



Power Reliability



## New benchmark in surge protection

Powerful, safe, and compact

# New benchmark in surge protection

## Easy and safe installation and operation

High demands are placed on the availability of electrical systems. With Safe Protection Plus (SPP), Phoenix Contact is setting new standards in lightning and surge protection. The SPP family of products include pluggable solutions with top performance in a compact design, and guarantee the optimum protection of systems in various application areas, thus sustainably increasing their availability.



### Easy and safe installation

with forward-thinking handling and safety features

### Can be used in a wide range of applications

due to the optimized design and broad portfolio

## Reliable system protection

with maximum performance and endurance



## Easy planning

due to comprehensive digital data and selectors

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### Power Reliability

Discover solutions for high system availability: Just enter the web code into the search field on our website or scan the QR code.



 Web code:  
#3081

## Your advantages

### Easy and safe installation

The Safe Protection Plus family is characterized by simplicity and safety. Miswiring and touch protection, a reduced tightening torque, and pluggability

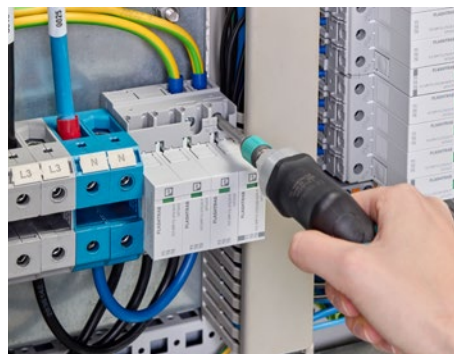
throughout make installation, testing, and maintenance much easier. The modular, double-insulated remote signaling ensures safe and convenient handling of the

protective devices. Safe Protection Plus thus sets new standards in terms of safety and ease of installation.



### Miswiring and touch protection

All AC versions are equipped with miswiring and touch protection. This prevents connecting cables from being pugged in incorrectly and ensures maximum safety during maintenance work.



### Tightening torque 3 Nm

With the reduced tightening torque, installation is reliable and safe even without a great deal of force.



### Pluggable protection modules

The pluggability of the protection modules enables individual protective plugs to be replaced safely and cost-effectively. At the same time, it makes it easier to carry out insulation measurements.

## Reliable system protection

The type 1 protective devices ensure top performance thanks to the wear-free, triggered multi-carbon spark gap. The reinforced insulation of the remote signaling

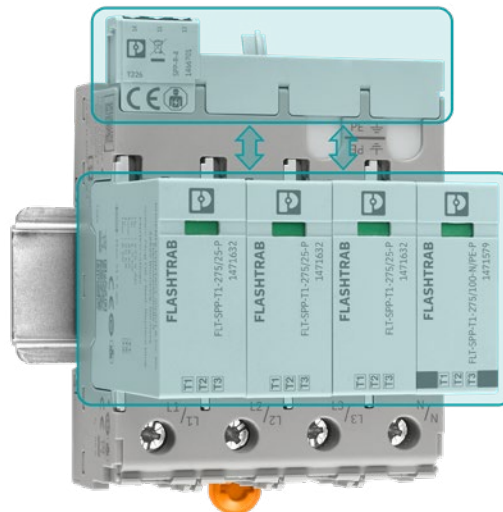
of all SPP products provides additional application and system safety. The direct response behavior of the type 1 and type 2 protective devices protects the backup fuse

and installation. Rapid disconnection in the event of an error guarantees a high level of operational safety.



### Double insulation – double protection

The surge protective devices of the SPP family have double insulation between the main and auxiliary circuits. They therefore meet the special requirements of SELV (Safety Extra Low Voltage) and PELV (Protective Extra Low Voltage). This provides additional protection for devices and people and, at the same time, increases the reliability of the entire system.



## Your advantages

### Versatile in use – in buildings, photovoltaic systems

The SPP family reliably protects industrial systems and buildings against lightning currents and surge voltages. FLASHTRAB SPP as a type 1+2+3 SPD guarantees top performance in the

feed-in. The VALVETRAB SPP type 2 surge protective devices provide protection in the subdistribution board and include versions for protecting grids with strong voltage fluctuations. The robust and compact

design allows SPP products to be used in demanding environments and at altitudes of up to 5,000 m. They also enable a space-saving installation with up to 315 A without backup fuse.



#### Photovoltaics

The PV versions of the Safe Protection Plus family provide reliable protection for solar parks and PV installations on buildings. Both type 1 lightning current arresters and type 2 surge protective devices feature the established 2+V circuit design. This enables reliable installation and reduces planning and maintenance costs. Both types of protective devices are available for systems with a  $U_c$  of up to 1,800 V DC.



## ... and in exposed telecommunications and wind turbine generator systems

In exposed locations, structures such as telecommunications systems and wind turbine generators are struck by lightning much more often. This results in a considerable energy load over the entire

operating period. The FLASHTRAB SPP combined lightning current and surge arresters provide optimum protection for these particularly stressed systems. The requirements of the IEC 61643-11 product

standard are significantly exceeded, providing additional safety reserves for applications with a high risk of lightning.



### Wind power

The robust design with protection class IP20C, pollution degree 3, and a temperature range of -40 to +85°C enables use in harsh environments, like those in wind turbines. The type 2 surge protection devices are available for continuous voltages with  $U_c = 880$  V. They provide reliable protection for rotor and stator circuits.



# Top performance in surge protection

## Type 1+2+3 combined lightning current and surge arrester – FLASHTRAB SPP

Ever-increasing demands on system protection in modern industry require innovative and powerful products. The new type 1 surge protection in the Safe Protection Plus product family combines a high discharge capacity of up to 100 kA and forward-thinking safety features with practical pluggability and a particularly compact overall width of just 17.5 mm per position.

### Consistent pluggable design

The protection modules can be plugged in separately for each path. The new two-stage latching or plug-in mechanism of the N/PE plugs ensures that they are held securely in the base element even under high pulse loads.

### Modular remote signaling

The modular remote signaling system makes maintenance easier. The double insulation also ensures a high level of safety between the main and auxiliary circuits.

### New technology

The triggered multi-carbon spark gap technology offers significant advantages over conventional spark gaps due to its multi-pulse capability and low residual voltage curve, for example.

### Reduced tightening torque

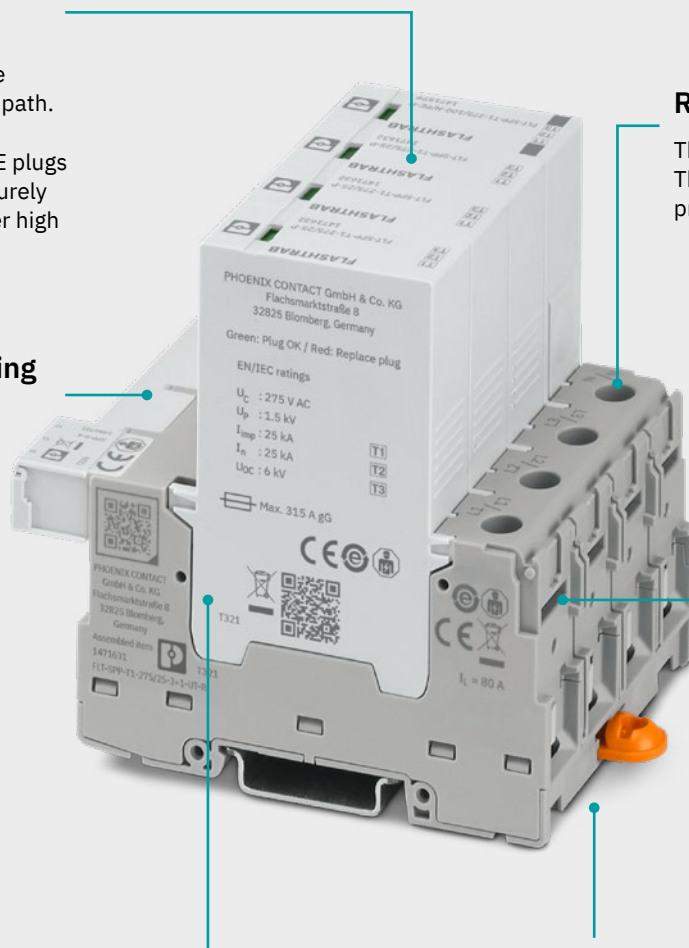
The tightening torque has been reduced. This makes it easier to install the protective devices correctly.

### Biconnect connection system

The Biconnect function enables you to easily bridge the lightning current arresters to other components, such as miniature circuit breakers and circuit breakers.

### Miswiring and touch protection

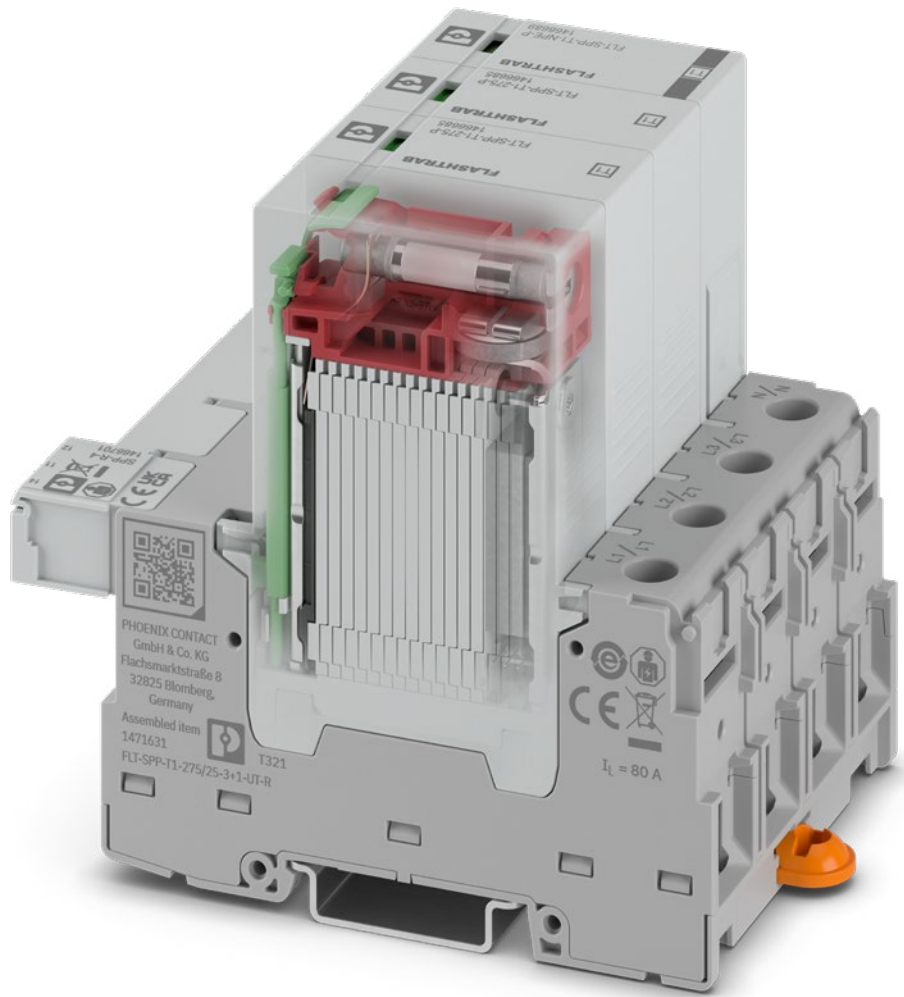
The products are equipped with miswiring and touch protection. This reliably prevents mismatching. Touch protection ensures greater safety during operation. Current-carrying parts can no longer be touched once the cables have been connected.



# The triggered multi-carbon spark gap technology

The triggered multi-carbon spark gap technology from Phoenix Contact marks a significant step forward in lightning and surge protection. It combines proven spark gap principles with state-of-the-art trigger and carbon technology. This enables a fast, defined ignition with low residual voltages. At the same time, it creates a grid-following current-free behavior in which the SPD immediately becomes high-impedance again after the lightning current has been discharged and no current flows from the grid. The low voltage protection level and reduced residual voltage protect the insulation of sensitive components and extend their service life.

The technology is extremely versatile due to its robust materials, high multi-pulse capability, and compact design. The result: robust, durable, and powerful type 1 SPDs for demanding applications ranging from residential buildings to exposed industrial systems.

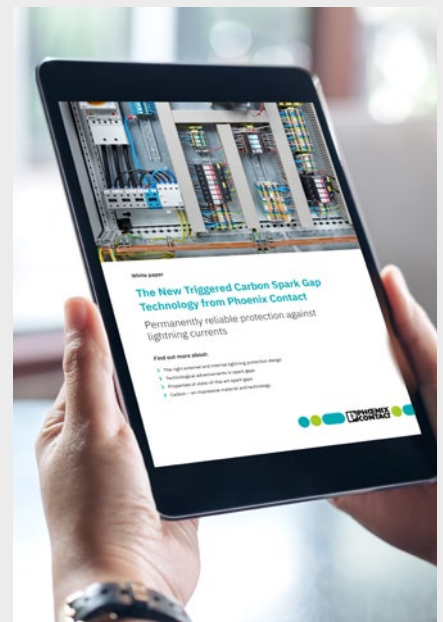


## White paper

Would you like to find out more about triggered multi-carbon spark gap technology?

Download our white paper on the subject here:

[➤ phoenixcontact.com/whitepaper-carbon](https://phoenixcontact.com/whitepaper-carbon)



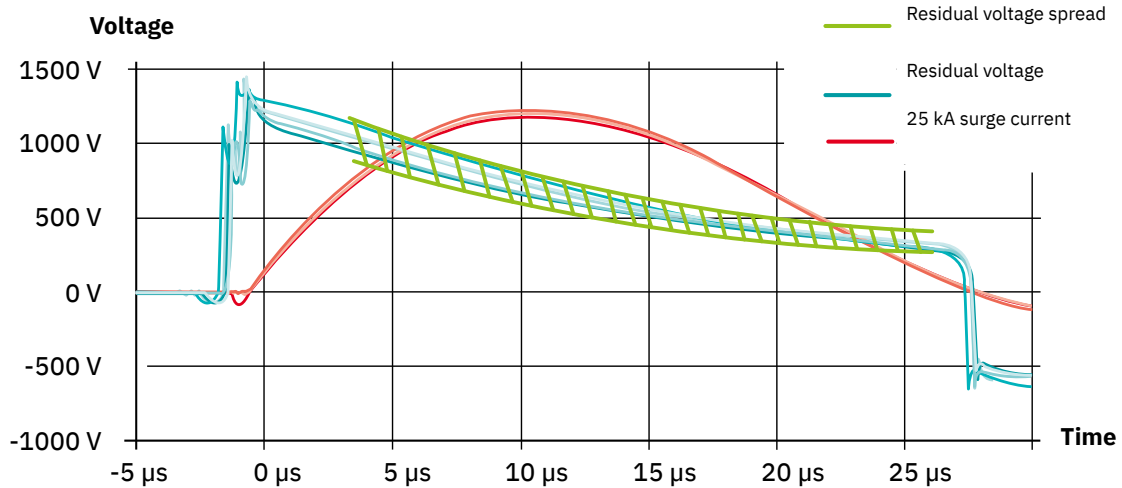
# Properties of the triggered multi-carbon spark gap technology

## Wear-free technology

The triggered multi-carbon spark gap uses particularly robust materials. The energy to be dissipated is distributed ideally across the entire installation space, which reduces heat generation in the SPD and

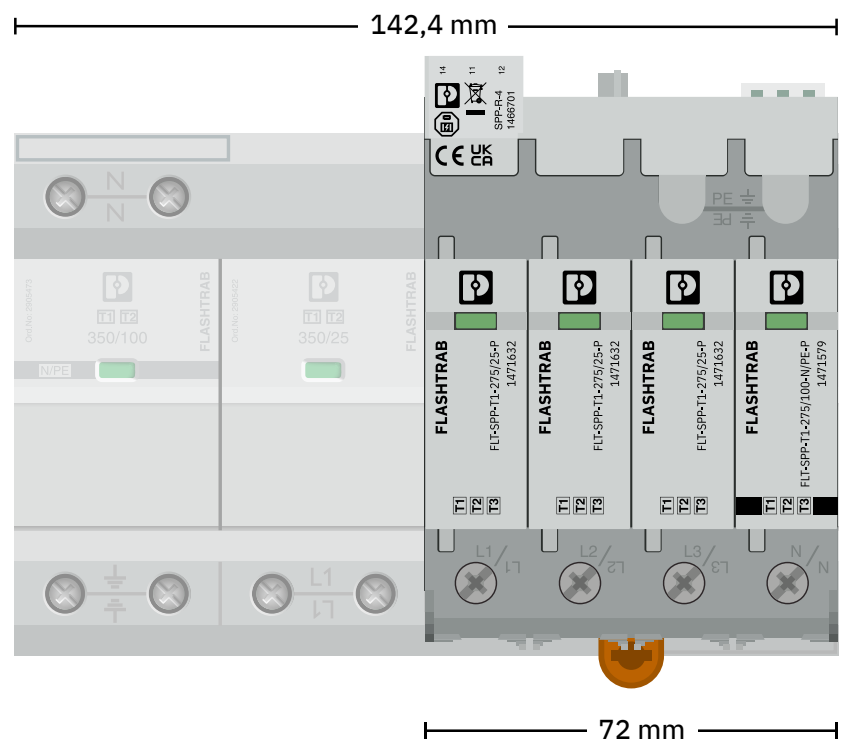
prevents wear. The technology therefore shows no signs of aging even after multiple loads. The figure shows that the residual stress curve remains unchanged even after intensive loading and that the

SPD therefore shows no signs of aging.



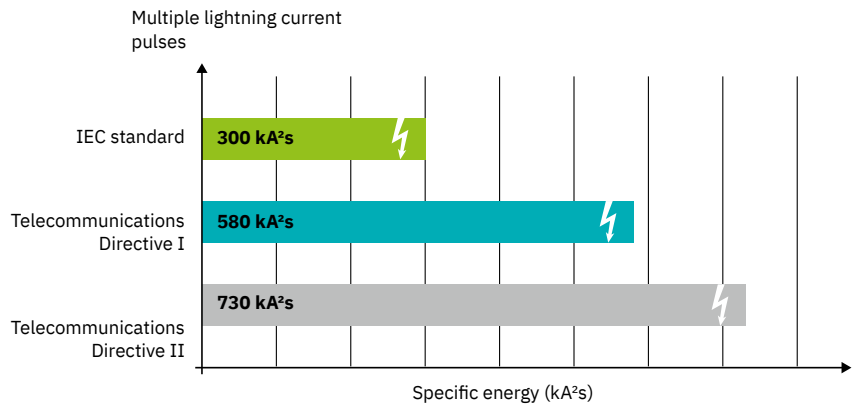
## Space saving and compact

The FLT-SPP-T1... sets new standards in internal lightning protection. With the triggered multi-carbon spark gap, the pluggable lightning current arrester offers maximum performance in a minimum of space. The protective devices only require 17.5 mm of installation space per position. This makes it significantly more compact than the FLT-SEC-P-T1... with comparable performance data. The result: more space in the control cabinet and maximum flexibility for state-of-the-art protection concepts.



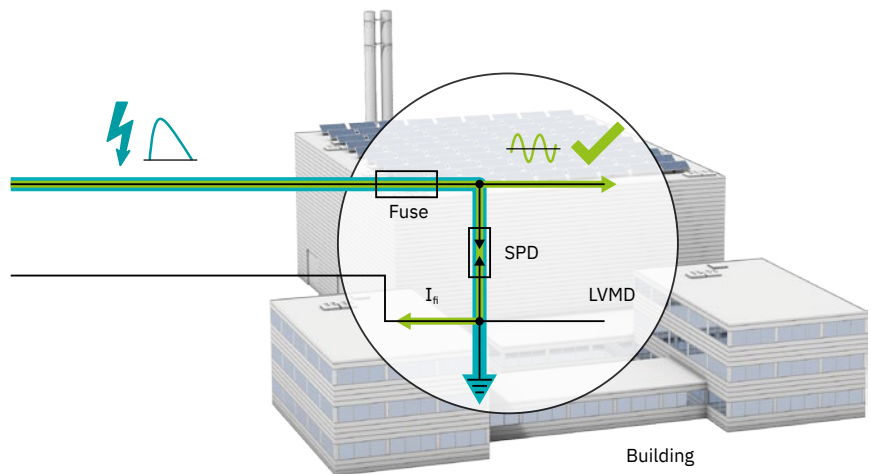
## Discharge capacity for lightning currents

Structures in exposed locations, such as telecommunications or wind turbine generators, are struck by lightning significantly more often than other buildings. Over the operating period, this leads to a significantly higher energy load. The lightning current arresters with triggered multi-carbon spark gap technology can dissipate more than twice as much energy as required by the IEC 61643-11 product standard. This means that they also fulfill the directions for applications with higher requirements.



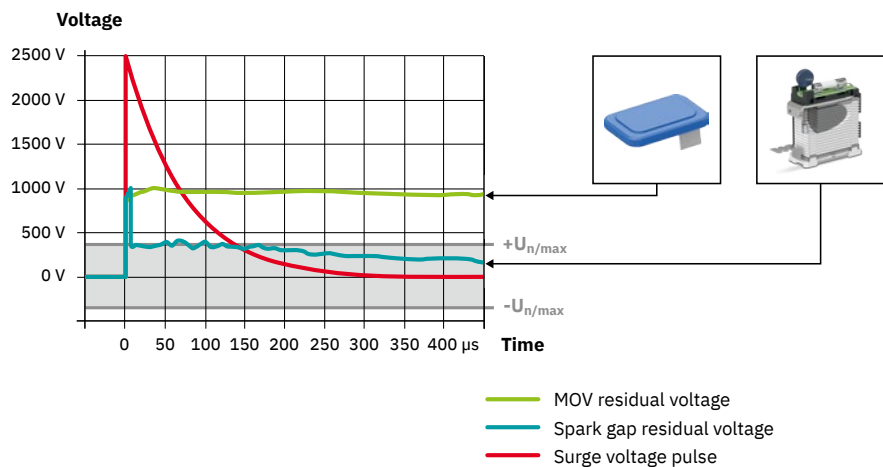
## Impact-free for high system availability

When discharging an overvoltage event, short-circuit currents, known as line follow currents, can occur in conventional spark gaps. The triggered multi-carbon spark gap suppresses these short-circuit currents very quickly and efficiently, so that even small fuses do not blow and your system always remains available.



## Excellent protection against surge voltages

The triggered multi-carbon spark gap has a very fast ignition behavior and a low, stable residual voltage curve. This significantly reduces the electrical and thermal load on downstream equipment. Compared to MOV surge protective devices, the energy input is significantly reduced.



# Forward-thinking features

## VALVETRAB SPP for AC and PV applications

With new features, the VALVETRAB Safe Protection Plus product family is the forward-thinking surge protection for the standards of the future. With our portfolio of different product versions, you will always find the right selection to meet the requirements of your system.

### Modular remote signaling

Many product versions in the Safe Protection Plus product family feature modular remote signaling that can be quickly and easily retrofitted and plugged into the corresponding base element.

### AC versions

#### New disconnection

The high-performance disconnection triggers even more rapidly and reliably in the event of an overload or fault.

#### Pluggable surge protection

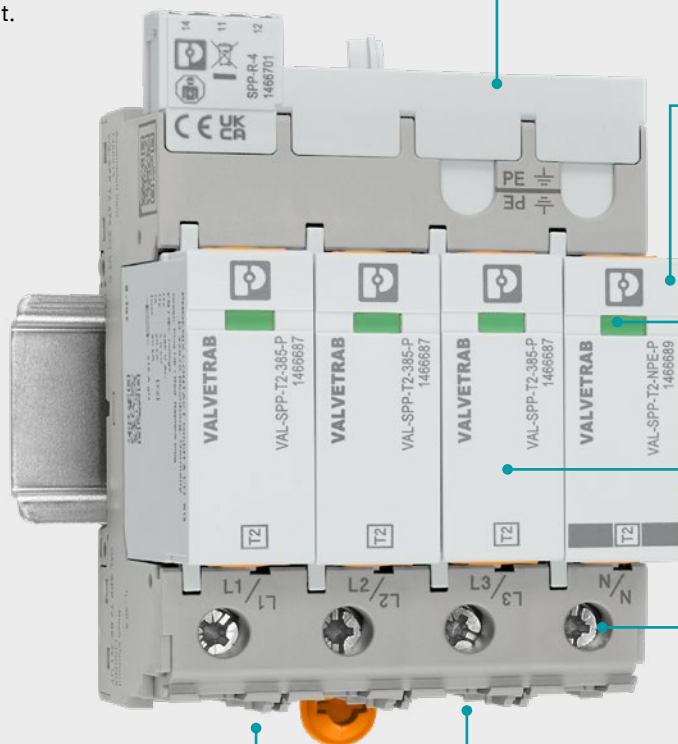
The protection modules can be plugged in separately for each path. Overloaded plugs can thus be replaced quickly and inexpensively.

### Biconnect connection system

The products for AC applications are equipped with the Biconnect connection systems. This means that you can effortlessly bridge the surge protection to other components, such as miniature circuit breakers.

### Miswiring and touch protection

The products are equipped with miswiring and touch protection. This reliably prevents mismatching. Touch protection ensures greater safety during operation. Current-carrying parts can no longer be touched once the cables have been connected.



## Type 1 and type 2

The protective devices are designed in a 2+V circuit. They are available both as type 1 lightning current arresters for 1,000 V DC or as type 2 surge protection for 600 V DC, 1,000 V DC, or 1,500 V DC.

## Remote signaling

Depending on the requirements, surge protective devices for photovoltaic applications are available with or without floating remote indication contact.

## PV versions

### Mechanical status indicator

Each plug has a mechanical status indicator. This enables the identification of overloaded protective plugs directly on site.

### Reduced tightening torque

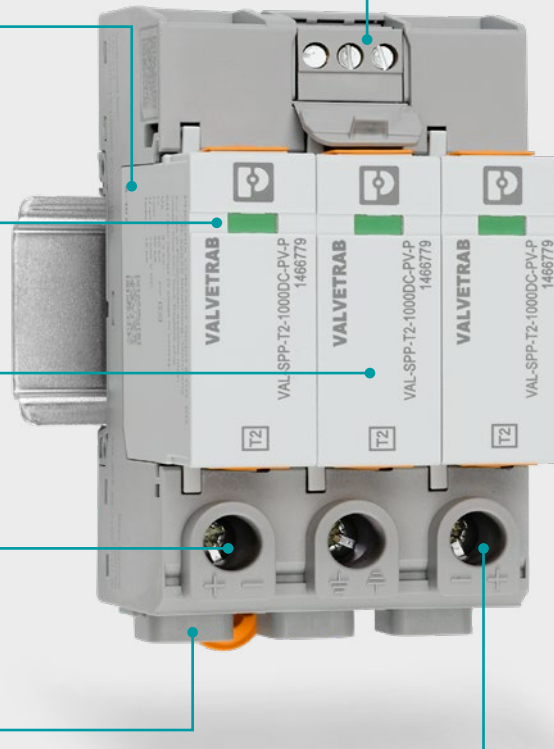
The tightening torque has been reduced. This makes it easier to install the protective devices correctly.

### Extended insertion funnels


The insertion funnels have been extended to achieve better air clearances and creepage distances and increase operational safety. This enables use at altitudes of up to 5,000 m.

### Extended screw shafts

The extended screw shafts optimize the air clearances and creepage distances and therefore offer greater safety even in the case of higher DC voltages.




# Product overview


FLASHTRAB Safe Protection Plus								
AC, 1-position to 4-position								
	Type	Supply system configuration	Nominal voltage $U_N$	Maximum continuous operating voltage $U_c$	Item designation	Remote signaling	Item no.	
	I+II+III/ T1+T2+T3	TN-S/TT TN-C	TN-S/TT TN-C	240 V AC	275 V AC	FLT-SPP-T1-275/25-1+0-UT-R <sup>1)</sup>	✓	<a href="#">1471595</a>
			TN-C			FLT-SPP-T1-275/25-3+0-UT-R	✓	<a href="#">1471629</a>
		TN-S/TT	FLT-SPP-T1-275/25-1+1-UT-R			✓	<a href="#">1471604</a>	
			FLT-SPP-T1-275/25-2+1-UT-R			✓	<a href="#">1471625</a>	
			FLT-SPP-T1-275/25-3+1-UT-R			✓	<a href="#">1471631</a>	
			FLT-SPP-T1-275/100-NPE-UT-R <sup>2)</sup>			✓	<a href="#">1811822</a>	

<sup>1)</sup> Only permitted between L and N in TT systems.


<sup>2)</sup> Only permitted between N and PE.


VALVETRAB Safe Protection Plus							
AC, 2-position							
	Type	Supply system configuration	Nominal voltage $U_N$	Maximum continuous operating voltage $U_c$	Item designation	Remote signaling	Item no.
	II/T2	TN-S/TT	240 V AC	275 V AC	VAL-SPP-T2-275-1+1-UT-R	✓	<a href="#">1466212</a>
					VAL-SPP-T2-275-1+1-UT	-	<a href="#">1466211</a>
				335 V AC	VAL-SPP-T2-335-1+1-UT-R	✓	<a href="#">1466597</a>
					VAL-SPP-T2-335-1+1-UT	-	<a href="#">1466589</a>
				385 V AC	VAL-SPP-T2-385-1+1-UT-R	✓	<a href="#">1466608</a>
VAL-SPP-T2-385-1+1-UT					-	<a href="#">1466607</a>	




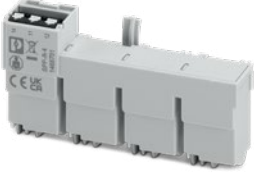
  

AC, 3-position							
	Type	Supply system configuration	Nominal voltage $U_N$	Maximum continuous operating voltage $U_c$	Item designation	Remote signaling	Item no.
	II/T2	TN-C	240/415 V AC	335 V AC	VAL-SPP-T2-335-3+0-UT-R	✓	<a href="#">1466599</a>
					VAL-SPP-T2-335-3+0-UT	-	<a href="#">1466598</a>
				440 V AC	VAL-SPP-T2-440-3+0-UT-R	✓	<a href="#">1466615</a>
					VAL-SPP-T2-750-3+0-UT-R	✓	<a href="#">1466614</a>
		IT	240/415 V AC 240 V AC	440 V AC	VAL-SPP-T2-440-3+0-VF-UT-R	✓	<a href="#">1466646</a>
					VAL-SPP-T2-440IT-3+0-UT-R	✓	<a href="#">1466619</a>
IT	400 V AC	880 V AC	VAL-SPP-T2-800WE-3+0-VF-UT-R	✓	<a href="#">1466642</a>		

# Product overview

VALVETRAB Safe Protection Plus							
AC, 4-position							
	Type	Supply system configuration	Nominal voltage $U_N$	Maximum continuous operating voltage $U_c$	Item designation	Remote signaling	Item no.
	II/T2	TN-S/TT	240/415 V AC	275 V AC	VAL-SPP-T2-275-3+1-UT-R	✓	1466214
					VAL-SPP-T2-275-3+1-UT	–	1466213
					VAL-SPP-T2-275/40-3+1-UT-R	✓	1466216
					VAL-SPP-T2-275/40-3+1-UT	–	1466215
				335 V AC	VAL-SPP-T2-335-3+1-UT-R	✓	1466604
					VAL-SPP-T2-335-3+1-UT	–	1466602
				385 V AC	VAL-SPP-T2-385-3+1-UT-R	✓	1466611
					VAL-SPP-T2-385-3+1-UT	–	1466609
	400/690 V AC	440 V AC	VAL-SPP-T2-440-3+1-UT-R	✓	1466617		

VALVETRAB Safe Protection Plus					
DC PV, 3-position					
	Type	Maximum Continuous voltage $U_{CPV}$	Item designation	Remote signaling	Item no.
	PV I+II/ PV T1+T2	1800 V DC	VAL-SPP-T1-1500DC-PV-2+V-UT-R	✓	1784481
			VAL-SPP-T1-1500DC-PV-2+V-UT	–	1784479
	PV I+II/ PV T1+T2	1200 V DC	VAL-SPP-T1-1000DC-PV-2+V-UT-R	✓	1466777
			VAL-SPP-T1-1000DC-PV-2+V-UT	–	1466776
	PV II/PV T2	800 V DC	VAL-SPP-T2-600DC-PV-2+V-UT-R	✓	1466771
			VAL-SPP-T2-600DC-PV-2+V-UT	–	1466770
		1200 V DC	VAL-SPP-T2-1000DC-PV-2+V-UT-R	✓	1466773
			VAL-SPP-T2-1000DC-PV-2+V-UT	–	1466772
		1800 V DC	VAL-SPP-T2-1500DC-PV-2+V-UT-R	✓	1466775
			VAL-SPP-T2-1500DC-PV-2+V-UT	–	1466774

Remote signaling module				
Replacement item or optional for AC product versions of the SPP product family				
				
Item designation	SPP-R-1	SPP-R-2	SPP-R-3	SPP-R-4
Item no.	1466698	1466699	1466700	1466701

## Open communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for producing forward-thinking products and solutions for the comprehensive electrification, networking, and automation of all sectors of the economy and infrastructure. With a global network, we maintain close relationships with our customers, something we believe is essential for our common success.

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

