



Power transmission and distribution


Products for your success

Shaping the energy industry's future together

When it comes to ensuring a reliable energy supply, energy providers have trusted our expertise for nearly a century. That's because we know as well as you that a stable power grid requires solutions that react intelligently and work reliably – both today and in the future – even under unfavorable conditions. Join us in shaping the energy industry's future together.

Find out more with the web code

For detailed information, use the web codes provided in this brochure. Simply enter # and the four-digit number in the search field on our website.

 **Web code:** #1234 (example)

Or use the direct link:
phoenixcontact.net/webcode/#1234



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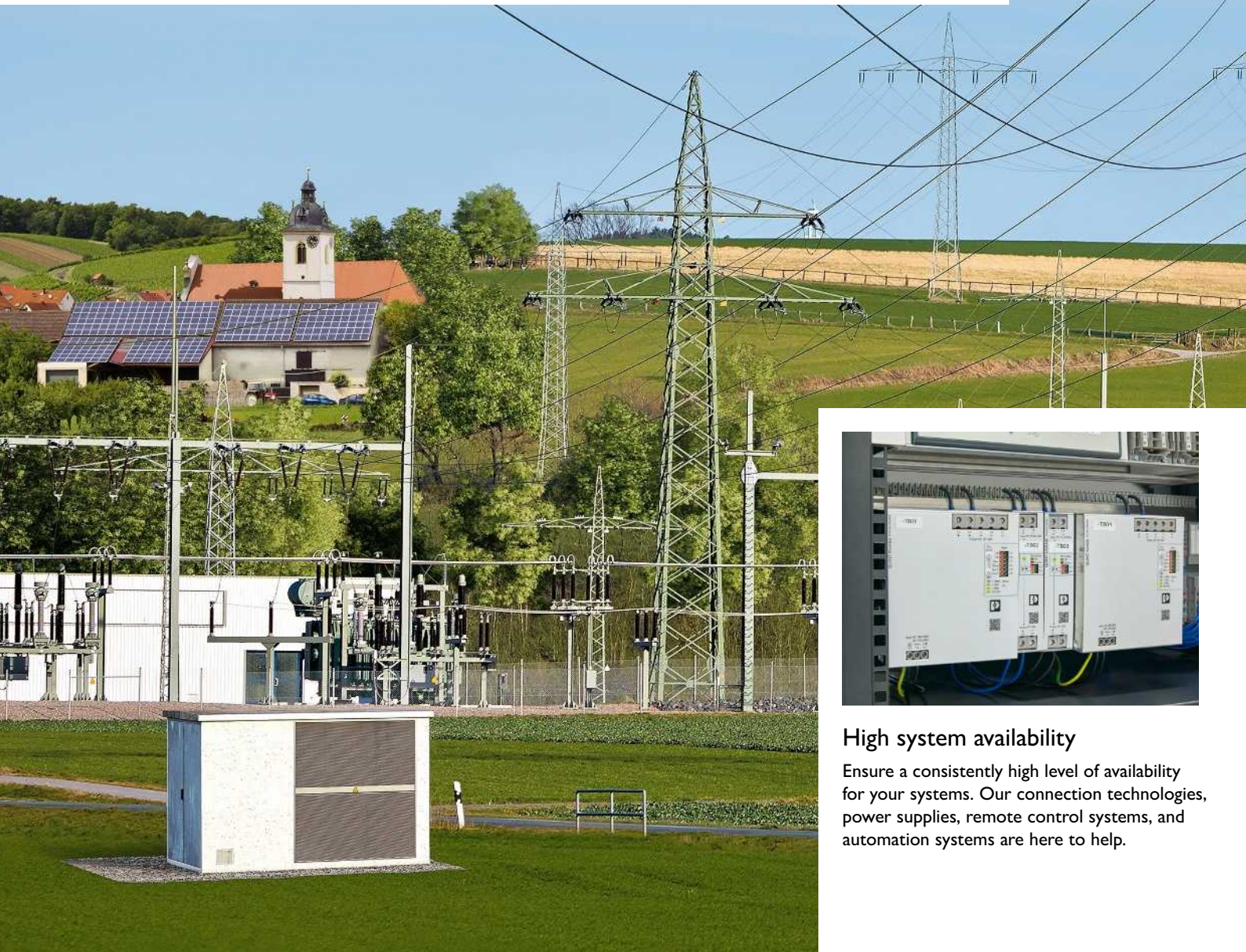
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Reliable, intelligent, future-proof

Highly available systems are based on reliable components that interact seamlessly with one another – just like the components from Phoenix Contact. We use innovative products and sophisticated solutions to help our customers operate highly available systems, implement efficient processes and establish a technical infrastructure that is fit for the digital future.



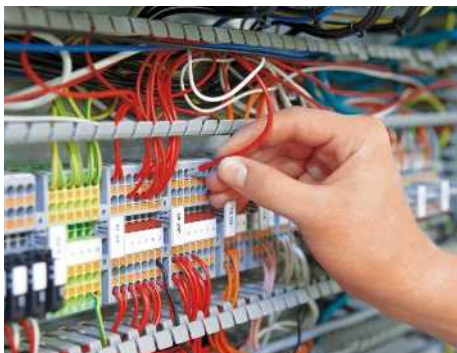
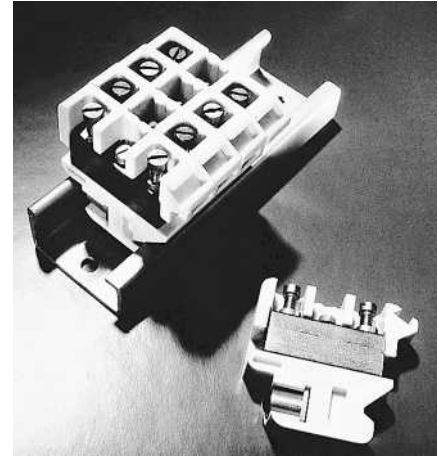
High system availability

Ensure a consistently high level of availability for your systems. Our connection technologies, power supplies, remote control systems, and automation systems are here to help.



Electrifying since 1923

We brought the first modular terminal block for power plants on the market nearly 100 years ago. Since then, we have successfully installed these terminal blocks in countless energy industry projects. Together with our customers we have broken new ground and driven innovative developments forward time and again. Because as a global market leader in electrical engineering, we want to offer our customers tomorrow's solutions today.



Efficient processes

Optimize and streamline your processes. Plan and configure your terminal strips quickly and conveniently with our complete solution for control cabinet manufacturing.



Future-oriented technologies

Keep an eye on your system data, even in a volatile energy market. Our intelligent technologies ensure the quick and reliable evaluation, processing, and transmission of your data.



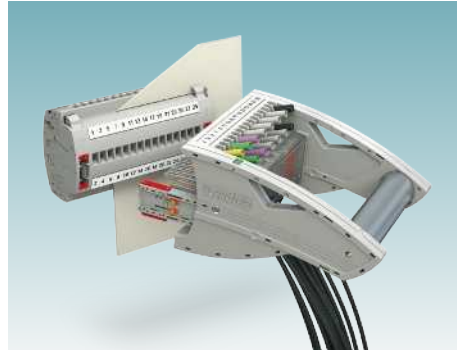
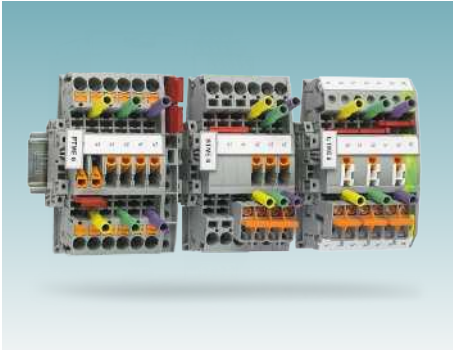
Smooth operation

Proper marking helps avoid operating errors: our marking systems meet every demand and are particularly suitable for substation maintenance.

Testing

Regular device and interface testing is crucial, in particular in critical infrastructures such as energy switching devices. Whether meters, measuring devices, or protective relays – with our special terminals or our pluggable FAME system, you can connect, test, and replace all devices quickly and safely.





Simple, individual configuration of current transformer sets

Use our current transformer disconnect terminal blocks to design space-saving and modular switching devices. The pluggable CLIPLINE complete system accessories for testing and short-circuiting the current transformers as well as potential distribution can be placed inside the terminal strips according to the specific application.

i Web code: #1095

Easy and safe connection of protection relay testing

Protective devices for high-voltage current transformers are tested regularly. The modular, pre-configured FAME plugs and terminal strips offer all switching actions for safe protective testing, enabling time-saving measuring and testing processes.

i Web code: #0131

Comparison of plug-in test systems

FAME is available in five versions. Choose your solution:

FAME 1 plug-in test system with operating plug and transformer short circuit in the plug-in test socket.

i Web code: #1097

FAME 2 plug-in test system without an operating plug and transformer short circuit in the test plug.

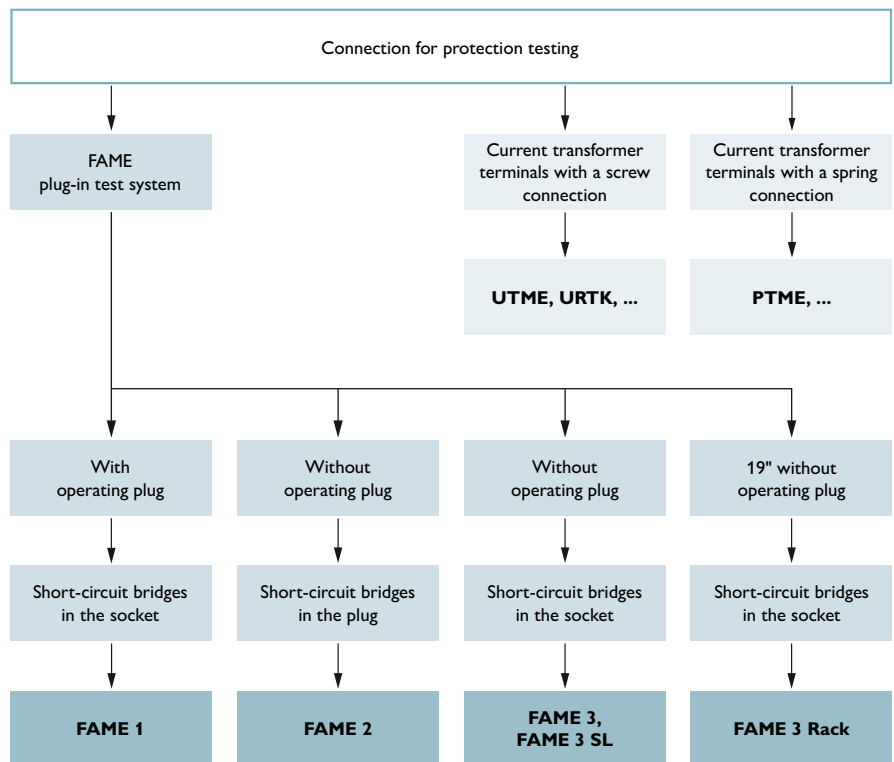
i Web code: #1096

FAME 3 and FAME 3 SL plug-in test systems without an operating plug and transformer short circuit in the plug-in test socket.

i Web code: #0999, #2352

FAME RACK plug-in test system without operating plug and transformer short circuit in the plug-in test socket.

i Web code: #2353



Power supply and protection

Station control technology is essential in order to guarantee safe and reliable operation of a substation. Supplying these devices with failsafe voltage while at the same time protecting them is one of the most important tasks of the power transmission and distribution system. For this purpose, we offer special power supply units for 24 V DC that can be installed redundantly, and compact device circuit breakers that can be used to protect each function separately.

With their broad range of protection, control, and measurement functions, our compact protection and control devices are well-suited for a wide variety of applications.





Effective protection of equipment

Provide individual protection for your operating equipment. Using device circuit breakers lets you protect your devices reliably and therefore ensure a consistently high level of availability for your system.

i Web code: #2096

Superior availability

Ensure the redundant supply of power to electronic devices in the substation using cutting-edge power supply technology.

i Web code: #0150

Complete protection for power grids

Thanks to their comprehensive protective functions, our innovative protective and control devices are ideal for customer grids and distribution networks. The devices are characterized by low-maintenance operation and long-term stability. High-resolution displays and comprehensive function keys allow for easy operation.

i Web code: #2274

Redundant auxiliary voltage supply in a substation

When it comes to substations, 100% system availability is the top priority. Failure of system parts or individual components can result in considerable costs. Redundant systems help to avoid these kinds of failures and, in this way, guarantee superior availability in substations.

With redundant auxiliary supply concepts, two power supplies are operated in parallel on the primary side so that the second power supply can completely take on the load if the first one fails.

To supply multiple control cabinets with a stabilized 24 V DC voltage, they must first be connected with the help of a ring feeder (-X1, -X2).

A ring feeder can be easily and quickly assembled on location thanks to our pluggable terminals with screw or Push-in connections.

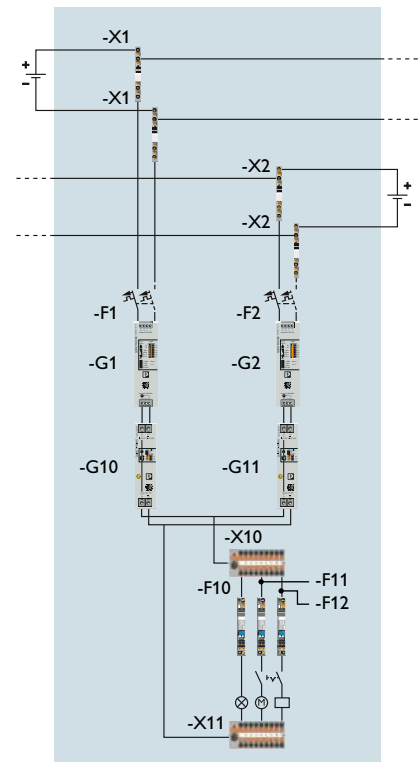
The power supplies are isolated via two redundancy modules/diodes (-G10, -G11) to ensure that a short circuit in a defective power supply (-G1, -G2) or in the cable routes does not cause the supply voltage to fail at the consumer. Now, just one module

can cover the full power requirements of the connected loads in all operating states. Our space-saving PTFIX terminal blocks (-X10, -X11) allow for simple voltage distribution in control cabinets. Integrated device circuit breakers protect your devices and ensure targeted deactivation in the event of a malfunction (-F10, -F11, -F12).

This guarantees superior system availability.

Use the web code to find more information on the products we used in this application:

i Web code: #2402



Remote control

Connecting decentralized process and grid stations in different locations to one central control center requires the use of modular remote control systems that are capable of utilizing a range of communication protocols. However, to ensure that the connection, evaluation, and parameterization of data remains functional, we offer solutions that can be configured, operated, and maintained safely and economically and require no programming knowledge. Moreover, these solutions guarantee reliable monitoring and access via a wide range of standardized communication protocols.





Open and innovative – PLCnext Control

PLCnext Control devices enable you to work flexibly with your preferred programming languages, whether IEC 61131-3 or high-level languages. It is easy to integrate and use certified libraries and function blocks, which makes PLCnext Control extremely adaptable. The use of current and future communication standards offers you complete flexibility in terms of remote control technology and controllers.

i Web code: #2108, #1147



Modular remote control and automation system

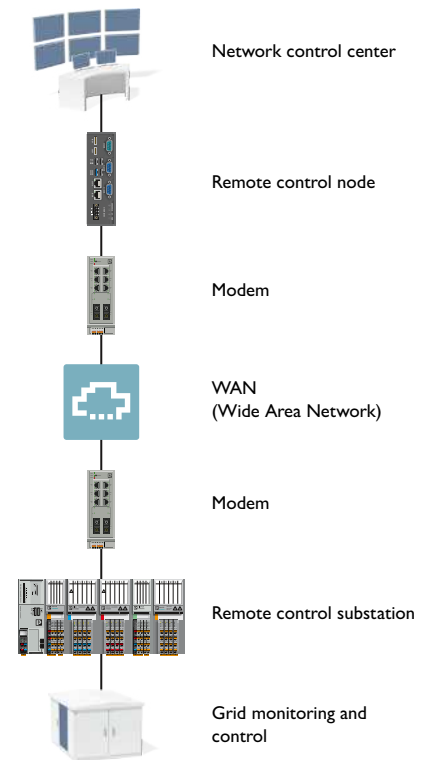
The smartRTU technology platform is a modular, easy-to-configure remote terminal solution for various fields of application. As a remote control or automation system in power grids, it is characterized by its pre-defined functions and ease of configuration.

i Web code: #2359

Power grid monitoring and control

The monitoring of parameters is a fundamental requirement for the efficient expansion and reliable operation of power grids. Easy configuration, evaluation, logic operations, and communication of signals and values are absolutely essential for this. Our smartRTU allows you to easily configure and quickly commission remote control technology applications using a web browser and without any programming knowledge. Its modular structure means that additional devices such as short-circuit and ground fault indicators can be integrated flexibly, enabling a wide range of applications to be implemented. Messages concerning operating states and variables are transferred to higher-level remote control nodes or control systems in compliance with all current regulations governing information security. The signals are communicated in parallel using various protocols such as IEC 60870-5-101/104 or IEC 61850.

Alongside monitoring solutions, smartRTU can also execute a wide range of (remote) control commands, from simple single-point information through to complex double commands with interlocks. For example, load switches and circuit breakers can be controlled remotely through straightforward parameterization.



Signaling

Annunciator relays are used for reliably signaling danger and operating states in control rooms, in mimic diagrams, and on control panels. Our range of alarm systems notify users of a variety of system states clearly and in good time. Malfunctions and faults are quickly and reliably detected, which in turn allows them to be addressed immediately.





Reliably display danger and operating states

The annunciator relays from Phoenix Contact are equipped with a freely configurable and easy-to-read display. Their robust design ensures reliable operation, even under extreme ambient conditions.

i Web code: #2358



Continually monitor grid states

Our electronic display and notification systems are used to process and visualize information. They are available with 8, 16, 24, or 40 notification displays. Optionally, they also allow for data transmission to a control room using standardized communication protocols.

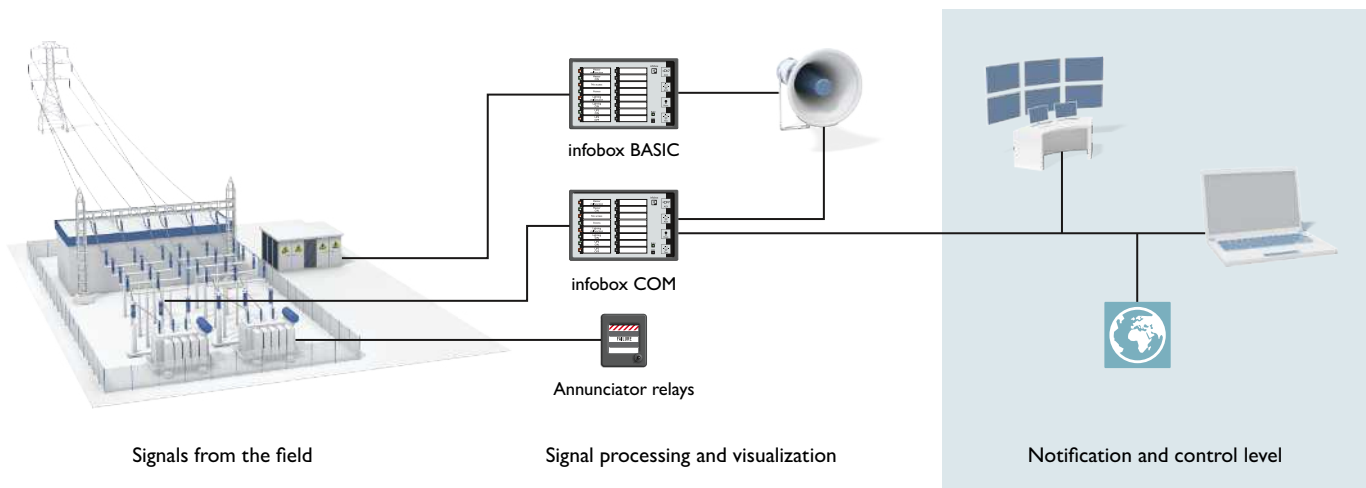
i Web code: #2356

Determine operating states and visualize messages

Signal processing systems provide the necessary overview of the current system status. Phoenix Contact offers a range of solutions for this purpose, from displaying data in the field through to forwarding data to the control room.

With the annunciator relay and infobox BASIC, you can signal messages visually on the device or with acoustic support, and you can also acknowledge the messages on site. Moreover, the infobox COM solution also enables data

to be forwarded to a control room and for your data to be accessed remotely so that messages can be acknowledged and required measures can be taken.



Networking

In times of volatile energy generation and new digital trends, providing a stable energy supply can be challenging. We are here to help you master this challenge. With intelligent technologies for processing and transmission of all relevant data while ensuring compliance with IEC 61850.





Superior availability, thanks to network redundancy

Data communication without switch-over times ensure maximum network availability. PRP redundancy modules from Phoenix Contact enable PRP network redundancy, which is based on two independent, active paths between two devices.

i Web code: #2355



Consistent communication in accordance with IEC 61850

Uninterrupted communication of data must be guaranteed, even under extreme environmental conditions. Our Managed Switches are particularly suitable for use in energy systems and meet the stringent requirements of standard IEC 61850.

i Web code: #2075



No danger due to electromagnetic influences

Extreme electromagnetic influences no longer present a problem. Our media converters have maximum immunity to interference and therefore, thanks to fiber optic technology, ensure reliable transmission.

i Web code: #1269



Communication via 2-wire cable

Transmit serial data reliably using your own cables. Our Ethernet extenders support reliable data transmission up to 20 km with a data rate of either 15 Mbps with a 2-wire cable or 30 Mbps with a 4-wire cable.

i Web code: #0943



IEC 61850 via fiber optics

Compact splice boxes ensure the secure connection of fiber optics. Corresponding pre-assembled patch cables are available. These cables satisfy the requirements of substations in particular and allow for the fast integration of fiber optic devices into existing fiber optic networks.

i Web code: #1731, #0298



Easy signal distribution

Radioline wireless modules enable easy and reliable I/O signal distribution. You can set up a meshed wireless network with very little effort. This allows you to guarantee communication even in the event of malfunctions.

i Web code: #1927

Measurement, conversion, and coupling

Isolate, convert, and filter signals and monitor and control processes: our MCR components cover all the tasks required for interference-free signal transmission from sensor level to control level.

Discover our energy measuring devices, current and voltage transformers, and relays.





Measurement and monitoring

With EMpro energy measuring devices, you can record and monitor the characteristic electrical data of your system and transfer this data to higher-level control and management systems via standard communication interfaces. Configure and integrate the devices in just a few steps, thanks to the web-based, user-guided installation wizards.

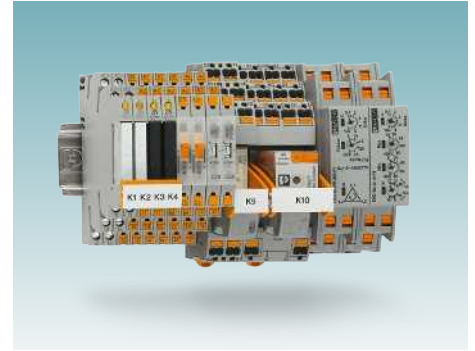
i Web code: #2351



Durable operation, thanks to high switching capacity

Our auxiliary relays are ideal for use in control and monitoring systems in high-availability and safety-relevant areas. They ensure electrical isolation between auxiliary and control circuits. At the same time, they consume very little energy despite their high switching capacities.

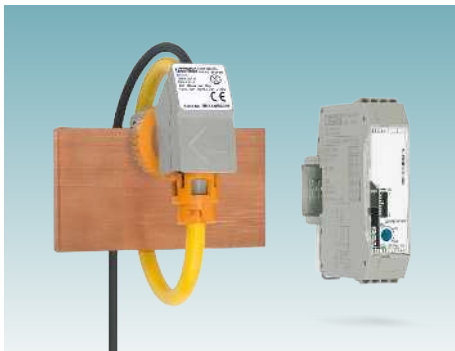
i Web code: #2357



Extremely compact control and switching

All voltages in a single system. Whether 24, 48, or 60 V DC for the control room or 110, 125, or 220 V DC in the field, our PLC relays process these signals or control voltages at the input as well as the output.

i Web code: #0962



Measure currents

Measure and convert currents and voltages using easy-to-install current transformers. Whether for a new installation or for quick and easy retrofitting: our current transformers offer a comprehensive product range for converting alternating currents from a maximum of 4000 A AC to between 0 and 1 A AC.

i Web code: #2127

Current measurement solution for outdoor installation

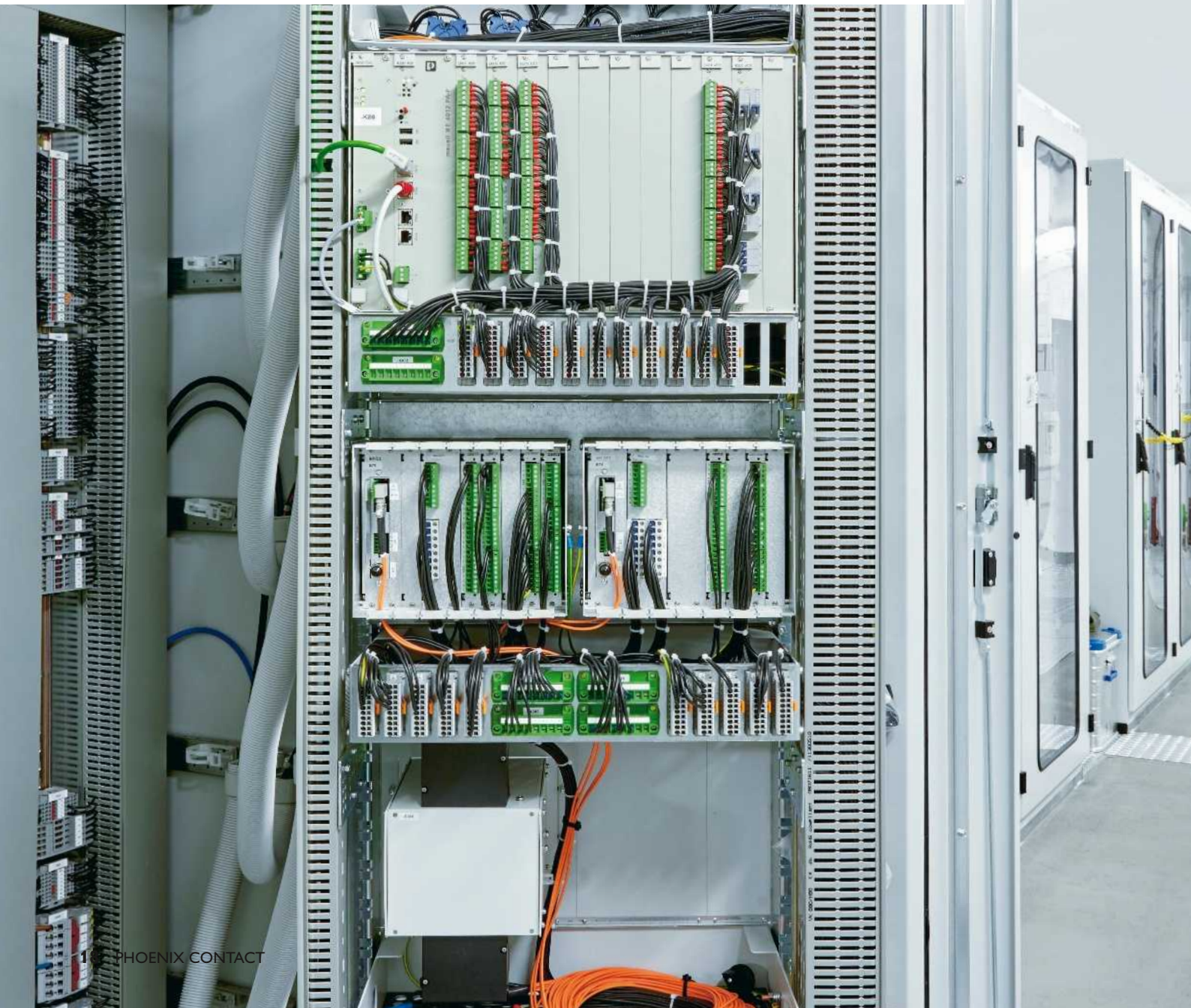
For outdoor current measurements, we recommend the PACT RCP...-UV measurement solution with UV-resistant Rogowski coil. Installation is complete in just a few simple steps.

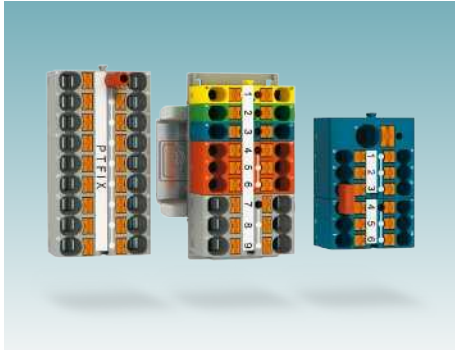
- UV-resistant materials
- Flexible, open-ended measuring coil
- Large bandwidth for the detection of harmonics and transients
- Choose from eight current measurement ranges from 0 to 100 A up to from 0 to 4,000 A



Connecting

Whether in a control cabinet or in the field – the energy industry places a large number of demands on connection technology. It must be as safe and secure as it is durable, and it must also be easy to operate. Connection technology from Phoenix Contact meets these demands, from screw connections, through insulation-displacement contacts, right through to Push-in connections.





Quick and easy potential distribution

You can save space and time with your potential distribution by using Push-in distribution blocks. The PTFIX distribution blocks come ready to connect and are available in different numbers of positions, mounting types, and colors.

i Web code: #1395



Easy and reliable connection

Ensure the reliable transmission of power and data even under the harshest conditions. The heavy-duty connectors from the HEAVYCON complete series are resistant to dirt, water, vibrations, and high mechanical strain and are completely sealed with a degree of protection of up to IP69K.

i Web code: #0002



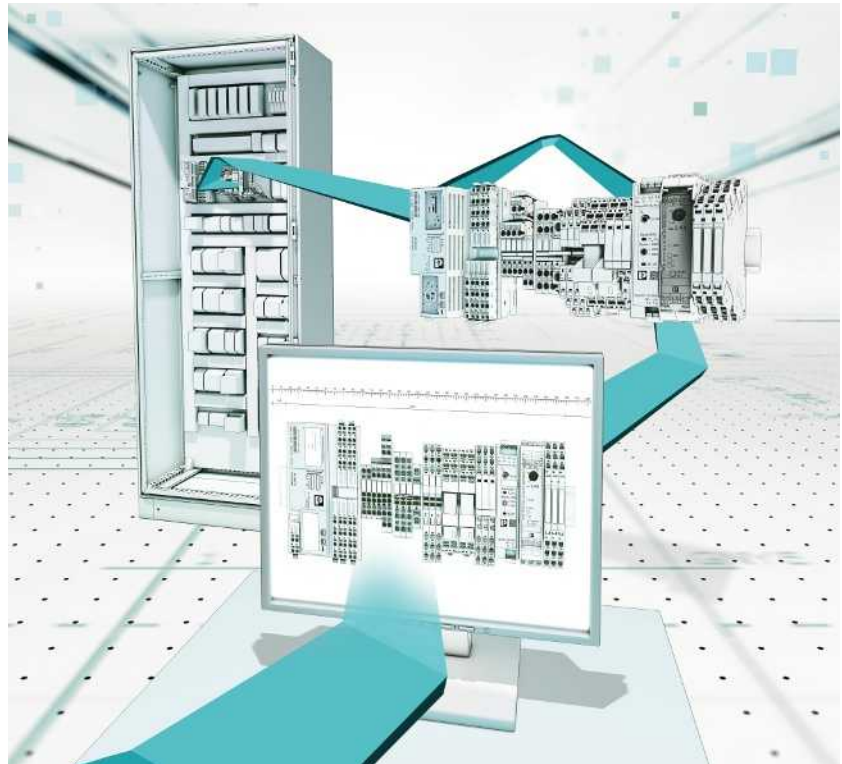
User-friendly, flexible cable routing

Cables between the cabinet and the cabinet doors are no longer subject to mechanical strain. With the CGS cable guiding system, cables are handled gently, which is particularly important when it comes to fiber optics. It allows cables to be laid or retrofitted without tools.

i Web code: #1146

COMPLETE line – the comprehensive control cabinet solution

COMPLETE line is a system comprising technologically leading and coordinated hardware and software components, consulting services, and system solutions that help you optimize your processes in control cabinet manufacturing. COMPLETE line helps you design your individual control cabinet as efficiently as possible, from engineering to procurement and installation all the way to operation.



Marking

A consistent plant marking system forms the basis for efficient maintenance, repairs and troubleshooting in substations. And we offer comprehensive, uniform system solutions for this purpose: from marking material to labeling systems all the way to software, and all from a single source.





Individual marking

Whether laser markers, high-speed UV LED printers, or thermal transfer printers: all of the aspects of the MARKING system use a uniform user-friendly operating menu that provides you with intuitive support as you create your marking.

i Web code: #0575



Marking material with RFID transponders

Integrated RFID transponders enable the extended use of our marking labels. They store information and transmit this without contact via radio frequency to the corresponding read/write devices. With the BLUEMARK ID printers, you can mark the marking labels as usual with text, images, and bar codes.



Clear plant marking

A clear plant marking system helps avoid operating errors and is essential for occupational safety. Our markings ensure clear, safe marking for your plant. Whether prohibition signs, mandatory signs or warning labels, magnetic labels or pipeline markers – the right marking is available for every application.

The terminal strip made simple

A consistent system from configuration through to the finished application. The PROJECT complete software is currently the most innovative solution for the easy planning of your terminal strip and the straightforward creation of the corresponding markings.

The program features an intuitive user interface that enables the individual planning, automatic checking, and direct ordering of terminal strips.

i Web code: #1093



Worldwide service and support – we are there for you

At Phoenix Contact, the focus is always on you, the customer. With over 50 subsidiaries and more than 30 agencies around the world, we are always close by. As a result, you receive expert, first-hand advice and benefit from fast and timely delivery of a complete package consisting of high-quality, optimally coordinated components. Our expertise and high level of vertical integration allow us to tailor your solution based on your needs. And, with our comprehensive after-sales services, we are also here for you after your purchase.





Fast terminal strip production

The terminal strip production service provides help you manage peak workloads flexibly, and enables terminal strips to be delivered just in time for series production. The fully mounted and marked terminal strips, ready-assembled with accessories, just need to be installed and connected.



Individual set solutions

To reduce the effort of materials and stock management, you can order pre-picked material sets using a single order number.



Customer-specific solutions

Can't find what you're looking for in our range? No problem: from minor adaptations to completely new product developments, we focus on your specific requirements.



Global approvals and certificates

Our numerous certificates prove that you can fully rely on our products! We strive to satisfy this requirement in every respect. For this reason, our systems, processes, and products are inspected and certified several times over.



Comprehensive after-sales services

We are there for you – not just before your purchase, but also afterwards with our comprehensive after-sales services such as repair, exchange, and replacement.



Comprehensive training program

From the basics to specialist expertise: we provide you with the skills you need in line with your specific requirements.

Open communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for producing future-oriented components, systems, and solutions in the fields of electrical engineering, electronics, and automation. With a global network reaching across more than 100 countries with over 17,400 employees, we maintain close relationships with our customers, something we believe is essential for success.

Our wide variety of innovative products makes it easy for our customers to implement the latest technology in a variety of applications and industries. We focus on developing the fields of energy, infrastructure, process, and factory automation.



You can find our complete product range at:
phoenixcontact.com

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