

COMPLETE line



# Shaping processes together

Process optimization in control cabinet building



# Shaping processes together

The general conditions of control cabinet builders are diverse. This is why the processes and the requirements for their optimization differ.

The challenges in control cabinet building cannot be met using just standard solutions; instead, they require an adapted approach using a flexible solution portfolio, modular systems, and a tailored consulting service.

With a partnership-based approach, our experts work with you to sustainably optimize and design your processes, from planning through to production.





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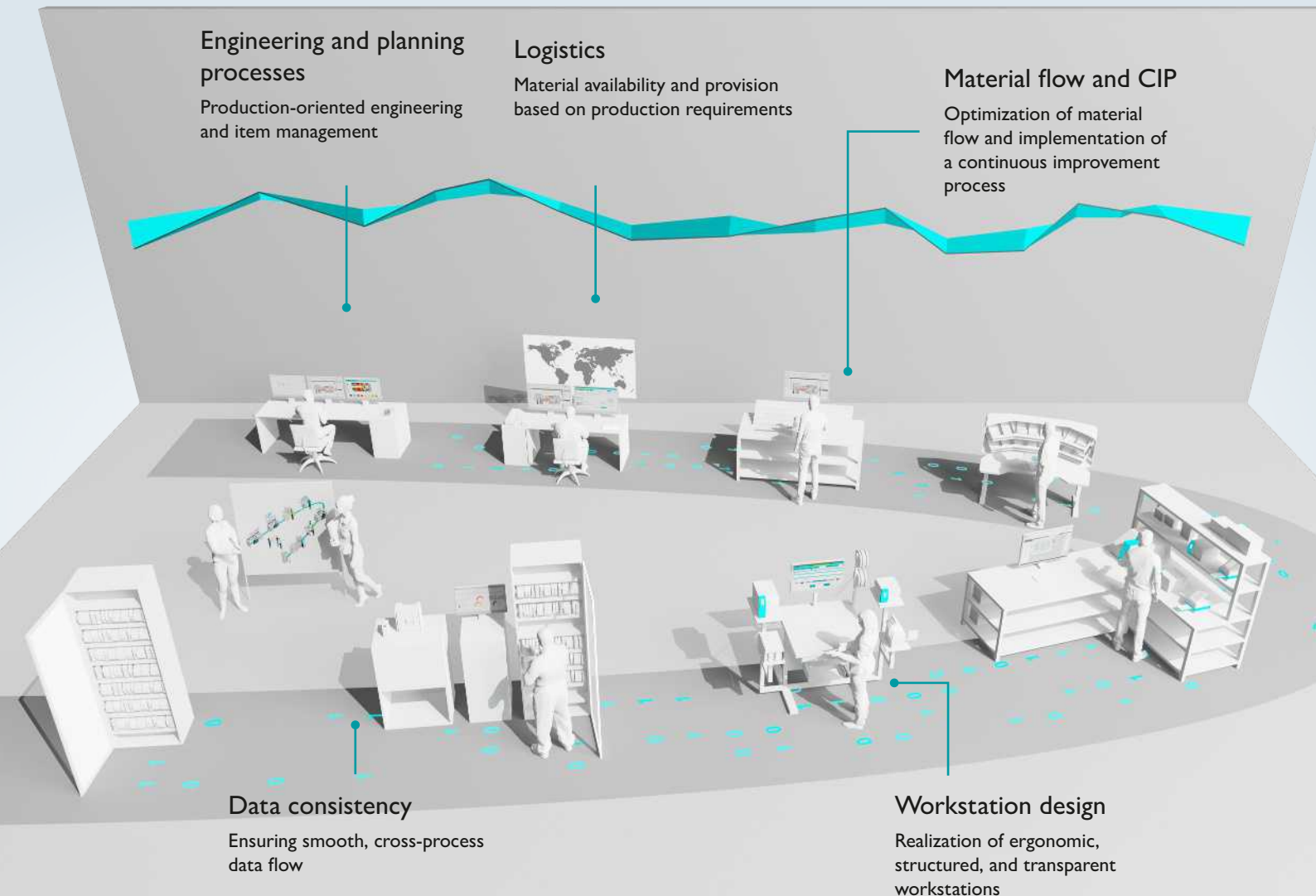
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# Optimizing the processes along the value chain

Every single process step in the value chain for control cabinet building holds potential for optimization – from the planning and engineering of your project through logistics, the mechanical processing of the control cabinet, the assembly and marking of terminal strips to the wiring and commissioning of the control cabinet.

Phoenix Contact's partnership-based approach looks at the individual need for action and identifies challenges ranging from a shortage of skilled workers to cost reductions and efficiency improvements.



## Segments in control cabinet building



### Increasing efficiency and productivity

- Reducing walking and reaching distances
- Switching from paper to digital production
- Efficient use of space in the workshop



### Reduced costs and production time

- Reducing stock levels
- Avoiding idle and waiting times
- Reducing processing times
- Making production flow without interruptions



### Lack of skilled workers

- Simplifying processes and tasks with software-supported worker assistance solutions
- Separating logistics and value-adding tasks to focus on specialist activities



### Satisfaction of employees

- Creating new impetus with employees
- The participation of employees is the basis for the acceptance of change
- Development of methodological skills through training in lean methods



### Sustainable process optimization

- Support from the initial idea through implementation to the successful establishment of the solution
- Partnership-based and long-term optimization strategy



### Everything from a single source

- Whatever challenge you face, our experts will help you find the solution and assist with conceptual design
- Broad portfolio of solutions for the realization of concepts





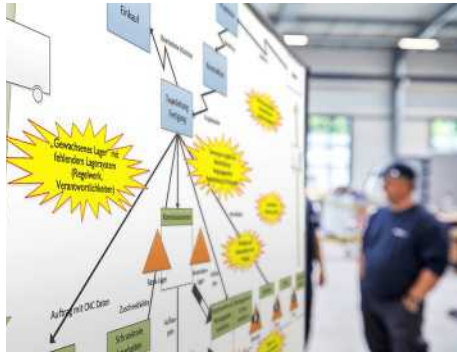
# Partnership-based and methodical consulting concept

The process consulting services are based on years of experience with lean production methods and include a comprehensive portfolio of consulting activities and training programs for employees. In order to combine our methodological expertise with the process expertise of your employees, it is very important for us to carry out the activities together with you and your employees. This achieves sustainable and long-lasting results in the long term.





# Practice-oriented methods for process optimization



## Value stream analysis

The material and data flow, from planning to delivery of the finished control cabinet, will be analyzed in detail with you and the optimization potential will be visualized.



## 5S workshop

Together with your employees, we will design the workshop in accordance with the 5S principles and develop a process to increase the transparency and structure.



## Factory planning

We will plan the entire material flow comprehensively with you and develop a hall layout for future production.



## Workstation design using cardboard engineering

Based on an analysis of all the production steps, with our training your employees will design the workstations as prototypes and simulate the production process. We will then support you in the realization of these innovative and customized workstations.



## Shopfloor management

We will support you in adopting a system for daily regular communication with your employees – both in the workshop and in the office. This is a key element of the continuous improvement process.



## Production-oriented engineering

Our experts will advise you on item and interface management to create data consistency right through to production.

# Optimizing production together with employees

AEM has specialized in automation in various industries since 1980. As a full-service provider, customers are provided with support for their own control cabinet building. With the creation of a new production hall, a new production concept was developed. Together with Phoenix Contact, an efficient control cabinet assembly line for small to medium-sized control cabinets – from mounting plate assembly to wiring – was planned and set up.



“From our point of view, data acquisition and evaluation creates significant added value for transparency in production. It’s possible to respond to customer requirements in a much shorter time.”

Alexander August  
General Manager  
AEM August Elektrotechnik GmbH







### Initial situation and objective

- There was no longer enough space in the existing production hall to handle the growing volume of orders.
- The new production hall would not only need to provide more space, but also workplace solutions that minimize efficiency losses such as long walking distances and reaching distances for the workers.
- In addition, the physical strain on employees needed to be reduced through the ergonomic design of the workstations.



### Procedure

- First, the actual situation was recorded based on the value stream analysis and the main areas of focus were determined.
- To ensure a methodical approach to optimization, a lean thinking training session was then held with all employees concerned.
- Together with the employees, the solutions were developed with the help of cardboard engineering. The solutions were then jointly implemented and deployed.

### Results of process optimization



#### Transparent production

Switching to paperless production means that data is continuously exchanged between production and engineering. It is therefore possible to respond much faster to resource bottlenecks. This minimizes delays in projects.



#### Implementation of a digitalization concept

With LogiQ PPS, a software platform developed in-house, information regarding all process steps can be made available to employees as required. The developed workstation solutions ensure that the digitalization solution achieves its full potential.



#### Satisfaction of employees

A team of three employees implemented the measures independently under the guidance of Phoenix Contact. This led to a high level of acceptance of the implemented measures.

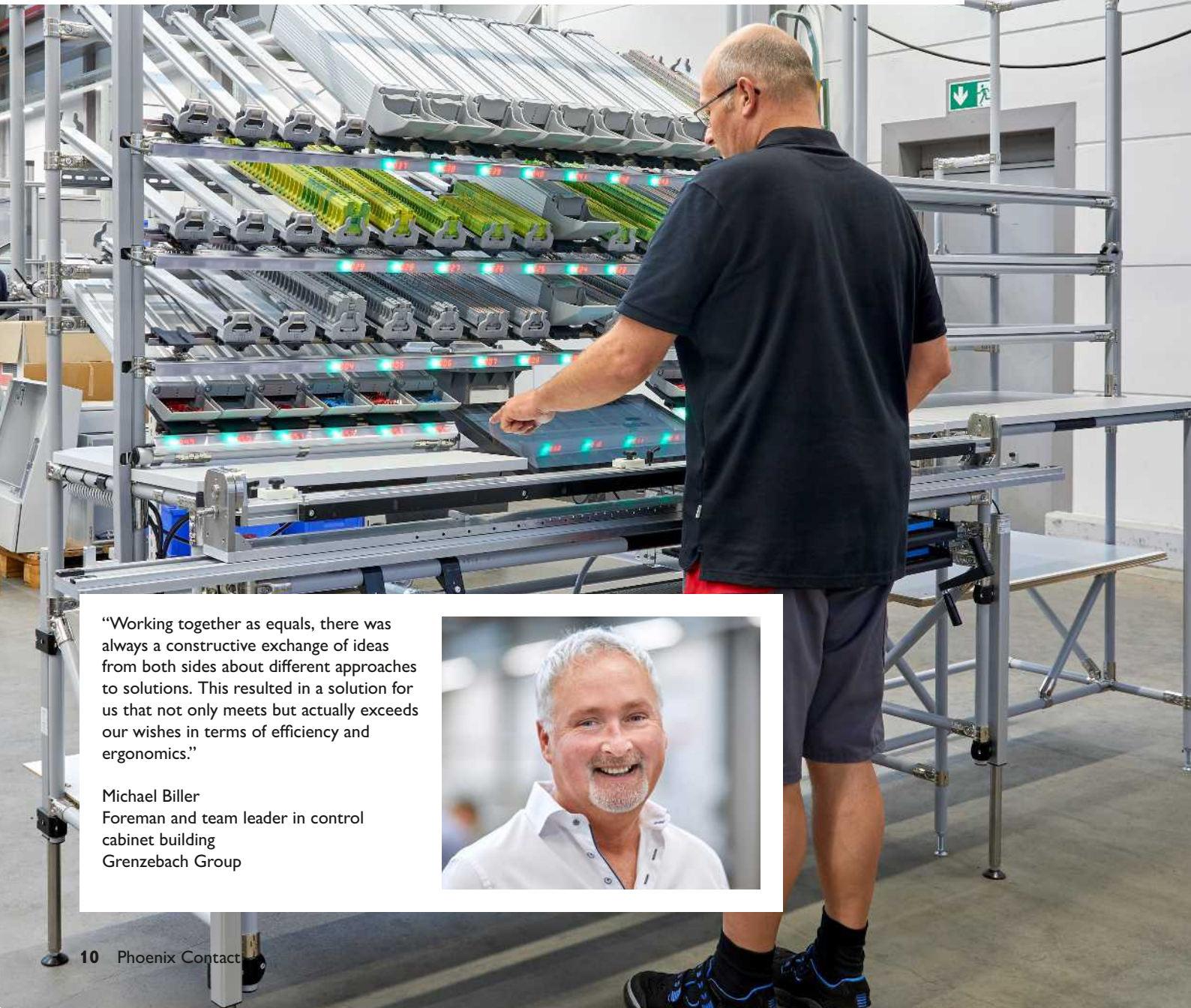




# Easing the workload on skilled workers with digital solutions

Grenzebach has been supplying the global markets of the glass and construction materials industries as well as intralogistics with customized automation and digitalization solutions for over 60 years. The digitalization of processes for efficient production also plays a prominent role in Grenzebach's in-house control cabinet building at their Hamlar site.

To optimize terminal strip production with the help of digital support, solutions were developed together with Phoenix Contact.



“Working together as equals, there was always a constructive exchange of ideas from both sides about different approaches to solutions. This resulted in a solution for us that not only meets but actually exceeds our wishes in terms of efficiency and ergonomics.”

Michael Biller  
Foreman and team leader in control  
cabinet building  
Grenzebach Group







### Initial situation and objective

- Up until this point, skilled workers had assembled terminal strips directly in the control cabinet.
- The assembly of the terminal strips was based on printed production documents.
- The terminal block assembly process needed to be made more efficient and more ergonomic for the skilled workers.



### Procedure

- The individual process steps for producing the terminal strips were recorded in a value stream analysis.
- With the help of cardboard engineering, a prototype production line including software-supported worker assistance was set up with the focus on ergonomic and fast assembly.
- Based on this prototype, the workstation system and the worker assistance software for the creation of terminal strips were developed further in close collaboration.

### Results of process optimization



#### Increased productivity

Worker assistance noticeably speeds up production processes, as the terminal strips can now be produced decoupled from the rest of the control cabinet.



#### Reduced production times

By centralizing terminal strip assembly, it has now also been possible to considerably reduce search, run, and idle times.



#### Simple process flow

The workstation solution that was developed, including worker assistance software, provides quick and easy guidance through the entire terminal strip creation process.



#### Improved ergonomics

The ergonomically optimized workstation eases the workload of employees in many ways, e.g., through short reaching distances.

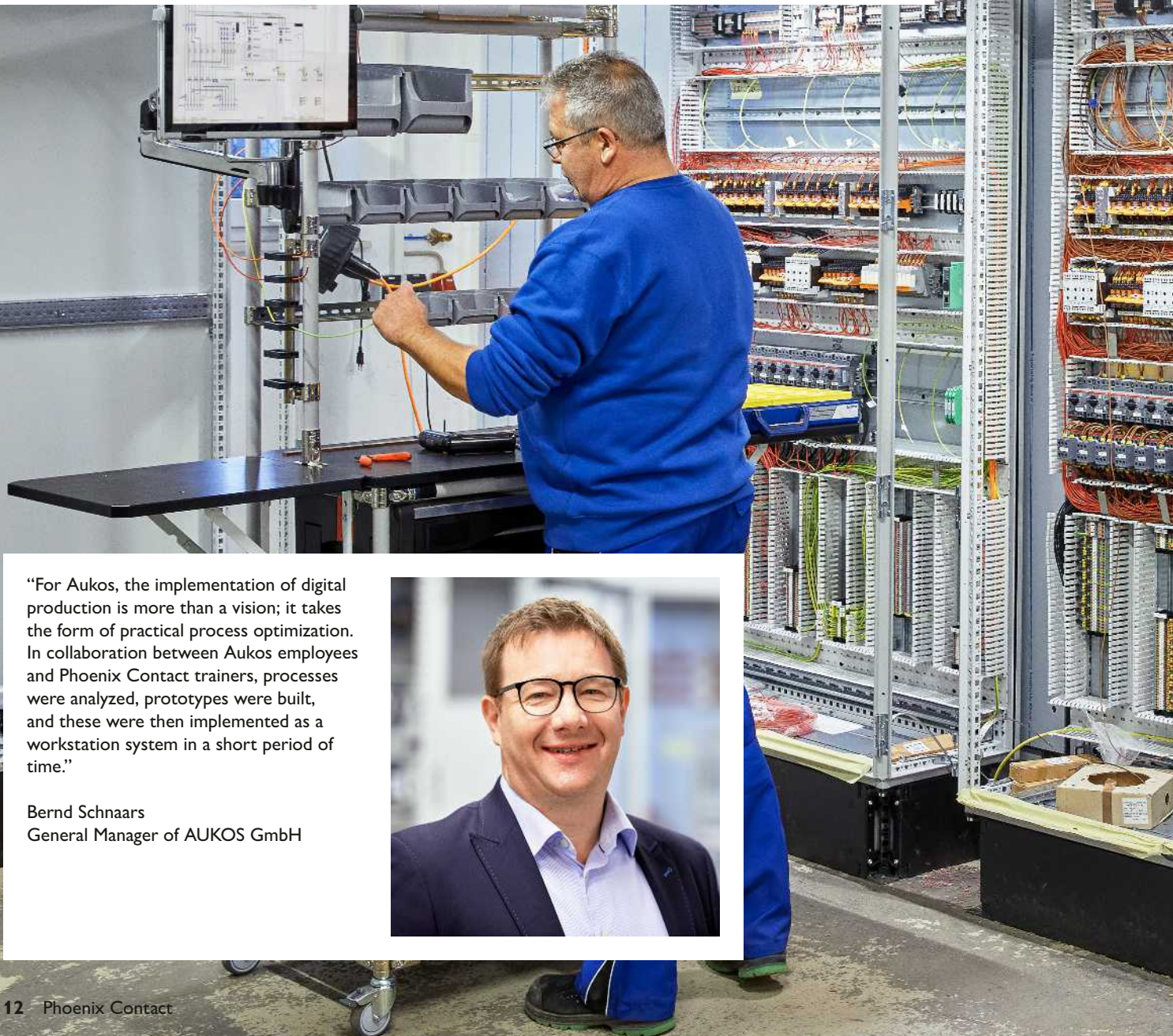




# Switching to digital production

AUKOS has been active worldwide as a service provider in the field of automation technology since 1993. Customers are provided with comprehensive support from the design stage through control cabinet building and programming to assembly.

AUKOS wants to establish a completely digital production concept. This will be developed together with Phoenix Contact. Because Phoenix Contact offers solutions for the digitalization of existing company processes.



“For Aukos, the implementation of digital production is more than a vision; it takes the form of practical process optimization. In collaboration between Aukos employees and Phoenix Contact trainers, processes were analyzed, prototypes were built, and these were then implemented as a workstation system in a short period of time.”

Bernd Schnaars  
General Manager of AUKOS GmbH







### Initial situation and objective

- There were high additional costs involved for warehousing and order picking.
- Efficiency losses and ergonomic deficiencies were visible in the production processes due to the workplace situation.
- The processes were paper-based and required a lot of documentation.
- Space was not used efficiently, which meant there was a lack of space.



### Procedure

- In the first step, a value stream analysis was carried out and the optimization potential was identified and evaluated.
- A 5S workshop with employees increased awareness of the need for change and the concept of lean methods.
- The workstations were then conceptualized in the cardboard workshop, after which the joint implementation of the developed solutions got underway very quickly.

### Results of process optimization



#### Increased efficiency and productivity

The production documents were converted from paper to digital documents. The provision of materials was organized according to the production process to reduce walking and reaching distances. By restructuring the work environment in accordance with the 5S method, it was possible to significantly reduce the amount of space required.



#### Sustainable process optimization

The roadmap designed with work packages enabled the step-by-step and sustainable optimization of processes.



#### Satisfaction of employees

The entire workforce was first trained on the 5S methodology in workshops. Employees then worked on the workstation design in three teams.



# Your partner from quick check to implementation and beyond

Right from the initial inspection of your company, we look at the optimization potential offered by your engineering and production operations. In a quick check, we record and analyze the current situation together.

Our consulting service provides much more than a recommendation for optimization – together we develop solutions, implement them, and ensure that the results are not just achieved in the short term. Our goal is to ensure that the successful results of optimization in your processes are sustainable.





# Three steps to process optimization



## 1. Quick check

We will work with you to evaluate and analyze the process chain from receipt of the order through the production process in the workshop to delivery, and we will identify the segments that need attention. Based on the quick check, we can develop a suitable approach for process optimization with you.



## 2. Process optimization

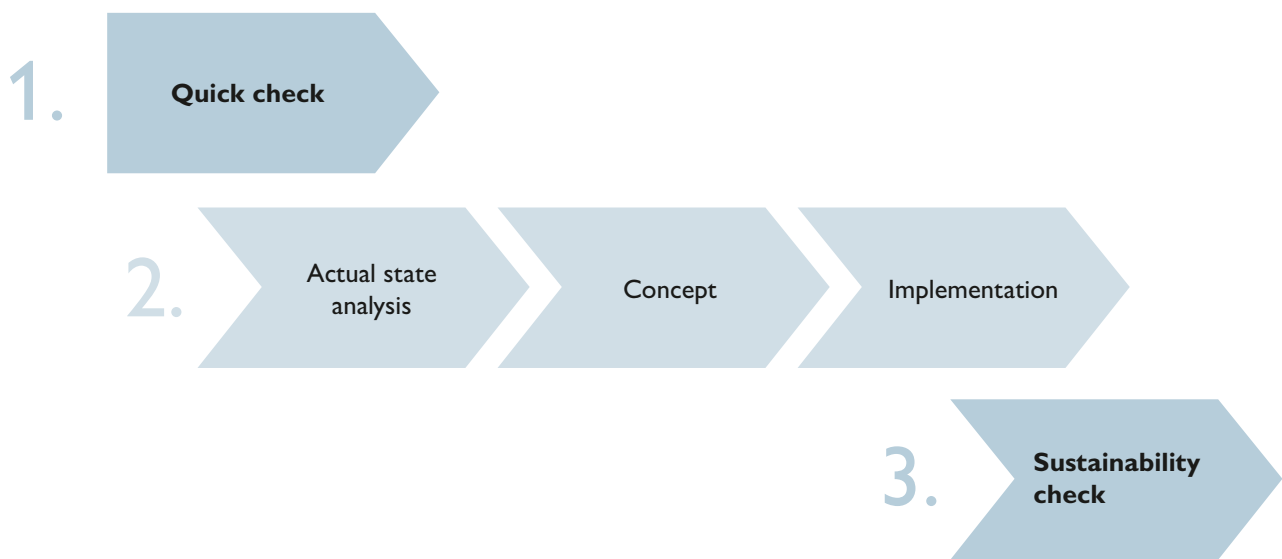
In an in-depth actual state analysis, we look at the processes and product structures. Based on this analysis, an optimization concept is developed using lean principles and digital solutions. Together, we turn the concept into real solutions and implement them in your company.



## 3. Sustainability check

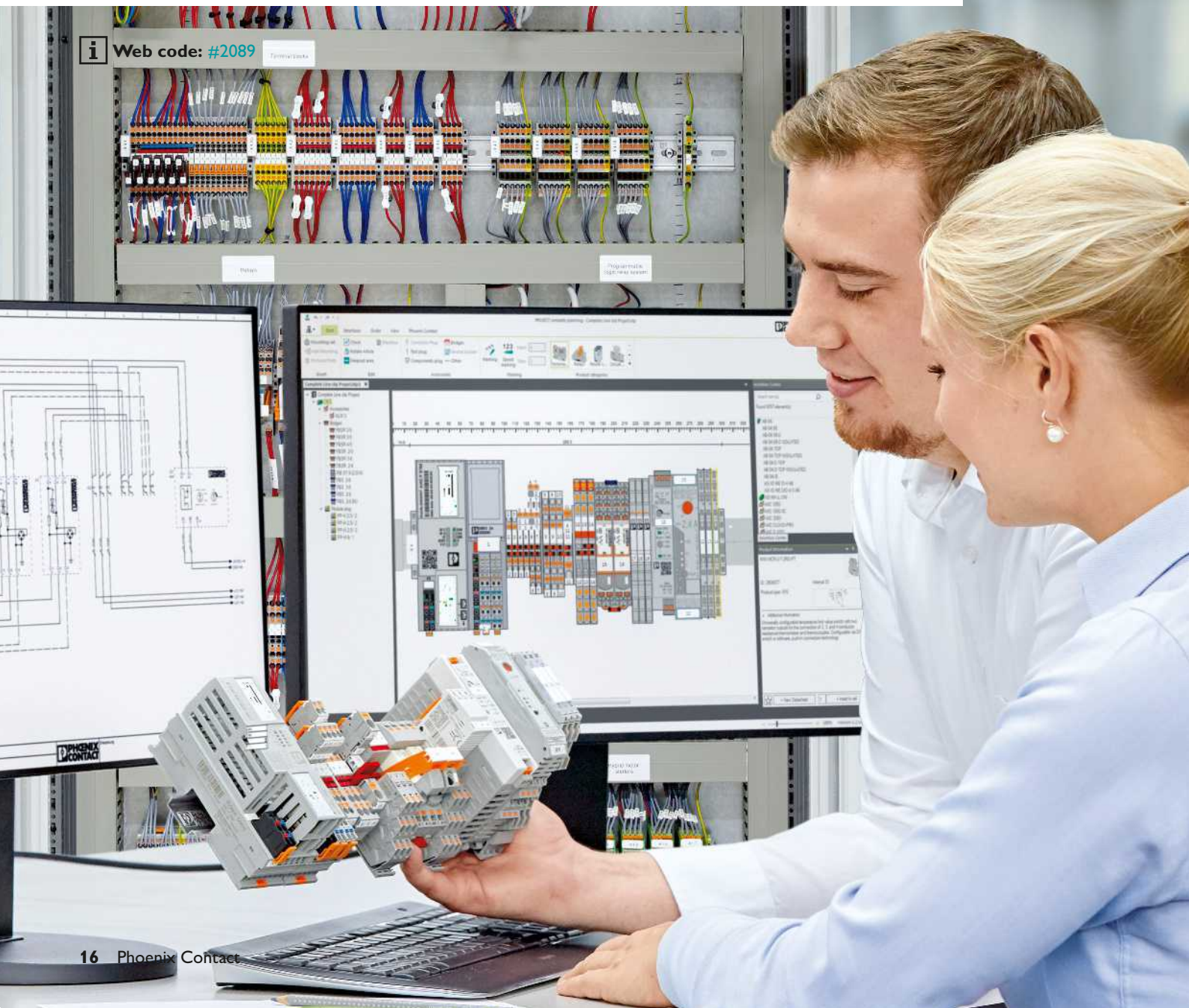
Once the process optimization measures have been implemented, we plan the next steps to check whether the effectiveness of the measures is sustained over a longer period of time.

### Step-by-step approach to sustainable process optimization in your control cabinet building



# COMPLETE line – the comprehensive solution for the control cabinet

The COMPLETE line system encompasses technologically leading and coordinated hardware and software products, consulting services, and system solutions that help you optimize your processes in control cabinet building. Engineering, purchasing, installation, and operation become significantly easier for you.





## Your advantages in detail:



### Comprehensive product portfolio

With COMPLETE line, we offer a complete product portfolio of technologically leading products. This includes:

- Controllers and I/O modules
- Power supplies and device circuit breakers
- Terminal blocks and distribution blocks
- Relay modules and motor starters
- Signal conditioners
- Safety technology
- Surge protection
- Heavy-duty connectors



### Intuitive handling

With the simple, intuitive handling of the coordinated hardware components, you will save time during installation, startup, and maintenance. With Push-in connection technology, you can wire applications quickly and without using tools. The broad, technologically leading product portfolio will always provide you with the right product for standard or special applications.



### Save time throughout the entire engineering process

PROJECT complete planning and marking software supports the entire process of control cabinet building. The program features an intuitive user interface that enables the individual planning, automatic checking, and direct ordering of terminal strips.



### Reduced logistics costs

Reduced variety of parts with standardized marking, bridging, and testing accessories. The COMPLETE line system coordinates products, design, and accessories so that you benefit from maximum reusability and thus reduce your logistics costs.



### Optimized processes in control cabinet building

COMPLETE line supports you, from engineering through to manufacturing, in designing your control cabinet production as efficiently as possible. This is how your customized concept for optimizing your processes in control cabinet building is created. Our terminal strip production helps you to flexibly manage order peaks or to supply your control cabinet production with fully assembled DIN rails just in time.



### The new standard for the control cabinet

Discover the extensive COMPLETE line product portfolio and find out more about COMPLETE line and the comprehensive solutions for your control cabinet.

Visit our website:

**[phoenixcontact.com/completeline](https://phoenixcontact.com/completeline)**

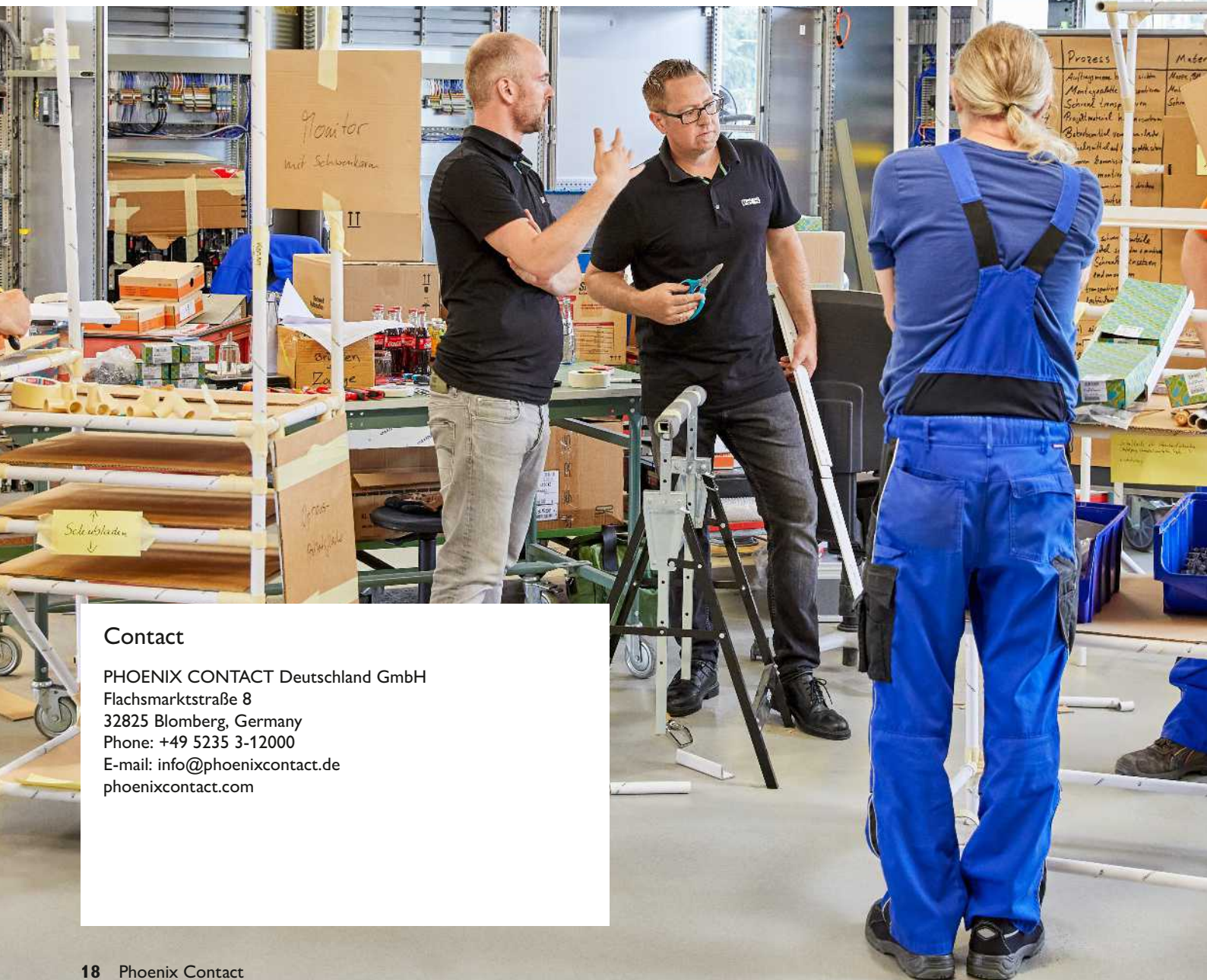
# Our expertise in control cabinet building

From engineering through to production – our experts will help you make your control cabinet building as efficient as possible.

In engineering, we support you in optimizing your electrical planning as the basis for continuous data flow right through to production.

In production, we support you with innovative mechatronic solutions for efficient and ergonomic workstation design.

This is how your customized concept for optimizing your processes is created.



## Contact

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## Your team for process optimization



“The combination of employee knowledge, practical lean methods, and an outside perspective is the key to sustainable process optimization.”

Christoph Marten  
Expert for lean methodology



“Solutions for process optimization should always optimally fit the requirements and the general conditions of the company. Because there is no such thing as a standard solution to all problems, we have to be analytical and systematic in developing solutions.”

Henning Rey  
Expert for workstation design



“Consistent digitalization from engineering through to production is the key to Industry 4.0. This also requires lean thinking in information systems. Because information processes also benefit from avoiding waste and conserving resources.”

Alexander Thiel  
Expert for engineering processes



“Due to constant changes and adaptations to the market, we want to use agile methods to support and advise our customers. Smart and customer-oriented solutions are the focus here.”

Harry Will  
Expert for mechatronic solutions



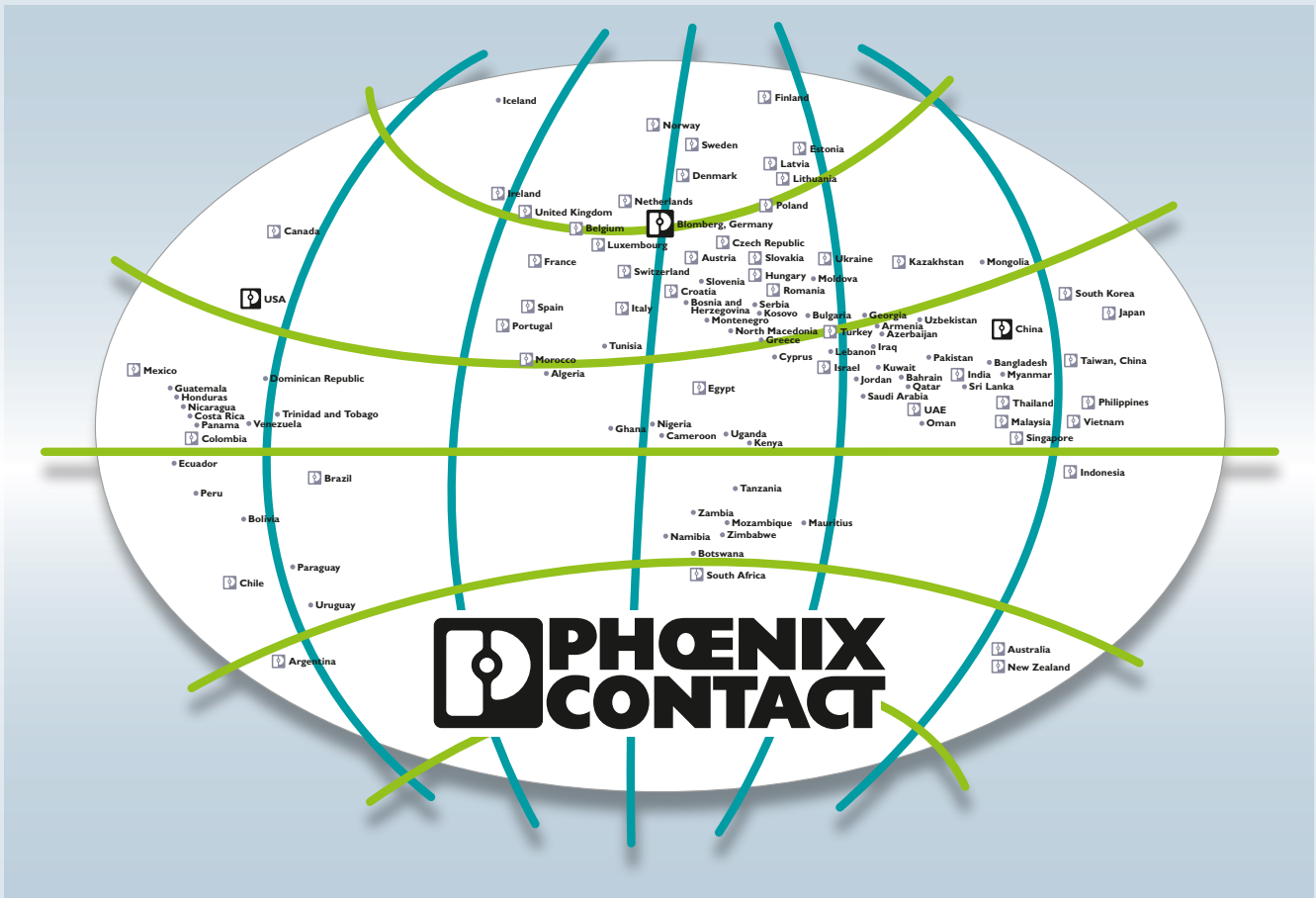
“We develop complete workstation systems for our customers, including marking, packaging, and order picking. And because that's adapted to the realities on the spot, it really future-proofs the process.”

Bernd Naguschewski  
Sales expert for process optimization in control cabinet building



“Paper-based circuit diagrams are a thing of the past. Today, it must be possible to generate all the production documents for control cabinet building from a circuit diagram project in order to support all the production processes involved. We'll show you how.”

Stephan Meier  
Expert for Process Management eCAD



## Open communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for producing future-oriented products and solutions for the electrification, networking, and automation of all sectors of the economy and infrastructure. With a global network reaching across more than 100 countries with over 20,000 employees, we maintain close relationships with our customers, something we believe is essential for our common success.

Our wide range of innovative products makes it easy for our customers to implement the latest technology in a variety of applications and industries. This especially applies to the target markets of energy, infrastructure, industry, and mobility.

You can find your local partner at  
[phoenixcontact.com](https://phoenixcontact.com)