Thermal circuit breaker/ switch combinations

Including ON/OFF actuator

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 a space-saving and thus more compact design of products.

In order to support design engineers in reducing components E-T-A offers so-called **circuit breaker/switch combinations**. It is a thermal overcurrent circuit breaker which at the same time serves as an ON/OFF switch of apparatus, machinery and systems.

Seven in one

Example for parts reduction for a 2-pole protection

The **E-T-A circuit breaker/switch combination** here replaces 2 blade fuse holders, 2 blade fuses, a double pole rocker switch as well as the two cable connections between the rocker switch and fuse holder

Your benefits at a glance

Benefit 1

Reduced mounting and wiring time
You only mount a single component. In addition you do not have to connect switch and blade fuse.

Benefit 2

Space-saving design
E-T-A circuit breaker/switch combinations feature integral overcurrent protection to save space. This leaves room for creativity and ideas with regard to space design, even in constricted rooms.

Benefit 3

Reduced disposition and storage costs
E-T-A circuit breaker/switch combinations replace switches, fuseholders and blade fuse inserts. They make purchasing logistics much easier.

Benefit 4

Enhanced overall reliability
Less single components always mean: less malfunction sources. The E-T-A circuit breaker/switch combinations help you to consistenly increase your products' reliability.

E-T-A

A globe-spanning network

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More information? Just scan the QR code!

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Thermal circuit breakers

Never replace a fuse again!

Thermal circuit breakers for equipment protection

Just push the button to reset

If overcurrents are not disconnected in time, heat damages will be the inevitable consequence. In a worst case scenario apparatus and machinery may even catch fire. This can only reliably be prevented by professional overcurrent protection. If the protected loads are motors, transformers, magnetic valves or low voltage lines, we recommend to use circuit breakers for equipment protection with a thermal trip characteristic.

Their benefits:
- They ensure reliable overload protection
- They tolerate inrush current peaks of motors, transformers and magnetic valves
- They trip sooner at high ambient temperatures. This is a major advantage for all electrical loads whose resilience strongly depends on the ambient temperature

Here are three good reasons to use E-T-A circuit breakers insteade of blade fuses:

Avoid downtimes!
Circuit breakers can easily and conveniently be reset after they tripped. As opposed to that, a blown fuse has to be replaced. And you do not always have a suitable replacement fuse ready at hand.

Do not take any risks!
Each E-T-A circuit breaker is reliably tested with regard to its function before leaving our factory. A blade fuse, however, can of course not be tested as this would destroy the fuse.

Rely on consistent technical data!
Blade fuses are subject to ageing. Over time they get faster and faster and thus they become unpredictable. Nuisance tripping may be the consequence. Circuit breakers, on the other hand, do not change their trip characteristic during their entire life span.

Basics: Thermal circuit breakers

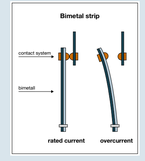
The most frequently used trip elements of thermal circuit breakers are thermo-bimetals. The trip time depends on the height and duration of the overcurrent as well as on the ambient temperature.

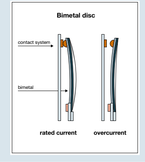
A **bimetal strip** consists of two form-locking or bonded (substance-to-substance) metal strips with different thermal expansion coefficient. The overcurrent heats up the bimetal and thus forces it to bend.

Advantages of bimetal-strip-operated circuit breakers:
- They can be calibrated easily and exactly
- They allow realisation of very low current ratings

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

Advantages of bimetal-disc-operated circuit breakers:
- Artless and cost-effective design
- Faster trip characteristics compared to circuit breakers with bimetal strips





Thermal
circuit breaker/switch combinations

circuit breaker/switch combination type	1110	1410-F	3120 (rocker)	3120 (push button)	X3120 (with C20 plug)	3130 (rocker)	3130 (push button)	X3130: (with C14 plug)	3131	3140
Illumination		●	●	●	●	●		●	●	
Splash cover	●		●	●		●			●	●
Auxiliary contacts			●	●	●					●
Undervoltage release			●	●	●					●
Multipole versions			●	●	●	●		●		●
Approvals to IEC and UL	●	●	●	●	●	●	●	●	●	●
Technical Data	**Rated voltage** AC 250 V, DC 50 V **Current ratings** 0.05...16 A	**Rated voltage** AC 240 V, DC 28 V **Current ratings** 0.63...10 A	**Rated voltage** AC 240 V, DC 50 V **Current ratings** 0.1...20 A	**Rated voltage** AC 240 V, DC 50 V **Current ratings** 0.1...20 A	**Rated voltage** AC 240 V, DC 50 V **Current ratings** 0.1...20 A	**Rated voltage** AC 240 V, 3 AC 415 V, DC 50 V **Current ratings** 0.1...20A (1- pole) 0.1...16A (multipole)	**Rated voltage** AC 240 V, DC 50 V **Current ratings** 0.1...20 A	**Rated voltage** AC 240 V, DC 50 V **Current ratings** 0.1...15 A	**Rated voltage** AC 240 V, DC 28 V **Current ratings** 0.1...20 A	**Rated voltage** 3 AC 415 V, DC 50 V **Current ratings** 0.1...16 A
Example of a typical application	grain mills	carpet brushes	life support machine	box column drill	treadmills	shredders	vending machines	laboratory centrifuges	motor yachts	wood cutting machines

More information? Just scan the QR code!

Thermal
resettable circuit breakers

Reset circuit breaker type	104	106	1140-G	1115	1410-L	1658	2-5700	2-6400	4130
Illumination									
Splash cover		●	●			●	●	●	●
Auxiliary contacts								●	
Undervoltage release									
Multipole versions			●						
Approvals to IEC and UL	●	●	●	●	●	●	●	●	●
Technical Data	**Rated voltage** AC 240 V, DC 48 V **Current ratings** 0.05...10 A	**Rated voltage** AC 240 V, DC 48 V **Current ratings** 0.05...10 A	**Rated voltage** AC 240 V, DC 48 V **Current ratings** 0.05...16 A	**Rated voltage** AC 250 V, DC 32 V **Current ratings** 1...16 A	**Rated voltage** AC 240 V, DC 28 V **Current ratings** 0,63...10 A	**Rated voltage** AC 240 V, DC 28 V **Current ratings** 5...30 A	**Rated voltage** AC 250 V, DC 28 V **Current ratings** 0.05...25 A	**Rated voltage** AC 250 V, DC 28 V **Current ratings** 0.05...16 A	**Rated voltage** AC 240 V, DC 50 V **Current ratings** 20...80 A
Example of a typical application	electrical chain saws	incubators	welding machines	gambling machines	electronic pcbs	vending machines	compressors	heaters	ride-on sweepers