

# PLC slimline relays

The original slim industrial relay system

# Reliably switch, isolate, and amplify signals

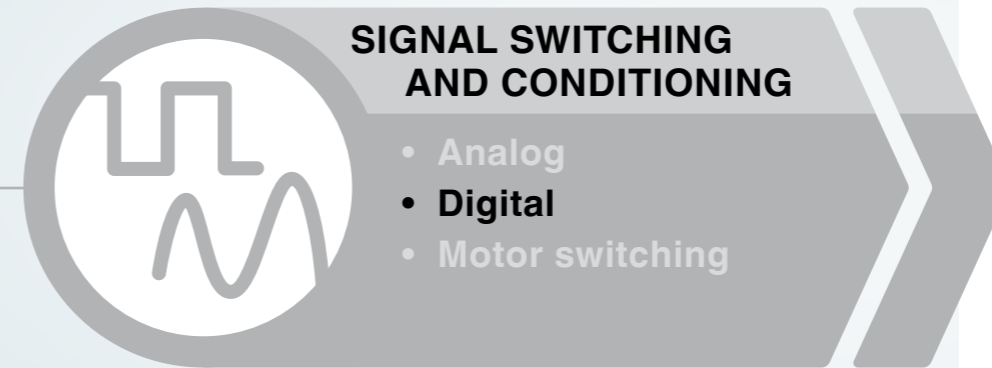
The most basic function of an industrial relay is to act as an interface to switch something from one state to another. Phoenix Contact relays do that and much more. The need to switch, isolate, amplify, or convert digital signals can be found in every industry. Our wide range of products offers a variety of cost-effective solutions to meet all requirements, from simple switching to more advanced control.



 **LIMITED LIFETIME WARRANTY**  
BUILD WITH CONFIDENCE

# Signal switching and conditioning

Every signal has a specific purpose, and not all signals are the same. And sometimes along the journey, signals may need to be isolated, amplified, or converted to serve their purpose in the system. Ensuring the signal's mission is accomplished can be as simple as choosing a universal product, or might require digging deeper and allowing the application to dictate the product selection. Analog signals, digital signals, and motors all require the right product to ensure that the signal gets the job done.

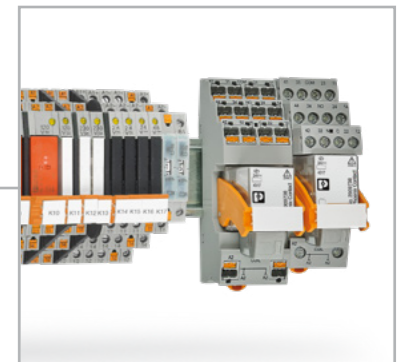


## Contents

Universal slimline relays	3
Specialty and application-specific relays	4
Quality overview	8
Quality from within pullout poster	10
Accessories	16
Selection tables	18
Other relays available	20



Analog



Digital



Motor switching



## Slimline relays

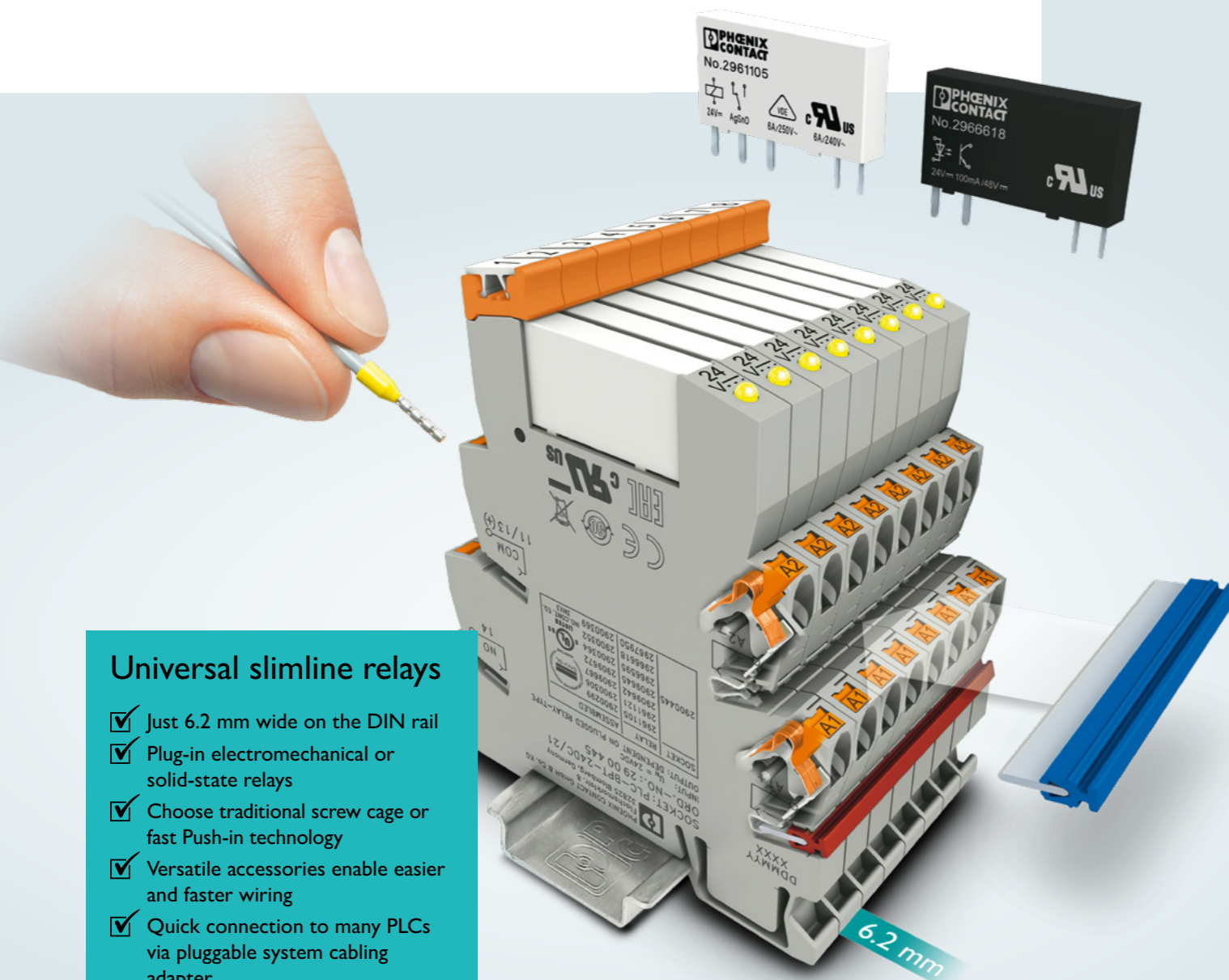
The PLC relay family from Phoenix Contact has been the industry standard since 1997. This family includes over 700 different part numbers ready to meet the needs of any switching application. Not only are its external features important to its use, the core of the relay is made from a copper “lead frame,” ensuring reliable connections every time.

- Universal slimline relays are the go-to for almost every application
- Application-specific relays are perfect for special requirements
- Specialty relays assist with unique functionality

## Application-specific and specialty relays

Our universal slimline relays are available in a wide range of options to easily handle most industrial applications. However, there are always unique circumstances where a universal relay either won't be suitable or it can do the job, but not the most efficiently.

That's where our specialty relays come in. Available in the same housing as our universal relays, most designs can also utilize the same accessories. We offer the widest breadth of specialty relays, so you know we'll have something to meet your needs.



### Universal slimline relays

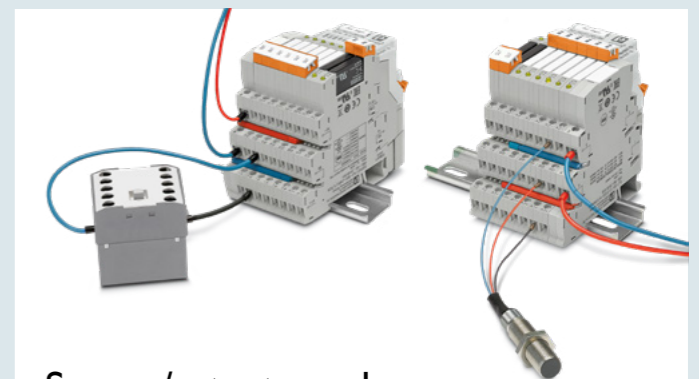
- ✓ Just 6.2 mm wide on the DIN rail
- ✓ Plug-in electromechanical or solid-state relays
- ✓ Choose traditional screw cage or fast Push-in technology
- ✓ Versatile accessories enable easier and faster wiring
- ✓ Quick connection to many PLCs via pluggable system cabling adapter



### Hazardous location relays

- ✓ Combined UL CID2, ATEX, and IECEx – the three most widely accepted hazardous location approvals in the world
- ✓ Triple-rated relays ensure your equipment will retain hazloc approval no matter where it gets shipped
- ✓ SPDT and DPDT versions with up to a 10A contact rating
- ✓ Available in 12 V DC, 24 V DC, 120 V UC, and 230 V UC coils
- ✓ Screw or push-in connections; compatible with all standard PLC relay accessories
- ✓ Listed replacement relays

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### Sensor/actuator relays

- ✓ Many 3-wire sensors and 2-wire actuators typically require extra terminal blocks for wiring common voltages
- ✓ Sensor relays have a busbar terminal on the output side where the common supply voltage can be connected
- ✓ Actuator relays have a busbar terminal on the input side where the common return can be wired
- ✓ Directly connect these devices to your relays and eliminate extra terminal blocks in your wiring
- ✓ Save significant DIN rail space and wiring effort

**i** Web code: #0617 Sensor relays

**i** Web code: #0618 Actuator relays



### Railway relays

- Railway relays are ideal for the unforgiving nature of rail yards
- Expanded input voltage range of 0.7 to 1.25 nominal accounts for swings in supply voltages
- Shock- and vibration-tested to EN 50155, ensuring they'll work even as heavy trains roll by
- Increased temperature range (-25°C to +70°C) accounts for harsh weather

**i** Web code: #0900



### Leakage filter relays

- Long cable runs can result in interference voltages, which can be more than a relay's release voltage
- AC output I/O cards can "leak" current, which can cause a relay to remain energized when output is off
- PLC...SO46 relays contain an integrated filter in the base to combat these issues
- The filter (resistor, capacitor, and diode) increases the release voltage, ensuring the relay switches off

**i** Web code: #0689



### Gold-plated relays

- Copper, silver, and nickel can oxidize in some harsh industrial atmospheres
- When oxidized, a layer builds and increases the resistance of the contact
- If this oxide layer isn't destroyed by a strong enough signal, it will build until the contact is unusable
- Gold is largely impervious to oxidation in most conditions – ideal for switching low-level signals

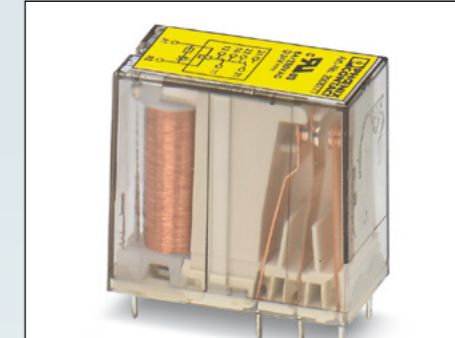
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### High-inrush current relays

- Ideal for the harsh startup of capacitive loads
- Inrush current can be hundreds of times the standard contact rating
- Built with specially alloyed contacts that can safely handle the large inrush
- Capacitive loads are becoming more common with the implementation of LED lights

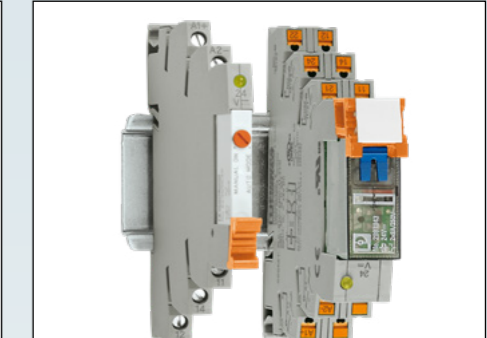
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### Force-guided relays

- To ensure that a contact hasn't failed, force-guided relays are often used
- The pole arms of each circuit are mechanically connected
- If a NO contact is welded, this can be demonstrated by the NC contact staying open when it's supposed to close

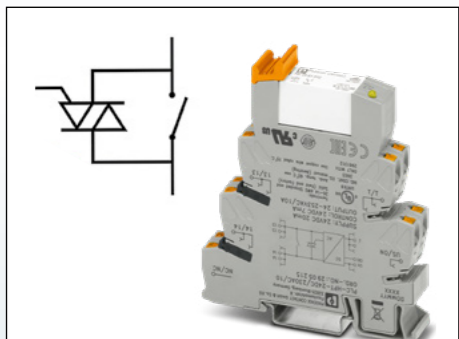
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### Manual operation relays

- Ideal for startup applications as well as frequent routine maintenance
- Our PLC...MS relays have a rotary screw (6.2mm) or pull tab (14mm) that manually switches contacts
- Switches can be operated quickly and without actually operating the PLC output or field sensor

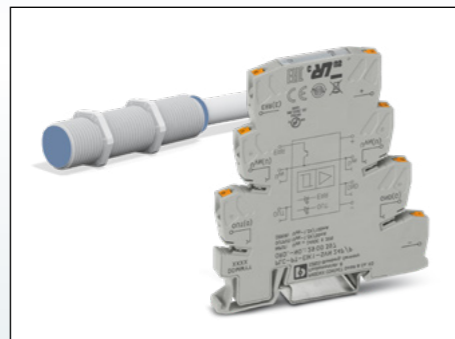
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### Hybrid relays

- Combine the best features of electromechanical and solid-state relays
- Based on our CONTACTRON hybrid technology, these relays offer up to 10x the service life of standard EM relays
- Extremely compact for their switching capacity: 10A at 250 V AC!
- Ideal for single-phase inductive loads

**i** Web code: #0691



### Relays for NAMUR sensors

- NAMUR sensors supply two different signal levels, depending on the switch state
- Our relays convert these signals into a digital signal that can be read by standard PLCs
- An integrated monitoring circuit checks for short or open circuits, indicated via LEDs

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### Timer relays

- ETD-BL timer relays are space-saving and cost-effective solutions for simple time and control applications
- Options for adjustable time as well as fixed, predefined functions
- Configuration dial provides precise and convenient time setting

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### Weak input signal relays

- Some devices can't deliver enough power to the relay input to actuate the coil
- SSI relays include an amplifier and auxiliary supply built into the relay base
- Ensure reliable relay actuation even with control current levels less than 1mA

**i** Web code: #0688

## Find out more with the web code

You can find web codes in this brochure: a pound sign followed by a four-digit number combination.

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

This allows you to access more information on our website quickly.

### It couldn't be simpler:

1. Go to the Phoenix Contact website
2. Enter # and the number combination in the search field
3. Receive more information and product versions



Or use the direct link:  
[phoenixcontact.net/webcode/#1234](http://phoenixcontact.net/webcode/#1234)



# What makes a quality relay?

Sure, anybody can make an interposing relay that switches outputs. But at Phoenix Contact, we believe it's the little (or occasionally unseen) details that make a great relay. From "little" things like making it easier to visually identify and wire your relays, to "big" things like offering universal bridging accessories, the first thing that matters to us is quality. We don't stop at the physical construction of the relay; we take great pride in our technical specs. Any value you find in our ratings has been taken from the absolute worst-case scenario for that application; we don't cherry-pick ideal ratings that would never happen in real-life use.

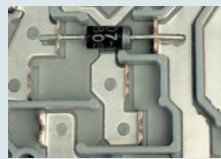
## Phoenix Contact

## Competition

### Core construction

Lead frame construction allows excellent heat distribution.

PCB construction allows for possible hot spots in the base.



### Terminal marking

Laser printing displays clear and easy-to-read text that is easily distinguished from both the orange plungers and gray housing.

Very difficult to read. Not printed, embossed into plastic.



### Bridging capability

NO, SPDT, and DPDT relays all have the same silhouette, accepting the same bridging.

Relays with different contact arrangements do not share the same bridge channel.

Both our screw and push-in terminals have the same outline, so the bridge crosses without a problem.

Screw and push-in relays have different base silhouettes, so the bridge cannot cross between.



### Relay differentiation

Electromechanical relays are white, and the solid state relays are black, making them clearly and immediately identifiable.

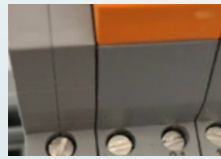
Both electromechanical and solid-state relays are black making them difficult to immediately distinguish.



### Max feeding current

Available power terminal block allows for up to 32A to distribute to adjacent common terminals.

Most competitors have no power terminal block available. Those that do are small and limited to a max of 10A available.



### Ejection lever

Lever protects relay from accidental removal, but does not cover up the majority of the relay.

Lever completely covers relay, greatly reducing available air space for heat dissipation.



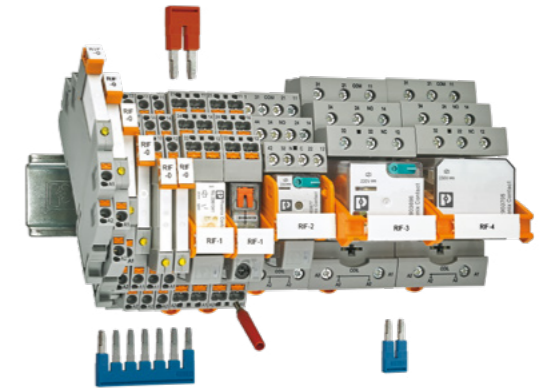
## Other relays

### RIFLINE Complete industrial relays

Phoenix Contact brings ice cube relays into the 21st century with RIFLINE Complete: an innovative line of general purpose industrial relays. This series offers both screw and push-in terminations, easy marking, and universal bridging.

RIFLINE Complete consists of fully assembled relays and individual components. The relays are available in multiple form factors and contact arrangements, offering a solution for virtually every switching application.

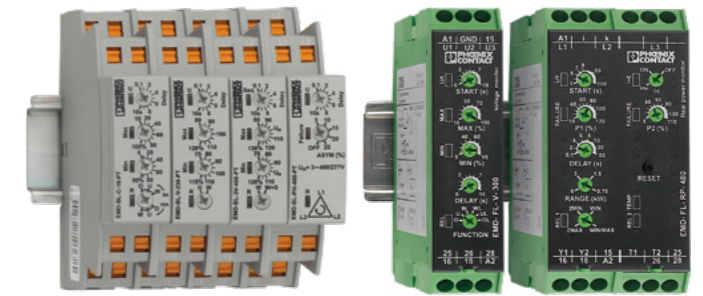
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### Compact monitoring relays

Our EMD monitoring relays are ideal for simple monitoring tasks. Efficiently and reliably monitor current, voltage (both 1- and 3-phase), phase sequence, active power,  $\cos \phi$ , and fill levels. Parameters can easily be set using rotary dials on the front of the housing. These relays are particularly suitable for use in building installation and series production of machines and systems.

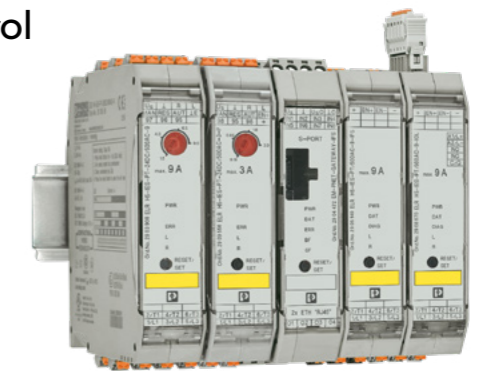
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### Electronic switching devices and motor control

CONTACTRON hybrid motor starters combine up to four functions in one device: motor starter, reversing function, overload protection, and emergency stop. Beyond the standard parallel wiring devices, network-capable versions (including IO-Link) are also available, allowing for integration into fieldbus environments.

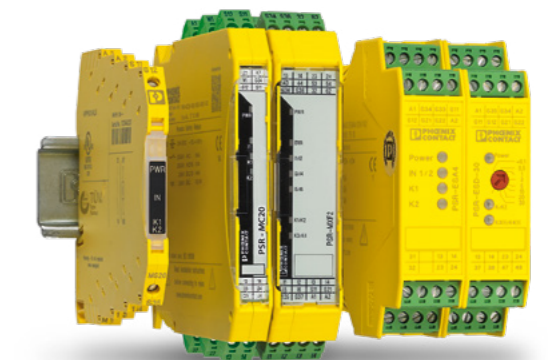
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### Safety relay modules

Benefit from our experience in safety technology. If you only require a few safety functions in your machine, our PSR safety relay modules are the ideal solution.

**i** Web code: #0704





## Quality comes from within

Phoenix Contact changed the industrial relay market forever back in 1997 by launching the first ever, super-compact, pluggable 6.2mm relay. Being the first to market with this product wasn't merely for bragging rights, the head start has allowed us to continue innovating new variations to the product family as competitors were stuck playing catch-up.

Follow the electron!



### Lead-frame construction

Phoenix Contact distinguishes itself in this market by using a frame of solid copper alloy in our relays. This offers several advantages over competitive relays built with PCBs:

- The large frame allows excellent heat dissipation and reduces hot spots, leading to a longer lifetime for electronic components
- Frame design allows for press-fit components, reducing weak solder connections and allowing high vibration resistance.
- Comes standard in both 6.2- and 14-mm wide relay housings, in both screw or push-in termination.

### Universal current input

An integrated polarity protection diode ensures that an improperly wired input won't damage the relay. UC relays also have a bridge rectifier, allowing for either DC or AC input.

### Rugged housing

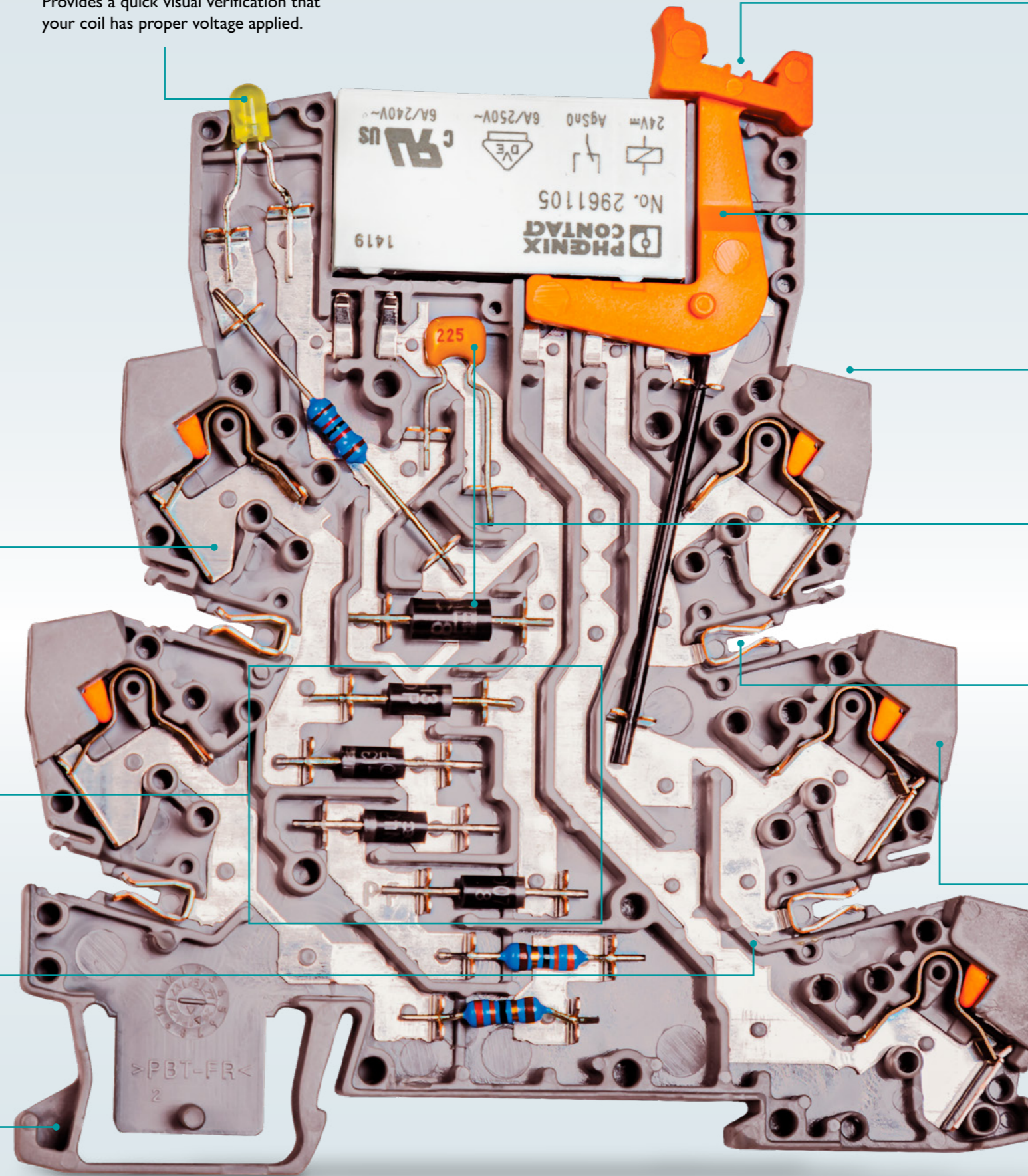
Our lead-frame design allows us to insert additional ribs into the relay base, greatly increasing sturdiness.

### DIN rail foot

Secure connection to the rail, rated for vibration resistance up to 5G

### LED status indication

Provides a quick visual verification that your coil has proper voltage applied.



### Integrated marking channel

Insertion of our ZB 6 or TM 6 markers allows for custom marking, but does not completely cover the relay, allowing for more heat dissipation.

### Relay release lever

The orange color on our products indicates an actionable part. A firm pull will release the relay and allow for easy replacement. Our relays are also color-coded: white for electromechanical and black for solid-state.

### Laser-printed terminals

Easy-to-read and concise marking clearly indicates every terminal.

### Kickback protection

An integrated freewheeling diode limits the voltage induced on the coil during shutoff, protecting upstream devices from inductive kickback.

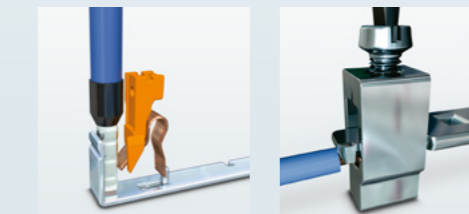
### Integrated bridging channel

Pairs with our FBST series continuous bridges for unparalleled wiring flexibility. These bridges are cut to length, and the channels line up in both our SPDT and DPDT relays.

### Screw or push-in connection

No matter your preference, our terminals are reliable. The screw cage features our patented Reakdyn® groove, which prevents screws from loosening over time.

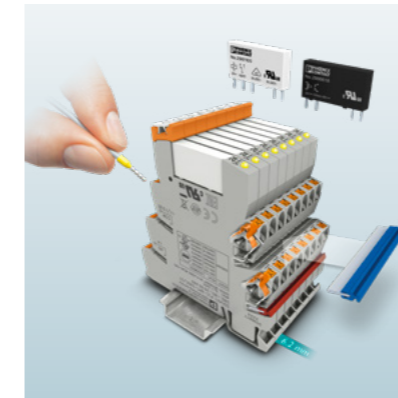
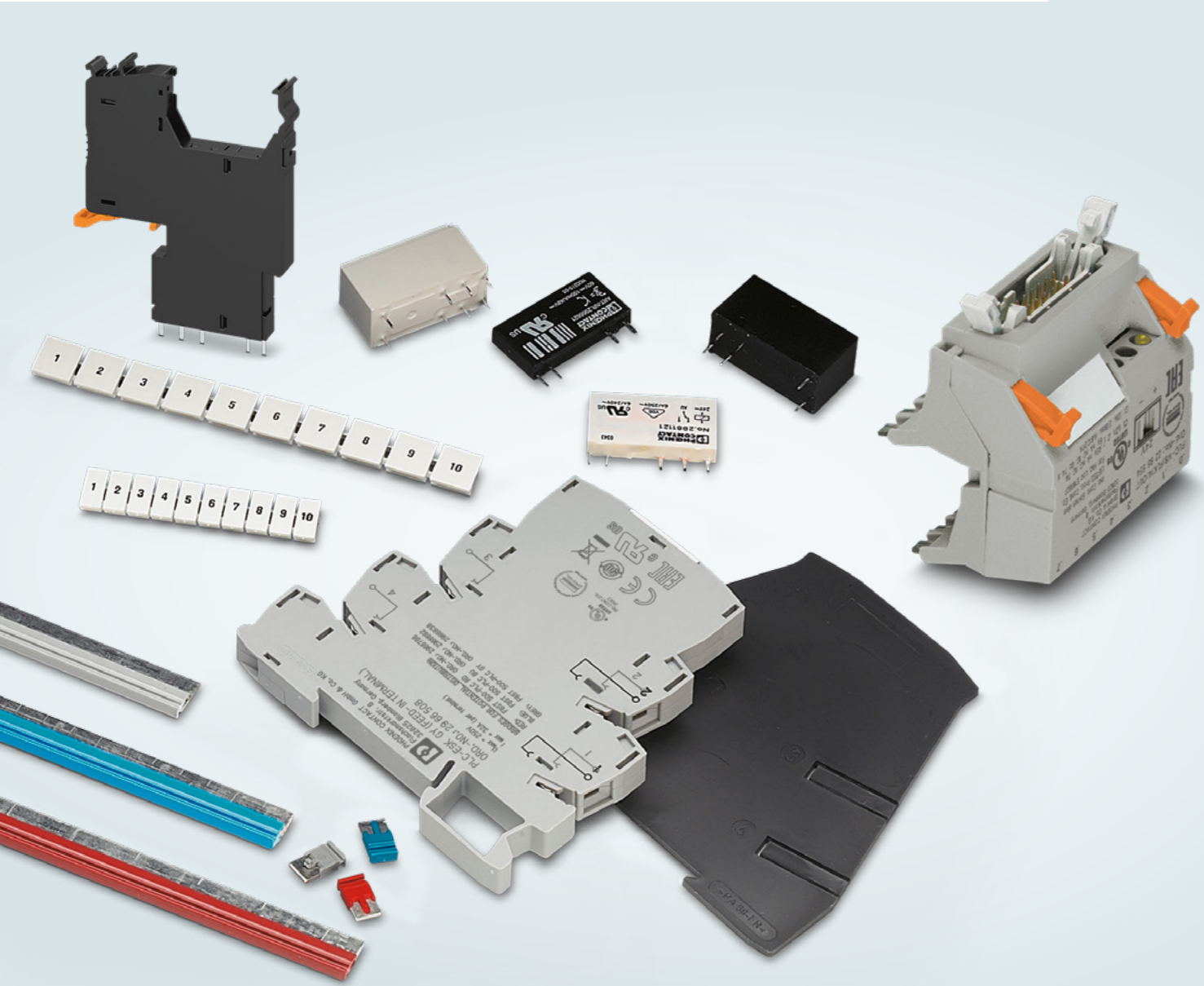
Our PT terminal is the original push-in terminal on the market. Simply depress the orange plunger, insert the wire, and release. Ferruled or solid wire can even be terminated tool-free.





# Accessories

The quality of the PLC relay family allows each device to shine on their own. However, the addition of our lineup of accessories really takes this relay platform to the next level. The flexibility of our range of bridging, cabling, fusing, and marking options turns a humble relay application into a way to save considerable wiring labor and improve reliability and system uptime.



## Plug-in bridges

Color-coded and insulated plug-in bridges can reduce wiring time by up to 70%. On universal relays, the A1+, A1-, COM, and NO terminals can all be independently bridged, depending on the needs of your application.

**i** Web code: #0692



## Power feed-in terminals

Assists in supplying any of the four available bridge potentials. Larger dedicated terminals allow greater load to be shared on the bridge.

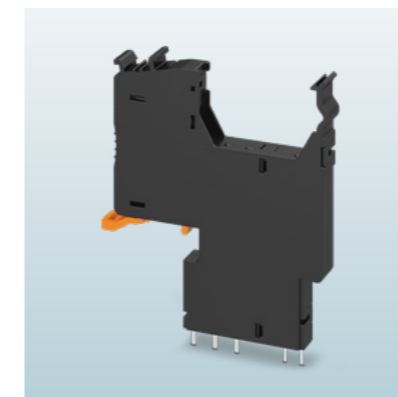
**i** Web code: #0692



## Separating plates

A 2 mm-thick plate allows the isolation of different voltages of neighboring relays, as well as visual separation of groups. Cutouts allow for bridges to pass through if desired.

**i** Web code: #0692



## Fuse holders

Add an in-line 5x20 glass fuse to a PLC relay with no additional space requirements. LED shows blown-fuse indication, and blown fuses can be easily replaced. Perfect for new installations and retrofit applications.

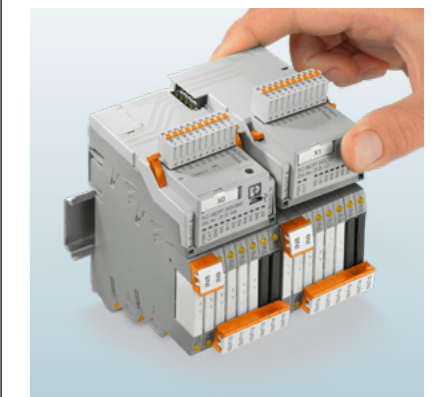
**i** Web code: #0692



## V8 system cabling adapters

These adapters enable fast connection of 8 relay channels to the controller, which can be used on input or output applications on universal relays, as well as sensor/actuator relays.

**i** Web code: #0897



## PLC Logic

Combine the advantages of plug-in relays with logic functions and intuitive LOGIC+ software. Easily implement small automation tasks with PLC Logic.

**i** Web code: #0687

## Relay identification and selection

### Electromechanical relays

- ✓ Moving arm switches contact states
- ✓ SPDT, DPDT, and NO versions available
- ✓ Many variants can be used with either AC or DC
- ✓ Cost effective, with flexible output voltages
- ✓ Disadvantages include switching frequency and mechanical wear-and-tear



**i** Web code: #0688

#### Product description key

PLC	-	RSC	-	24 DC	/	21-21	/	AU
<b>Family name:</b> PLC RIF		<b>Product type:</b> B = base only R = EM relay		<b>Input voltage</b>		<b># of contacts:</b> 21 = SPDT 21-21 = DPDT 2x21 = DPDT 3x21 = SPDT 4x21 = 4PDT		<b>Specialty indicator:</b> AU = gold contacts ACT = actuator SEN = sensor SO46 = leakage filter RW = railway CID2 = hazardous loc HC = high current

### Solid-state relays (also known as opto-couplers)

- ✓ Transistor is switched on/off with light signal from LED on input
- ✓ Most often a normally-open contact
- ✓ Must specify voltage of both input and output
- ✓ Wear-free and very fast switching capability
- ✓ Disadvantages include higher expense and lower power density



**i** Web code: #0899

#### Product description key

PLC	-	OSC	-	24 DC	/	48 DC	/	100
<b>Family name:</b> PLC RIF		<b>Product type:</b> B = base only O = opto/SSR relay		<b>Input voltage</b>		<b>Maximum output voltage</b>		<b>Maximum output current/AMPS-mA</b>

### What type of load are you switching?

The nominal contact rating of a relay is a quick and dirty way to tell the rough current capacity of a relay. Unfortunately, there is much more to the story of what size load a relay can actually switch. By far, the most important criteria when selecting a relay is knowing whether you have a resistive, capacitive, or inductive load.

The nominal contact rating is almost always representative of what a relay can switch for AC resistive loads. In many modern industrial applications, this type of load is increasingly rare. When you review the datasheet for a Phoenix Contact

relay, we list a more specific set of resistive load ratings under the “interrupting rating.” The capacitive load rating will be listed as “maximum inrush current.” Lastly, our inductive load ratings are found under “switching capacity.”

We want you to be fully informed to properly select a relay for your application. These ratings represent the conservative data retrieved from exhaustive, real-world testing performed on fully assembled relays – not cherry-picked data from individual components tested in isolation.

■	What application or load are you switching: Electromechanical or solid state?
■	What is the input-coil voltage: DC or AC?
■	What is your output current (Amps)? (Ratings are for resistive loads)
■	How many sets of contacts do you need: SPDT, DPDT, etc.?
■	What connection technology: Screw terminal (UT) or push-in (PT)?
■	Which kind of specialty relays: Hazardous location, sensor/actuator, filter base?
■	Resulting Phoenix Contact part number

Electromechanical relays					
Input-coil voltage	Output current	Sets of contacts	Termination style	Description	Order #
12 V DC	6 A	SPDT - 6.2 mm	Screw	PLC-RSC-12 DC/21	2966906
			Push-in	PLC-RPT-12 DC/21	2900316
		DPDT - 14 mm	Screw	PLC-RSC-12 DC/21-21	2967235
			Push-in	PLC-RPT-12 DC/21-21	2900329
24 V DC	50 mA	SPDT - 6.2 mm	Screw	PLC-RSC-24 DC/21AU	2966265
			Push-in	PLC-RPT-24 DC/21AU	2900306
		6 A	SPDT - 6.2 mm	Screw	PLC-RSC-24 DC/21
	Push-in			PLC-RPT-24 DC/21	2900299
	DPDT - 14 mm		Screw	PLC-RSC-24 DC/21-21	2967060
		Push-in	PLC-RPT-24 DC/21-21	2900330	
10 A		SPDT - 14 mm	Screw	PLC-RSC-24 DC/21HC	2967620
	Push-in		PLC-RPT-24 DC/21HC	2900291	
24 V AC or DC	6 A	SPDT - 6.2 mm	Screw	PLC-RSC-24 UC/21	2966184
			Push-in	PLC-RPT-24 UC/21	2900300
		DPDT - 14 mm	Screw	PLC-RSC-24 UC/21-21	2967073
			Push-in	PLC-RPT-24 UC/21-21	2900332
120 V AC or DC	6 A	SPDT - 6.2 mm	Screw	PLC-RSC-120 UC/21	2966197
			Push-in	PLC-RPT-120 UC/21	2900304
		DPDT - 14 mm	Screw	PLC-RSC-120 UC/21-21	2967086
			Push-in	PLC-RPT-120 UC/21-21	2900335

Solid-state relays					
Input-coil voltage	Output current	Sets of contacts	Termination style	Description	Order #
5 V DC	3 A	NO ONLY - 6.2 mm	Screw	PLC-OSC-5 DC/24 DC/2/ACT	2980144
			Push-in	PLC-OPT-5 DC/24 DC/2/ACT	2900375
24 V DC	100 mA	NO ONLY - 6.2 mm	Screw	PLC-OSC-24 DC/48 DC/100	2966728
			Push-in	PLC-OPT-24 DC/48 DC/100	2900352
	3 A	NO ONLY - 6.2 mm	Screw	PLC-OSC-24 DC/24 DC/2	2966634
			Push-in	PLC-OPT-24 DC/24 DC/2	2900364
120 V AC or DC	3 A	NO ONLY - 6.2 mm	Screw	PLC-OSC-120 UC/24 DC/2	2966650
			Push-in	PLC-OPT-120 UC/24 DC/2	2900355

Note: AC outputs also available

Triple-rated, hazardous location relays: <a href="http://www.phoenixcontact.com/HAZLOCRELAYS">www.phoenixcontact.com/HAZLOCRELAYS</a>					
Input-coil voltage	Output current	Sets of contacts	Termination style	Description	Order #
12 V DC	6 A	SPDT - 6.2 mm	Screw	PLC-RSC-12 DC/21/EX	2909522
			Push-in	PLC-RPT-12 DC/21/EX	2909517
24 V DC	10 A	SPDT - 14 mm	Screw	PLC-RSC-12 DC/21/HC/EX	2909518
			Push-in	PLC-RPT-12 DC/21/HC/EX	2909524
		6 A	SPDT - 6.2 mm	Screw	PLC-RSC-24 DC/21/EX
	Push-in			PLC-RPT-24 DC/21/EX	2909509
	DPDT - 14 mm		Screw	PLC-RSC-24 DC/21-21/EX	2909514
		Push-in	PLC-RPT-24 DC/21-21/EX	2909519	
10 A		SPDT - 14 mm	Screw	PLC-RSC-24 DC/21/HC/EX	2909532
	Push-in		PLC-RPT-24 DC/21/HC/EX	2909525	
120 V AC or DC	6 A	SPDT - 6.2 mm	Screw	PLC-RSC-120 UC/21/EX	2909511
			Push-in	PLC-RPT-120 UC/21-21/EX	2909520
10 A	SPDT - 14 mm	Screw	PLC-RSC-120 UC/21/HC/EX	2909520	

Note: Additional coil voltages and connection technology options are available

Replacement parts					
Mechanical relays					
Input-coil voltage	Output current	Sets of contacts	Description	Order #	
12 V DC	6 A	SPDT - 6.2 mm	REL-MR-12 DC/21	2961150	
			REL-MR-24 DC/21	2961105	
24 V DC	6 A	SPDT - 6.2 mm	REL-MR-24 DC/21-21	2961192	
			REL-MR-24 DC/21HC	2961312	
		10 A	SPDT - 14 mm	REL-MR-60 DC/21	2961118
120 V AC	6 A	SPDT - 6.2 mm	REL-MR-110 DC/21-21	2961202	
120 V AC	6 A	DPDT - 14 mm			
Solid-state relays					
5 V DC	3 A	SPST - 6.2 mm	OPT-5 DC/24 DC/2	2967989	
24 V DC	3 A	SPST - 6.2 mm	OPT-24 DC/24 DC/2	2966595	
120 V AC	3 A	SPST - 6.2 mm	OPT-60 DC/24 DC/2	2966605	



## Technical Support

Need help selecting a relay or troubleshooting an issue? Our team of technical engineers is available to help!

Phone: (800) 322-3225

Email: [US-TechnicalService@PhoenixContact.com](mailto:US-TechnicalService@PhoenixContact.com)

Hours: Monday - Thursday 8 a.m. to 8 p.m. EST, Friday 9:30 a.m. to 5 p.m. EST

24/7 after-hours emergency service — leave a message in the emergency voice mailbox and your call will be returned within 15 minutes by an on-call engineer



## Customer Support

Our help doesn't stop after receipt of order. If you need help expediting an order or confirming information, our customer service team is here for you.

Phone: (800) 808-7177

Fax: (717) 702-4225

Email: [US-CustomerService@phoenixcontact.com](mailto:US-CustomerService@phoenixcontact.com)

Hours: Monday - Thursday 8 a.m. to 5 p.m. EST, Friday 9:30 a.m. to 5 p.m. EST



## Logistics Center

Our U.S. headquarters is home to the Logistics Center for the Americas. By bringing logistics closer to our customers, we provide shorter lead times, easier on-site reviews, faster response, and increased flexibility for our U.S. customers. The result of all this is a customer-focused operation from start to finish.

Phoenix Contact USA

586 Fulling Mill Road

Middletown, PA 17057



# LIMITED LIFETIME WARRANTY

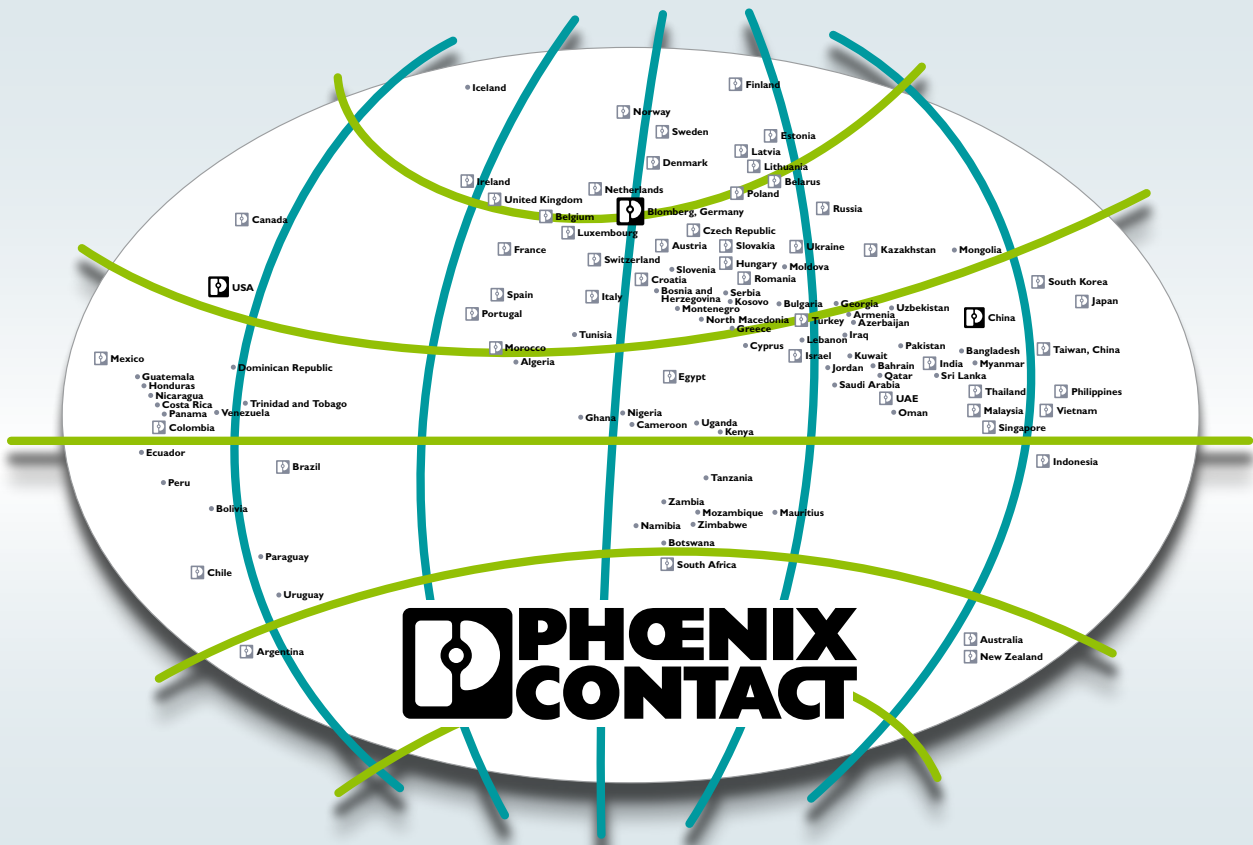
## BUILD WITH CONFIDENCE



## Build with confidence

Our Limited Lifetime Warranty is our promise to you that the products you install in your control cabinets are built to last. In industry and infrastructure, we stand with you. Simply register and relax. Isn't it time you trusted Phoenix Contact to build your cabinet confidence?

Register today at: [www.phoenixcontact.com/LLW](http://www.phoenixcontact.com/LLW)



## Ongoing communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for our 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 stay in close contact with our customers, something we believe is essential for success.

Our wide variety of innovative products makes it easy for our customers to find future-oriented solutions for multiple applications and industries. We focus predominantly on the fields of energy, infrastructure, process, and factory automation.

You can find your local partner at

[www.phoenixcontact.com](http://www.phoenixcontact.com)