

The background is a photograph of an industrial setting. On the left, a large yellow emergency stop button is mounted on a metal frame. In the center, a robotic arm is positioned over a conveyor belt. On the right, a female worker in a white lab coat is holding a yellow electronic component. In the background, a male worker in a white lab coat is holding a tablet. A yellow and black checkered safety pattern is overlaid on the image, extending from the emergency stop button towards the right.

Start

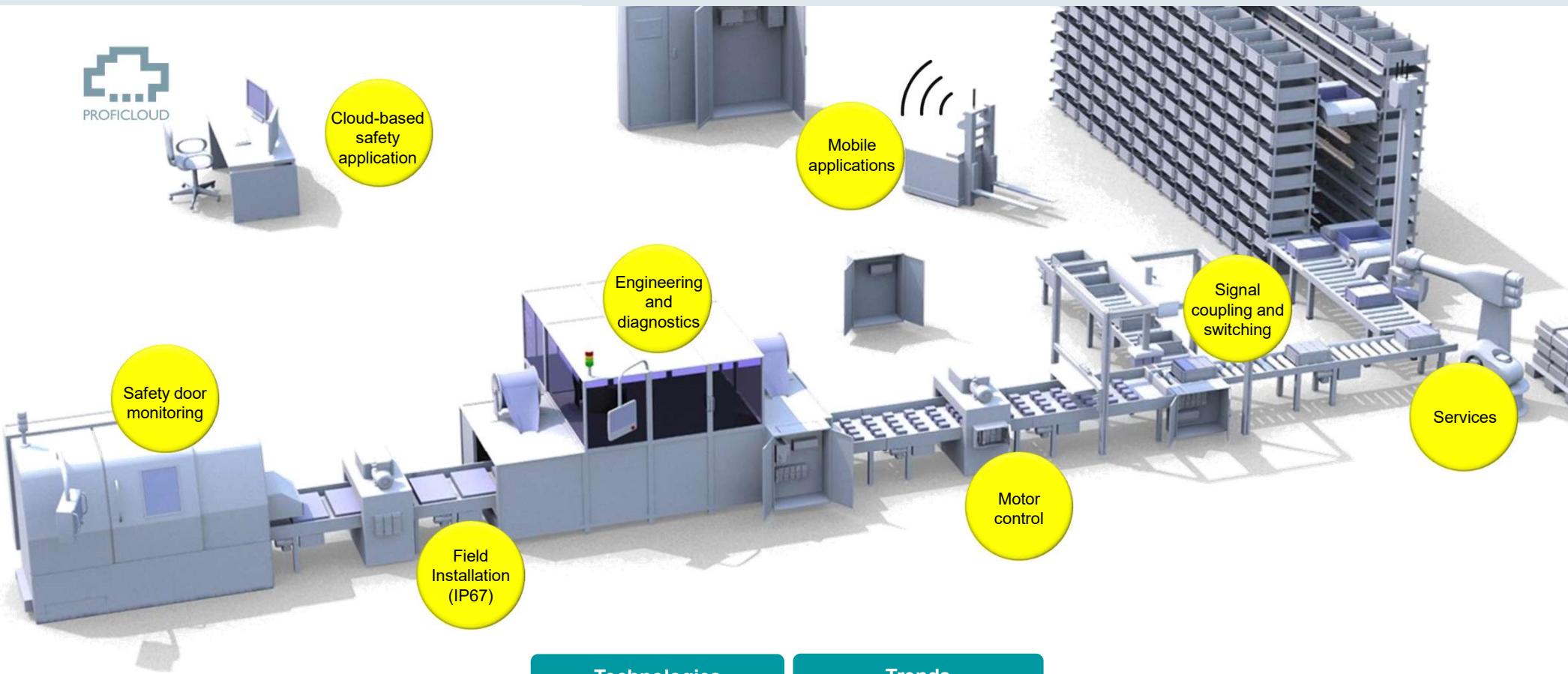
# PL Functional Safety

EN ISO 12100

PL e  
SIL

# Smart safety solutions

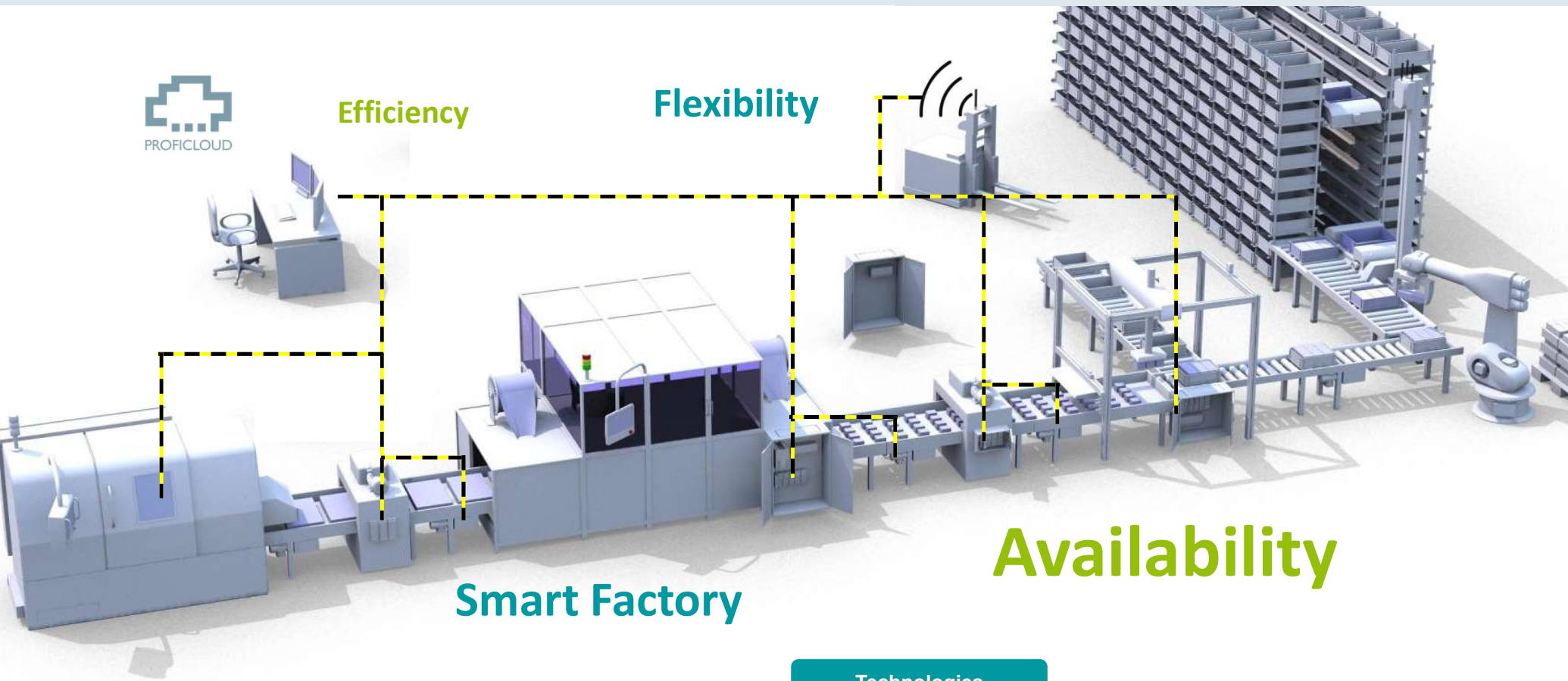
## Best fit for market needs



| Technologies |                 | Trends     |                   |
|--------------|-----------------|------------|-------------------|
| Products     | Safety services | Industries | Quality assurance |



Trends  
Inspiring safety technologies



- Products
- Safety services
- Industries
- Quality assurance

Technologies



# Safety product portfolio

## From safety switches to safe controllers



### Configuration software



### Programming software



### Signal processing

**Safety relay modules**  
PSRmini, PSRclassic,  
PSRmotion and PSRmultifunction



**Configurable safety system**  
PSRmodular



**Safe I/O's**  
Axioline and Inline



**Performance controllers**  
RFC



### Sensors

### Signal conditioning

### Actuators

### Power

**Safety switches**  
PSRswitch



**Safe signal conditioners**  
MACX Safety



**Safe motor starters**  
CONTACTRON



**Safe power supplies**  
QUINT POWER



# Progressive through innovative technologies

## Relay Technology



### Relay Technology from Phoenix Contact

Phoenix Contact has developed a narrow force-guided elementary relay which features full performance with an overall width of just 6 mm.

The miniaturization of mechatronic functions enables modular safety concepts, as required for IIoT. With a switching capacity of 6 ampere, the relay ensures superior availability, thanks to a redundant diagnostic contact, and enabled us to develop the PSRmini safety relay in a 6 mm housing.

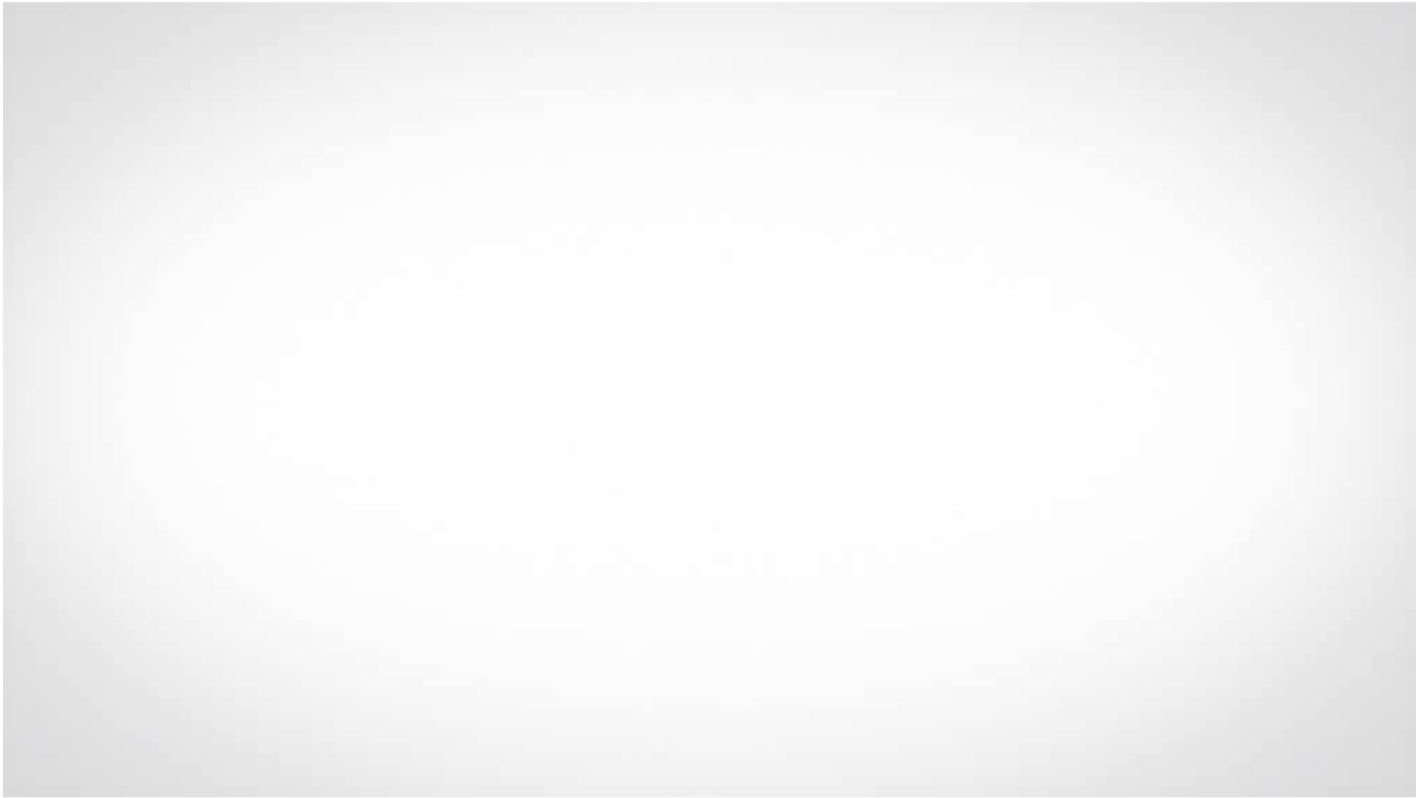
[Watch movie](#)

Relay Technology<sup>®</sup>  
Designed by PHOENIX CONTACT



Progressive through innovative technologies

# Relay Technology



Relay Technology<sup>12</sup>  
Designed by PHOENIX CONTACT



Webinar IMA Septiembre 2021

## Relés de seguridad para proceso, oferta, selección y aplicación



|          |                    |
|----------|--------------------|
| Fecha    | 21 Septiembre 2021 |
| Hora     | 16:00              |
| Hora     | 17:00              |
| Duración | 1 hora             |
| Costo    | gratuito           |

Conozca los conceptos básicos en relevadores de seguridad para proceso, la oferta que Phoenix Contact desarrolla para Sistemas de Seguridad y las posibilidades de ahorro de espacio y flexibilidad con las nuevas tecnologías VIP I/O que pueden involucrar elementos de seguridad

Aprenda los diferentes tipos de relevadores de acoplamiento, su selección, compatibilidad, características esenciales y particulares que son requeridas para una mejor funcionalidad, ahorros en hardware, diagnóstico, pruebas y sus mejores prácticas de aplicación en las instalaciones de los segmentos de proceso más reconocidos en la Industria. Los relés de acoplamiento con contactos de conducción forzada cuentan con certificación de nivel de integridad de seguridad (SIL). Sirven para la separación galvánica y la amplificación de potencia.

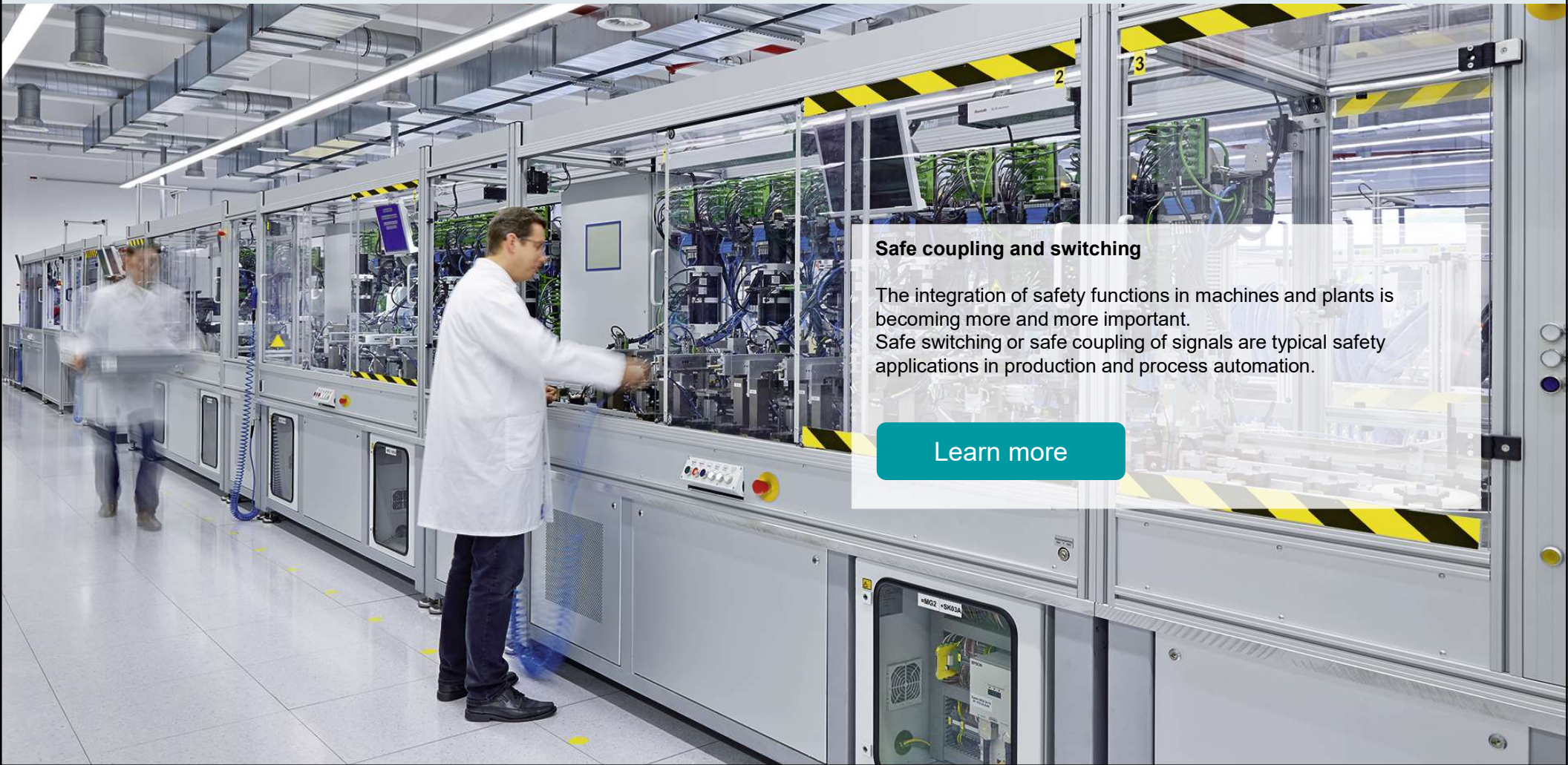


## Overview safe coupling relays – Safety relays for the process industry



# Smart safety solutions

## Signal coupling and switching



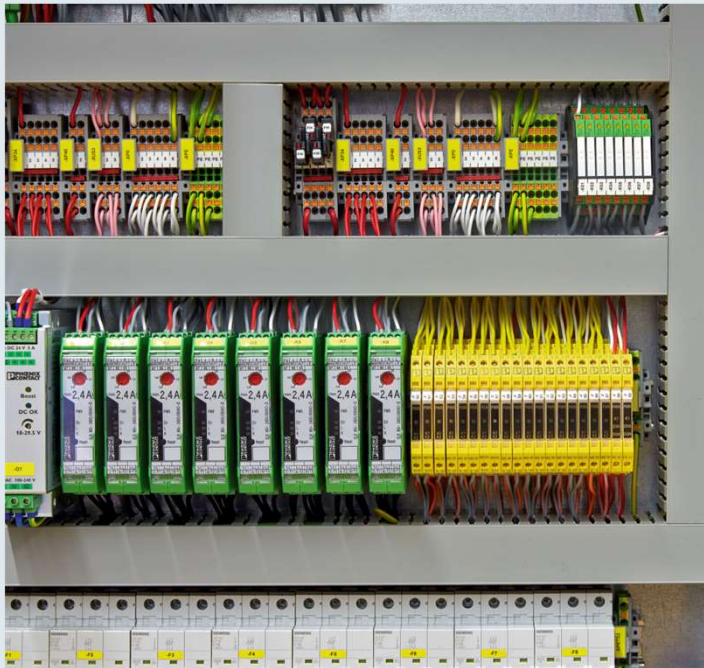
### Safe coupling and switching

The integration of safety functions in machines and plants is becoming more and more important. Safe switching or safe coupling of signals are typical safety applications in production and process automation.

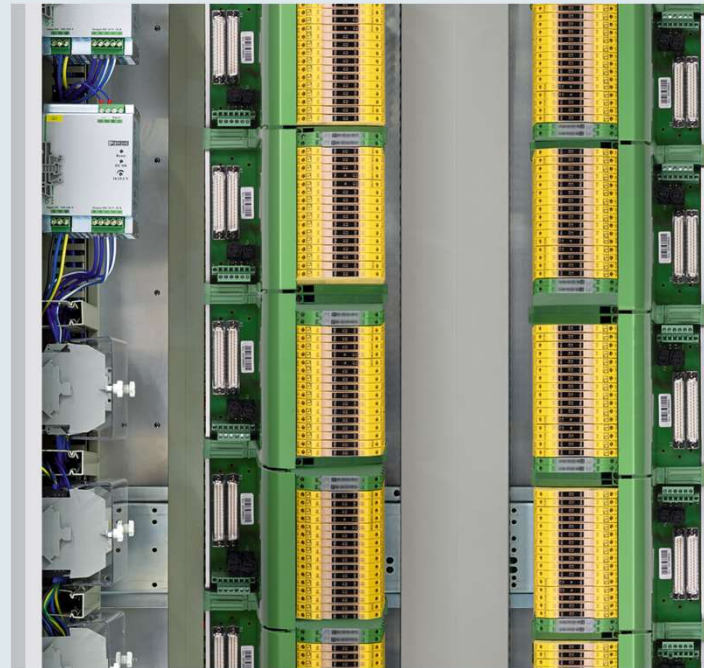
[Learn more](#)

# Smart safety solutions

## Signal coupling and switching



Safety for  
production automation



Safety for  
process automation







## Conventional safe coupling relays PSRclassic

In the PSRclassic series, you will find the conventional coupling relays with force-guided contacts for safe shut down. The conventional coupling relays are characterized by a wide range of features and versions. They are compatible with standard safe systems.

- ✓ Safe diagnostics and easy proof test in accordance with IEC 61508
- ✓ Overall width from 17.5 mm
- ✓ Proven safety, thanks to force-guided relay contacts
- ✓ TÜV-certified and approvals for all global markets
- ✓ SIL 3 in accordance with IEC 61508 / IEC 61511 / EN 50156

[Product overview](#)

# Smart safety solutions

## Signal coupling and switching



**Safety relays**  
PSRmini and PSRclassic



**Multifunctional safety relays**  
PSRmultifunction



**Safe coupling relays**  
PSRmini and PSRclassic



Emergency Shutdown

# Highly-compact safe coupling relays

## Product overview



| Type                                                                                                  | Applications                                                                                                                    | Output contacts                                                                   |                                                                                   |                                                                                   | Diagnostics / proof test |                                                 |                           |                                   | Safety approvals                         |                                  |                               |                                         |    | Width | Connection technology   |                         |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------|-------------------------------------------------|---------------------------|-----------------------------------|------------------------------------------|----------------------------------|-------------------------------|-----------------------------------------|----|-------|-------------------------|-------------------------|
|                                                                                                       |                                                                                                                                 |  |  |  | Visual via LED           | Active error acknowledgment via A1 <sup>2</sup> | Measurement on the device | Self-monitoring with interlocking | SIL in accordance with IEC 61508 / 61511 | SIL in accordance with IEC 50156 | ATEX / IECEx / Class I zone 2 | G3 in accordance with ANSI / ISA-S71.04 | GL | In mm | Screw connection        | Push-in connection      |
|  PSR-PS20<br>24 V DC | Highly compact, safe coupling relays for failsafe controllers:<br><br><br><br><br><br><br><br>For safety-related shutdown (ESD) | 1                                                                                 | 1                                                                                 | 1                                                                                 | •                        | •                                               | •                         | –                                 | 3                                        | 3                                | •                             | •                                       | •  | 6.8   | <a href="#">2700356</a> | –                       |
| PSR-PS21<br>24 V DC                                                                                   |                                                                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | •                        | •                                               | •                         | –                                 | 2                                        | 2                                | •                             | •                                       | •  | 6.8   | <a href="#">2700357</a> | –                       |
| PSR-PS22<br>24 V DC                                                                                   |                                                                                                                                 | 1                                                                                 | 1                                                                                 | –                                                                                 | •                        | •                                               | •                         | –                                 | 3                                        | 3                                | •                             | •                                       | •  | 6.8   | <a href="#">2702524</a> | –                       |
| PSR-PS23<br>24 V DC                                                                                   |                                                                                                                                 | 1                                                                                 | 1                                                                                 | –                                                                                 | •                        | –                                               | •                         | –                                 | 3                                        | 3                                | •                             | •                                       | •  | 6.8   | <a href="#">2702663</a> | –                       |
| PSR-PS40<br>24 V DC                                                                                   |                                                                                                                                 | 1                                                                                 | –                                                                                 | 1                                                                                 | •                        | –                                               | –                         | •                                 | 3                                        | 3                                | •                             | •                                       | •  | 6.8   | <a href="#">2700398</a> | –                       |
| PSR-PC20<br>24 V DC                                                                                   |                                                                                                                                 | 1                                                                                 | 1                                                                                 | 1                                                                                 | •                        | •                                               | •                         | –                                 | 3                                        | 3                                | •                             | •                                       | •  | 12.5  | <a href="#">2700577</a> | <a href="#">2700578</a> |
| PSR-PC32<br>24 ... 230 V                                                                              |                                                                                                                                 | 2                                                                                 | 1                                                                                 | –                                                                                 | •                        | –                                               | •                         | –                                 | 3                                        | 3                                | •                             | •                                       | •  | 17.5  | <a href="#">2700581</a> | <a href="#">2700582</a> |
| PSR-PC40<br>24 V DC                                                                                   |                                                                                                                                 | 2                                                                                 | –                                                                                 | 1                                                                                 | •                        | •                                               | –                         | •                                 | 3                                        | 3                                | •                             | •                                       | •  | 12.5  | <a href="#">2700588</a> | <a href="#">2700589</a> |

## Highly-compact safe coupling relays



## Highly-compact safe coupling relays PSRmini

PSRmini coupling relays are the narrowest coupling relays in the world, available for safe switch-on and switch-off.

- ✓ Safe diagnostics and easy proof test in accordance with IEC 61508
- ✓ Diagnostic LEDs for SIL 3-qualified inspection directly on the module
- ✓ Active error messaging to the controller ensures short downtimes during planned maintenance phases
- ✓ Overall width 6 mm and 12 mm
- ✓ TÜV-certified and approvals for all global markets
- ✓ SIL 3 in accordance with IEC 61508 / IEC 61511 / EN 50156

## Product overview



## Fire and Gas Safety



# Highly-compact safe coupling relays

## Product overview

| Type                                                                              | Applications                                                   | Output contacts                                                                   |                                                                                   |                                                                                   | Diagnostics / proof test |                                                  |                           |                                   | Safety approvals                         |                                  |                               |                                         | Width | Connection technology |                         |                         |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------|---------------------------|-----------------------------------|------------------------------------------|----------------------------------|-------------------------------|-----------------------------------------|-------|-----------------------|-------------------------|-------------------------|
|  | Highly compact, safe coupling relays for failsafe controllers: |  |  |  | Visual via LED           | Active error acknowledgment via A1 <sup>1)</sup> | Measurement on the device | Self-monitoring with interlocking | SIL in accordance with IEC 61508 / 61511 | SIL in accordance with IEC 50156 | ATEX / IECEx / Class I zone 2 | G3 in accordance with ANSI / ISA-S71.04 | GL    | In mm                 | Screw connection        | Push-in connection      |
| PSR-PC50<br>24 V DC                                                               | For safety-related startup (F&G)                               | 1                                                                                 | –                                                                                 | 1                                                                                 | –                        | ●                                                | ●                         | –                                 | 3 <sup>1)</sup>                          | –                                | ●                             | –                                       | ●     | 17,5                  | <a href="#">2904664</a> | <a href="#">2904665</a> |
| PSR-PC51<br>24 V DC                                                               |                                                                | 1                                                                                 | 1                                                                                 | –                                                                                 | –                        | ●                                                | ●                         | –                                 | 3                                        | 3                                | ●                             | ●                                       | ●     | 17,5                  | <a href="#">2702522</a> | <a href="#">2702523</a> |
| PSR-PC52<br>24 V DC                                                               |                                                                | 1                                                                                 | 1                                                                                 | –                                                                                 | –                        | ●                                                | ●                         | –                                 | 3                                        | 3                                | ●                             | ●                                       | ●     | 17,5                  | <a href="#">1017062</a> | <a href="#">1017064</a> |

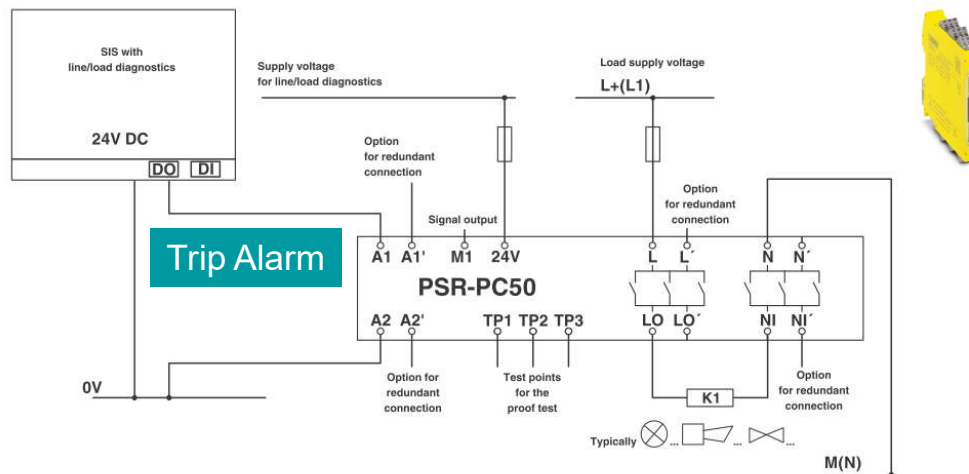


Safe State ON

## PSR-PC50 ..... Fire & Gas

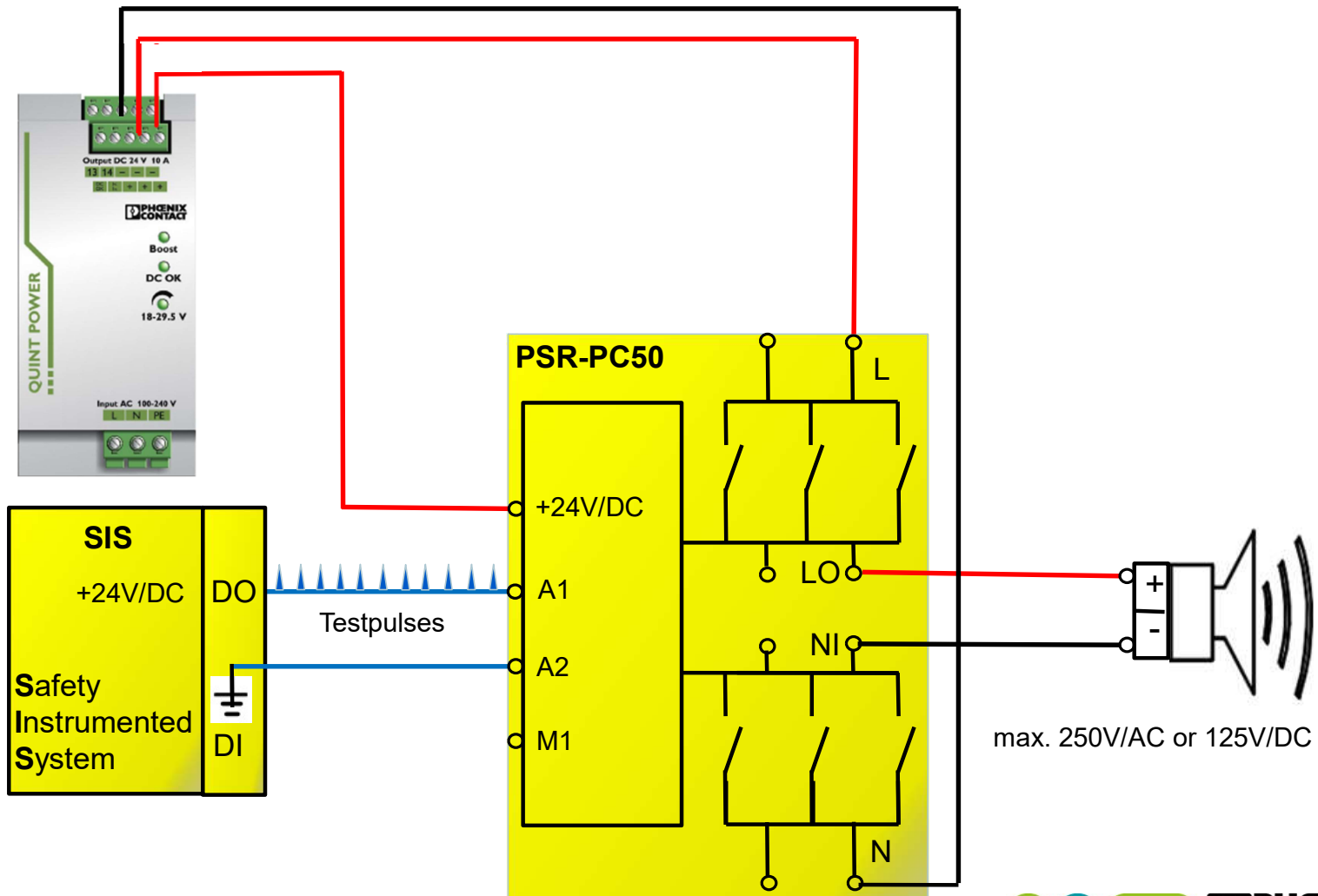


# PSRmini – safe-state on

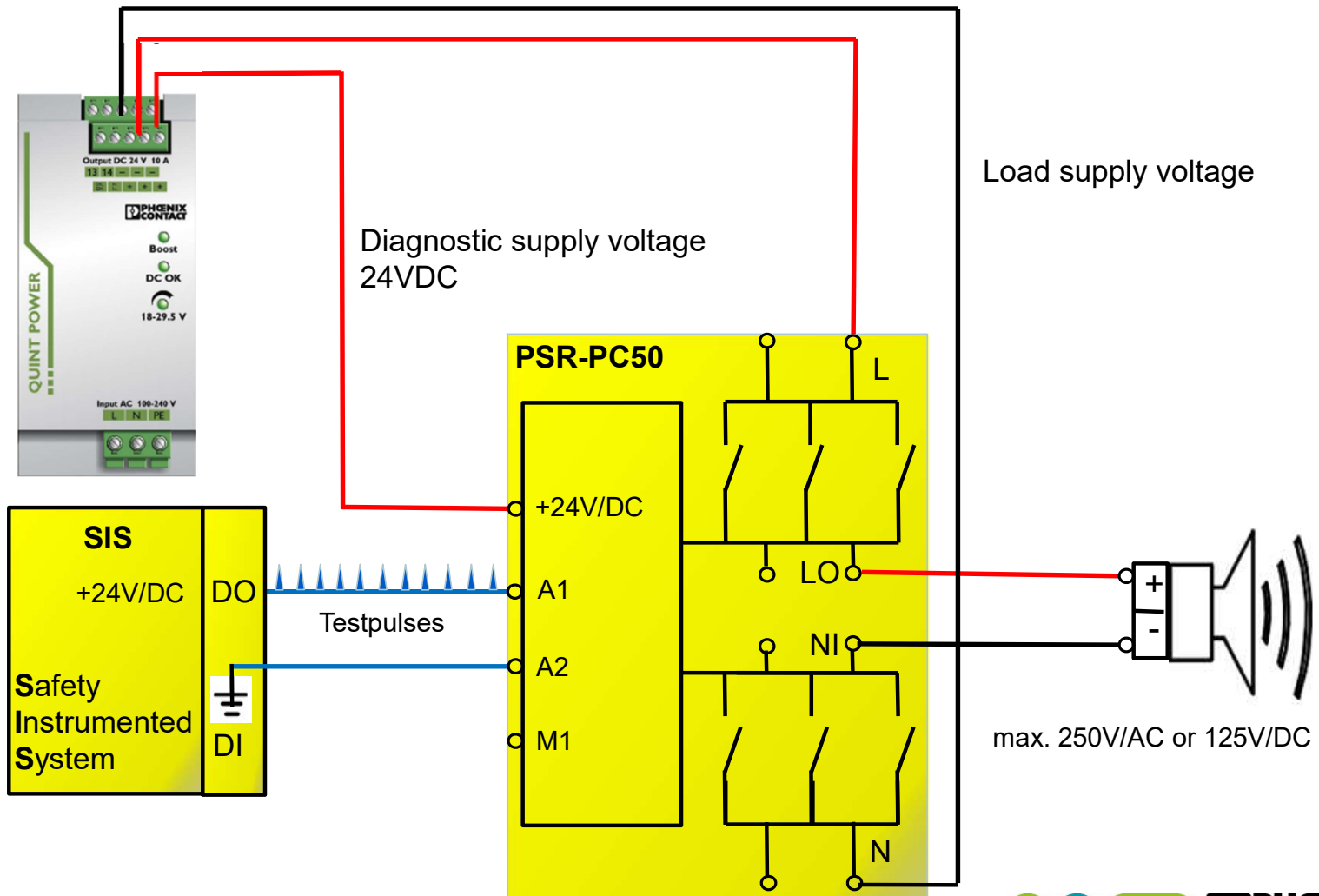


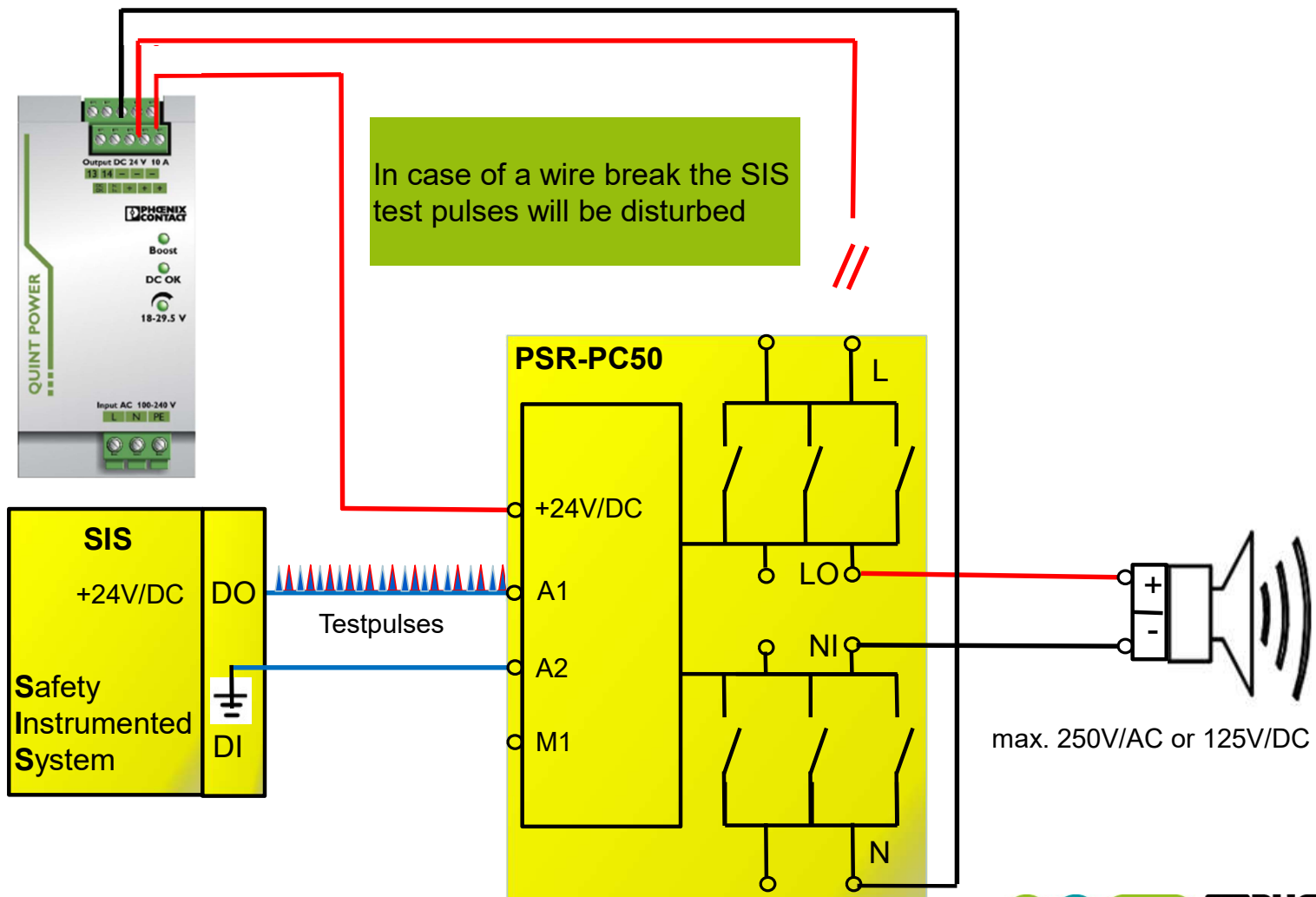
High Power Field Devices – deluge valves, beacons, horns, signaling devices

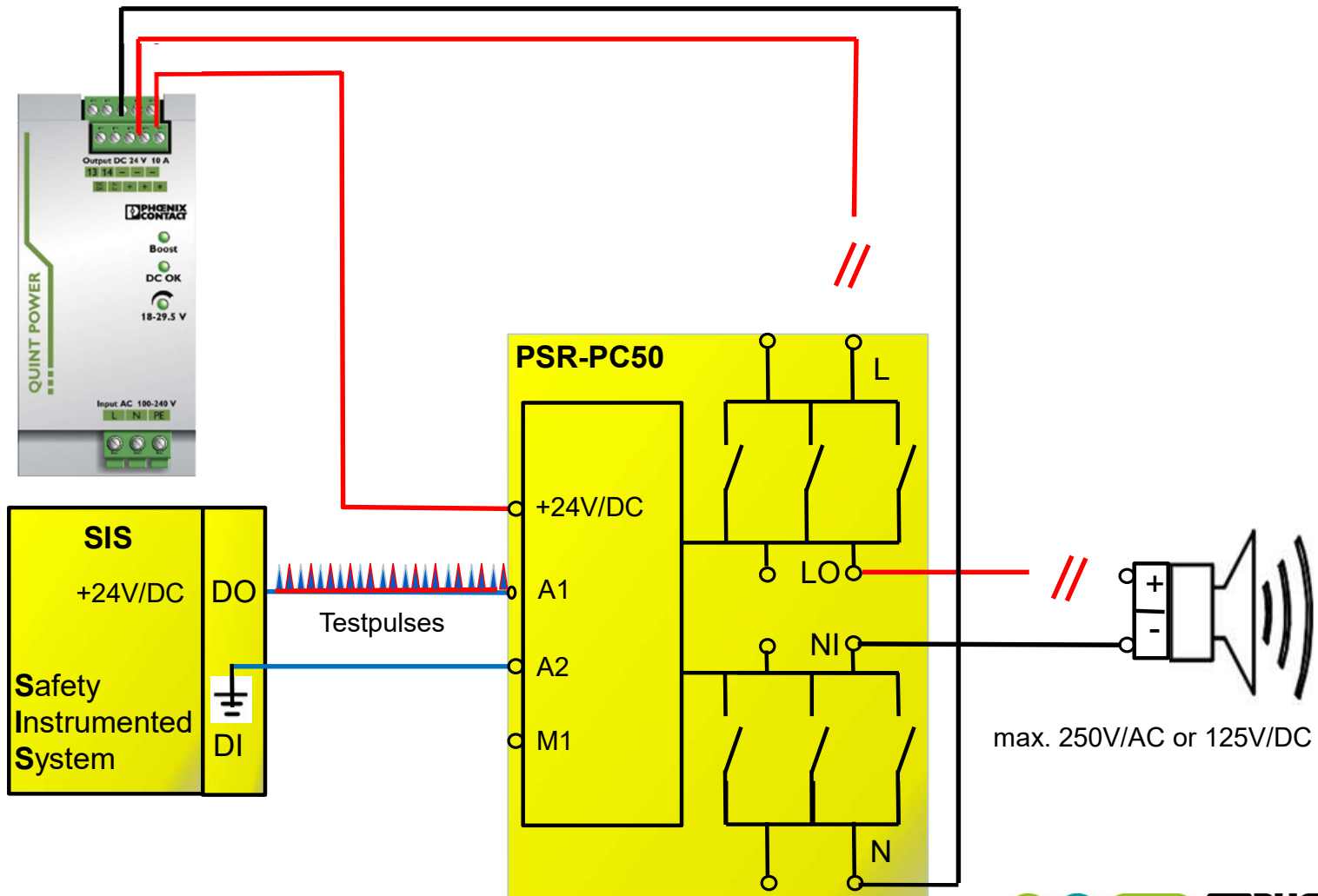
- Safe-state on function
- Load open and short circuit detection
- Load supply drop out detection
- Trip alarm via A1

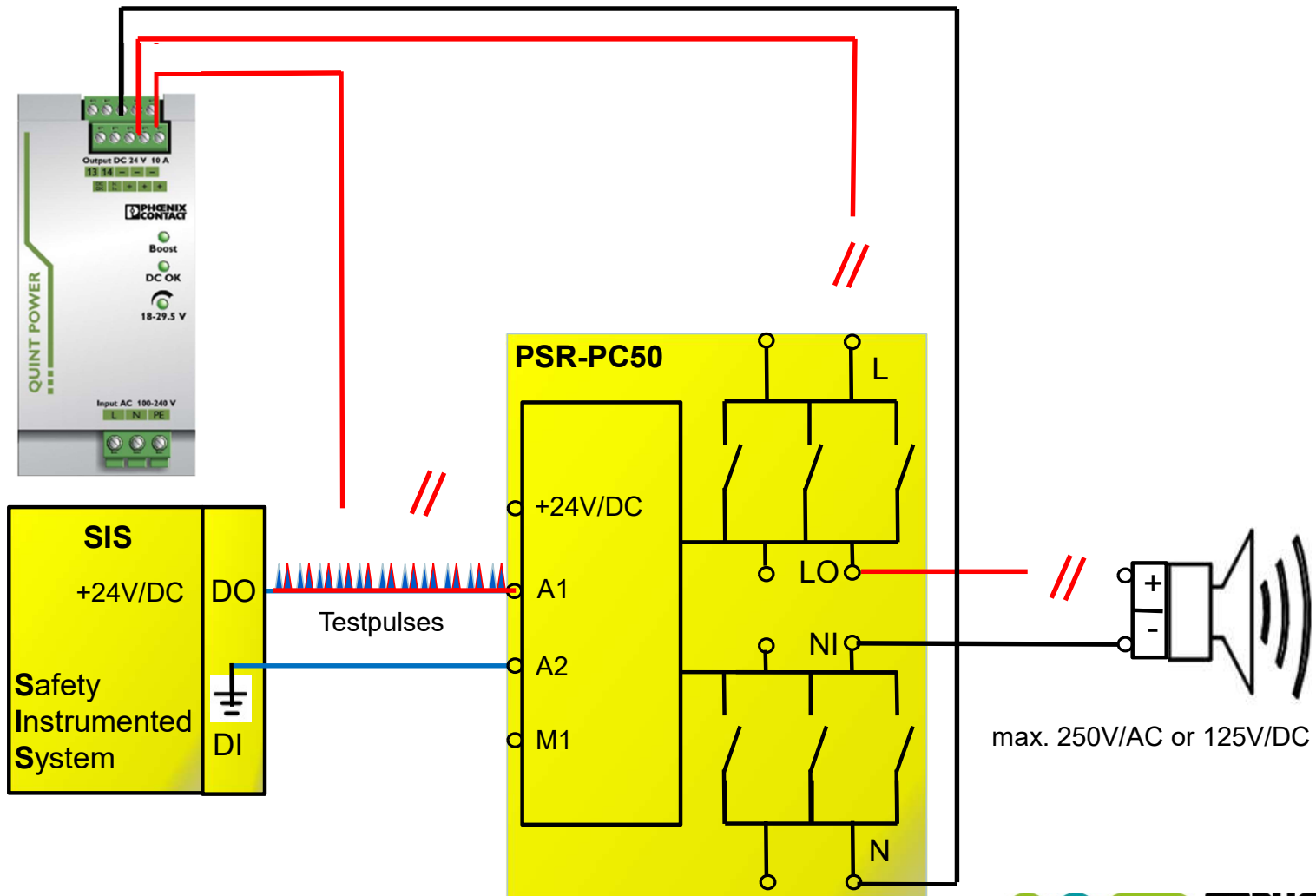


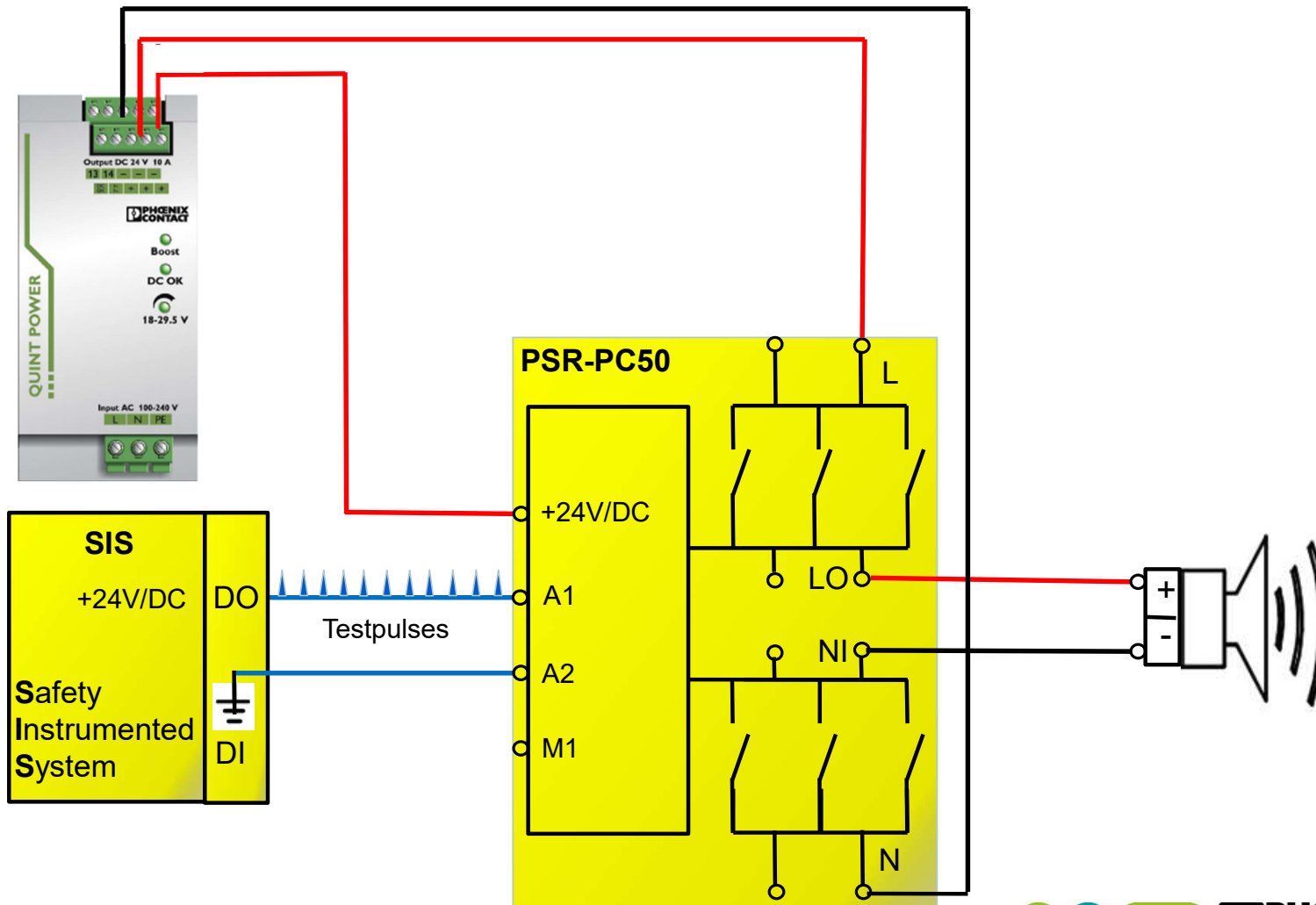




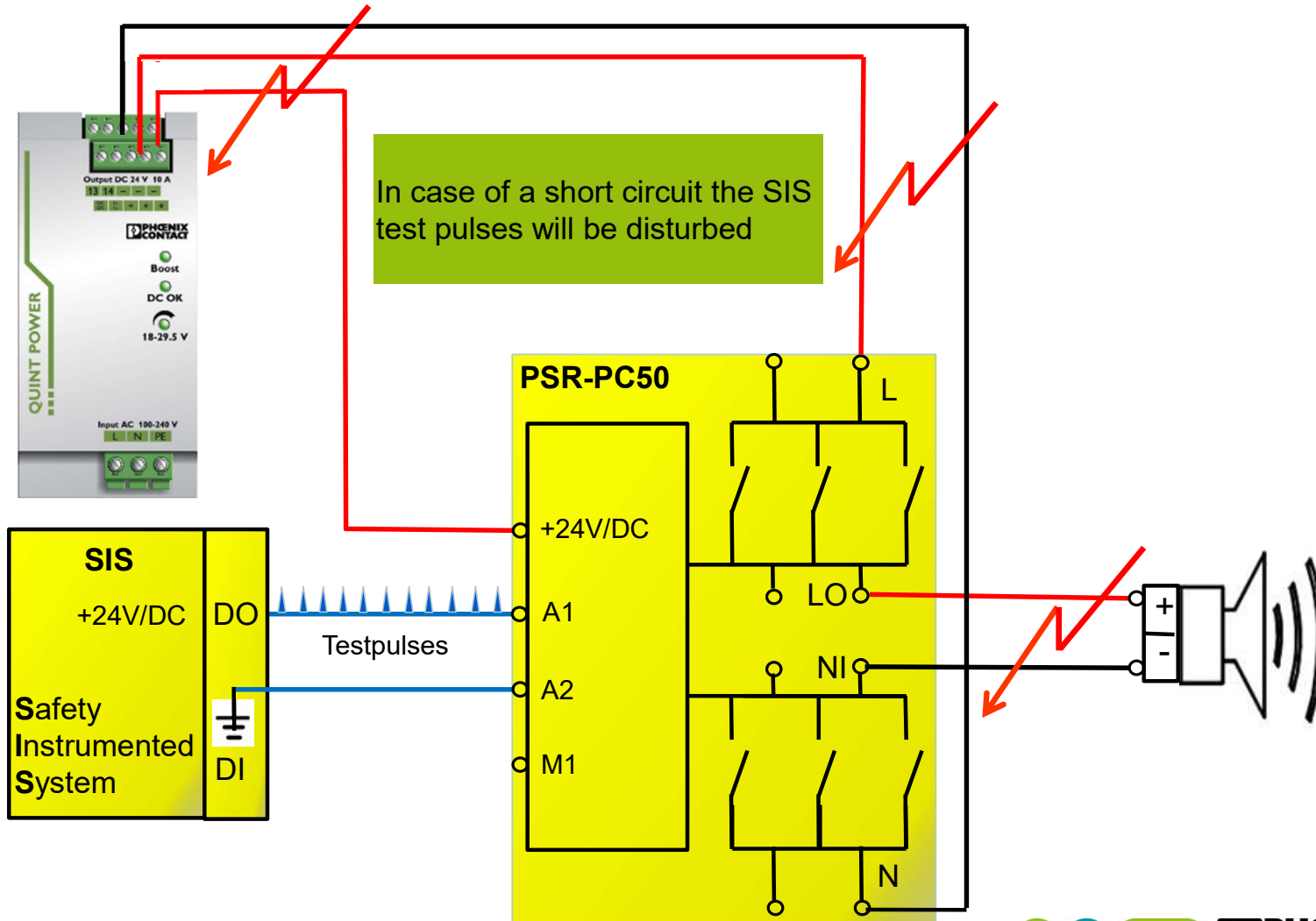


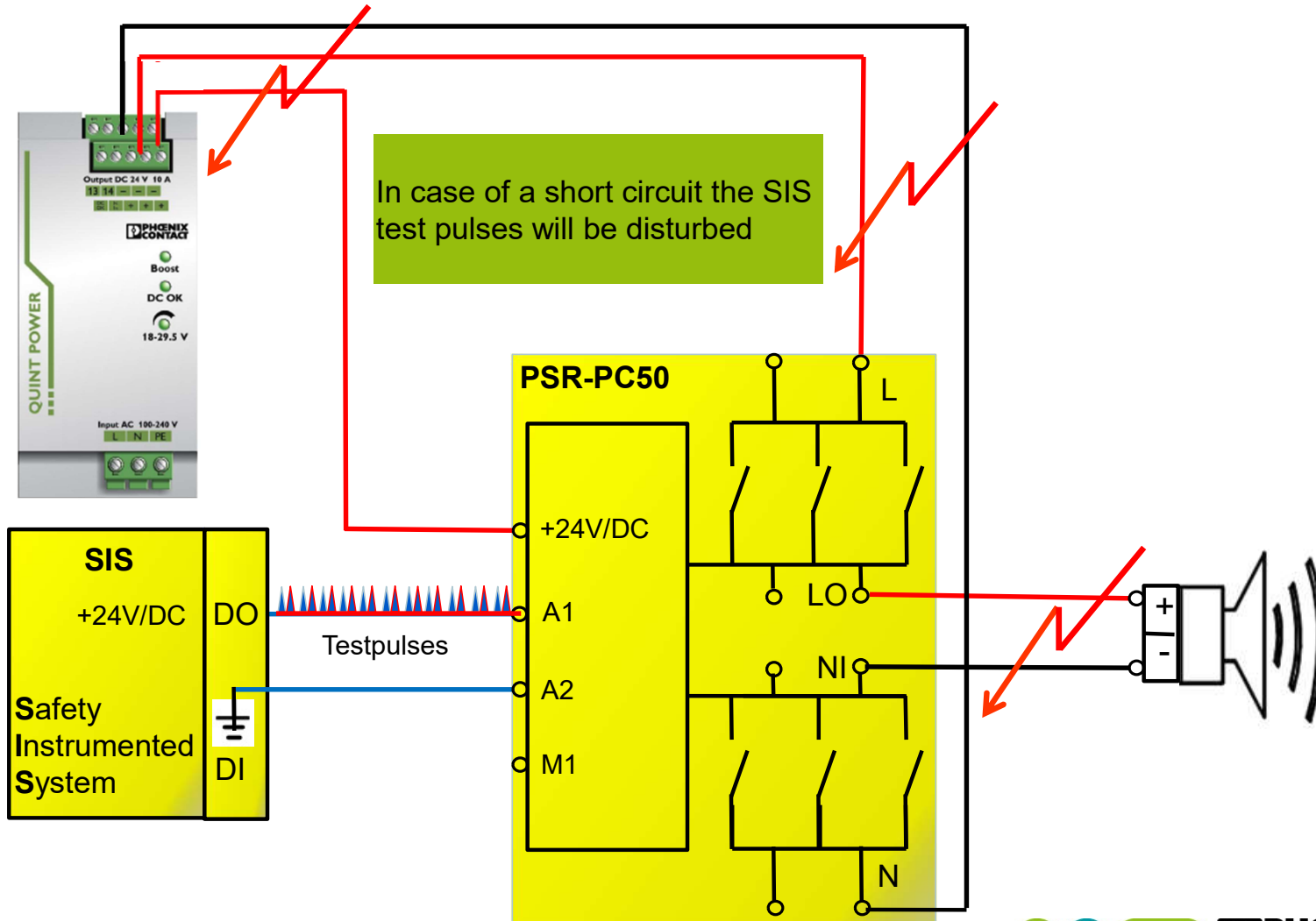












Thank you

Questions???



Relay Technology  
Designed by PHOENIX CONTACT



## Hazard and Operabilit Study

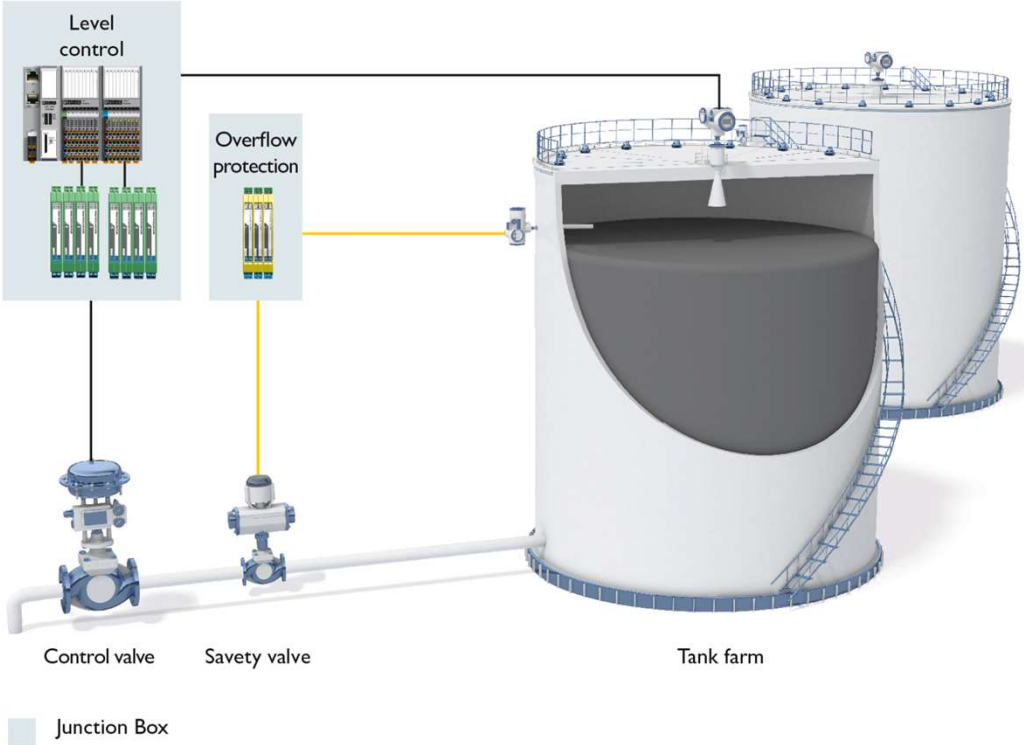
# Safe coupling relays

## Tank monitoring



### Complete solutions for automated tank farm management

With a broad portfolio of SIL-certified technology for functional safety, Ex-i signal conditioners and modular control systems, you can design efficient level control. An overflow protection is installed parallel to the level control, which activates a safety valve in an emergency and immediately stops the flow of the conveyed material.



# Products

## Safe signal conditioners



### Signal conditioners with SIL and PL functional safety

Signal conditioners for safe isolation, conditioning, filtering, and amplifying - also suitable for the Ex area.

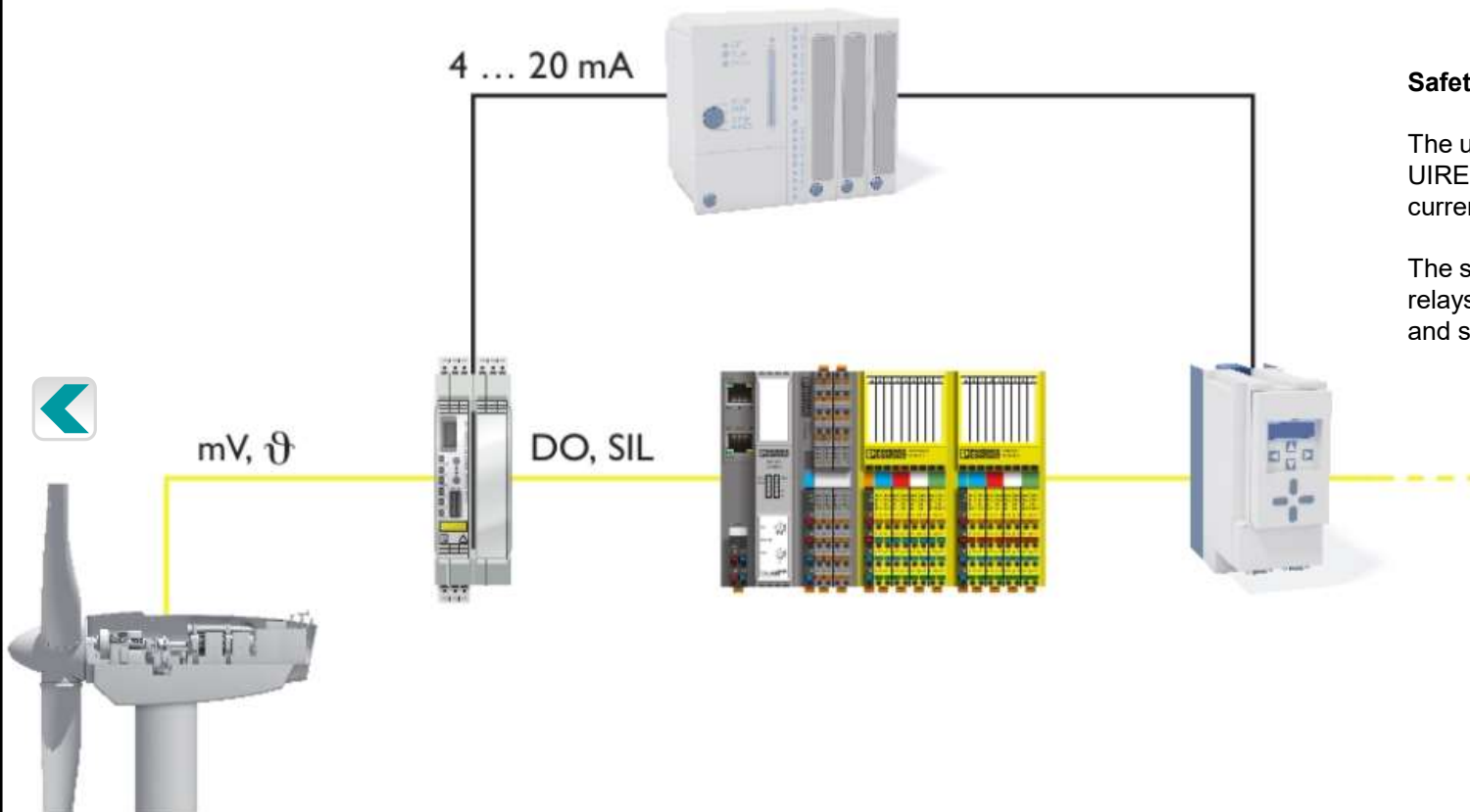
- ✓ SIL certified
- ✓ PL d in accordance with EN ISO 13849-1
- ✓ Versions with wide range input for worldwide power supply networks
- ✓ Push-in connection technology
- ✓ Ex approvals in accordance with ATEX and IECEx





# Safe signal conditioners

## Safe signal conditioning with functional safety



### Safety-relevant temperature monitoring

The universal temperature transducer (MACX TTT-UIREL) has two switching outputs, in addition to a current output.

The safety-relevant switching output, to which two relays are connected, switches limit values directly and safely without an additional safety controller.

# Products

## Safe power supply



### Safe power supplies QUINT POWER

The high-performance power supplies QUINT POWER ensure superior availability of your system. It satisfies the requirements in accordance with functional safety (SIL) and ensures maximum operational safety.

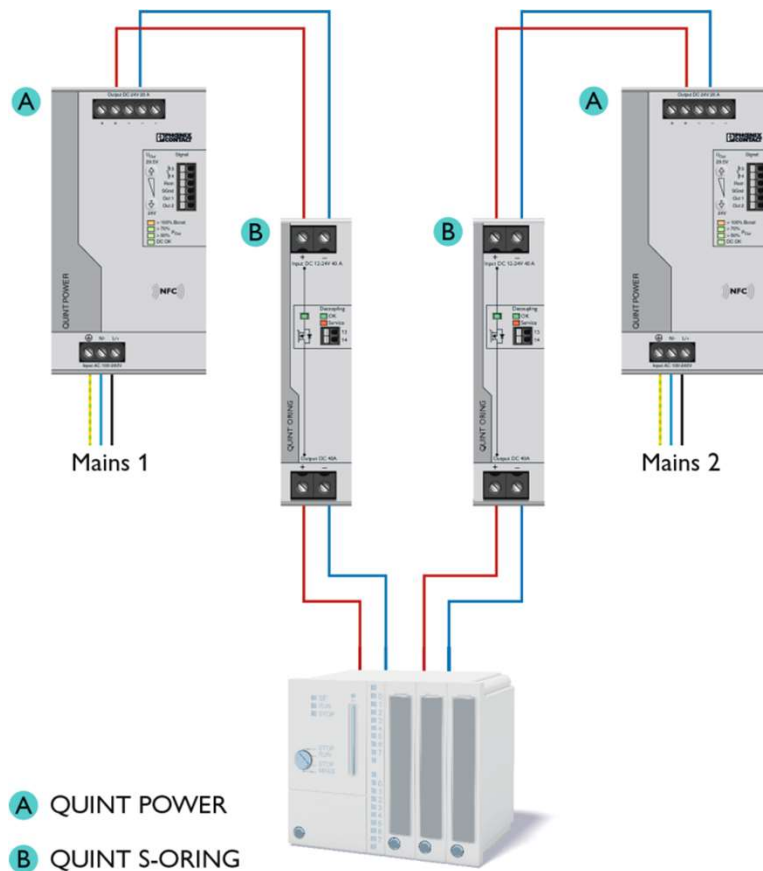
- ✓ Superior system availability, thanks to SFB Technology and preventive function monitoring
- ✓ Safe supply for your application, thanks to SIL certification in accordance with IEC 61508
- ✓ Fully functional monitoring, thanks to redundant system



[Product overview](#)

# Safe power supply

## Increased demands on functional safety



### Redundant system for functional safety

The 1+1 redundant power supply system provides symmetrical load distribution and increases system availability. Thanks to isolated conductor routing, consistent redundancy through to the load is assured.

Thanks to the SIL 3 certification in accordance with IEC 61508, the system can be integrated into redundant applications with the greatest demands on functional safety and superior system availability.



## BU Interface Components

# VIP I/O-Marshalling



VIP I/O-Marshalling

## Traditional Process Automation Project

- Extremely unflexible when it comes to changes (e.g. signal types)
- High planning efforts necessary
- Exact number and types of IOAs need to be known at a very early stage

**Delays in project execution time very likely**



VIP I/O-Marshalling

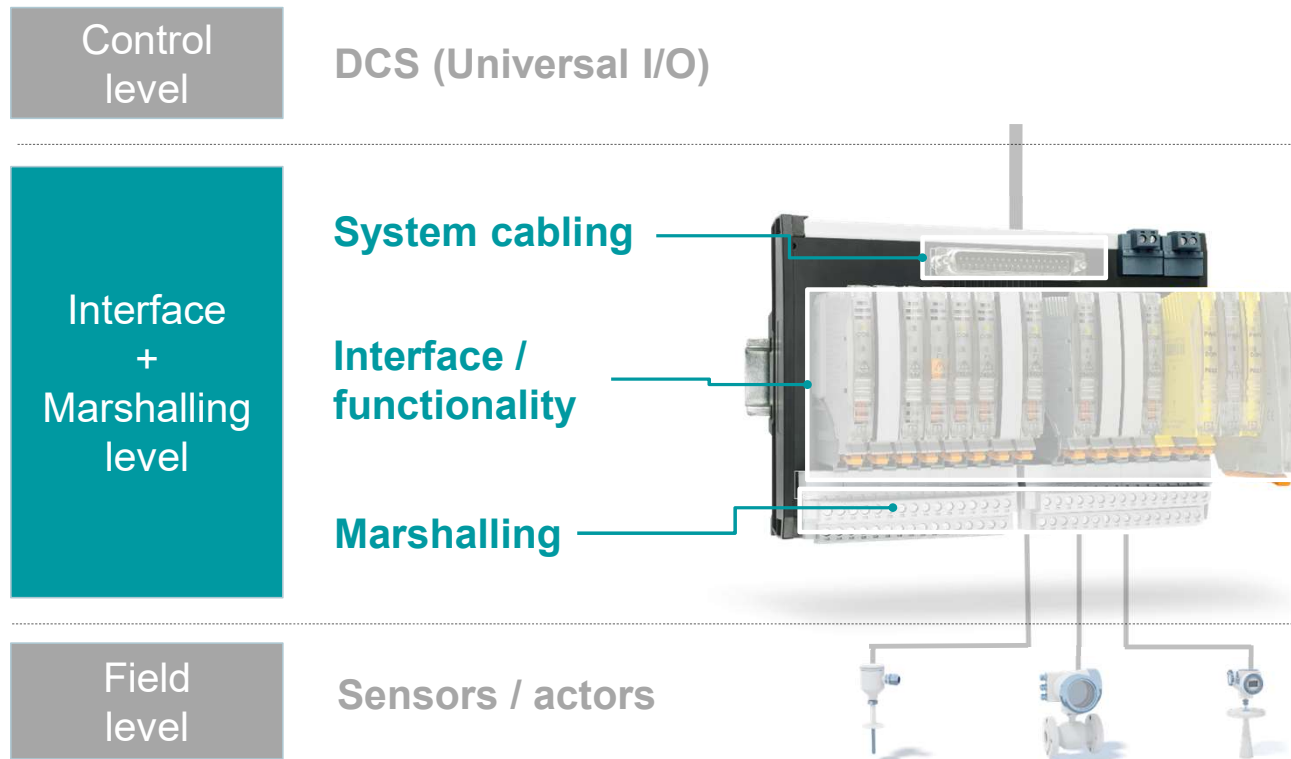
## **Process Automation Project with Universal I/O**

- High flexibility due to adaptable I/O channels
- Reduced planning effort
  - Only overall I/O number needed, not I/O types
- Reduce commissioning efforts
  - By using standard adaptable UIO cabinets

**Approx. 30% savings in project execution times**

VIP I/O-Marshalling

## Product Overview



**The most compact adaptive I/O marshalling system for Universal I/O, combining system cabling, interface and marshalling level in one single solution.**

## Utilize the full potential of Universal I/O

Complex process automation projects contain many challenges in planning and implementation. Improvements have already been achieved with the universal I/O approach. However, planners and users also need an equally flexible solution at the marshalling and interface level.

VIP I/O Marshalling makes Universal I/O systems truly universal also on the marshalling and interface level.

Learn more about the Universal I/O approach and the VIP I/O Marshalling product portfolio in this webinar

### Topics:

- What is Universal I/O?
- What role does VIP I/O Marshalling play for Universal I/O Systems?
  - What does the product portfolio look like today?
  - Which extensions are planned?
  - What is the sales approach?

## Products VIP IO Safety

Pluggable SIL coupling relay as an input/output accessory for VIP base module, SIL 3 high and low-demand applications, safe-state-off, couples digital output signals to the periphery, 1 enabling current path, 1 confirmation current path, test pulse filter



### IOA-PSR-PS22

Pluggable SIL coupling relay for use on a VIP base module

Data sheet  
108235\_en\_02

© PHOENIX CONTACT 2019-07-04



IOA-PSR-PS22-1NO-1NC-24DC - 2702971

# IOA-PSR-PS22

The application example illustrates the safe switch-off of a load in high-demand operation. The safe coupling relay is controlled via a single channel using a failsafe controller. The device starts automatically.

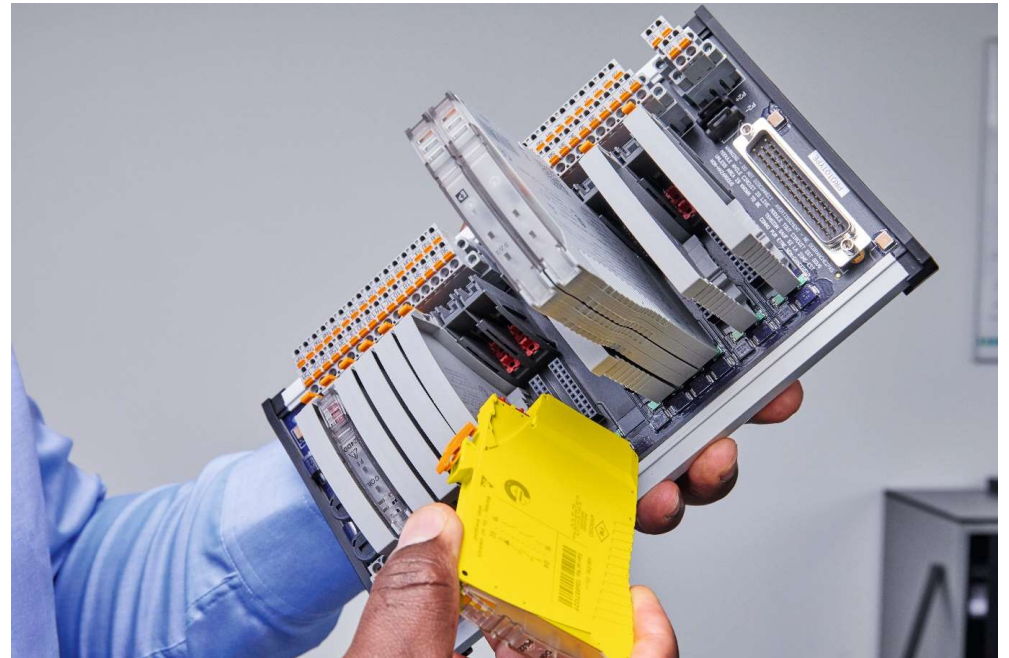


# VIP I/O-Marshalling





# VIP I/O-Marshalling



PHOENIX CONTACT

## Virtual DEMO .... Better understanding

Virtual DEMO

# Quality assurance

## Certified products and processes



### Quality assurance over the product lifecycle

- Certified Functional Safety Management (FSM)
- Independent product certifications
- Qualified personnel (FS Engineers)
- Application oriented services and support
- Qualified training programs

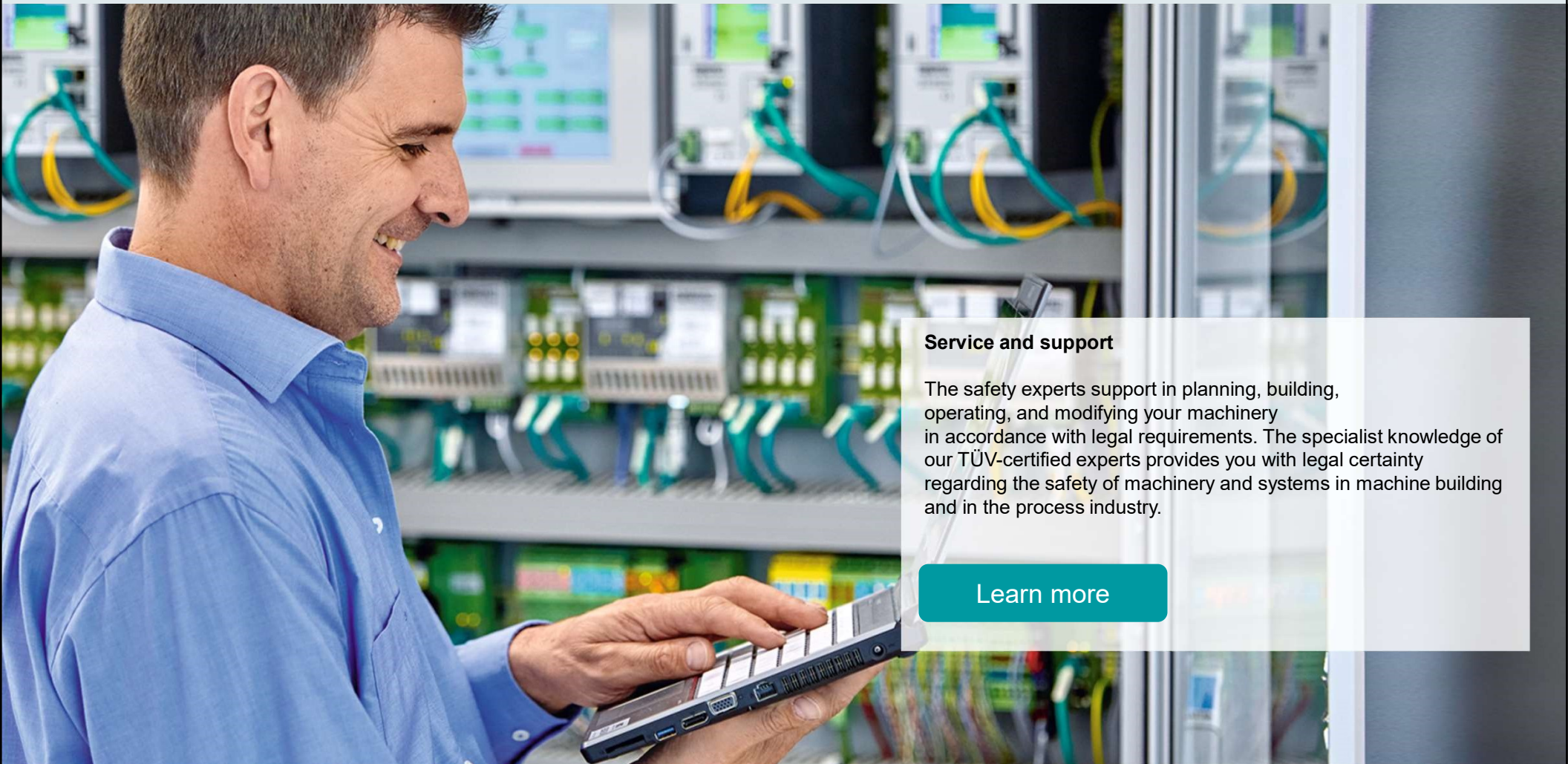
### Certified and tested for your application

- EN 50205 force-guided contacts
- EN ISO 13849-1 and EN 62061 for machine building
- IEC 61508/61511 for the process industry
- EN 50156 for use in furnaces, steam generators, waste heat boilers, rotary furnaces and hot gas generators
- Germanic Lloyd (GL) for use in shipbuilding and offshore systems
- SIL 1, 2 and 3



## Safety service and support

### Worldwide support from TÜV certified experts



#### Service and support

The safety experts support in planning, building, operating, and modifying your machinery in accordance with legal requirements. The specialist knowledge of our TÜV-certified experts provides you with legal certainty regarding the safety of machinery and systems in machine building and in the process industry.

[Learn more](#)

# Safety service and support

## Services for machine and system safety



### Consulting

We provide advice on various subjects in the planning and implementation of your system:

- Design of the safety lifecycle: standards and their implementation
- Machinery Directive
- Changes to machinery and systems



### Engineering

To assess the safety integrity, we determine the SIL of the safety functions with the help of your technical documentation. These must be sufficiently robust to withstand random errors. In the case of Machinery Directive requirements, we implement the entire **safety lifecycle process**.



### Product support

We provide support regarding any Phoenix Contact safety hardware and software questions. You can contact our support team regarding anything – from the preliminary technical clarification, through planning and implementation, right through to operation



### Seminars and trainings

We offer instruction and practical training that is tailored to your individual requirements, e.g. safety application software:

- Demands on safety-related software
- Specification of safety requirements and software
- Realization of safety functions



# Safety service and support

## Services for safety in the process industry



### Demands on safety in the process industry

Design guidelines relating to functional safety are in place for the requirements on the safe operation of systems in the process industry. The internationally harmonized procedure is described in IEC 61511.

A significant component of this is the safety lifecycle in conjunction with functional safety management.

### Seminars for functional safety in the process industry in accordance with EN 61511:

- Risk analysis
- Safety lifecycle
- Creation of process control technology

# Successful in use Industries



Machine building



Automotive



Process industry





# Industries

## Process industry



- ✓ Extensive diagnostic features
- ✓ IEC 61508/61511 and EN 50156 for the use in furnaces, steam generators, waste heat boilers, rotary furnaces and hot gas generator
- ✓ Germanischer Lloyd (GL) for the use in shipbuilding and the offshore industry
- ✓ ATEX



## Process Relays

# Thank you

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55 3233 6518

