



**Customizable protection:** The CAPAROC circuit breaker system offers numerous combination options for more security in machines and systems.

## More than just circuit protection

New customizable circuit breaker system offers advantages from design through operation

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In many industries, optimized process sequences ensure the reliable operation of systems without failures or downtimes. Some manufacturers are taking a systems approach to electronic circuit breakers, supporting the protection requirements without sacrificing uptime for maintenance. Modules can be replaced without de-energizing the entire system.

Today, 24 V DC power systems in control cabinets have more requirements than ever before. Many systems feature high-quality power supplies, redundancy modules, and UPS modules, along with electronic circuit breakers and remote monitoring mechanisms, to ensure high system availability. At the same time, it is getting more complex to plan, combine and procure suitable components, and set up supply systems. Individual components, such as circuit breakers, can help reduce system complexity.



**Customized modular system for surge protection:** with many combination options, intuitive operation, and simple design-in, CAPAROC marks a new standard in device protection.

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## Advantages for developers and buyers

The electrical development department's design-in process is the first step for electronic components and modules. The developer typically expects full digital setup support, especially if they work in a CAD-supported environment.

To make the design process easier, some manufacturers offer an online configurator to simplify the circuit breaker assembly process. For example, the configurator for Phoenix Contact's CAPAROC circuit breaker system includes several options:

- Power modules with or without a communication interface
- 1-channel circuit breaker modules with four output terminals
- 2-channel circuit breaker modules with two output terminals per channel
- 4-channel circuit breaker modules with one output terminal per channel
- 0 V potential distributor module
- Current rails designed for modular extension

The developer can make additional adjustments with the configurator, such as defining the individual nominal trip current per channel or defining physical marking on the modules and channels. Ensuring that individual channels have clear marking will also simplify installation, initial startup, subsequent maintenance, and any subsequent troubleshooting.

While numerous combinations are available, the configurator always assigns a unique solution ID. This solution ID can be recalled and adapted to current requirements at any time, simplifying system planning changes and modifications.

In addition, the configurator can provide system data sheets, marking data, 2D and 3D data, bill of materials, and EPLAN data. The entire configuration process generates one master data set – an additional benefit for developers and buyers. Generating and maintaining master data is notoriously time-consuming and expensive.

## Advantages for installation and startup

Once the new modules are designed in, circuit breaker modules with tool-free, plug-and-play technology simplify the assembly process. Other helpful features, like color-coded operating elements and push-in technology, can prevent connection errors. Installers can adapt the channel current settings to the application, either via the LED buttons or rotary switches on the modules or centrally via the network communication interface.

## Advantages for the operator: no system failures

The use of redundancy modules, UPSs, and monitoring mechanisms in a 24 V DC supply system faces three challenges:

- Undervoltage: the feed from the upstream power supply has a problem, or the power supply is not operating in a nominal state
- Overvoltage: the control of the upstream power supply is defective, and the voltage consequently rises to an unacceptable level
- Current consumption over 80 percent of the specified nominal value: increased load on the module due to downstream components drawing too much power or a ground fault downstream

In addition to these three externally caused process states, a circuit breaker should recognize two internal states:

- One or more channels are tripped
- Overall current shutdown over 45 A: the modules turn off according to priority to avoid a full system overload state

A communication interface that can collect these operating steps is especially valuable. This interface can collect individual modules' operating states and report that data to a central control room or controller. If needed, the technician can initiate preventative measures, such as resetting tripped channels via the reset command. Locally, colored LEDs directly signal the circuit breaker module's operating state. If a module requires replacement, it can be replaced during operation without impacting other components in the protective system.

For higher security, look for a circuit breaker system that can be globally locked against two undesired external impacts:

- Nominal current programming lock: the local nominal current programming on all circuit breaker modules is locked
- User interface lock: the operation capabilities of the circuit breaker modules via the buttons and nominal current rotary switches is completely locked

These protection mechanisms contribute decisively to maximum system availability..



**Intuitive operation, simple maintenance, fast troubleshooting: The easy nominal current setting and clear identification of connections and potentials increase security and comfort.**

## Summary

Not long ago, a complete package would have been hard to imagine in a circuit breaker system. With the introduction of CAPAROC, Phoenix Contact has created a fully adaptable circuit breaker system. CAPAROC offers numerous features, including:

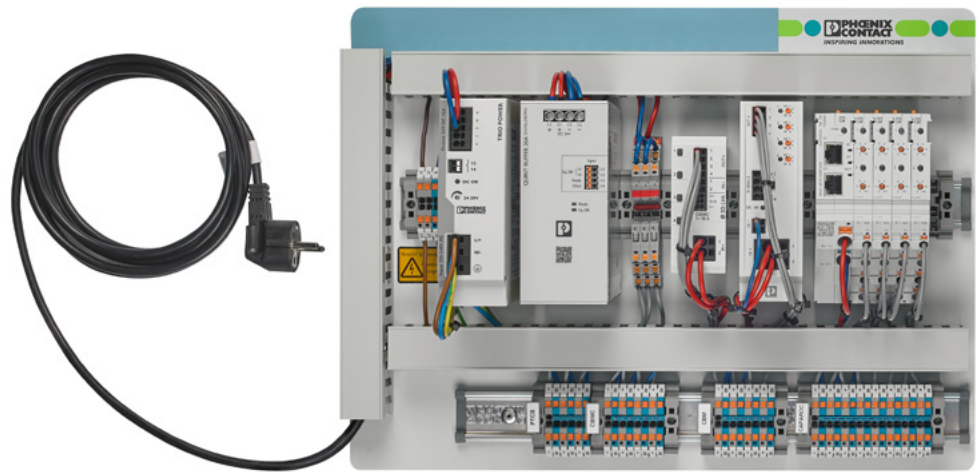
- Customizable
- Easy data acquisition
- A complete digital data packet
- Tool-free mechanical structure
- Quick installation and startup
- Easy maintenance and quick troubleshooting
- Comprehensive information about the state of the supply system

With its versatile combination options and easy design-in and operation, CAPAROC creates a tailored system to meet any application's circuit protection needs.

## Solutions from a single source

In addition to circuit breakers, Phoenix Contact offers additional products and solutions for supply systems of 24 V DC control cabinets. This includes:

- A powerful surge protection system, which safely discharges transient overvoltages on the AC side before expensive system downtimes occur
- Redundant solutions and batteries, which supplement the DC power supply when needed, thus safeguarding the 24 V supply even in critical situations
- Innovative solutions for AC and DC potential distribution, which reduce the space required and the installation time
- Future-proof monitoring solutions, which help save energy in the overall system and constantly provide information on the state of the power supply



**Application board: 24 V supply solutions are tested with different trigger characteristics and circuit breaker designs – directly in the application.**

## Further information:

[www.phoenixcontact.com/us-CAPAROC](http://www.phoenixcontact.com/us-CAPAROC)

[www.phoenixcontact.com/us-CAPAROC-configurator](http://www.phoenixcontact.com/us-CAPAROC-configurator)

[www.phoenixcontact.com/us-CAPAROC-demo](http://www.phoenixcontact.com/us-CAPAROC-demo)

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