V / DC 50 V
- 20...80 A
- VDE, UL, CSA



Thermal circuit breaker type 4130





## Approvals:



Protection with high current ratings:  
4130 thermal resettable circuit breaker

# Overview

## Thermal resettable circuit breakers

Type	1658	1115	1410	104,
				
Multipole versions				
Integral auxiliary contacts				
Manual release / manual switch-off				
Splash cover	●	●		
Approvals to IEC and UL	●	●	●	
Current rating range	5...30 A	1...16 A	0.63 ... 10 A	0.0
Voltage	AC 240 V DC 28 V	AC 250 V DC 32 V	AC 240 V/DC 28 V (VDE) AC 250 V/DC 50 V (UL)	AC DC
Tripping element	disk-type bimetal	disk-type bimetal	hot wire	bim
Typical applications	power outlet strips	gambling machines	electronic pcbs	inc






### Thermal overcurrent circuit breaker (TO)

The trip time of thermal circuit breakers depends on the height and duration of the overload current and on the ambient temperature. The higher the overcurrent, the faster the bimetal will reach its defined tripping temperature. In the event of a low overload it will take longer until the required disconnection of potentials takes place. Thermal circuit breakers are recommended for all applications where an overload is expected. They are the ideal solution for protecting loads such as motors, transformers, magnetic valves, on-board electrical systems and low voltage lines.

### Benefits of a thermal circuit breaker at a glance:

- They are a thermal copy of the loads to be protected: The higher the overload current, the faster the breaker trips.
- They tolerate inrush current peaks of motors, transformers and magnetic valves. Hence no nuisance trippings.
- They trip sooner at high ambient temperatures. This is a major advantage for all electrical loads whose resilience strongly depends on the ambient temperature.



105, 106	1140-E / F / G	2-5000, 2-5700	2-6400	4130
				
	●			
●			●	
●		●		
●	●	●	●	●
●	●	●	●	●
5...10 A	1-pole: 3.5...16 A 2-pole: 0.05...16 A	0.05...25 A	0.05...16 A	20...80 A
AC 240 V DC 48 V	AC 240 V DC 48 V	AC 250 V/DC 28 V (VDE) AC 250 V/DC 50 V (UL)	AC 250 V/DC 28 V (VDE) AC 250 V (UL)	AC 240 V DC 50 V
bimetal strip	bimetal strip	bimetal strip	bimetal strip	bimetal strip
submersible pumps	electrical chain saws	compressors	heaters	riding sweepers

### Tripping elements

A **bimetal strip** consists of two form- locking or bonded (substance-to-substance) metal strips with different thermal expansion coefficient. The overcurrent heats up the bimetal and thus forces it to bend.

### Advantages of bimetal-strip-operated circuit breakers:

- They can be calibrated easily and precisely.
- They allow realisation of very low current ratings.

**Disc-type snap-action bimetals** have a firm domed shape. If the switching temperature is reached through the overcurrent, the bimetal disc suddenly snaps into the other direction.

### Advantages of bimetal-disc-operated circuit breakers:

- Simple and cost-effective design.
- Faster trip characteristics compared to circuit breakers with bimetal strips.

Models with **hot wires** make use of the particularly high coefficient of expansion of specific metals to open the circuit breaker's contacts. Current will flow through a wire hung up between two springs. Consequently the wire will expand and the element will snap when a certain temperature is reached.

### Advantage of circuit breakers working with a hot wire compared to circuit breakers with bimetal strips:

- They trip faster.
- They are insensitive to fluctuations of temperature.

Thermal circuit breaker/switch combination

# 3120-N



© Peter Atkins/Fotolia.com

- Time savings
- Cost reduction
- Space savings



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**Type 3120-N:**  
Replaces a switch, two fuse holders, two blade fuses and the two connecting cables between switch and fuse holder.





# Thermal circuit breaker/switch combination

## 3120-N – for a wealth of options

Single pole and double pole thermal circuit breaker/switch combinations for snap-in or screw mounting with current ratings up to 20 A.

The 3120-N thermal circuit breaker also serves as an ON/OFF switch for devices and machinery.

It offers a reliable trip-free mechanism and is also available with add-on modules for undervoltage release, remote trip and auxiliary contact function (mounted on delivery).

A broad range of frame sizes and designs is available. For actuation you can choose between push buttons or rocker actuators, available in a wealth of colours and marking options. Illumination optional.

### Your benefits

#### ● Cost savings

In AC 230 V applications where both phase and neutral conductor must be protected, the 3120-N replaces a switch, two fuse holders, two blade fuses and the two connecting cables between switch and fuse holder. This reduction of components makes purchasing logistics much easier.

#### ● Time savings

You only have to mount one component! Installation of cable connection between switch and fuse holder is eliminated.

#### ● Space savings

The 3120-N features space-saving integral overcurrent protection. It offers you nearly unlimited installation options.

### Accessories:

- Water splash covers
- Blanking pieces
- Terminal shrouds
- Terminal adapters

### Application in the industries

- Medical equipment
- Equipment Control
- Professional tools
- Industrial kitchenware
- Household appliances and garden tools
- Office equipment
- Lighting engineering



*3120-N circuit breaker/switch combination with innovative accordion-style seal (IP65) and Push-in terminals*



*3120-N thermal circuit breaker with splash cover*

**3120-N thermal circuit breaker/switch combination**  
**Single pole and double pole versions**

- AC 240 V / DC 50 V
- 0.1...20 A
- undervoltage release module, remote trip module or auxiliary contact module optional
- VDE, UL, CSA, CQC

### Approvals:



Your all-in-one solution:  
**3120-N thermal circuit breaker/switch combination**

Thermal circuit breaker/switch combination

# 3130

- Time savings
- Cost reduction
- Space savings



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# Thermal circuit breaker/switch combination 3130 – for making life easier

Single, double or three-pole thermal circuit breaker/switch combinations for snap-in mounting with current ratings up to 20 A

Besides its basic function as a thermal circuit breaker, the compact 3130 also serves as a reliable ON/OFF switch for devices and machines.

The rocker is the standard actuator and is available in a range of colours and optional illumination. The single pole version is also available with push button actuation.

Other major features include a reliable trip-free mechanism and a snap-action mechanism that prevents contact wear. This increases the endurance of the devices significantly.

## Your benefits

### ● Cost savings

The 3130 circuit breaker/switch combination includes the functionalities of a switch, fuse holders and blade fuses within a single device. Fewer components mean less disposition and storage costs.

### ● Time savings

If only a single component has to be mounted, it is much easier to save time and avoid operating errors.

### ● Space savings

Integral overcurrent protection is a space-saving feature of the 3130. It opens up more opportunities to use available space in your application.

## Application in the industries

- Medical equipment
- Equipment Control
- Professional tools
- Industrial kitchenware

## Accessories:

- Water splash covers



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## Thermal circuit breaker/ switch combinations

### Single to three pole versions

- AC 240 V, 3 AC 415 V / DC 50 V
- 1-pole: 0.1 ... 20 A  
2- and 3- pole: 0.1...16 A
- VDE, UL, CSA



3130 thermal circuit breaker (3-pole)

## Approvals:



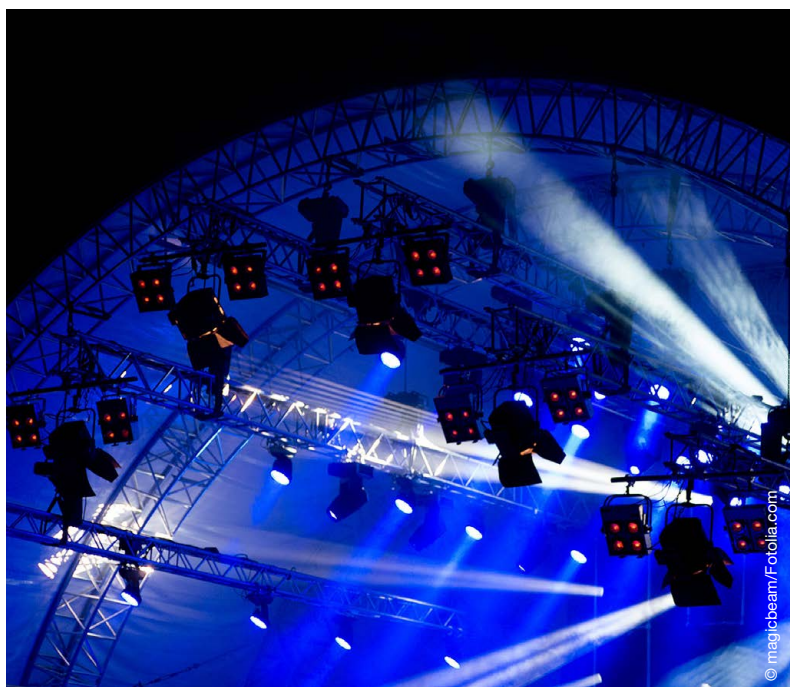
A wealth of installation options:  
3130 thermal circuit breaker/switch combination



Thermal circuit breaker/switch combination

# 1410-F

- Cost reduction
- Time savings
- Space savings



Type 1410-F thermal circuit breaker

# Thermal circuit breaker/switch combination 1410-F – for a fast trip performance

**Single pole thermal circuit breaker/switch combination for snap-in mounting with current ratings up to 10 A.**

The 1410-F thermal circuit breaker not only protects devices and machinery against the consequences of overcurrents. It also serves as an ON/OFF switch for equipment and machinery.

Its trip element is a special hot wire. In the event of an overcurrent it ensures immediate disconnection. In addition the 1410 is tolerant to temperature. The trip time is only marginally influenced with fluctuations in ambient temperature.

The 1410's features include a reliable trip-free mechanism and a snap action mechanism which prevents contact wear and enhances endurance.

**Illumination of the rocker actuator is also available.** E-T-A also offers a special version with a rocker which is illuminated in the OFF condition. It visually indicates overcurrent trip.

## Your benefits

### ● Cost savings

1410-F makes a single unit out of a switch, a fuse holder and a blade fuse. It helps to reduce the number of components requires and also material planning and storage costs.

### ● Time savings

Instead of three components, the user has to install only one. And what is more: Installation of cable connection between switch and fuse holder is eliminated.

### ● Space savings

The 1410-F is approximately the same size as two sugar cubes. This leaves room for creativity and ideas with regard to space design.

## Application in the industries

- Equipment Control
- Household appliances and garden tools
- Lighting engineering



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## Thermal circuit breaker/ switch combination 1410-F

### Single pole version

- AC 250 V  
DC 60 V (0.63 ... 5 A)  
DC 50 V (0.63 ... 8 A)
- 0.63 ... 10 A
- UL, CSA



1410-F thermal circuit breaker

## Approvals:



Safety - favourably priced, small size:  
1410-F thermal circuit breaker/switch combination

Thermal circuit breaker/switch combination

# 1110

- Cost reduction
- Time savings
- Space savings



Thermal circuit breaker **type 1110** with splash covers over terminals and push button (IP64)



# Thermal circuit breaker/switch combination 1110 – for small spaces

Single pole thermal circuit breaker/switch combination with push-push actuation for snap-in mounting with current ratings up to 16 A.

The 1110 is a thermal circuit breaker combining overcurrent protection with ON/OFF function for devices and machines. Upon request it also available in a purely reset version.

The device offers its users a reliable trip-free mechanism and snap action operation which prevents contact wear and ensures a long life span.

Its ultra-slim design makes the 1110 ideal for replacing closed vertical fuse holders.

## Your benefits

### ● Cost savings

The 1110 combines the functionalities of a switch, a fuse holder and a blade fuse into a single device. It helps to significantly reduce material planning and storage costs.

### ● Time savings

Mounting time is reduced because only a single component has to be installed. In addition, further steps for wiring between switch and fuse holder are eliminated.

### ● Space savings

The 1110 features a space-saving integral overcurrent protection. This leaves room to manoeuvre inside the equipment.

## Application in the industries

- Equipment Control
- Professional tools
- Industrial kitchenware
- Household appliances and garden tools

## Accessories:

- Water splash covers



1110 thermal circuit breaker

## Thermal circuit breaker/ switch combination

1110

### Single pole version

- AC 250 V / DC 50 V
- 0.05...16 A
- VDE, UL, CSA

## Approvals:



Compact design creates leeway for design:  
1110 thermal circuit breaker/switch combination

Thermal circuit breaker/switch combination

# 3140

- Cost reduction
- Time savings
- Space savings



← Integral seal



3140 thermal circuit breaker

# Thermal circuit breaker/switch combination

## 3140 – for water-tight safety

Single, double or three-pole thermal circuit breaker/switch combinations for snap-in mounting with current ratings up to 16 A.

E-T-A's 3140 is a powerful thermal circuit breaker which does not only protect devices and machines, but also serves as an ON/OFF switch.

Two large actuator buttons allow convenient operation. Operators can even wear gloves without compromising easy and safe actuation.

An integral rubber seal protects the circuit breaker against dust and water ingress. It meets IP66 protection degree for the operating area and it features a reliable trip-free mechanism.

### Your benefits

#### ● Cost savings

The 4130 circuit breaker combines the functionalities of switch, fuse holder and blade fuse in a single device. Less components allow for a significant reduction of components with reduced disposition and storage costs.

#### ● Time savings

You only have to mount one component! Installation of cable connection between switch and fuse holder is eliminated.

#### ● Space savings

The 4130 features space-saving integral overcurrent protection.

### Application in the industries

- Equipment Control
- Professional tools
- Industrial kitchenware

#### Thermal circuit breaker/ switch combination 3140

#### Three and four pole versions

- 3 AC 415 V / DC 50 V
- 0.1 ... 16 A
- undervoltage release module, remote trip module or auxiliary contact module optional
- VDE, UL, CSA, CQC



3140 thermal circuit breaker  
with undervoltage release module

### Approvals:



Compact size, convenient operation:  
3140 thermal circuit breaker/switch combination



# Overview

## Thermal circuit breaker/switch combinations

Type	3120-N	3130 (1-pole)	3130 (2- and 3-pole)
			
Illumination	●	●	●
Multipole versions	●		●
Auxiliary contacts	●		
Undervoltage release	●		
Splash cover	●		● (3-pole version)
Approvals to IEC and UL	●	●	●
Push-in terminals	●		
Current rating range	0.1 ... 20 A	1-pole: 0.1 ... 20 A	2- and 3- pole: 0.1 ... 20 A
Voltage	AC 240 V DC 50 V	AC 240 V DC 50 V	AC 240 V DC 50 V
Tripping element	bimetal strip	bimetal strip	bimetal strip
Typical applications	dentist's chairs	paper shredders	laboratory centrifuges

### Thermal overcurrent circuit breaker (TO)


The trip time of thermal circuit breakers depends on the height and duration of the overload current and the ambient temperature. The higher the overcurrent, the faster the bimetal will reach its defined tripping temperature. In the event of a low overload it will take longer until the required disconnection of potentials takes place. Thermal circuit breakers are recommended

for all applications where an overload is expected. They are the ideal solution for protecting loads such as motors, transformers, magnetic valves, on-board electrical systems and low voltage lines.

### Benefits of a thermal circuit breaker at a glance:

- They are a thermal copy of the loads to be protected: The higher the overload current, the faster the breaker trips.

- They tolerate inrush current peaks of motors, transformers and magnetic valves. Hence no nuisance trippings.
- They trip sooner at high ambient temperatures. This is a major advantage for all electrical loads whose resilience strongly depends on the ambient temperature.

3-pole)	1410-F	1110	3140
			
	•		
			•
			•
			•
on only)		•	•
	•	•	•
0.1 ... 16 A	0.63 ... 10 A	0.05 ... 16 A	0.1 ... 16 A
V V	AC 250 V DC 60 V (0.63 ... 5 A) DC 50 V (0.63 ... 8 A)	AC 250 V DC 50 V	3 AC 415 V DC 50 V
trip	hot wire	bimetal strip	bimetal strip
ntrifuges	carpet brushes	grain mills	woodworking machines

### Reduce components and cut costs

One of the major goals of design engineers today is to systematically reduce components. This is one of the keys to a cost-saving design. In addition less components normally also allow for space-saving and thus more compact design of products.

In order to support design engineers in reducing components E-T-A offers circuit

breaker/switch combinations. These are thermal overcurrent circuit breakers that also serve as an ON/OFF switches for apparatus and machines.

Appliance inlet modules

# X3120

# X3130

- Time savings
- Cost savings
- Reliability



*X3120-A appliance inlet module*



*X3120-B appliance inlet module*



# Appliance inlet modules

## X3120, X3130 – for a good combination

Appliance inlet modules with integral 2-pole circuit breaker/switch combination and either IEC appliance inlet or IEC inlet filter.

### X3120-A

Screw-type mounting with integral 2-pole 3120-N circuit breaker/switch combination and IEC inlet filter C14. E-T-A offers standard filters and special high performance filters with low leakage currents for use in medical equipment.

### X3120-B

Screw-type mounting with integral 2-pole 3120-N circuit breaker/switch combination and IEC inlet plug C14. The switch/circuit breaker combination is placed inwards. This protects the actuator against inadvertent operation.

### X3130

Screw-type mounting with integral 2-pole 3130 circuit breaker/switch combination and IEC inlet plug C14.

### Your benefits

#### ● Time savings

Switch, resettable overcurrent protection, IEC inlet plug and filter included in a single component. You only mount a single part. And what is more: Wiring between the individual parts is eliminated.

#### ● Cost savings

Compared to standard solutions with switches, blade fuses, appliance inlets and filters, purchasing has to buy only a single component. This reduction of components makes purchasing logistics much easier.

#### ● Reliability

E-T-A appliance inlet modules are designed to ensure reliable protection by means of the circuit breaker also of the filter in the event of overcurrents.

### Application in the industries

- Medical equipment
- Equipment Control
- Industrial kitchenware



X3130 appliance inlet module

### Appliance inlet modules

#### X3120, X3130

- AC 240 V
- X3120-A: C14 inlet filter
- X3120-B: C20 appliance inlet
- X3130: C14 appliance inlet
- VDE, ENEC, UL, CSA, CCC

### Approvals:



Convenience, reliability, versatility:  
X3120 , X3130 appliance inlet modules

Thermal-magnetic circuit breakers

# 3120-M1

# 2210-S



- Cost reduction
- Time savings
- Limited downtime
- Space savings



**3120-M1** thermal-magnetic circuit breaker



**2210-S** thermal-magnetic circuit breaker

# Thermal-magnetic circuit breakers

## 3120-M1 and 2210-S – for any possible requirement

### 3120-M1

Single or double pole thermal-magnetic circuit breaker for snap-in mounting with current ratings up to 16 A.

The 3120-M1 thermal-magnetic circuit breaker also serves as an ON/OFF switch for devices and machinery. The rocker actuators or push buttons are available in various colours or with illumination.

Design of the 2-pole version:

Pole 1 is thermal-magnetically protected.  
Pole 2 is only thermally protected.

#### Your benefits

##### ● Cost savings

In AC 230 V applications where both phase and neutral conductor must be protected (e.g. medical equipment) the 3120-N replaces a switch, two fuse holders, two blade fuses and the two connecting cables between switch and fuse holder. This reduction of components makes purchasing logistics much easier.

##### ● Time savings

You only have to mount one component! Installation of cable connection between switch and fuse holder is eliminated.

##### ● Limited downtime

In the event of a short circuit in the equipment, the 3120-M1 disconnects it much faster than the upstream MCB. Only the faulty load is disconnected. All other loads in the same path remain unaffected.

#### Application in the industries

- Medical equipment
- Equipment Control
- Professional tools
- Industrial kitchenware

### 2210-S

One to four-pole thermal-magnetic circuit breaker for plug-in or front panel mounting with current ratings up to 25 A.

2210 is a thermal-magnetic circuit breaker with an integral ON/OFF switch for devices and machines. It has a reliable trip-free mechanism and is also available with integral auxiliary contacts. The actuating element is a toggle. The version with intermediate position is also available with manual or electrical disconnection. Delayed, medium delayed and instantaneous trip curves are available.

#### Your benefits

##### ● Cost savings

Compared to standard solutions consisting of circuit breakers and auxiliary contact modules, only one component has to be stocked. This makes purchasing logistics much easier.

##### ● Time savings

Integral auxiliary contacts eliminate assembly of circuit breakers and auxiliary contact modules.

##### ● Space savings

2210-S circuit breakers feature an installation width of only 12.5 mm including auxiliary contacts. Compared to standard MCB this provides a space reduction of 50 %.

#### Application in the industries

- Medical equipment
- Equipment Control
- Industrial kitchenware

#### Accessories:

- Water splash covers
- Blanking pieces
- Terminal shrouds
- Mounting sockets
- Terminal blocks
- Power distribution systems
- Busbars
- Connector bus links
- Water splash covers
- Actuator guards

#### Thermal-magnetic circuit breakers 3120-M1

- Single pole and double pole versions
- AC 240 V / DC 50 V
- 0.1...16 A
- VDE, UL, CSA, CQC

#### 2210

- Single to four pole versions
- AC 250 V / 3 AC 433V / DC 65 V
- 0.1...25 A
- VDE, UL, CSA, CQC
- Various trip characteristics

#### Approvals:



A choice of accessories for unrivalled flexibility:  
Circuit breaker models 3120-M1 and 2210-S

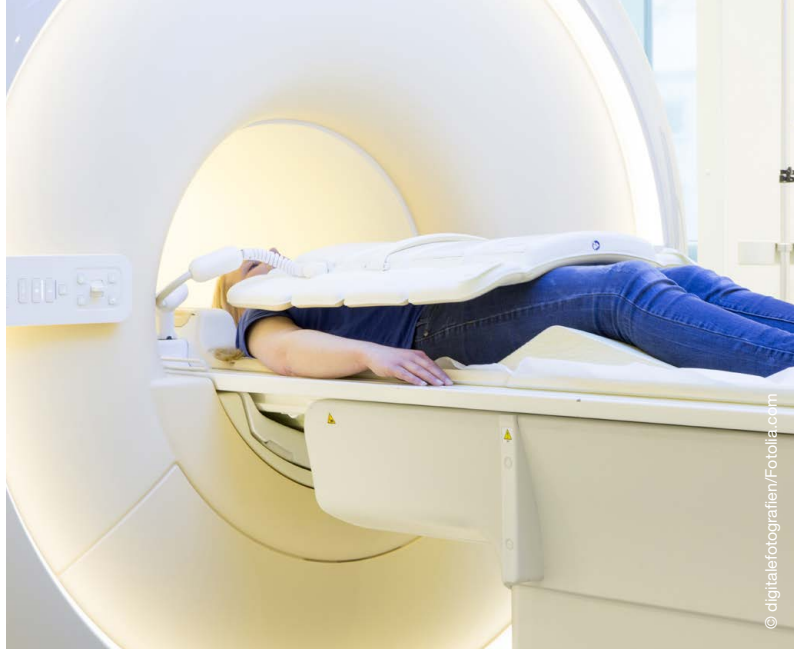


Hydraulic-magnetic circuit breakers

8330

8340-F

8345



- Limited downtime
- Wide application range
- Space savings



8330 hydraulic-magnetic circuit breaker



8340-F hydraulic-magnetic circuit breaker

# Hydraulic-magnetic circuit breakers

## 8330, 8340-F, 8345 - unending flexibility

One- to four-pole hydraulic-magnetic circuit breakers for snap-in mounting, front panel mounting, threadneck mounting or plug-in mounting with current ratings up to 125 A.

8330, 8340-F and 8345 are hydraulic-magnetic circuit breakers serving also as ON/OFF switches for devices and machines. Type 8330 is also available in a pure reset version.

Toggle, rockers and push button actuators are available. All models of this series are reliably trip-free and auxiliary contacts are available as an option. Delayed, medium delayed and instantaneous trip curves are available:.

The 8345 models are also available with remote ON/OFF actuation motor.

### Your benefits

#### ● Limited downtime

Unlike thermal circuit breakers, hydraulic-magnetic models can immediately be reset after tripping due to an overcurrent.

#### ● Wide application range

Various design styles and a range of trip characteristics make hydraulic-magnetic circuit breakers the ideal choice for many applications.

#### ● Space savings

All hydraulic-magnetic circuit breakers feature a very compact design **and integral auxiliary contacts do not require additional space.**

### Application in the industries

- Medical equipment
- Equipment Control
- Industrial kitchenware

### Accessories:

- Water splash covers
- Busbars
- Supply terminals

### Hydraulic-magnetic circuit breakers 8330

- 1- and 2-pole versions
- AC 250 V / DC 80 V
- 0.1 ... 30 A
- VDE, UL, CSA

### 8340-F

- 1- and 4-pole versions
- AC 240 V, 3 AC 415 / DC 80 V
- AC 0.02...30 A / DC 0.02...50 A
- VDE, UL, CSA, CQC, QPL

### 8345

- 1- to 4-pole versions
- AC 240 V, 3 AC 415 V, AC 277/480 V / DC 80 V
- 0.05 ... 125 A
- VDE, UL, CSA, CQC



8345 hydraulic-magnetic circuit breaker



### Approvals:



Hydraulic-magnetic protection:  
8330, 8340 and 8345 circuit breaker models

# Overview

## Thermal-magnetic circuit breakers

Type	2210	3120-M	
			
Illumination		●	
Multipole versions	●	●	
Auxiliary contacts	●		
Splash cover	●	●	
Approvals to IEC and UL	●	●	
Intermediate position	●		
Various trip characteristics	●		
Current rating range	0.1...25 A	0.1...16 A	
Voltage	AC 250 V/3 AC 433 V DC 65 V	AC 250 V DC 50 V	
Typical applications	laboratory equipment	vending machines	

### Thermal-magnetic circuit breakers (TM)

The protective function of thermal-magnetic circuit breakers is achieved by combining temperature and magnetic force. The thermal element of the circuit breakers provides protection in the event of an overload with a delayed trip characteristic. The magnetic part responds without delay to high overload and short circuit currents and disconnects the faulty circuit within only a few milliseconds.


### Benefits of thermal-magnetic circuit breakers at a glance:

- Overload and short circuit protection in a single device.
- High interrupting capacity can be achieved by suitable arc arresters.



# Overview

## Hydraulic-magnetic circuit breakers

8330	8340-F	8345
		
●		
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
0.1...30 A	AC: 0.02...30 A DC: 0.02...50 A	0.05...125 A
AC 250 V DC 80 V	AC 240 V/3 AC 415 V DC 80 V	AC 240 V, 3 AC 415 V, AC 277/480 V DC 80 V
life support machine	ultrasonic devices	medical illumination units

### Hydraulic-magnetic circuit breakers (HM)

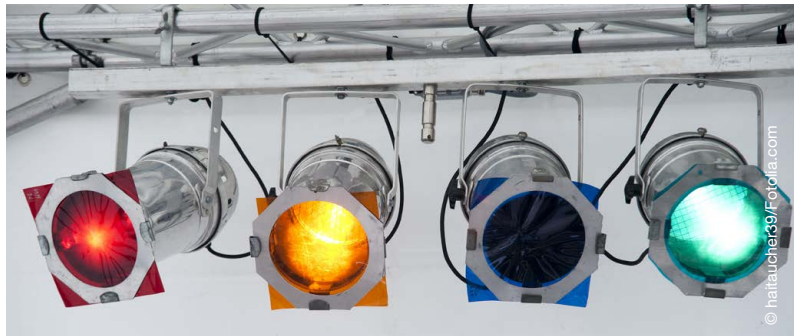
A well-proven design of solenoid coil with optional hydraulic delay provides tripping that is highly tolerant to changes in ambient temperature. A wide range of performance characteristics is available in single, double and three pole configurations. The magnetic part responds without delay to high overload and short circuit currents and disconnects the faulty circuit within only a few milliseconds.

### Benefits of hydraulic-magnetic circuit breakers at a glance:

- Compact design
- Trip times mostly independent of the ambient temperature
- Very fast reset times

# Technical Information

- Basic information and application examples



## Thermal overcurrent circuit breaker (TO)

The trip time of thermal circuit breakers depends on the height and duration of the overload current and on the ambient temperature. The higher the overcurrent, the faster the bimetal will reach its defined tripping temperature. In the event of a low overload it will take longer until the required disconnection of potentials takes place. Thermal circuit breakers are recommended for all applications where an overload is expected. They are the ideal solution for protecting loads such as motors, transformers, magnetic valves, on-board electrical systems and low voltage lines.

## Benefits of a thermal circuit breaker at a glance:

- They are a thermal copy of the loads being protected: The higher the overload current, the faster the breaker trips.
- They tolerate inrush current peaks of motors, transformers and magnetic valves. Hence no nuisance trippings.
- They trip sooner at high ambient temperatures. This is a major advantage for all electrical loads whose resilience strongly depends on the ambient temperature.

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### Hydraulic-magnetic circuit breakers (HM)

A well-proven design of solenoid coil with optional hydraulic delay provides tripping that is highly tolerant to changes in ambient temperature. A wide range of performance characteristics is available in single, double and three pole configurations. The magnetic part responds without delay to high overload and short circuit currents and disconnects the faulty circuit within only a few milliseconds.

### Benefits of hydraulic-magnetic circuit breakers at a glance:

- compact design
- trip times largely independent of the ambient temperature
- very fast reset times

### Snap-action mechanism

The snap-action mechanism used in many E-T-A products ensures that the contact closing speed is independent of the speed of operation of the actuator (push button rocker, toggle etc.). The moving contact is retained until the actuator causes a defined force to act in the closing direction of the contacts. Once this force is exceeded, the mechanical retention is overcome allowing the contacts to snap closed (tease-free mechanism). The closing speed is a function of this force alone. Snap action

mechanisms eliminate contact welding upon switching on to sustained short circuits and minimise the risk of contact wear over the life of a circuit breaker.

### Trip-free mechanism

Reliable switching behaviour of E-T-A circuit breakers is ensured by the trip-free mechanism (positively trip-free). The circuit breaker trips reliably in the event of an overcurrent even when the actuator (push button, toggle or rocker) is blocked.

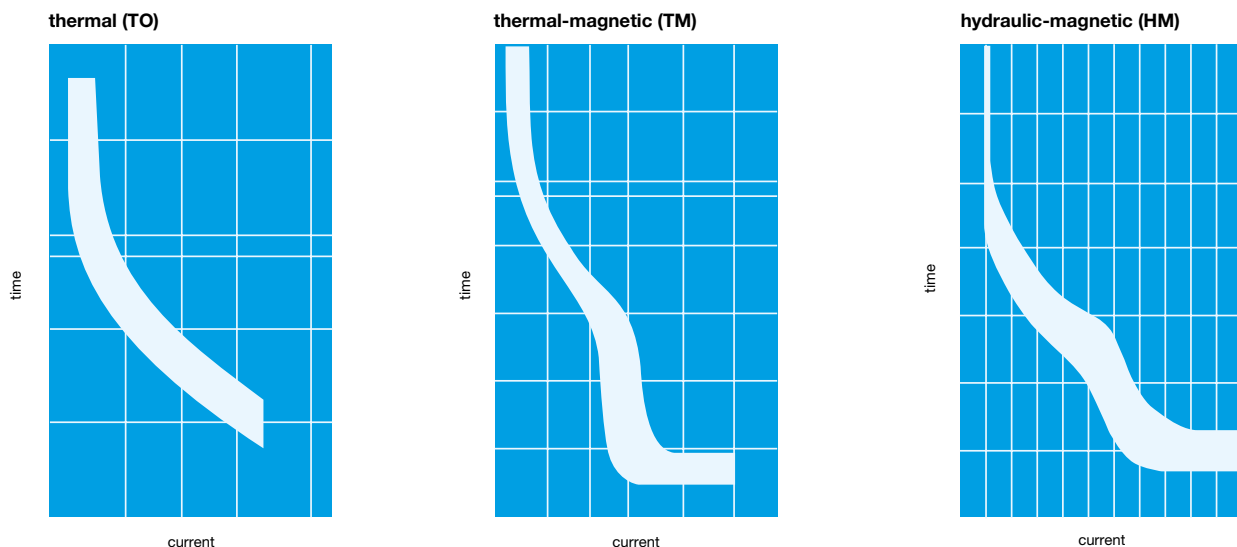
### Auxiliary contacts

A part of our circuit breaker range offers auxiliary contacts. These electrically separate low current contacts can be included for use with alarm and control switching circuits.

### Accessories for circuit breakers, circuit protectors and system solutions

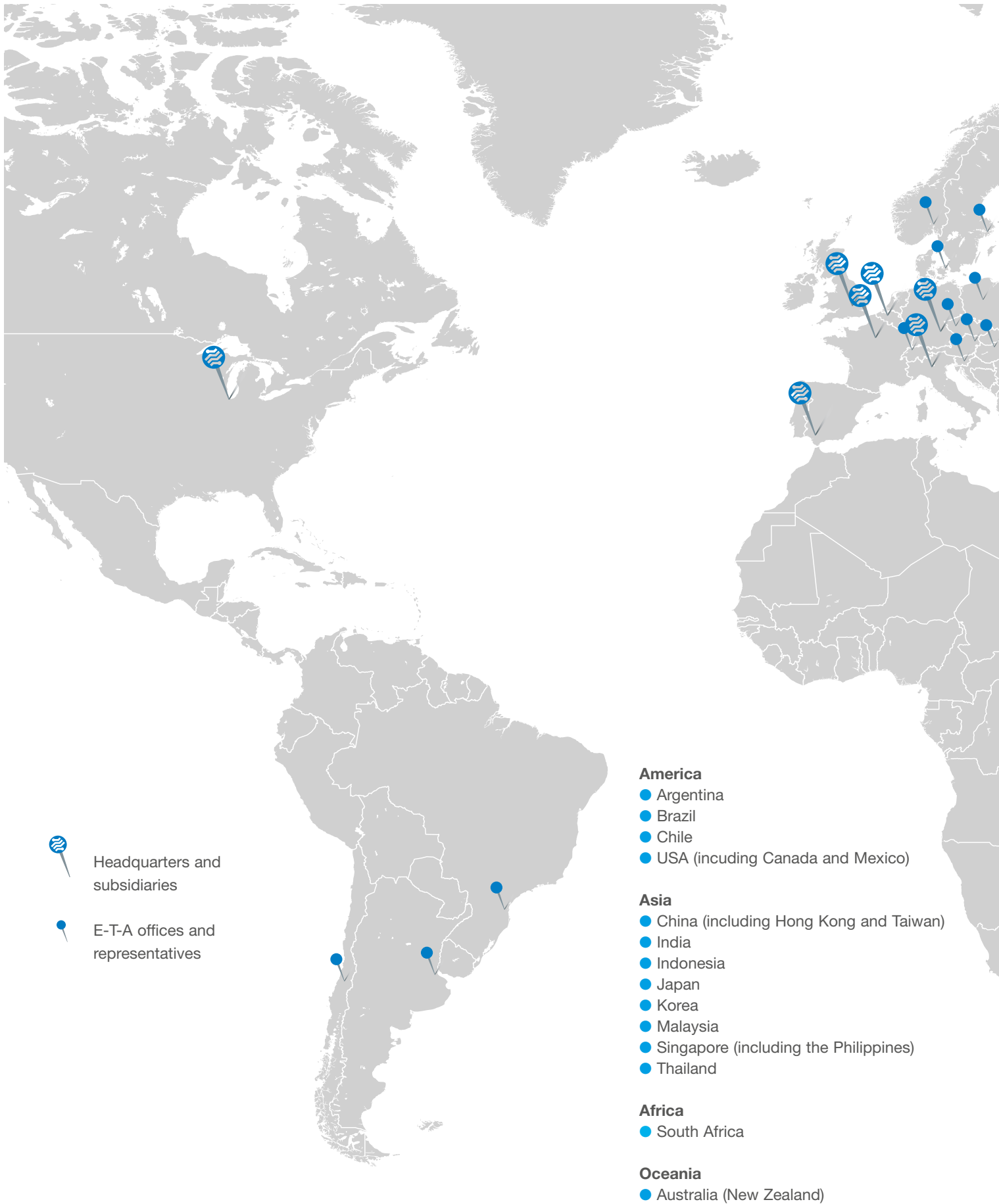
E-T-A offers a comprehensive range of accessories completing our product portfolio. It includes add-on modules for zero-voltage release or auxiliary contact function as well water splash covers, terminal blocks, sockets, busbars, retaining clips, jumpers and many more. For detailed information please see the individual technical data sheets of our products ([www.e-t-a.de](http://www.e-t-a.de)), section "Accessories". For further details on our products please visit [www.e-t-a.de](http://www.e-t-a.de)

## Typical time/current characteristic curves





# E-T-A – a globe-spanning network



For information on our global network please visit: [www.e-t-a.de/contact](http://www.e-t-a.de/contact)



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