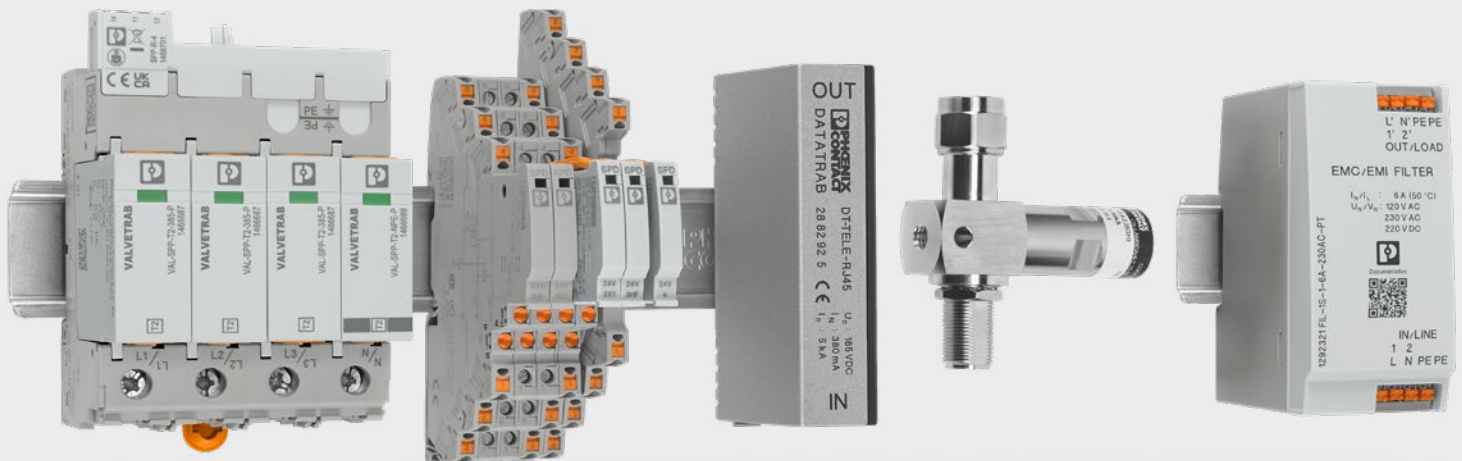




Power Reliability

2026



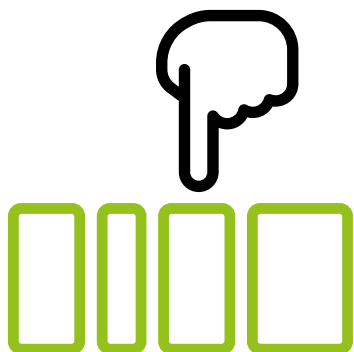
Surge protection and EMC filters

Protection for superior system availability

How does this product brochure work?

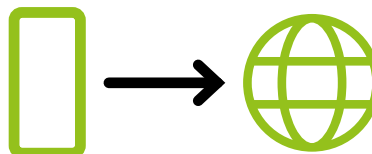
The product brochures provide an initial overview of the Phoenix Contact range. They provide support in the preselection of products and make it possible to switch directly to the online shop to obtain more detailed technical information.

You can also compare your product selection in a comparison table on our website. Use the product brochures and our website to find the ideal solution for your requirements.



Selection of the product group

The brochures are divided into different product categories. Each brochure is structured according to the product groups of the respective category. First, the individual groups are compared, and then presented in separate sections.



Product selection and website

Clear information and the most important technical data can be found at a glance within the individual sections. Once you have made a preselection of products, switch directly to the items in our online shop via the item numbers or links.

Note

In some cases, older product series and color versions can only be found on the Internet. The accessories are also located on the individual product pages on the Internet.



From the product brochure ...

Overview of product brochures

All product brochures can be found on our website. Simply enter the web code in the search bar or scan the QR code.



Web code: #3369



Detailed product assessment

A detailed overview of all technical data for your preselected products is available in the online shop. In addition, our website provides more detailed information, suitable accessories, and a product comparison function.



Order

After selecting the appropriate products, you can add them to your shopping cart and order them. Alternatively, the “Purchase from Distributors” button leads to a list of our distribution partners.

... to our online shop: phoenixcontact.com

Protection for superior system availability

Powerful and reliable

Our products for the operational safety of electrical systems, installations, and devices enable you to effortlessly create an uninterruptible and clean power supply, as well as a stable data connection. With our coordinated product portfolio for surge protection, a protection concept can be created for practically any application.



1

Surge protection for power supplies

From feed-in through to the end device: Increase the availability of your system with our surge protection.

➤ More information starting on page 8



2

Surge protection for MCR technology

Powerful protective devices with low voltage protection levels provide optimum protection for your MCR applications.

➤ More information starting on page 48

EMC filters

EMC filters protect against high-frequency interference voltages and currents that can be caused by electrical equipment during normal operation and in case of faults. You can use our EMC filters to ensure uninterrupted and safe operation even in environments subject to interference.

➤ More information starting on page 90



Surge protection for information technology

Safeguard your data cables. Fast signals require one thing above all else – protection that responds very quickly.

➤ More information starting on page 76

Surge protection for transmitter and receiver systems

Antennas are often in exposed locations. Therefore, use high-performance surge protection with low attenuation for your system.

➤ More information starting on page 86

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Interference-free power supply and signal transmission

Surge voltages – An underestimated danger

Several million lightning strikes occur throughout the world every single day. Ten percent of these are ground bolts with surge currents up to 200,000 amps. In addition to the discharges caused by thunderstorms, surge voltages also occur within local power grids. These are caused, for example, by switching operations and electrostatic discharges. Whatever their cause, time and again surge voltages lead to device defects and system failures.



Fundamental protective measures and devices

Coordinated protective measures and protective devices are essential to ensure the comprehensive protection of buildings and systems against the effects of lightning strikes and overvoltages. This protection can be classified as follows:

External lightning protection:

The purpose of the external lightning protection system is to provide the lightning with a defined path to ground and thus effectively minimize the danger of a direct strike for the object.

Internal lightning protection:

The internal lightning protection system prevents the formation of harmful sparks within the system and thus reliably protects the infrastructure.

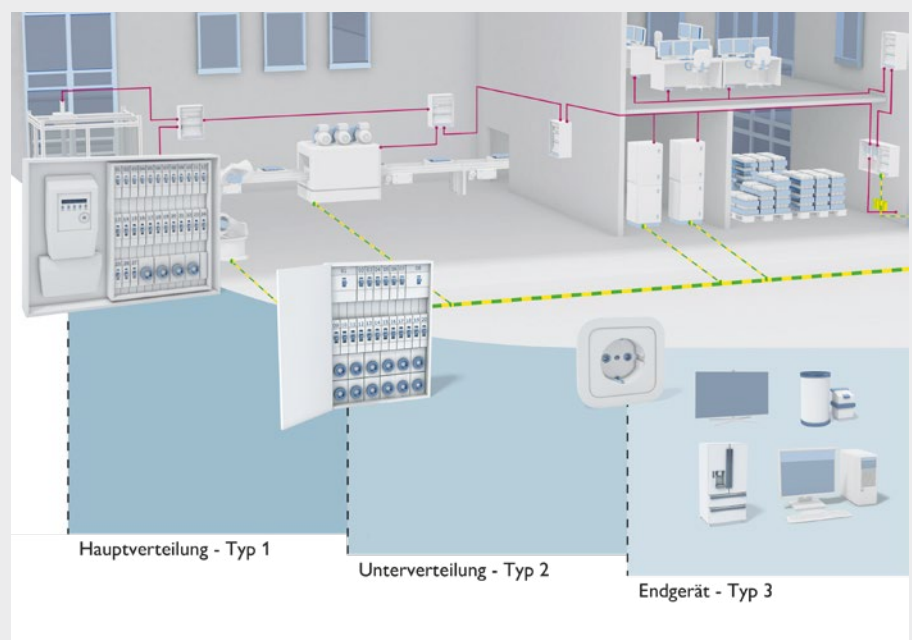
Grounding and equipotential bonding:

The grounding system ensures that the discharged lightning current is safely distributed in the ground and that effective equipotential bonding can be established.

Coordinated SPD system

A coordinated SPD system is a multi-level, coordinated system of surge protective devices.

- Type 1 protection level: Powerful lightning current arrester (type 1+2 combined lightning current and surge arrester or type 1+2 special combined lightning current and surge arrester)
- Type 2 protection level: Protection against surge voltages caused by indirect lightning strikes and switching operations (type 2 surge protective device)
- Type 3 protection level: Surge protection for sensitive end devices (type 3 device protection)



Three-level protection concept in a building

Interference-free power supply and signal transmission

All-round safety with the protective circuit

The protective circuit principle defines complete protection against surge voltages.

An imaginary circle is drawn around the devices, plants, or systems to be protected. At all points where cables, conductors, or lines intersect this circle,

surge protective devices that correspond to the rated data of the respective power supply or signal type must be installed. In order to consistently protect objects against conducted surge voltage couplings, the following areas should be considered:

Protection for data and signals

Protective devices for the requirements of measurement and control technology as well as for data and communication interfaces with application-specific connections ensure the availability of your application.



Protection for the power supply

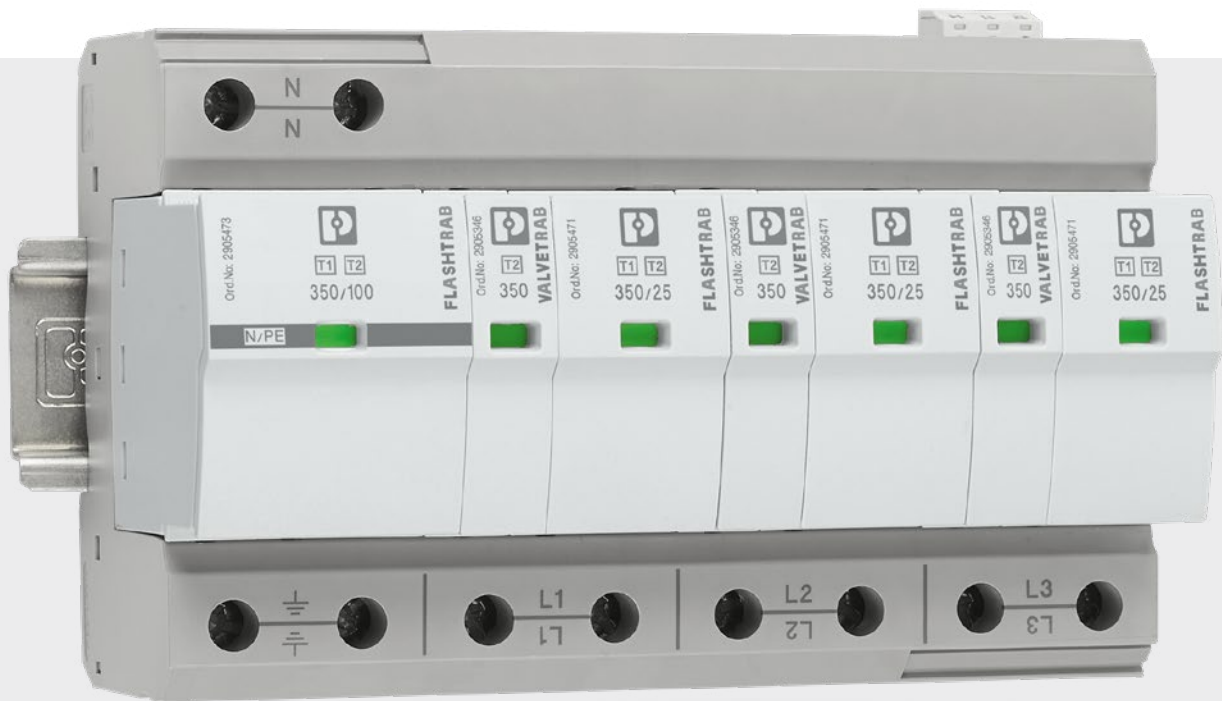
From feed-in to the end device, our SPDs provide reliable protection in AC, linear DC, and PV systems. You can use these to provide your systems with permanent protection against damaging voltage peaks.

Surge protection for power supplies

1

From feed-in to the end device

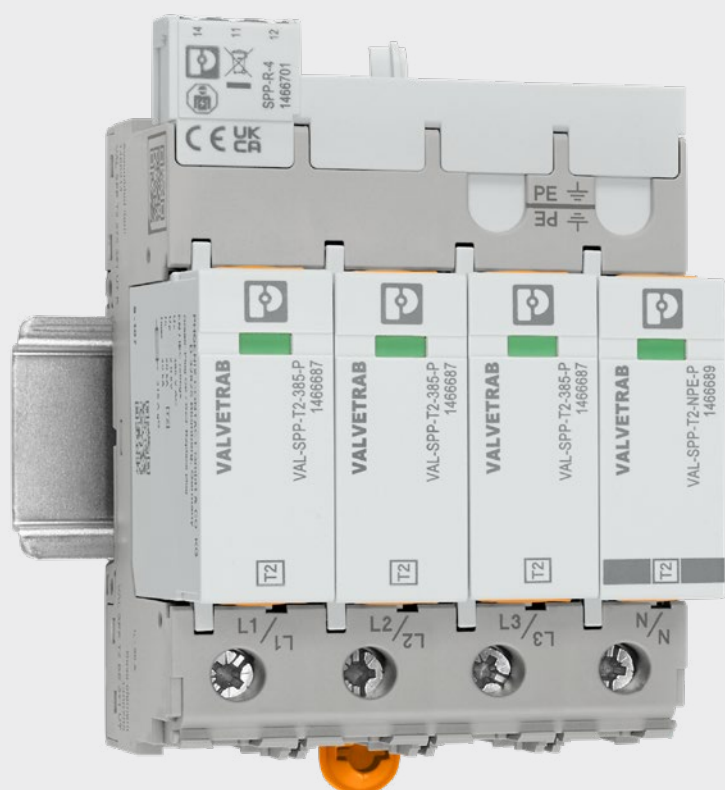
The power supply is the part of a system in which particularly high surge voltages occur. All system parts, from the incoming supply to the load, can be directly affected. A powerful surge protection system ensures an uninterrupted power supply, and thus also a higher level of system availability.



Universal protection

Products of the SEC family are the first choice for integrating surge protection into industrial systems and control cabinets.

➤ More information starting on page 10



Application-related protection

Each application has its own special conditions and requirements. Therefore, the surge protection should be tailored to these as best as possible. The right products for protecting individual requirements.

➤ More information starting on page 22



Protection directly at the end device

Sensitive end devices need special protection. Generally, this is installed directly upstream of the end devices to be protected. Various designs enable installation in a wide range of applications.

➤ More information starting on page 42

Protection for power supply systems

Universal protection for power grids

The surge protective devices in the Safe Energy Control product family form a comprehensive easy-to-install package, combining maximum performance with high durability. Electronic loads are reliably protected and maintenance costs are reduced. Installing the surge protective devices is easy, cost-effective, and space-saving.



Your advantages

- ✓ Can be used in all common power supply systems
- ✓ High system availability with spark gap technology without line follow current
- ✓ Consistent protection across all protection levels
- ✓ Space-saving and cost-effective installation

Type 1+2, type 2, and type 3 surge protective devices



Type 1+2 combined lightning current and surge arrester

Typical installation location: feed-in.
Meets the requirements of test classes T1 (lightning currents) and T2 (surge voltages).



Type 2 surge protective device

Typical installation location: subdistribution systems, machine control cabinets. Surge protective device in accordance with test class T2.



Type 3 device protection

Typical installation location: Directly at the end device. Surge protective device in accordance with test class T3.

Type 1+2 special combined lightning current and surge arrester

The type1+2 special combined lightning current and surge arrester differs fundamentally from the type 1+2 version. This is because the type 1+2 special combined lightning current and surge arrester contains two independent protective devices that are connected in parallel in a very small space. A combination of a type 1 spark gap without line follow current and a type 2 varistor arrester in one protective device.

The voltage-switching spark gap (SPD type 1+2) works ideally in combination with a voltage-limiting varistor (SPD type 2). In this combination, two autonomous protective devices in one compact block ensure optimum response behavior, optimal system protection, and a long service life for the components.

The type 1+2 special combined lightning current and surge arrester is perfectly suited for maximum protection of installations and devices.



Type 1+2 special combined lightning current and surge arrester – FLT-SEC-T1+T2-3S-350

Type 1+2 combined lightning current and surge arresters with integrated backup fuse

The FLT-SEC-HYBRID is a combination of a spark gap without line follow current and a surge-proof fuse, and can therefore be used without a separate backup fuse. This means that long cable routes from and to the backup fuse are no longer needed. This has further positive effects on the voltage protection level.

With a short-circuit current rating up to 100 kA, use in large power distribution systems is also possible.



Type 1+2 combined lightning current and surge arrester – FLT-SEC-H-T1-1C-264/25

Universal protection for power supply systems

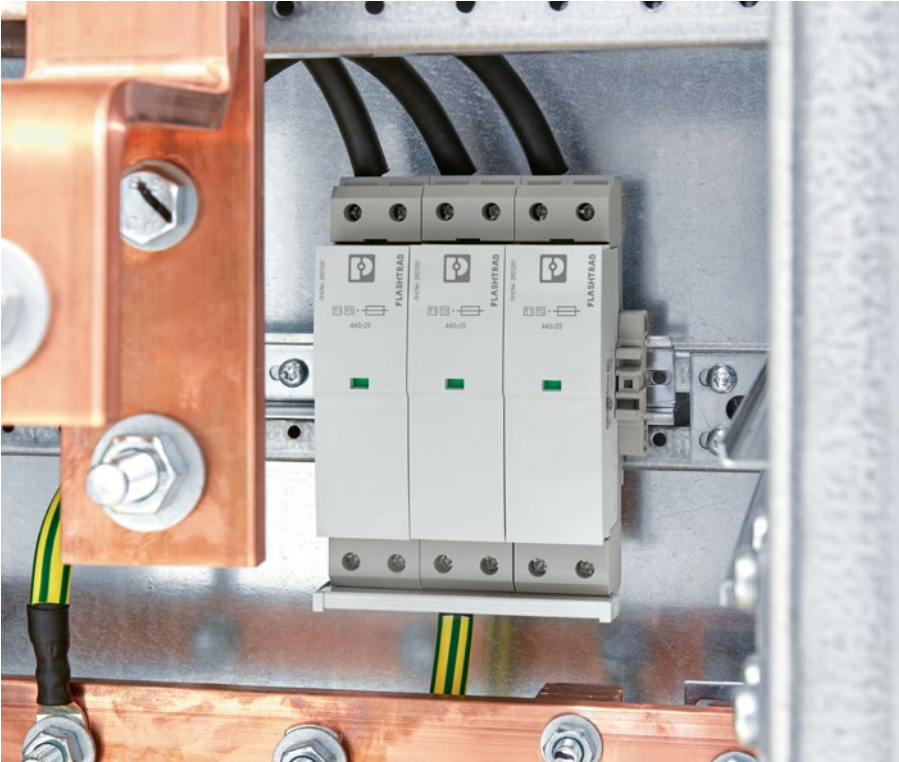
For universal use

With the surge protective devices of the SEC family, you can protect practically any power supply in standard applications against surge voltages.

From system manufacturing and machine building, to building installation, right through to infrastructure applications, the broad portfolio of the SEC family features products for comprehensive protection concepts.

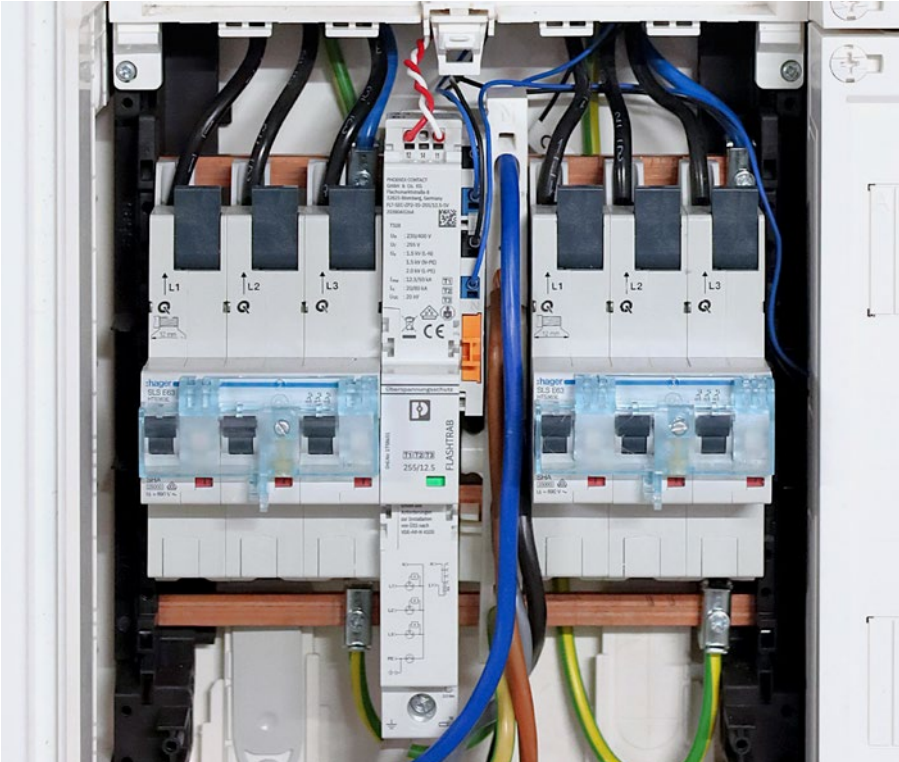
All of the type 1+2, type 2, and type 3 surge protective devices feature extraordinary durability and high performance in the field of lightning current and surge protection.

Installation is cost-effective and space-saving due to the uniform compact design of the surge protective devices and the fact that they do not need a backup fuse.



Tailored to requirements

The combined lightning current and surge arrester FLT-SEC-ZP2... (-SV) is designed for 40 mm busbars and can be installed in any meter cabinet to save space. It satisfies the requirements of the VDE-AR-N 4100 standard. The power can be fed in via SH switches, feed-in adapters, or busbar terminals. Versions with integrated voltage pick-off enable the supply of additional components in the meter cabinet, such as smart meter gateways. Despite the integrated voltage pick-off, the design remains slim and fits into the mains connection compartment even with two SH switches.



Advantages for your control cabinet building



Efficient

Plan your control cabinets more efficiently and easily, thanks to compact surge protective devices for backup-fuse-free applications. Due to their uniform design and uniform haptics, installing the SEC family products is very easy.



Pluggable

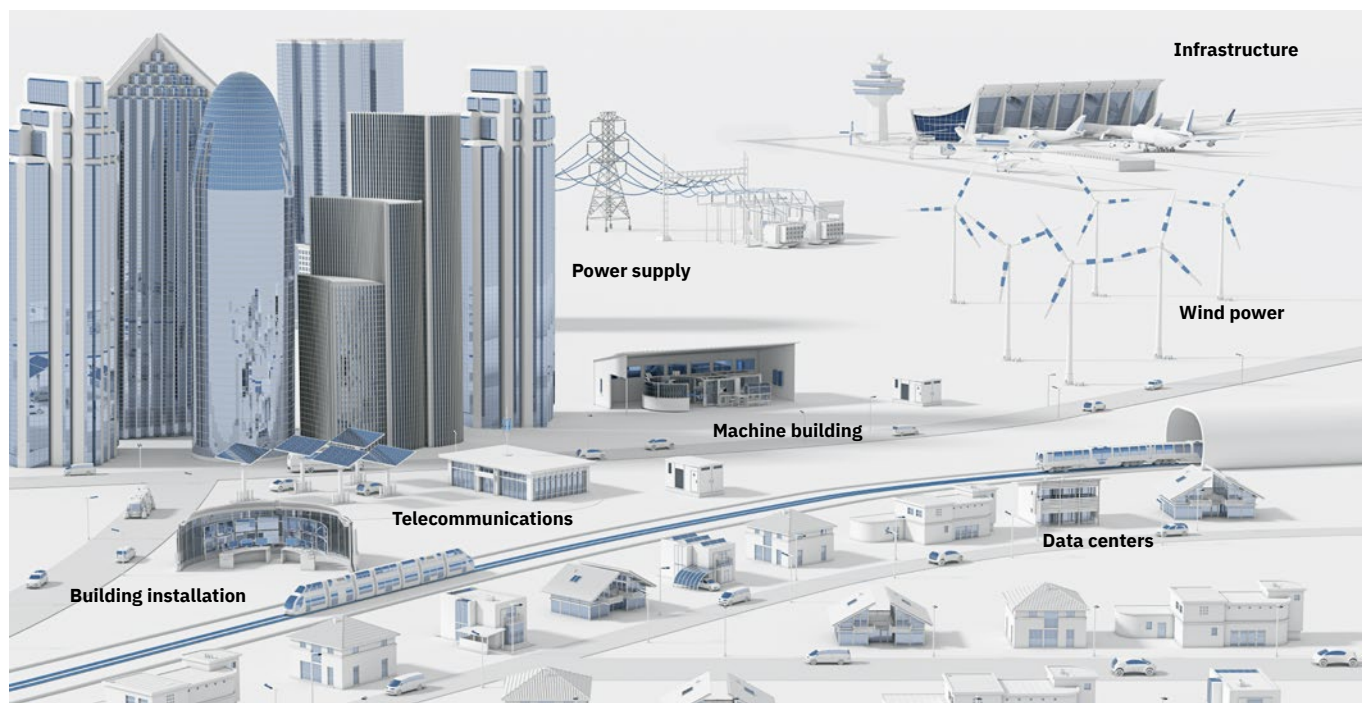
Consistent pluggability ensures a high degree of convenience, for example when taking insulation measurements in the system. Instead of reaching into the system, simply pull the plug. In the unlikely event of a defective protective plug, it is very easy to replace.



Informed

Stay informed about the status of the surge protective devices. The floating remote indication contact can be integrated easily into alarm concepts. The mechanical-optical status indicator provides information on site without additional energy consumption.

For installation in any control cabinet



With coordinated voltage versions, the surge protective devices of the SEC family can be used in all conventional power supply systems for standard installation applications

Universal protection for power supply systems

Type 1+2 combined lightning current and surge arresters with integrated backup fuse				
				
Number of positions	1-pos.	3-pos.	1-pos.	3-pos.
Nominal voltage	240 V AC (TN-C)	240/415 V AC (TN-C)	400 V AC (TN) 400 V AC (IT)	400/690 V AC (TN-C) 400 V AC (IT)
Type in accordance with IEC	T1 / T2	T1 / T2	T1 / T2	T1 / T2
Maximum continuous operating voltage U_c	264 V AC	264 V AC	440 V AC	440 V AC
Voltage protection level	≤ 1.5 kV	≤ 1.5 kV	≤ 2.5 kV	≤ 2.5 kV
Approvals				
Nominal discharge current	25 kA	25 kA	25 kA	25 kA
Lightning impulse current	25 kA	25 kA	25 kA	25 kA
Type	FLT-SEC-H-T1-1C-264/25-FM	FLT-SEC-H-T1-3C-264/25-FM	FLT-SEC-H-T1-1C-440/25-FM	FLT-SEC-H-T1-3C-440/25-FM
Item no.	2801615	2905871	2907259	2907260

Type 1+2 combined lightning current and surge arrester with high short-circuit current rating, also for unstable grids			
			
Number of positions	2-pos.	3-pos.	4-pos.
Nominal voltage	240 V AC (TN-S) 240 V AC (TT)	240/415 V AC (TN-C)	240/415 V AC (TN-S) 240/415 V AC (TT)
Type in accordance with IEC	T1 / T2	T1 / T2	T1 / T2
Maximum continuous operating voltage U_c	350 V AC	350 V AC	350 V AC
Voltage protection level	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 1.5 kV	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)
Max. backup fuse F2	315 A (gG)	315 A (gG)	315 A (gG)
Approvals			
Nominal discharge current	25 kA (L-N) 100 kA (N-PE)	25 kA	25 kA (L-N) 100 kA (N-PE)
Lightning impulse current	25 kA (L-N) 100 kA (N-PE)	25 kA	25 kA (L-N) 100 kA (N-PE)
Type	FLT-SEC-P-T1-1S-350/25-FM	FLT-SEC-P-T1-3C-350/25-FM	FLT-SEC-P-T1-3S-350/25-FM
Item no.	2905415	2905419	2905421

Universal protection for power supply systems

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Surge protection for power supplies

Type 1+2 combined lightning current and surge arresters for 400/690 V and 400 V IT and a high short-circuit current rating

	  		
	1-pos.	3-pos.	4-pos.
Nominal voltage	400 V AC (TN-C) 400 V AC (IT)	400/690 V AC (TN-C) 400 V AC (IT)	400/690 V AC (TN-S) 400/690 V AC (TT)
Type in accordance with IEC	T1 / T2	T1 / T2	T1 / T2
Maximum continuous operating voltage U_c	440 V AC	440 V AC	440 V AC
Voltage protection level	≤ 2.5 kV	≤ 2.5 kV	≤ 2.5 kV (L-N) ≤ 2.5 kV (N-PE)
Max. backup fuse F2	400 A (gG)	400 A (gG)	400 A (gG)
Approvals	 	 	
Nominal discharge current	35 kA	35 kA	35 kA (L-N) 100 kA (N-PE)
Lightning impulse current	35 kA	35 kA	35 kA (L-N) 100 kA (N-PE)
Type	FLT-SEC-P-T1-1C-440/35-FM	FLT-SEC-P-T1-3C-440/35-FM	FLT-SEC-P-T1-3S-440/35-FM
Item no.	2905987	2905988	2908264

Universal protection for power supply systems

Type 1+2 combined lightning current and surge arresters for very high lightning currents and a high short-circuit current rating			
			
Number of positions	2-pos.	3-pos.	4-pos.
Nominal voltage	240 V AC (TN-S) 240 V AC (TT)	240/415 V AC (TN-C)	240/415 V AC (TN-S) 240/415 V AC (TT)
Type in accordance with IEC	T1 / T2	T1 / T2	T1 / T2
Maximum continuous operating voltage U_c	264 V AC (L-N) 350 V AC (N-PE)	264 V AC	264 V AC (L-N) 350 V AC (N-PE)
Voltage protection level	≤ 2.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 2.5 kV	≤ 2.5 kV (L-N) ≤ 1.5 kV (N-PE)
Max. backup fuse F2	500 A (gG)	500 A (gG)	500 A (gG)
Approvals			
Nominal discharge current	50 kA (L-N) 100 kA (N-PE)	50 kA	50 kA (L-N) 100 kA (N-PE)
Lightning impulse current	50 kA (L-N) 100 kA (N-PE)	50 kA	50 kA (L-N) 100 kA (N-PE)
Type	FLT-SEC-P-T1-1S-264/50-FM	FLT-SEC-P-T1-3C-264/50-FM	FLT-SEC-P-T1-3S-264/50-FM
Item no.	2907388	2907390	2909589

Type 1+2 special combined lightning current and surge arresters, lightning current arrester and surge protection			
			
Number of positions	2-pos.	3-pos.	4-pos.
Nominal voltage	240 V AC (TN-S) 240 V AC (TT)	240/415 V AC (TN-C)	240/415 V AC (TN-S) 240/415 V AC (TT)
Type in accordance with IEC	T1 + T2	T1 + T2	T1 + T2
Maximum continuous operating voltage U_c	350 V AC	350 V AC	350 V AC
Voltage protection level	≤ 2.2 kV (L-PE) ≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 1.5 kV	≤ 2.2 kV (L-PE) ≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)
Max. backup fuse F2	315 A (gG)	315 A (gG)	315 A (gG)
Approvals			
Nominal discharge current	25 kA (L-N) 25 kA (L-PE) 100 kA (N-PE)	25 kA	25 kA (L-N) 25 kA (L-PE) 100 kA (N-PE)
Lightning impulse current	25 kA (L-N) 25 kA (L-PE) 100 kA (N-PE)	25 kA	25 kA (L-N) 25 kA (L-PE) 100 kA (N-PE)
Type	FLT-SEC-T1+T2-1S-350/25-FM	FLT-SEC-T1+T2-3C-350/25-FM	FLT-SEC-T1+T2-3S-350/25-FM
Item no.	2905466	2905469	2905470

Universal protection for power supply systems

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Surge protection for power supplies

Type 1+2+3 combined lightning current and surge arrester for 40 mm busbar systems with voltage pick-off

				
Number of positions	3-pos. NEW	3-pos. NEW	4-pos. NEW	4-pos. NEW
Nominal voltage	230/400 V AC (TN-C)	230/400 V AC (TN-C)	230/400 V AC (TN-S) 230/400 V AC (TT)	230/400 V AC (TN-S) 230/400 V AC (TT)
Type in accordance with IEC	T1 + T2 + T3	T1 + T2 + T3	T1 + T2 + T3	T1 + T2 + T3
Maximum continuous operating voltage U_c	255 V AC	255 V AC	255 V AC	255 V AC
Voltage protection level	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)
Max. backup fuse F2	315 A (gG)	315 A (gG)	315 A (gG)	315 A (gG)
Nominal discharge current	20 kA	20 kA	20 kA (L-N) 80 kA (N-PE)	20 kA (L-N) 80 kA (N-PE)
Lightning impulse current	7.5 kA	12.5 kA	7.5 kA (L-N) 30 kA (N-PE)	12.5 kA (L-N) 50 kA (N-PE)
Combined surge	20 kV	20 kV	20 kV	20 kV
Type	FLT-SEC-ZP2-3C-255/7.5-SV	FLT-SEC-ZP2-3C-255/12.5-SV	FLT-SEC-ZP2-3S-255/7.5-SV	FLT-SEC-ZP2-3S-255/12.5-SV
Item no.	1758650	1758657	1758648	1758651

Type 1+2+3 combined lightning current and surge arresters for 40 mm busbar systems

					
Number of positions	3-pos.	3-pos.	4-pos.	4-pos.	—
Nominal voltage	230/400 V AC (TN-C)	230/400 V AC (TN-C)	230/400 V AC (TN-S) 230/400 V AC (TT)	230/400 V AC (TN-S) 230/400 V AC (TT)	—
Type in accordance with IEC	T1 + T2 + T3	T1 + T2 + T3	T1 + T2 + T3	T1 + T2 + T3	—
Maximum continuous operating voltage U_c	255 V AC	255 V AC	255 V AC	255 V AC	—
Voltage protection level	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	—
Max. backup fuse F2	160 A (gG)	160 A (gG)	160 A (gG)	160 A (gG)	—
Approvals	  	  	  	  	—
Nominal discharge current	20 kA	20 kA	20 kA (L-N) 80 kA (N-PE)	20 kA (L-N) 80 kA (N-PE)	—
Lightning impulse current	7.5 kA	12.5 kA	7.5 kA (L-N) 30 kA (N-PE)	12.5 kA (L-N) 50 kA (N-PE)	—
Combined surge	20 kV	20 kV	20 kV	20 kV	—
Type	FLT-SEC-ZP2-3C-255/7.5	FLT-SEC-ZP2-3C-255/12.5	FLT-SEC-ZP2-3S-255/7.5	FLT-SEC-ZP2-3S-255/12.5	FLT-SEC-ZP2 FM-MODULE
Item no.	1168942	1168946	1168940	1168943	1168947

Universal protection for power supply systems

Type 2 surge protection for 240/415 V systems			
COMPLETE line			
Number of positions	2-pos.	3-pos.	4-pos.
Nominal voltage	240 V AC (TN-S) 240 V AC (TT)	240/415 V AC (TN-C)	240/415 V AC (TN-S) 240/415 V AC (TT)
Type in accordance with IEC	T2	T2	T2
Maximum continuous operating voltage U_c	350 V AC (L-N) 264 V AC (N-PE)	350 V AC	350 V AC (L-N) 264 V AC (N-PE)
Voltage protection level	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 1.5 kV	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)
Max. backup fuse F2	315 A (gG)	315 A (gG)	315 A (gG)
Approvals			
Nominal discharge current	20 kA	20 kA	20 kA
Type	VAL-SEC-T2-1S-350-FM	VAL-SEC-T2-3C-350-FM	VAL-SEC-T2-3S-350-FM
Item no.	2905333	2905339	2905340

Type 2 surge protection for 240/415 V systems, free of leakage current, even for unstable grids			
COMPLETE line			
Number of positions	2-pos.	3-pos.	4-pos.
Nominal voltage	240 V AC (TN-S) 240 V AC (TT)	240/415 V AC (TN-C)	240/415 V AC (TN-S) 240/415 V AC (TT)
Type in accordance with IEC	T2	T2	T2
Maximum continuous operating voltage U_c	350 V AC (L-N) 264 V AC (N-PE)	350 V AC	350 V AC (L-N) 264 V AC (N-PE)
Voltage protection level	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 1.5 kV	≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)
Max. backup fuse F2	200 A (gG)	200 A (gG)	200 A (gG)
Approvals	ERC	ERC	ERC
Nominal discharge current	10 kA (L-N) 20 kA (N-PE)	10 kA	10 kA (L-N) 20 kA (N-PE)
Type	VAL-SEC-T2-1S-350VF-FM	VAL-SEC-T2-3C-350VF-FM	VAL-SEC-T2-3S-350VF-FM
Item no.	2909592	2909591	2909590

Universal protection for power supply systems

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Surge protection for power supplies

Type 2 surge protection for 400/690 V and 400 V IT systems

				
	3-pos.		4-pos.	
Number of positions				
Nominal voltage	400/690 V AC (TN-C) 400 V AC (IT)		400/690 V AC (TN-S) 400 V AC (IT)	
Type in accordance with IEC	T2		T2	
Maximum continuous operating voltage U_c	440 V AC		440 V AC	
Voltage protection level	≤ 1.9 kV		≤ 4 kV (L-N) ≤ 1.9 kV (N-PE)	
Max. backup fuse F2	315 A (gG)		315 A (gG)	
Approvals			-	
Nominal discharge current	20 kA		20 kA	
Type	VAL-SEC-T2-3C-440-FM		VAL-SEC-T2-4+0-440-FM	
Item no.	2909968		1076468	

Type 2 surge protection for 120/208 V systems

						
	2-pos.		3-pos.		4-pos.	
Number of positions						
Nominal voltage	120 V AC (TN-S) 120 V AC (TT)		120/208 V AC (TN-C)		120/208 V AC (TN-S) 120/208 V AC (TT)	
Type in accordance with IEC	T2		T2		T2	
Maximum continuous operating voltage U_c	175 V AC (L-N) 150 V AC (N-PE)		175 V AC		175 V AC (L-N) 150 V AC (N-PE)	
Voltage protection level	≤ 0.85 kV (L-N) ≤ 0.95 kV (N-PE)		≤ 0.85 kV		≤ 0.85 kV (L-N) ≤ 0.95 kV (N-PE)	
Max. backup fuse F2	315 A (gG)		315 A (gG)		315 A (gG)	
Approvals						
Nominal discharge current	20 kA		20 kA		20 kA	
Type	VAL-SEC-T2-1S-175-FM		VAL-SEC-T2-3C-175-FM		VAL-SEC-T2-3S-175-FM	
Item no.	2905348		2905353		2905354	

Universal protection for power supply systems

Type 2 surge protection for unipolar DC applications				
				
Number of positions	2-pos.	2-pos.	2-pos.	2-pos.
Nominal voltage	48 V DC ... 60 V DC	100 V DC ... 120 V DC	200 V DC ... 220 V DC	350 V DC ... 400 V DC
Type in accordance with IEC	T2	T2	T2	T2
Maximum continuous operating voltage U_c	75 V DC	150 V DC	250 V DC	450 V DC
Voltage protection level	≤ 0.9 kV (DC-DC) ≤ 0.5 kV (DC-PE)	≤ 1.8 kV (DC-DC) ≤ 0.85 kV (DC-PE)	≤ 3 kV (DC-DC) ≤ 1.5 kV (DC-PE)	≤ 3 kV (DC-DC) ≤ 1.5 kV (DC-PE)
Max. backup fuse F2	20 A DC (gG / B at $I_{SCCR} > 200$ A)	20 A (gG / B at $I_{SCCR} > 200$ A)	20 A (gG / B at $I_{SCCR} > 200$ A)	20 A (gG / B at $I_{SCCR} > 200$ A)
Approvals				
Nominal discharge current	20 kA	20 kA	20 kA	20 kA
Type	VAL-SEC-T2-2+0-48DC-FM	VAL-SEC-T2-2+0-120DC-FM	VAL-SEC-T2-2+0-220DC-FM	VAL-SEC-T2-2+0-380DC-FM
Item no.	2907865	2907874	2907875	2907876

Type 2 surge protection for unipolar isolated DC applications				
				
Number of positions	2-pos.	2-pos.	2-pos.	2-pos.
Nominal voltage	40 V DC ... 60 V DC	100 V DC ... 120 V DC	200 V DC ... 220 V DC	350 V DC ... 400 V DC
Type in accordance with IEC	T2	T2	T2	T2
Maximum continuous operating voltage U_c	75 V DC	150 V DC	250 V DC	450 V DC
Voltage protection level	≤ 0.9 kV (DC-DC) ≤ 1 kV (DC-PE)	≤ 1.8 kV (DC-DC) ≤ 1.3 kV (DC-PE)	≤ 3 kV (DC-DC) ≤ 1.9 kV (DC-PE)	≤ 3 kV (DC-DC) ≤ 1.9 kV (DC-PE)
Max. backup fuse F2	20 A DC (gG / B at $I_{SCCR} > 200$ A)	20 A (gG / B at $I_{SCCR} > 200$ A)	20 A (gG / B at $I_{SCCR} > 200$ A)	10 A (gG/B at $I_{SCCR} > 100$ A)
Nominal discharge current	20 kA	20 kA	20 kA	20 kA
Type	VAL-SEC-T2-2+F-48DC-FM	VAL-SEC-T2-2+F-120DC-FM	VAL-SEC-T2-2+F-220DC-FM	VAL-SEC-T2-2+F-380DC-FM
Item no.	1033786	1033788	1033789	1033790

Universal protection for power supply systems

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Surge protection for power supplies

Type 3 device protection with Push-in connection

				
Number of positions	2-pos.	2-pos.	2-pos.	2-pos.
Nominal voltage	24 V AC (TN-S)	60 V AC (TN-S)	120 V AC (TN-S) 120 V AC (TT)	240 V AC (TN-S) 240 V AC (TT)
Type in accordance with IEC	T3	T3	T2 / T3	T2 / T3
Maximum continuous operating voltage U_c	34 V AC	80 V AC	150 V AC	264 V AC
Voltage protection level	≤ 0.2 kV (L-N) ≤ 0.6 kV (N-PE)	≤ 0.48 kV (L-N) ≤ 0.8 kV (N-PE)	≤ 0.75 kV (L-N) ≤ 0.85 kV (N-PE)	≤ 1.25 kV (L-N) ≤ 1.4 kV (N-PE)
Max. backup fuse F2	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)
Approvals		DNV 	DNV 	DNV 
Nominal discharge current	1 kA	2 kA	5 kA	5 kA
Combined surge	2 kV	4 kV	6 kV	6 kV
Type	PLT-SEC-T3-24-FM-PT	PLT-SEC-T3-60-FM-PT	PLT-SEC-T3-120-FM-PT	PLT-SEC-T3-230-FM-PT
Item no.	2907925	2907926	2907927	2907928

Type 3 device protection with screw connection

					
Number of positions	2-pos.	2-pos.	2-pos.	2-pos.	4-pos.
Nominal voltage	24 V AC (TN-S)	60 V AC (TN-S)	120 V AC (TN-S) 120 V AC (TT)	240 V AC (TN-S) 240 V AC (TT)	230/400 V AC (TN-S) 230/400 V AC (TT)
Type in accordance with IEC	T3	T3	T2 / T3	T2 / T3	T3
Maximum continuous operating voltage U_c	34 V AC	80 V AC	150 V AC	264 V AC	264 V AC
Voltage protection level	≤ 0.2 kV (L-N) ≤ 0.6 kV (N-PE)	≤ 0.48 kV (L-N) ≤ 0.8 kV (N-PE)	≤ 0.75 kV (L-N) ≤ 0.85 kV (N-PE)	≤ 1.25 kV (L-N) ≤ 1.4 kV (N-PE)	≤ 1.4 kV (L-N) ≤ 1.5 kV (N-PE)
Max. backup fuse F2	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)	— (not necessary)
Approvals	DNV 	DNV 	DNV 	DNV 	ETL
Nominal discharge current	1 kA	2 kA	5 kA	5 kA	3 kA
Combined surge	2 kV	4 kV	6 kV	6 kV	6 kV
Type	PLT-SEC-T3-24-FM-UT	PLT-SEC-T3-60-FM-UT	PLT-SEC-T3-120-FM-UT	PLT-SEC-T3-230-FM-UT	PLT-SEC-T3-3S-230-FM
Item no.	2907916	2907917	2907918	2907919	2905230

Surge protection for power supplies

Precisely tailored protection for every requirement

Individual for each industry

Protect your systems with industry-oriented surge protection. From photovoltaics to wind power, building installation, and e-mobility, our products offer optimally coordinated solutions for every requirement. Robust, durable, and certified, for maximum availability and reliable protection.



Your advantages

- ✓ Optimally tailored protection thanks to sector-specific products
- ✓ Robust and durable with test methods designed for the installation location
- ✓ Market-specific products for compliance with regional standards and stipulations

Application-related protection for different applications



The specialists

From renewable energies through to machine building. VALVETRAB SPP are the specialists for different applications.



The robust ones

POWERTRAB is an extremely robust lightning current arrester for applications in harsh conditions and exposed locations.



The minimalists

BLOCKTRAB T2 products are ideally suited for protecting LED street lighting. Optimum protection in the tightest spaces.

Surge protection for all energy sectors

With the right surge protection, you ensure the availability of your application. Whether for renewable and thus clean energy generation or for the mobility of the future, the right protection against surge voltages is simply essential.

Networked buildings, industrial systems, and the associated infrastructure are the basis for automated value creation. These should be equipped with surge protection specially developed for this purpose.



Photovoltaics	Wind power	E-mobility	Building installation	Machine building	Infrastructure
More information starting on page 32	More information starting on page 27	More information starting on page 26	More information starting on page 28	More information starting on page 28	More information starting on page 33

The right surge protection for your application

Machine building and systems manufacturing

Control cabinets are the control centers of electrotechnical systems and production facilities. They therefore have to be protected accordingly with care.

The sensitive electronic components in the control cabinet have to be protected reliably against surge voltages. They are particularly susceptible to damage caused by lightning currents and surge voltage coupling across the power grid.

In order to avoid costly failures and downtimes, surge protection should be taken into consideration as early as when planning the system components and their supply.

In our broad portfolio of surge protective devices for various applications in machine building and systems manufacturing, you will find the right protection for your application.

Protective devices with specially tailored voltage ranges, integrated, coordinated backup fuses, or, upon request, even versions designed to meet the requirements of global markets increase the availability of your systems and thus protect against costly production downtimes.



Increased system availability

Photovoltaic systems

Solar power is an essential source of renewable energy. Decreasing system costs mean that photovoltaic power generation systems are attractive not only from an ecological perspective. They are also extremely competitive from an economic point of view when compared with conventional power generation. In order to provide optimum protection against surge voltages for the various system parts such as PV panels, inverters, and battery storage systems, surge protection must be used.

The parameters on the DC side of photovoltaic systems differ substantially from those on the AC side. High system DC voltages are generated and a photovoltaic generator is operated close to its short-circuit current. Fuse mechanisms that are typically used for AC applications, such as backup fuses, are not used here. Due to these special features of the DC side, surge protective devices that have been specifically developed for photovoltaic systems must be used.

Phoenix Contact provides a broad product range of surge protective devices specially designed for the DC side of photovoltaic systems.

Type 1+2 combined lightning current and surge arresters as well as type 2 for generator voltages of up 1,500 V DC are included in this portfolio. Here, you can choose between plug-in and non-plug-in versions.

Naturally, our portfolio does not just include suitable DC and AC surge protection for your photovoltaics application, but also string combiner boxes (SCBs) for rooftop systems and ground-mounted systems.

➤ More information on this topic at: phoenixcontact.com/pv-surge



Uninterruptible energy generation

Wind power

Whether on rough seas, flat coastal landscapes, high plateaus, or wide plains, wind turbine generators (WTGs) are exposed to extreme weather conditions wherever installed. These systems, which are up to 200 m high, are particularly at risk during thunderstorms. It is therefore very important to protect the electrical and electronic system parts and components against lightning currents and surge voltages. If a WTG fails, this results in both high yield losses and costly maintenance work.

With its robust housing, the POWERTRAB type 1+2 combined lightning current and surge arrester is specially designed for harsh conditions. Featuring a rated voltage of 800 V AC and a discharge capacity of 35 kA per channel, it is ideal for use in 690 V IT grids in wind turbine generators.

The specially designed VAL-SPP-T2-750... and VAL-SPP-T2-800WE... versions are available for targeted protection of the rotor and stator in wind turbine generators.



Safe system operation in exposed locations

E-mobility

Charging stations and EV chargers must be available at all times – day and night, and in any weather. In order to protect the charging infrastructure of your connected e-vehicle against surge voltages caused by lightning strikes or switching operations, it is included in a comprehensive overvoltage protection concept.

This allows you to ensure that the charging process continues uninterrupted and unaffected by surge voltages, and that your electric car is ready for use at any time.

You can use the type 1+2+3 FLT-MB lightning current arrester to safely and reliably protect the sensitive electronic components in EV charging stations. The protective device works wear-free due to the triggered carbon spark gap technology and makes a decisive contribution to the high availability of your charging infrastructure and your electric car.



Protection for the charging infrastructure

Infrastructure

LED technology provides durable solutions for road and building lighting. Premature blackouts caused by surge voltages significantly reduce the savings potential of energy-saving LED lights. This is often caused by ballasts which are sensitive to transient voltages. The BLOCKTRAB surge protective devices have been designed such that they can be installed directly in the light. Due to the increased insulation, they can be used in LED applications in protection class II equipment without any further measures.

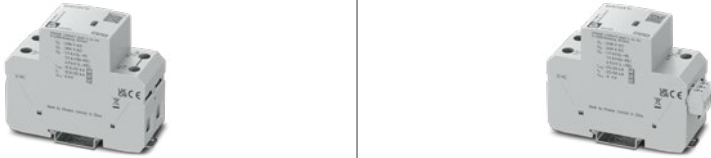
Depending on requirements, the devices can be installed in through-wiring or branch wiring and are designed either as versions for lights with a grounded connection (L, L', N, PE) or for lights with an insulated connection (L, L', N).



Consistent availability

Application-related protection

Type 1+2+3 combined lightning current and surge arrester				
				
	4-pos.	4-pos.	4-pos.	4-pos.
Number of positions	4-pos.	4-pos.	4-pos.	4-pos.
Nominal voltage	240/415 V AC (TN-S) 240/415 V AC (TT)	240/415 V AC (TN-S) 240/415 V AC (TT)	240/415 V AC (TN-C)	240/415 V AC (TN-C)
Type in accordance with IEC	T1 + T2 + T3	T1 + T2 + T3	T1 + T2 + T3	T1 + T2 + T3
Maximum continuous operating voltage U _c	264 V AC	264 V AC	264 V AC	264 V AC
Voltage protection level	≤1.5 kV (L-N) ≤1.5 kV (N-PE)	≤1.5 kV (L-N) ≤1.5 kV (N-PE)	≤1.5 kV	≤1.7 kV
Max. backup fuse F2	315 A (gG)	315 A (gG)	315 A (gG)	315 A (gG)
Approvals				
Nominal discharge current	12.5 kA (L-N) 50 kA (N-PE)	25 kA (L-N) 100 kA (N-PE)	12.5 kA	25 kA
Lightning impulse current	12.5 kA (L-N) 50 kA (N-PE)	25 kA (L-N) 100 kA (N-PE)	12.5 kA	25 kA
Combined surge	6 kV	6 kV	6 kV	6 kV
Type	FLT-MB-T1-264/12.5-3+1-UT	FLT-MB-T1-264/25-3+1-UT-R	FLT-MB-T1-264/12.5-3+0-UT-R	FLT-MB-T1-264/25-3+0-UT-R
Item no.	1380661	1461304	1380660	1461302

Type 1+2+3 combined lightning current and surge arrester		
		
	2-pos.	2-pos.
Number of positions	2-pos.	2-pos.
Nominal voltage	240 V AC (TN-S) 240 V AC (TT)	240 V AC (TN-S) 240 V AC (TT)
Type in accordance with IEC	T1 + T2 + T3	T1 + T2 + T3
Maximum continuous operating voltage U _c	264 V AC	264 V AC
Voltage protection level	≤1.5 kV (L-N) ≤1.5 kV (N-PE)	≤1.5 kV (L-N) ≤1.5 kV (N-PE)
Max. backup fuse F2	315 A (gG)	315 A (gG)
Approvals		
Nominal discharge current	12.5 kA (L-N) 25 kA (N-PE)	25 kA (L-N) 50 kA (N-PE)
Lightning impulse current	12.5 kA (L-N) 25 kA (N-PE)	25 kA (L-N) 50 kA (N-PE)
Combined surge	6 kV	6 kV
Type	FLT-MB-T1-264/12.5-1+1-UT	FLT-MB-T1-264/25-1+1-UT-R
Item no.	1380654	1461300

Application-related protection

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Surge protection for power supplies

Type 1+2 combined lightning current and surge arresters for lightning protection level III and IV

		
Number of positions	4-pos.	2-pos.
Nominal voltage	240/415 V AC (TN-S) 240/415 V AC (TT)	240 V AC (TN-S) 240 V AC (TT)
Type in accordance with IEC	T1 / T2	T1 / T2
Maximum continuous operating voltage U_c	335 V AC (L-N) 335 V AC (L-PE) 264 V AC (N-PE)	335 V AC (L-N) 335 V AC (L-PE) 264 V AC (N-PE)
Voltage protection level	≤ 2 kV (L-PE) ≤ 1.2 kV (L-N) ≤ 1.7 kV (N-PE)	≤ 2 kV (L-PE) ≤ 1.2 kV (L-N) ≤ 1.7 kV (N-PE)
Max. backup fuse F2	160 A (gG)	160 A (gG)
Approvals		
Nominal discharge current	12.5 kA (L-N) 12.5 kA (L-PE) 50 kA (N-PE)	12.5 kA (L-N) 12.5 kA (L-PE) 50 kA (N-PE)
Lightning impulse current	12.5 kA (L-N) 12.5 kA (L-PE) 50 kA (N-PE)	12.5 kA (L-N) 12.5 kA (L-PE) 50 kA (N-PE)
Type	VAL-MS-T1/T2 335/12.5/3+1-FM	VAL-MS-T1/T2 335/12.5/1+1-FM
Item no.	2800183	2800186

Type 1+2 combined lightning current and surge arresters for high nominal voltages

		
Number of positions	1-pos.	3-pos.
Nominal voltage	690 V AC 554/960 V AC (TN-C) 690 V AC (IT)	690 V AC 554/960 V AC (TN-C) 690 V AC (IT)
Type in accordance with IEC	T1 / T2	T1 / T2
Maximum continuous operating voltage U_c	800 V AC (L-PE)	800 V AC (L-PE)
Voltage protection level	≤ 4.5 kV	≤ 4.5 kV
Max. backup fuse F2	400 A (gG at 2 x 50 mm ²)	400 A (gG at 2 x 50 mm ²)
Approvals		
Nominal discharge current	35 kA (L-PE)	35 kA (L-PE)
Lightning impulse current	35 kA	35 kA
Type	PWT 35-800AC-FM	PWT 100-800AC-FM
Item no.	2800419	2800531

Application-related protection

Type 2 surge protection for stable 240/415 V systems								
COMPLETE line 								
	Number of positions		4-pos.	NEW	2-pos.	NEW	1-pos.	NEW
	Nominal voltage		240/415 V AC (TN-S) 240/415 V AC (TT)		240/415 V AC (TN-S) 240/415 V AC (TT)		240 V AC (TN) 240 V AC (TT)	
	Type in accordance with IEC		T2		T2		T2	
	Maximum continuous operating voltage U _c		275 V AC (L-N) 305 V AC (N-PE)		275 V AC (L-N) 305 V AC (N-PE)		275 V AC	
	Voltage protection level		≤1.35 kV (L-N) ≤1.5 kV (N-PE)		≤1.35 kV (L-N) ≤1.5 kV (N-PE)		≤1.35 kV	
	Max. backup fuse F2		315 A (gG)		315 A (gG)		315 A (gG)	
	Approvals		DNV  CB 		DNV  CB 		DNV  CB 	
	Nominal discharge current		20 kA		20 kA		20 kA	
	Type		VAL-SPP-T2-275-3+1-UT-R		VAL-SPP-T2-275-1+1-UT-R		VAL-SPP-T2-275-1+0-UT-R	
	Item no.		1466214		1466212		1466210	

Type 2 surge protection for unstable 240/415 V systems		
		
	4-pos. NEW	
	Nominal voltage 240/415 V AC (TN-S) 240/415 V AC (TT)	
	Type in accordance with IEC T2	
	Maximum continuous operating voltage U_c 335 V AC (L-N) 305 V AC (N-PE)	
	Voltage protection level ≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	
	Max. backup fuse F2 315 A (gG)	
	Approvals DNV  CB 	
	Nominal discharge current 20 kA	
	Type VAL-SPP-T2-335-3+1-UT-R	
	Item no. 1466604	

		
	2-pos. NEW	
	Nominal voltage 240/415 V AC (TN-S) 240/415 V AC (TT)	
	Type in accordance with IEC T2	
	Maximum continuous operating voltage U_c 335 V AC (L-N) 305 V AC (N-PE)	
	Voltage protection level ≤ 1.5 kV (L-N) ≤ 1.5 kV (N-PE)	
	Max. backup fuse F2 315 A (gG)	
	Approvals DNV  CB 	
	Nominal discharge current 20 kA	
	Type VAL-SPP-T2-335-1+1-UT-R	
	Item no. 1466597	

Application-related protection

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Surge protection for power supplies

Surge protection for 24 V DC and 48 V DC applications		
COMPLETE line		
Number of positions	1-pos.	2-pos.
Nominal voltage	60 V AC (TN)	60 V AC (TN-S)
Type in accordance with IEC	T2	T1 / T2
Maximum continuous operating voltage U_c	75 V AC	75 V AC
Voltage protection level	≤ 0.55 kV	≤ 0.8 kV (L-PE) ≤ 0.4 kV (L-N) ≤ 0.4 kV (N-PE)
Max. backup fuse F2	125 A AC (gG)	160 A (gG)
Approvals		
Nominal discharge current	15 kA	12.5 kA
Lightning impulse current	-	12.5 kA
Type	VAL-MS 60/FM	VAL-MS-T1/T2 48/12.5/1+1V-FM
Item no.	2868033	2801533

Application-related protection

Type 2 surge protection with high electric strength		
COMPLETE line		
Number of positions	1-pos.	NEW
Nominal voltage	240 V AC (TN) 240 V AC (TT) 230 V AC (IT)	
Type in accordance with IEC	T2	
Maximum continuous operating voltage U _c	350 V AC	
Voltage protection level	≤1.5 kV	
Max. backup fuse F2	200 A (gG)	
Approvals	DNV CB	
Nominal discharge current	20 kA	
Type	VAL-SPP-T2-350-1VF+0-UT-R	
Item no.	1466640	

Type 2 surge protection for 400/690 V and 400 V IT systems			
COMPLETE line			
Number of positions	3-pos.	NEW	3-pos. NEW
Nominal voltage	554/960 V AC (TN-C) 690 V AC (IT)		400/690 V AC (TN-C)
Type in accordance with IEC	T2		T2
Maximum continuous operating voltage U _c	760 V AC		440 V AC
Voltage protection level	≤3 kV		≤2.1 kV
Max. backup fuse F2	250 A (gG)		315 A (gG)
Approvals	DNV eULUS CB		DNV eULUS CB
Nominal discharge current	20 kA		20 kA
Type	VAL-SPP-T2-750-3+0-UT-R		VAL-SPP-T2-440-3+0-UT-R
Item no.	1466614		1466615

Application-related protection

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Surge protection for power supplies

Type 2 surge protection with coordinated backup fuse

					
Number of positions	2-pos.	3-pos.	4-pos.	4-pos.	3-pos.
Nominal voltage	240 V AC (TN-S) 240 V AC (TT)	240/415 V AC (TN-C)	240/415 V AC (TN-S) 240/415 V AC (TT)	240/415 V AC (TN-S) 240/415 V AC (TT)	240/415 V AC (TN-C) 240/415 V AC (TT)
Type in accordance with IEC	T2	T2	T2	T2	T2
Maximum continuous operating voltage U_c	350 V AC (L-N) 264 V AC (N-PE)	350 V AC	350 V AC (L-N) 264 V AC (N-PE)	350 V AC (L-N) 264 V AC (N-PE)	350 V AC
Voltage protection level	≤ 2.5 kV (L-N) ≤ 1.7 kV (N-PE)	≤ 2.5 kV	≤ 2.5 kV (L-N) ≤ 1.7 kV (N-PE)	≤ 2.5 kV (L-N) ≤ 1.5 kV (N-PE)	≤ 2.5 kV
Approvals					
Nominal discharge current	15 kA (L-N) 20 kA (N-PE)	15 kA	15 kA (L-N) 20 kA (N-PE)	20 kA	20 kA
Type	VAL-CP-MCB-1S-350/40/FM	VAL-CP-MCB-3C-350/40/FM	VAL-CP-MCB-3S-350/40/FM	VAL-CP-MOSO 60-3S-FM	VAL-CP-MOSO 60-3C-FM
Item no.	2882763	2882776	2882750	2804403	2804416

Surge protection for linear DC grids

			
Number of positions	2-pos.	2-pos.	2-pos.
Nominal voltage	1000 V DC	750 V DC	1000 V DC
Type in accordance with IEC	T1 / T2	T2	T2
Maximum continuous operating voltage U_c	1000 V DC	800 V DC	1100 V DC
Voltage protection level	≤ 4.5 kV	≤ 3.3 kV	≤ 4.5 kV
Max. backup fuse F2	80 A (gG at $I_{SCCR} > 800$ A DC)	40 A (gG / 1200 V DC)	40 A (gG / 1200 V DC)
Nominal discharge current	20 kA	20 kA	20 kA
Type	VAL-MB-T1/T2-1000DC-2+V-R	VAL-MB-T2-750DC-2+V-R	VAL-MB-T2-1000DC-2+V-R
Item no.	1683780	1376160	1376162

Application-related protection

Type 1+2 combined lightning current and surge arresters for photovoltaics		
COMPLETE line		
Number of positions	3-pos. NEW	2-pos.
Type in accordance with IEC	T1 / T2	T1 / T2
Maximum continuous operating voltage U_c	1200 V DC	1500 V DC
Voltage protection level	≤ 4.2 kV	≤ 4.5 kV
Approvals		
Nominal discharge current	20 kA	20 kA
Lightning impulse current	5 kA	6.25 kA
Type	VAL-SPP-T1-1000DC-PV-2+V-UT-R	VAL-MB-T1/T2 1500DC-PV/2+V-FM
Item no.	1466777	2905640

Type 2 surge protection for photovoltaics			
COMPLETE line			
Number of positions	3-pos. NEW	3-pos. NEW	3-pos. NEW
Type in accordance with IEC	T2	T2	T2
Maximum continuous operating voltage U_c	800 V DC	1200 V DC	1800 V DC
Voltage protection level	≤ 3 kV	≤ 4.2 kV	≤ 5.7 kV
Approvals			
Nominal discharge current	20 kA	20 kA	20 kA
Type	VAL-SPP-T2-600DC-PV-2+V-UT-R	VAL-SPP-T2-1000DC-PV-2+V-UT-R	VAL-SPP-T2-1500DC-PV-2+V-UT-R
Item no.	1466771	1466773	1466775

Application-related protection

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Surge protection for power supplies

Type 2 surge protection for stators and rotors

				
	Number of positions		Number of positions	
Nominal voltage	554/960 V AC (TN-C) 690 V AC (IT)		800 V AC (IT)	
Type in accordance with IEC	T2		T2	
Maximum continuous operating voltage U_c	760 V AC		880 V AC	
Voltage protection level	≤ 3 kV		≤ 4.5 kV	
Max. backup fuse F2	250 A (gG)		250 A (gG)	
Approvals	DNV  CB 		DNV  CB 	
Nominal discharge current	20 kA		20 kA	
Type	VAL-SPP-T2-750-3+0-UT-R		VAL-SPP-T2-800WE-3+0-VF-UT-R	
Item no.	1466614		1466642	

Type 2 surge protection for LED applications

				
	Nominal voltage		Nominal voltage	
Nominal voltage	100 V AC ... 277 V AC		100 V AC ... 277 V AC (TN-S) 100 V AC ... 277 V AC (TT)	
Type in accordance with IEC	T2 / T3		T2 / T3	
Maximum continuous operating voltage U_c	320 V AC		320 V AC (L-N) 305 V AC (N-PE)	
Voltage protection level	≤ 1.3 kV		≤ 1.3 kV (L-N) ≤ 1.4 kV (N-PE)	
Max. backup fuse F2	16 A (MCB B/C)		16 A (MCB B/C)	
Approvals	KEUR  CB 		KEUR  CB 	
Nominal discharge current	5 kA		5 kA (L-N) 10 kA (N-PE)	
Type	BLT-T2-320-UT		BLT-T2-1S-320-UT	
Item no.	2906100		2906101	

UL-compliant surge protection

For North American supply systems

Separate safety and testing requirements in accordance with UL 1449 for the North American market. Systems that are operated in North America and subject to the NEMA (National Electrical Manufacturers Association) regulations require special UL-listed surge protective devices.

The VAL-US-SPP products are UL Type 1 Listed and therefore fulfill the requirements of UL 1449. They ensure that installations can be reliably tested, approved, and permanently operated in compliance with standards.



Your advantages

- ✓ Easy integration into existing applications with Open Type UL Listed
- ✓ Available for all standard network configurations according to NEMA
- ✓ Available throughout Europe and can be used throughout Europe thanks to CE conformity
- ✓ Easy system status monitoring with an optical status indicator and remote indication contact

UL-compliant surge protection

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Surge protection for power supplies

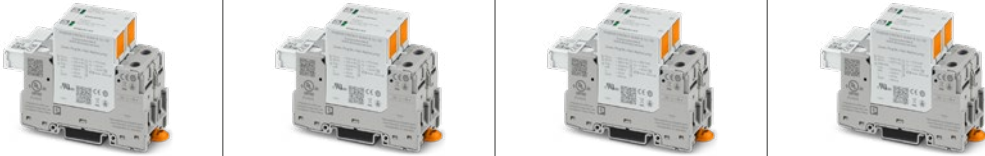
UL-listed type 1 surge protection – circuit version 1+0

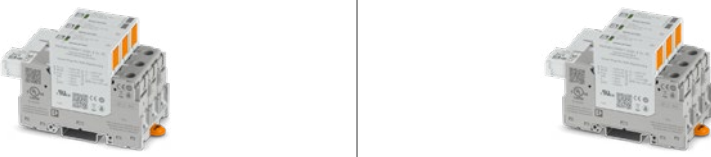
				
	Number of positions	1-pos. NEW	1-pos. NEW	1-pos. NEW
Nominal voltage U_N	120 V AC	120 V AC	240 V AC	277 V AC
Type in accordance with UL	1	1	1	1
Maximum continuous voltage MCOV	175 V AC	175 V AC	385 V AC	385 V AC
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA	200 kA
Voltage protection rating VPR	700 V	700 V	1500 V	1500 V
Approvals				
Nominal discharge current I_n	20 kA	20 kA	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA	50 kA	50 kA
Type	VAL-US-SPP-120/50/1+0-R	VAL-US-SPP-120/65/1+0-R	VAL-US-SPP-240/50/1+0-R	VAL-US-SPP-277/50/1+0-R
Item no.	1790744	1790752	1790763	1790770

UL-listed type 1 surge protection – circuit version 1+1

				
	Number of positions	2-pos. NEW	2-pos. NEW	2-pos. NEW
Nominal voltage U_N	120 V AC	120 V AC	240 V AC	277 V AC
Type in accordance with UL	1	1	1	1
Maximum continuous voltage MCOV	175 V AC (L-N) 175 V AC (L-G) 305 V AC (N-G)	175 V AC (L-N) 175 V AC (L-G) 305 V AC (N-G)	385 V AC (L-N) 385 V AC (L-G) 305 V AC (N-G)	385 V AC (L-N) 385 V AC (L-G) 305 V AC (N-G)
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA	200 kA
Voltage protection rating VPR	700 V (L-N) 900 V (L-G) 900 V (N-G)	700 V (L-N) 900 V (L-G) 900 V (N-G)	1500 V (L-N) 1500 V (L-G) 900 V (N-G)	1500 V (L-N) 1500 V (L-G) 900 V (N-G)
Approvals				
Nominal discharge current I_n	20 kA	20 kA	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA	50 kA	50 kA
Type	VAL-US-SPP-120/50/1+1-R	VAL-US-SPP-120/65/1+1-R	VAL-US-SPP-240/50/1+1-R	VAL-US-SPP-277/50/1+1-R
Item no.	1790745	1790753	1790764	1790772

UL-compliant surge protection

UL-listed type 1 surge protection – circuit version 2+0				
				
	2-pos. NEW	2-pos. NEW	2-pos. NEW	2-pos. NEW
Nominal voltage U _N	120/240 V AC (split phase)	120/240 V AC (split phase)	240/480 V AC (split phase)	240 V AC (Delta)
Type in accordance with UL	1	1	1	1
Maximum continuous voltage MCOV	350 V AC (L-L) 175 V AC (L-G)	350 V AC (L-L) 175 V AC (L-G)	770 V AC (L-L) 385 V AC (L-G)	550 V AC (L-L) 275 V AC (L-G)
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA	200 kA
Voltage protection rating VPR	1200 V (L-L) 700 V (L-G)	1200 V (L-L) 700 V (L-G)	2500 V (L-L) 1500 V (L-G)	1800 V (L-L) 1000 V (L-G)
Approvals				
Nominal discharge current I _n	20 kA	20 kA	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA	50 kA	65 kA
Type	VAL-US-SPP-120/50/2+0-R	VAL-US-SPP-120/65/2+0-R	VAL-US-SPP-240/50/2+0-R	VAL-US-SPP-240D/65/2+0-R
Item no.	1790747	1790754	1790765	1790786

UL-listed type 1 surge protection – circuit version 2+1		
		
	3-pos. NEW	3-pos. NEW
Nominal voltage U _N	120/208 V AC (wye) 120/240 V AC (split phase)	120/240 V AC (wye) 120/208 V AC (split phase)
Type in accordance with UL	1	1
Maximum continuous voltage MCOV	350 V AC (L-L) 175 V AC (L-N) 175 V AC (L-G) 305 V AC (N-G)	350 V AC (L-L) 175 V AC (L-N) 175 V AC (L-G) 305 V AC (N-G)
Short-circuit current rating (SCCR)	200 kA	200 kA
Voltage protection rating VPR	1200 V (L-L) 700 V (L-N) 900 V (L-G) 900 V (N-G)	1200 V (L-L) 700 V (L-N) 900 V (L-G) 900 V (N-G)
Approvals		
Nominal discharge current I _n	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA
Type	VAL-US-SPP-120/50/2+1-R	VAL-US-SPP-120/65/2+1-R
Item no.	1790748	1790756

UL-compliant surge protection

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Surge protection for power supplies

UL-listed type 1 surge protection – circuit version 3+0 (wye – N and G combined)			
COMPLETE line			
Number of positions	3-pos. NEW	3-pos. NEW	3-pos. NEW
Nominal voltage U_N	120/208 V AC (wye) 120/240 V AC (split phase)	120/208 V AC (wye) 120/240 V AC (split phase)	240/415 V AC (wye)
Type in accordance with UL	1	1	1
Maximum continuous voltage MCOV	350 V AC (L-L) 175 V AC (L-G)	350 V AC (L-L) 175 V AC (L-G)	770 V AC (L-L) 385 V AC (L-G)
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA
Voltage protection rating VPR	1200 V (L-L) 700 V (L-G)	1200 V (L-L) 700 V (L-G)	2500 V (L-L) 1500 V (L-G)
Approvals			
Nominal discharge current I_n	20 kA	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA	50 kA
Type	VAL-US-SPP-120/50/3+0-R	VAL-US-SPP-120/65/3+0-R	VAL-US-SPP-240/50/3+0-R
Item no.	1790749	1790758	1790766

COMPLETE line			
Number of positions	3-pos. NEW	3-pos. NEW	3-pos. NEW
Nominal voltage U_N	277/480 V AC (wye)	277/480 V AC (wye)	400/690 V AC (wye) 347/600 V AC (wye)
Type in accordance with UL	1	1	1
Maximum continuous voltage MCOV	770 V AC (L-L) 385 V AC (L-G)	770 V AC (L-L) 385 V AC (L-G)	1100 V AC (L-L) 550 V AC (L-G)
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA
Voltage protection rating VPR	2500 V (L-L) 1500 V (L-G)	2500 V (L-L) 1500 V (L-G)	4000 V (L-L) 2000 V (L-G)
Approvals			
Nominal discharge current I_n	20 kA	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA	40 kA
Type	VAL-US-SPP-277/50/3+0-R	VAL-US-SPP-277/65/3+0-R	VAL-US-SPP-400/40/3+0-R
Item no.	1790773	1790778	1790783

UL-compliant surge protection

UL-listed type 1 surge protection – circuit version 3+0 (ungrounded Delta)			
COMPLETE line			
Number of positions	3-pos. NEW	3-pos. NEW	3-pos. NEW
Nominal voltage U _N	240 V AC (Delta)	480 V AC (Delta)	600 V AC (Delta)
Type in accordance with UL	1	1	1
Maximum continuous voltage MCOV	550 V AC (L-L) 275 V AC (L-G)	1100 V AC (L-L) 550 V AC (L-G)	1500 V AC (L-L) 750 V AC (L-G)
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA
Voltage protection rating VPR	1800 V (L-L) 1000 V (L-G)	1800 V (L-L) 2000 V (L-G)	5000 V (L-L) 2500 V (L-G)
Approvals			
Nominal discharge current I _n	20 kA	20 kA	20 kA
Maximum surge current per phase	65 kA	40 kA	40 kA
Type	VAL-US-SPP-240D/65/3+0-R	VAL-US-SPP-480D/40/3+0-R	VAL-US-SPP-600D/40/3+0-R
Item no.	1790787	1790790	1790793

UL-listed type 1 surge protection – circuit version 3+1 (high-leg Delta)		
COMPLETE line		
Number of positions	4-pos. NEW	4-pos. NEW
Nominal voltage U _N	120/240 V AC	240/480 V AC
Type in accordance with UL	1	1
Maximum continuous voltage MCOV	350 V AC (450 V AC (HL-L)) (L-L) 175 V AC (275 V AC (HL-N)) (L-N) 175 V AC (275 V AC (HL-N)) (L-G) 305 V AC (N-G)	550 V AC (L-L) 275 V AC (L-N) 275 V AC (550 V AC (HL-G)) (L-G) 440 V AC (N-G)
Short-circuit current rating (SCCR)	200 kA	200 kA
Voltage protection rating VPR	1200 V (L-L) 700 V (L-N) 900 V (L-G) 900 V (N-G)	1800 V (L-L) 1000 V (L-N) 1500 V (L-G) 1500 V (N-G)
Approvals		
Nominal discharge current I _n	20 kA	20 kA
Maximum surge current per phase	65 kA	40 kA
Type	VAL-US-SPP-240HLD/65/3+1-R	VAL-US-SPP-480HLD/40/3+1-R
Item no.	1790794	1790795

UL-compliant surge protection

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Surge protection for power supplies

UL-listed type 1 surge protection – circuit version 3+1 (wye)			
COMPLETE line			
Number of positions	4-pos. NEW	4-pos. NEW	4-pos. NEW
Nominal voltage U_N	120/208 V AC (wye)	120/208 V AC (wye)	240/415 V AC (wye)
Type in accordance with UL	1	1	1
Maximum continuous voltage MCOV	350 V AC (L-L) 175 V AC (L-N) 175 V AC (L-G) 305 V AC (N-G)	350 V AC (L-L) 175 V AC (L-N) 175 V AC (L-G) 305 V AC (N-G)	770 V AC (L-L) 385 V AC (L-G) 305 V AC (N-G)
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA
Voltage protection rating VPR	1200 V (L-L) 700 V (L-N) 900 V (L-G) 900 V (N-G)	1200 V (L-L) 700 V (L-N) 900 V (L-G) 900 V (N-G)	2500 V (L-L) 1500 V (L-N) 1500 V (L-G) 900 V (N-G)
Approvals			
Nominal discharge current I_n	20 kA	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA	50 kA
Type	VAL-US-SPP-120/50/3+1-R	VAL-US-SPP-120/65/3+1-R	VAL-US-SPP-240/50/3+1-R
Item no.	1790750	1790760	1790767

COMPLETE line			
Number of positions	4-pos. NEW	4-pos. NEW	4-pos. NEW
Nominal voltage U_N	277/480 V AC (wye)	277/480 V AC (wye)	400/690 V AC (wye) 347/600 V AC (wye)
Type in accordance with UL	1	1	1
Maximum continuous voltage MCOV	770 V AC (L-L) 385 V AC (L-N) 385 V AC (L-G) 305 V AC (N-G)	770 V AC (L-L) 385 V AC (L-N) 385 V AC (L-G) 305 V AC (N-G)	1100 V AC (L-L) 550 V AC (L-N) 550 V AC (L-G) 440 V AC (N-G)
Short-circuit current rating (SCCR)	200 kA	200 kA	200 kA
Voltage protection rating VPR	2500 V (L-L) 1500 V (L-N) 1500 V (L-G) 900 V (N-G)	2500 V (L-L) 1500 V (L-N) 1500 V (L-G) 900 V (N-G)	4000 V (L-L) 2000 V (L-N) 3000 V (L-G) 1500 V (N-G)
Approvals			
Nominal discharge current I_n	20 kA	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA	40 kA
Type	VAL-US-SPP-277/50/3+1-R	VAL-US-SPP-277/65/3+1-R	VAL-US-SPP-400/40/3+1-R
Item no.	1790774	1790779	1790785

UL-listed type 1 surge protection – circuit version 4+0 (wye)		
Number of positions	4-pos. NEW	4-pos. NEW
Nominal voltage U_N	277/480 V AC (wye)	277/480 V AC (wye)
Type in accordance with UL	1	1
Maximum continuous voltage MCOV	770 V AC (L-L) 385 V AC (L-N) 385 V AC (L-G) 385 V AC (N-G)	770 V AC (L-L) 385 V AC (L-N) 385 V AC (L-G) 385 V AC (N-G)
Short-circuit current rating (SCCR)	200 kA	200 kA
Voltage protection rating VPR	2500 V (L-L) 2500 V (L-N) 1500 V (L-G) 1500 V (N-G)	2500 V (L-L) 2500 V (L-N) 1500 V (L-G) 1500 V (N-G)
Approvals		
Nominal discharge current I_n	20 kA	20 kA
Maximum surge current per phase	50 kA	65 kA
Type	VAL-US-SPP-277/50/4+0-R	VAL-US-SPP-277/65/4+0-R
Item no.	1790776	1790781

UL-compliant surge protection

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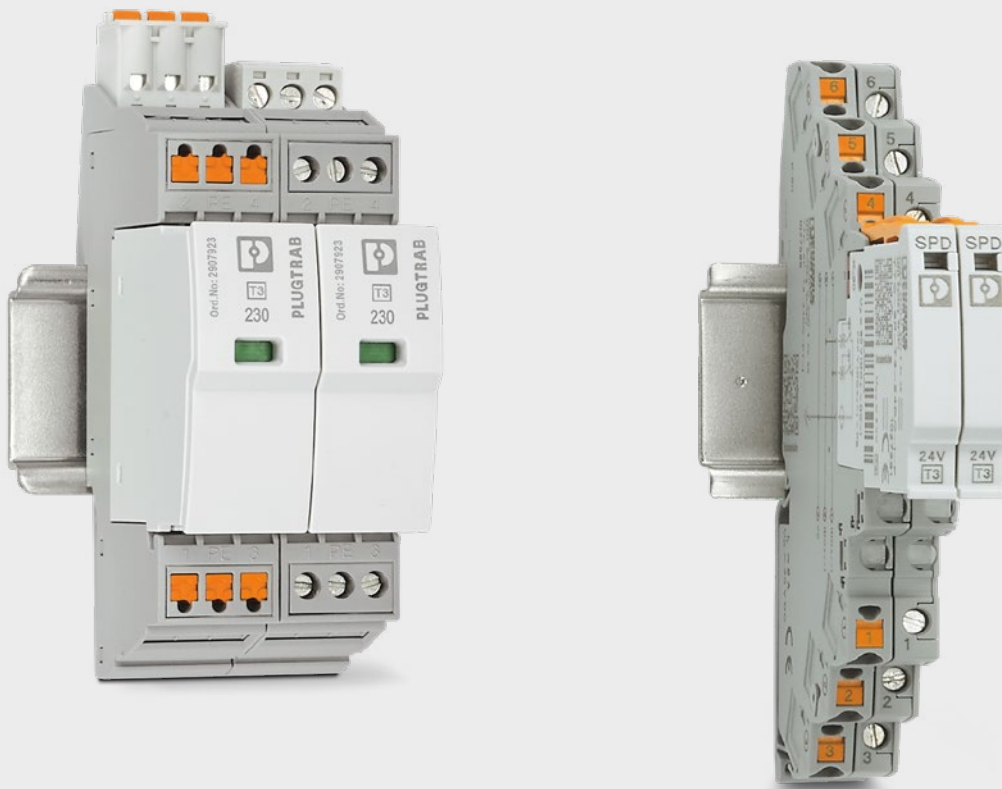
Surge protection for power supplies

Surge protection for 24 V DC and 48 V DC applications – UL-listed		
COMPLETE line		
Number of positions	1-pos.	2-pos.
Nominal voltage U_N	48 V DC	48 V DC
Type in accordance with UL	1	1
Maximum continuous voltage MCOV	100 V DC	100 V DC ((DC+)-(DC-)) 100 V DC ((DC+)-G) 100 V DC ((DC-)-G)
Short-circuit current rating (SCCR)	5 kA	5 kA (DC)
Voltage protection rating VPR	400 V	400 V ((DC+)-(DC-)) 400 V ((DC+)-G) 600 V ((DC-)-G)
Approvals		
Nominal discharge current I_n	20 kA	20 kA
Maximum surge current per phase	65 kA	65 kA
Type	VAL-US-48/65/1+0-FM	VAL-US-48/65/1+1V-FM
Item no.	2910345	2910346

Reliable protection for modern systems

Secure end device protection for industry and buildings

Robust industrial processes and modern building automation systems require the reliable protection of sensitive end devices against surges. Type 3 surge protection supplements existing type 2 installations and ensures that control systems, sensors, and smart home technology continue to work undisturbed even during transient events.



Your advantages

- ✓ Variable in installation with different designs
- ✓ Powerful protection for AC and DC applications enables use in a variety of applications
- ✓ Disconnect device provides increased safety in case of electrical and thermal overload

Device protection for different applications

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Surge protection for power supplies

Surge protection and power supply for high system availability

For extreme operating conditions, use the optimally coordinated combination of PLUGTRAB-SEC surge protection and powerful 4th generation QUINT POWER power supply.

Higher current carrying capacity

Using harmonized surge protective components enables symmetrical current distribution when overvoltage occurs.

Up to ten times higher protection

By using the type 3 PLT-SEC surge protective device, the QUINT POWER 4th generation power supply is ten times better able to withstand surge currents than it would be without the protection.

Double the life expectancy

A comparison with uncoordinated products shows that our combination of PLT-SEC surge protection and QUINT POWER 4th generation power supply doubles the power supply's life expectancy.

5-year warranty

If your 4th generation QUINT POWER becomes damaged in the first five years following purchase despite using this combination, you will receive a free replacement.

For further information and conditions, see our website at:

phoenixcontact.com/perfectteam

- Overview of the PLT-SEC type 3 products:
More information starting on page 44



A strong team combining surge protection and a power supply

Surge protection for I/Os and controllers

Based on the 6 mm wide TERMITRAB complete range, the TTC type 3 protects the 24 V power supplies of end devices such as I/Os and controllers against surge voltages from the field.

Moreover, the TTC type 3 can be used to protect a potential distribution system from the CLIPLINE complete terminal block program and PTCB device circuit breakers directly against surge voltages. Of the same contour as the TTC type 3, the PTCB electronic circuit breakers are the ideal overcurrent protection for your end devices.

- You will find more information on electronic circuit breakers at:
phoenixcontact.com/electronic-circuit-breakers



Protect potential distribution systems directly against surge voltages.

Protection directly at the end device

Type 3 device protection with Push-in connection					
COMPLETE line					
Number of positions	2-pos.	2-pos.	2-pos.	2-pos.	2-pos.
Nominal voltage	24 V DC	24 V AC (TN-S)	60 V AC (TN-S)	120 V AC (TN-S) 120 V AC (TT)	240 V AC (TN-S) 240 V AC (TT)
Type in accordance with IEC	T3	T3	T3	T2 / T3	T2 / T3
Maximum continuous operating voltage U _c	30 V DC	34 V AC	80 V AC	150 V AC	264 V AC
Voltage protection level	≤0.09 kV (U _{oc} = 2 kV) ≤0.2 kV (U _{oc} = 6 kV) (DC-DC) ≤0.7 kV (DC-PE)	≤0.2 kV (L-N) ≤0.6 kV (N-PE)	≤0.48 kV (L-N) ≤0.8 kV (N-PE)	≤0.75 kV (L-N) ≤0.85 kV (N-PE)	≤1.25 kV (L-N) ≤1.4 kV (N-PE)
Max. backup fuse F2	6 A (gG)	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)
Approvals					
Nominal discharge current	1 kA	1 kA	2 kA	5 kA	5 kA
Combined surge	2 kV (2 Ω)	2 kV	4 kV	6 kV	6 kV
Type	TTC-6P-T3-24DC-PT-I	PLT-SEC-T3-24-FM-PT	PLT-SEC-T3-60-FM-PT	PLT-SEC-T3-120-FM-PT	PLT-SEC-T3-230-FM-PT
Item no.	1027586	2907925	2907926	2907927	2907928

Protection directly at the end device

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Surge protection for power supplies

Type 3 device protection with screw connection					
COMPLETE line					
Number of positions	2-pos.	2-pos.	2-pos.	2-pos.	2-pos.
Nominal voltage	24 V DC	24 V AC (TN-S)	60 V AC (TN-S)	120 V AC (TN-S) 120 V AC (TT)	240 V AC (TN-S) 240 V AC (TT)
Type in accordance with IEC	T3	T3	T3	T2 / T3	T2 / T3
Maximum continuous operating voltage U_c	30 V DC	34 V AC	80 V AC	150 V AC	264 V AC
Voltage protection level	≤ 0.09 kV ($U_{oc} = 2$ kV) ≤ 0.2 kV ($U_{oc} = 6$ kV) (DC-DC) ≤ 0.7 kV (DC-PE)	≤ 0.2 kV (L-N) ≤ 0.6 kV (N-PE)	≤ 0.48 kV (L-N) ≤ 0.8 kV (N-PE)	≤ 0.75 kV (L-N) ≤ 0.85 kV (N-PE)	≤ 1.25 kV (L-N) ≤ 1.4 kV (N-PE)
Max. backup fuse F2	6 A (gG)	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)	32 A (gG / B / C)
Approvals		DNV 	DNV 	DNV 	DNV 
Nominal discharge current	1 kA	1 kA	2 kA	5 kA	5 kA
Combined surge	2 kV (2 Ω)	2 kV	4 kV	6 kV	6 kV
Type	TTC-6P-T3-24DC-UT-I	PLT-SEC-T3-24-FM-UT	PLT-SEC-T3-60-FM-UT	PLT-SEC-T3-120-FM-UT	PLT-SEC-T3-230-FM-UT
Item no.	1027584	2907916	2907917	2907918	2907919

Surge protection and power supplies

The perfect team for high system availability

Combine our products to create an overall concept and benefit from the advantages of system integration.

Systems are precisely clocked – one component fails, and system downtimes occur. Surge voltages, mains interruptions, or fluctuations as well as an overload or short circuit can severely impact your system. High availability requires coordinated components that not only supply, but also protect.



Your advantages

- ✔ Surge protection for protection concepts in every application
- ✔ Device circuit breaker for protection against overload and short circuit
- ✔ Failsafe and reliable through coordinated components
- ✔ Individual expansion with the comprehensive product portfolio

Further information on surge protection and device protection

Simply scan the QR code or enter the web code into the search field on our website.



Power supplies



 Web code:
#0151

Device protection



 Web code:
#0156

Protection for high system availability

Our products for the operational safety of electrical systems, installations, and devices enable you to effortlessly create an uninterruptible and clean power supply, as well as a stable data connection.

Increasing demand for high quality and efficiency in production is leading

to the construction of increasingly complex systems. At the same time, the requirements on safety and availability are increasing. The failure of machines or larger system parts results in significant costs.

With our coordinated product portfolio for power supplies and coordinated protective devices, a protection concept can be created for any application.



Power supplies, DC/DC converters, redundancy modules, and uninterruptible power supplies

- Power supplies for the reliable supply of your system, with various designs, performance classes, and functions
- DC/DC converters for a regulated direct voltage, with long cable lengths
- Redundancy, UPS, and battery modules for decoupling power supply units connected in parallel as well as for uninterrupted system operation of DC and AC loads

Device circuit breakers for different requirements:

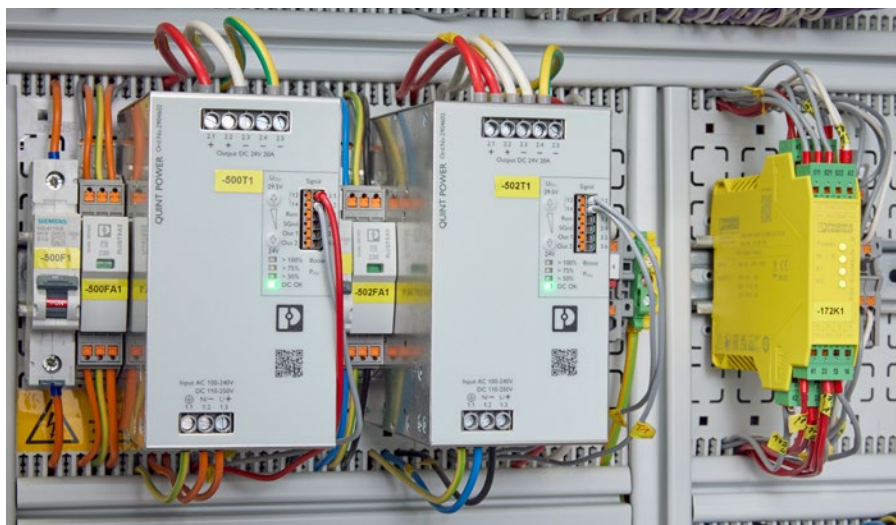
- Electronic circuit breakers for protection in the event of overload, short circuit, line attenuation, and high input capacitance
- Thermal-magnetic circuit breakers for protection in the event of overload and short circuit
- Thermal circuit breakers for protection in the event of overload

The protected system

Components that work together perfectly are needed to ensure permanently high system availability. This is exactly where the powerful team of PLUGTRAB-SEC surge protection and QUINT POWER power supplies comes in. Both technologies are optimally matched to each other. They offer maximum safety even under high EMC loads and in harsh environments. The symmetrical current distribution increases the load capacity of the power supply tenfold and doubles its service life. This reliably prevents unplanned downtime, stabilizes production processes, and creates planning security. This combination makes the duo the ideal solution for demanding applications where protection, efficiency, and availability are paramount.

You will find more product combinations with added value at:

phoenixcontact.com/perfectteam

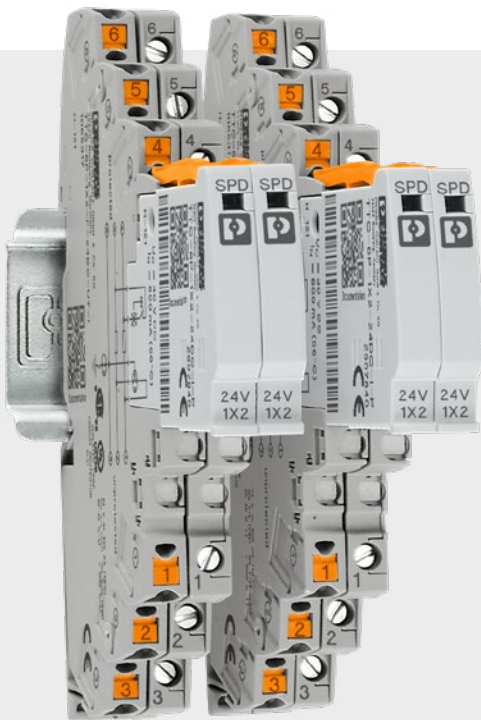


Surge protection for measurement and control technology

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Interference-free signal transmission guaranteed

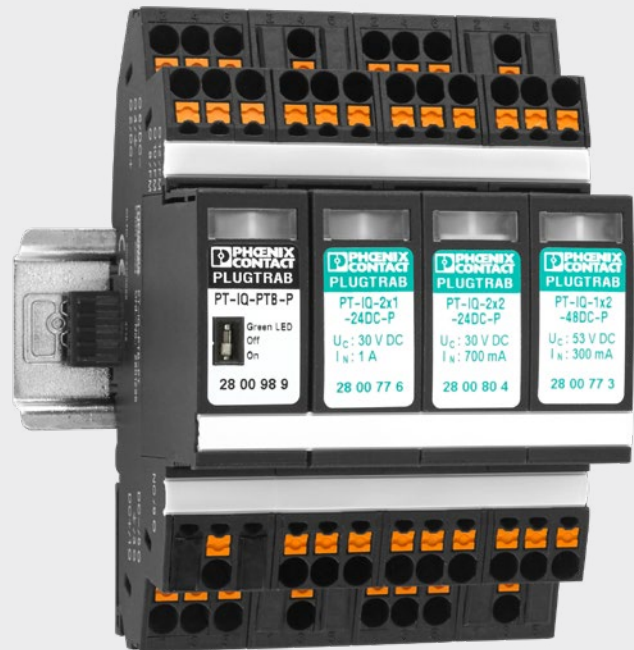
The interfaces in measurement and control technology are particularly sensitive. Even low surge voltages have the potential to disrupt smooth operation of the building control technology, production, and process technology. Surge protection systems specially tailored to the requirements enable the interference-free transmission of signals.



Compact for every application

TERMITRAB complete – surge protection with an overall width starting at 3.5 mm for applications in the extra-low-voltage range with a selectable range of functions.

➤ More information starting on page 52



Intelligent and predictive

PLUGTRAB PT-IQ – surge protection with intelligent monitoring of applications in the extra-low-voltage range with three-stage function indicator.

➤ More information starting on page 62

	TERMITRAB complete	PLUGTRAB PT-IQ	CLIXTRAB	SURGETRAB
Mounting type	DIN rail	DIN rail	DIN rail	Can be screwed onto field device
Overall width	3.5 mm / 6.2 mm	17.5 mm	10.3 mm	½ inch, M20
Connection technology	Push-in / screw	Push-in / screw	Push-in	Cables
Pluggable / not pluggable	Yes / Yes	Yes / No	Yes / No	-
Status indicator	2-stage, mechanical	3-stage, LED	2-stage, mechanical	No
Remote signaling	Optional	Yes	Optional	No
Can be tested with CHECKMASTER 2	Yes	Not necessary	Yes	No
Intrinsically safe versions (Ex i)	Yes	Yes	No	Yes



Space-saving for high signal voltages

CLIXTRAB – the combination of surge protection and terminal block for signal voltages up to 230 V AC/DC with function indicator.

➤ More information starting on page 68



Robust for applications in the field

SURGETRAB – surge protection for easy mounting on field devices.

➤ More information starting on page 72

Typical applications for MCR products

Process technology

Transient overvoltages are often indirectly coupled into copper cables, for example, as when lightning strikes in the vicinity. These cause defects in electronic MCR systems in process technology systems, which can lead to system downtime and costly repair work. Surge protection designed specifically to protect your system against surge voltages is always recommended. This ensures that your system is in stable condition over the long term. The comprehensive portfolio includes an optimized circuit for every application. The surge protective devices feature a variety of additional functions

that make maintenance easier in large processing systems. Products with an integrated disconnect knife enable separation between the controller and the field cable, for example. This allows maintenance work and measurements to be carried out easily. Product families for potentially explosive areas and for direct installation on measuring heads complete the portfolio.



Stable processes even in extreme weather situations

Wind turbine generators

Maximum system availability, safe operation, and efficient maintenance are required to optimize the energy yield from wind turbine generators. Surge protection for MCR technology helps you in reaching these goals. Wind turbine generators are installed in exposed locations. They are often the tallest structures in the area, so they are hit by many lightning strikes. A broad portfolio of surge protective devices makes it possible to protect the high number of sensors in a wind turbine generator. System availability is optimized. This provides optimum protection of systems for blade load monitoring,

wind measurement, speed measurement, and condition monitoring of the system. State monitoring with a remote signaling option for surge protective devices is available to ensure efficient maintenance. Even the harsh ambient conditions in which a wind turbine generator operates cannot impede optimal protection.



Protected signal circuits at lofty heights

Water and wastewater treatment

High system availability and a comprehensive maintenance concept are essential for state-of-the-art system operation in water and wastewater treatment. To ensure this, the use of surge protection for MCR technology is recommended. The various devices offer numerous additional functions, such as the ability to permanently monitor the status of the surge protection via telecommunication systems in a central control room. This reduces the amount of maintenance required for external structures such as groundwater wells and wastewater pumping stations.

Products with integrated knife disconnection also simplify the maintenance and diagnostics of connected field devices. The devices can even be used reliably in harsh ambient conditions. The product portfolio for surge protection in the field of MCR technology includes solutions for protecting various interfaces in the water and wastewater treatment industry.



Clean water with high system availability

Photovoltaics

Data networking is playing an ever increasing role in photovoltaic systems. Due to the decentral structure in ground-mounted systems, transmission systems are particularly exposed to the dangers of coupled, transient overvoltages. Sensors, data loggers, and transmission systems ensure the comprehensive, split-second recording of PV performance data and meteorological measured values. Permanent availability is prerequisite for the stable operation of such a system. It is necessary to use special surge protection products to protect the copper-based transmission systems against transient

surge voltages during storms. In the worst case, a transient overvoltage can cause a complete failure of the system monitoring system if control and data cables are unprotected. Depending on requirements, our comprehensive portfolio includes the perfect surge protective devices to protect measurement, control, and data cables in photovoltaic projects.



Prevention of complete PV facility failures

Railway infrastructure

Control command and signaling technology ensures safe and reliable railway operations. In signal boxes, secured routes are set up, points are set, and the corresponding signals are switched. In addition to signals, external signal technology systems also contain components such as axle counters and track-clear signaling devices, which are necessary for interference-free operation. Overvoltages that are caused by lightning strikes or sparkovers on overhead lines, for example, can occur at any time in the extensive rail network and endanger the measurement and control data.

Reliable lightning and surge protection is therefore essential to protect signal technology and control systems from damage caused by transient couplings. Since high signal voltages are often used in railway technology, the CLIXTRAB product family of surge protective devices offers optimal protection even for these special requirements.

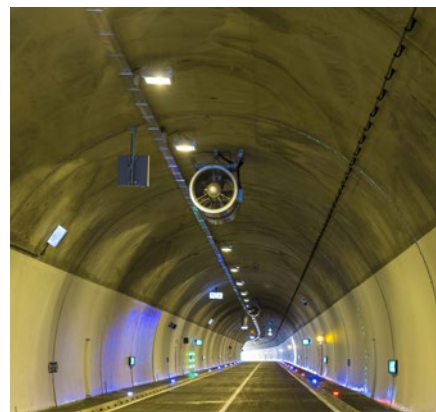


Modern railway infrastructure with surge protection

Transportation infrastructure

Transient overvoltages caused by lightning strikes or switching operations can damage technical systems and devices, and even cause them to fail. Despite their underground location, tunnels are not protected against such events. There are numerous safety-relevant systems in a tunnel, such as ventilation, emergency lighting, and traffic signal control, and it is essential to ensure that they operate reliably. Any failures that arise due to overvoltage will lead to expensive repairs and even tunnel closure. Each interface therefore requires suitable surge protection.

The extensive product range features the right solution for every requirement, such as for fast data communication or for monitoring and controlling technical systems. Intelligent components detect when their performance limit has been reached at an early stage so that the protective device can be replaced and tunnel operation remains interference-free.



Safely through the tunnel thanks to surge protection

Narrow protection for MCR applications

Slim design, powerful performance

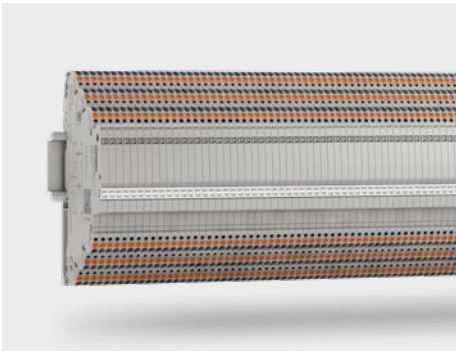
TERMITRAB complete is the world's narrowest surge protection solution for MCR technology. Starting from an overall width of just 3.5 mm, the product family provides you with a complete system with many advantages. Depending on your requirements, choose from simple protective devices in a slim design to items with comprehensive functions.



Your advantages

- ✓ Space saving, thanks to the world's narrowest surge protection starting from 3.5 mm
- ✓ Stay informed at all times with the integrated status indicator and remote signaling option
- ✓ Ideal protection for your application with the tailored portfolio

TERMITRAB complete – compact for every application



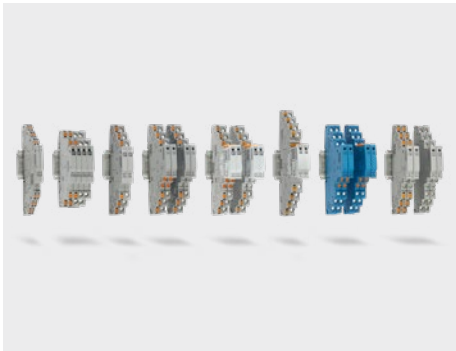
Extremely narrow overall width

Starting at an overall width of just 3.5 mm – protect up to 572 signals across 1 m with the ultra-slim overall width.



Status indicator and remote signaling

Always know what is going on. With a mechanical status indicator on the protective device or via optional remote signaling modules in the control room.



Tailored portfolio

With TERMITRAB complete, you will find the ideal surge protective device for your specific requirements.

Testing and maintenance made easy

TERMITRAB complete features versions with integrated knife disconnection. This saves even more installation space. The disconnection option can be used on the top two terminal levels. For example, insulation measurements can be carried out on the cables without the voltage-limiting components distorting the test results.

Pluggable surge protective devices can be replaced during maintenance without having to access the wiring. The measuring signal is not interrupted, which means that errors are not generated in the measurement results.

Testing directly at the protective device

Item designation key		
TTC-6P-1X2-F-M-24DC-PT-I	Example	Further options
	Indicator (status indicator)	Without indicator (status indicator)
	Push-in	Universal terminal (screw)
	24 V DC	5 V DC / 12 V DC / 48 V DC / 60 V DC / 120 V AC
	Knife disconnection	Ex applications
	Floating	Directly grounded
	1X2 ONEPAIR (isolated)	2X1 / 2 / 2-HC / 3 / 3-HF / 4 / TELE / APL
	Pluggable	One-piece
	6 mm	3.5 mm
	TERMITRAB complete	

TERMITRAB complete – compact for every application

Basic protection for isolated signal circuits and signals with a common reference potential		
COMPLETE line		
Pluggable	No	No
Knife disconnection	No	No
Number of signal wires	3	2
Rated current	250 mA (70°C)	
Maximum continuous voltage U _c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I _{imp} (10/350) µs	0.5 kA	
Total discharge current I _{total} (8/20) µs	10 kA	
Resistance per path	2.2 Ω ±10%	
Push-in connection	TTC-3-2X1-24DC-PT 2907326	TTC-3-1X2-24DC-PT 2907325

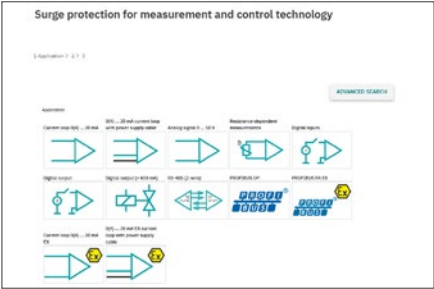
Isolated signal circuits		
COMPLETE line		
Pluggable	Yes	No
Knife disconnection	Yes	Yes
Number of signal wires	3	3
Rated current	600 mA (56°C)	600 mA (40°C)
Maximum continuous voltage U _c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I _{imp} (10/350) µs	0.5 kA	
Total discharge current I _{total} (8/20) µs	10 kA	
Resistance per path	1.65 Ω ±20%	
Push-in connection	TTC-6P-3-HF-F-M-24DC-PT-I 2906797	TTC-6-3-HF-F-M-24DC-PT-I 2906779
Screw connection	TTC-6P-3-HF-F-M-24DC-UT-I 2906787	TTC-6-3-HF-F-M-24DC-UT-I 2906770

TERMITRAB complete – compact for every application

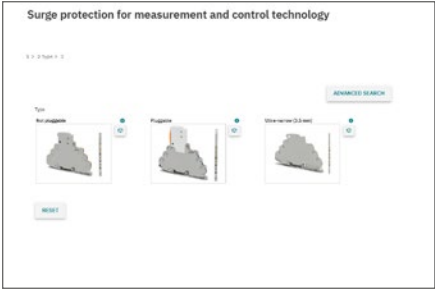
The right product is just two clicks away

TERMITRAB complete offers over 100 items with different circuit and voltage variants. Various connection technologies and product features complete the portfolio. This variety provides a solution for virtually all applications in MCR technology. The configurator helps you to keep track of everything. In just two clicks, you can navigate to a selection of products that offer optimum protection for your application. First, select the application or interface that you want to protect. Then select the desired design. You then also have the option to define additional features on the selection page.

If a suitable TERMITRAB complete product is not available for your application, use the advanced search to find more items.



Step 1:
Select the application or interface

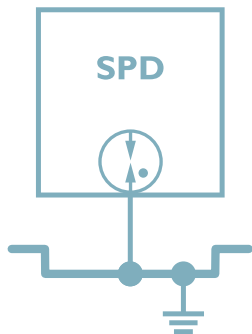


Step 2:
Select the design

For further information on the online configurator, simply enter the web code in the search field on our website.

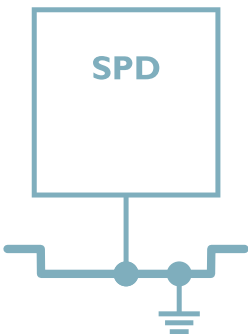
 **Web code: #1389**

Direct and indirect grounding



Indirect grounding

For surge protective devices with “F” in the name, the connection terminal blocks for the shield or the reference potential are indirectly connected to the metal mounting foot via a gas discharge tube and thus to the DIN rail.



Direct grounding

For surge protective devices without “F” in the name, the connection terminal blocks for the shield or the reference potential are directly connected to the DIN rail via the metal mounting foot.

TERMITRAB complete – compact for every application

Common reference potential, directly grounded				
				
Pluggable	Yes	Yes	No	No
Knife disconnection	Yes	No	Yes	No
Number of signal wires	3	3	3	3
Rated current	600 mA (56°C)		600 mA (40°C)	
Maximum continuous voltage U _c	30 V DC / 21 V AC			
IEC test classification	C1, C2, C3, D1			
Pulse discharge current I _{imp} (10/350) µs	0.5 kA			
Total discharge current I _{total} (8/20) µs	10 kA			
Resistance per path	1.65 Ω ±20%			
Push-in connection	TTC-6P-2X1-M-24DC-PT-I 2906753	TTC-6P-2X1-24DC-PT-I 2906816	TTC-6-2X1-M-24DC-PT-I 2906729	TTC-6-2X1-24DC-PT 2906805
Screw connection	TTC-6P-2X1-M-24DC-UT-I 2906741	TTC-6P-2X1-24DC-UT-I 2906810	TTC-6-2X1-M-24DC-UT-I 2906716	TTC-6-2X1-24DC-UT 2906799

Common reference potential, indirectly grounded		
		
Pluggable	Yes	No
Knife disconnection	Yes	Yes
Number of signal wires	3	3
Rated current	600 mA (56°C)	600 mA (40°C)
Maximum continuous voltage U _c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I _{imp} (10/350) µs	0.5 kA	
Total discharge current I _{total} (8/20) µs	10 kA	
Resistance per path	1.65 Ω ±20%	
Push-in connection	TTC-6P-3-HF-F-M-24DC-PT-I 2906797	TTC-6-3-HF-F-M-24DC-PT-I 2906779
Screw connection	TTC-6P-3-HF-F-M-24DC-UT-I 2906787	TTC-6-3-HF-F-M-24DC-UT-I 2906770

TERMITRAB complete – compact for every application

For resistance-dependent measurements				
				
Pluggable	Yes	Yes	Yes	No
Knife disconnection	No	No	No	No
Number of signal wires	4	3	3	2
Rated current	2.5 A (60°C, for insulated systems)	5 A (55°C)		450 mA (80°C)
Maximum continuous voltage U _c	36 V DC / 30 V AC	5 V DC / 3 V AC	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	C1, C2, C3	C1, C2, C3, D1	
Pulse discharge current I _{imp} (10/350) μs	0.5 kA	—	0.5 kA	
Total discharge current I _{total} (8/20) μs	10 kA			
Resistance per path	0.03 Ω	<0.1 Ω		≤100 mΩ
Push-in connection	TTC-6P-4-24DC-PT-I 1106014	TTC-6P-3-5DC-PT-I 1061385	TTC-6P-3-24DC-PT-I 1061383	TTC-6-2-24DC-PT 2906806
Screw connection	TTC-6P-4-24DC-UT-I 1106013			TTC-6-2-24DC-UT 2906800

TERMITRAB complete – compact for every application

For potentially explosive applications with isolated signal circuits		
COMPLETE line		
Pluggable	Yes	No
Knife disconnection	Yes	Yes
Number of signal wires	3	3
Rated current	600 mA (40°C)	
Maximum continuous voltage U _c	30 V DC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I _{imp} (10/350) µs	0.5 kA	
Total discharge current I _{total} (8/20) µs	10 kA	
Resistance per path	1.65 Ω ±20%	
Screw connection	TTC-6P-3-HF-F-M-EX-24DC-UT-I 2906828	TTC-6-3-HF-F-M-EX-24DC-UT-I 2906823

For potentially explosive applications with resistance-dependent measurements	
COMPLETE line	
Pluggable	Yes
Knife disconnection	No
Number of signal wires	3
Rated current	5 A (55°C)
Maximum continuous voltage U _c	30 V DC
IEC test classification	C1, C2, C3, D1
Pulse discharge current I _{imp} (10/350) µs	0.5 kA
Total discharge current I _{total} (8/20) µs	10 kA
Resistance per path	<0.1 Ω
Screw connection	TTC-6P-3-EX-24DC-UT-I 1064665

TERMITRAB complete – compact for every application

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Surge protection for measurement and control technology

Signal circuits with high rated current

COMPLETE line				
Pluggable	Yes	Yes	No	No
Knife disconnection	Yes	No	Yes	No
Number of signal wires	2	2	2	2
Rated current	6 A (55°C)			
Maximum continuous voltage U_c	30 V DC / 21 V AC			
IEC test classification	C1, C2, C3, D1			
Pulse discharge current I_{imp} (10/350) μ s	0.5 kA			
Total discharge current I_{total} (8/20) μ s	5 kA			
Resistance per path	≤ 100 m Ω			
Push-in connection	TTC-6P-2-HC-M-24DC-PT-I 2906755	TTC-6P-2-HC-24DC-PT-I 2906817	TTC-6-2-HC-M-24DC-PT-I 2906731	TTC-6-2-HC-24DC-PT-I 2908439
Screw connection	TTC-6P-2-HC-M-24DC-UT-I 2906743	TTC-6P-2-HC-24DC-UT-I 2906811	TTC-6-2-HC-M-24DC-UT-I 2906719	TTC-6-2-HC-24DC-UT-I 2908438

Single-level protective devices, fine protection with suppressor diode

COMPLETE line				
Pluggable	No	No	No	No
Knife disconnection	No	No	No	No
Number of signal wires	2	1	2	2
Rated current	10 A (60°C)		6 A (55°C)	
Maximum continuous voltage U_c	30 V DC / 21 V AC			15 V DC / 10 V AC
IEC test classification	C3		C1, C3	C1, C2, C3
Total discharge current I_{total} (8/20) μ s	—		1 kA	2 kA
Resistance per path	≤ 100 m Ω			
Direction of action	Line-line			
Push-in connection	TTC-6-TVSD-D-24DC-PT-I 2906851	TTC-6-TVSD-C-24DC-PT-I 2906848	TTC-6-2XTVSD-24DC-PT 2906808	TTC-6-2XTVSD-12DC-PT 2906807
Screw connection	TTC-6-TVSD-D-24DC-UT-I 2906834	TTC-6-TVSD-C-24DC-UT-I 2906831		

TERMITRAB complete – compact for every application

Single-level protective devices, medium protection with metal oxide varistor				
COMPLETE line				
Pluggable	No	No	No	No
Knife disconnection	No	No	No	No
Number of signal wires	2	2	1	1
Rated current	10 A (60°C)			
Maximum continuous voltage U_c	30 V DC / 21 V AC	150 V DC / 150 V AC	30 V DC / 21 V AC	150 V DC / 150 V AC
IEC test classification	C1, C2, C3			
Resistance per path	≤100 mΩ			
Direction of action	Line-line		Line-earth ground	
Push-in connection	TTC-6-MOV-D-24DC-PT-I 2906859		TTC-6-MOV-C-24DC-PT-I 2906854	TTC-6-MOV-C-120AC-PT-I 2906858
Screw connection	TTC-6-MOV-D-24DC-UT-I 2906841	TTC-6-MOV-D-120AC-UT-I 1109673	TTC-6-MOV-C-24DC-UT-I 2906837	TTC-6-MOV-C-120AC-UT-I 2906840

Single-level protective devices, coarse protection with gas discharge tube	
COMPLETE line	
Pluggable	No
Knife disconnection	No
Number of signal wires	1
Rated current	1 A DC (60 °C) / 2 A AC (60 °C)
Maximum continuous voltage U_c	28 V DC / 36 V AC
IEC test classification	C1, C2, C3, D1
Pulse discharge current I_{imp} (10/350) μs	0.5 kA
Resistance per path	≤100 mΩ
Direction of action	Line-earth ground
Push-in connection	TTC-6-GDT-C-24AC-PT-I 2906860
Screw connection	TTC-6-GDT-C-24AC-UT-I 2906842

TERMITRAB complete – compact for every application

Remote signaling sets and modules		
		
Description	Remote signaling module – transmitter	Remote signaling module – receiver
Push-in connection	TTC-6-FMTX-PT 1193565	TTC-6-FMRX-PT 1193571
Screw connection	TTC-6-FMTX-UT 1193555	TTC-6-FMRX-UT 1193557

Intelligent and predictive

Systematic surge protection

PLUGTRAB PT-IQ is a system comprising a supply and remote signaling module and the actual surge protective devices with a three-level status indicator. One module supplies the protective devices and provides the group remote signaling for up to 28 protective modules. Each voltage-limiting component is intelligently monitored.



Your advantages

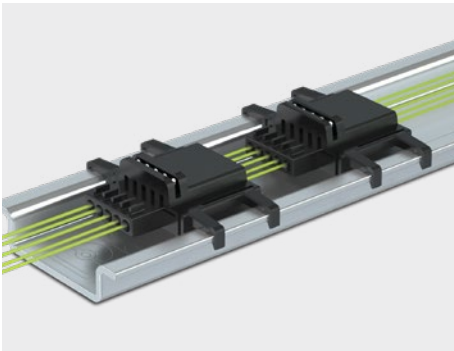
- ✓ Preventive replacement of surge protective devices with pre-existing damage with multi-stage display and remote signaling
- ✓ Direct installation in Ex zone 2 with protective devices for intrinsically safe circuits up to Ex zone 0
- ✓ Rapid and error-free installation with DIN rail connectors and coded plugs

PLUGTRAB PT-IQ – intelligent and predictive



Visual control function

The status at a glance: green = everything ok, yellow = replacement recommended, red = replacement required.



Permanent installation

Power supply and status information via individual DIN rail connectors that can be extended to form a bus.



Easy to extend

A controller supplies up to 28 protective modules and collects the status of the protective devices.

Always know what is going on

The protective devices of the PLUGTRAB range feature practical functions. The protective devices are pluggable, which means they can be quickly replaced when necessary, even when the system is in operation.

PLUGTRAB PT-IQ provides multi-stage monitoring of the protective devices and group messages via the controller. A yellow status signal indicates that the performance limit has been reached, as a result of frequent surge voltages. The protective devices are still functional. Your system continues to be protected. However, to avoid unnecessary

service operations, a replacement is recommended. Remote signaling enables you to check how well your system is being protected at any time and place.

PLUGTRAB PT-IQ with three-level status indicator

Item designation key		
PT-IQ-1X2+F- 24DC-PT	Example	Further options
	Push-in	Universal terminal (screw)
	24 V DC	5 V DC / 12 V DC / 48 V DC / 60 V DC
	Floating (indirectly grounded)	Directly grounded
	1X2 ONEPAIR (isolated)	2X1 / 3-HF / 4X1/ 5-HF / TELE / PTB
	PLUGTRAB-IQ	

PLUGTRAB PT-IQ – intelligent and predictive

Isolated signal circuits, directly grounded		
		
Pluggable	Yes	Yes
Number of signal wires	2	4
Rated current	1000 mA (40°C)	700 mA (50°C)
Maximum continuous voltage U_c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I_{imp} (10/350) μ s	2.5 kA	
Total discharge current I_{total} (8/20) μ s	20 kA	
Cut-off frequency	Type 1.1 MHz	
Resistance per path	1.2 Ω $\pm$ 5%	
Direction of action	Line-line Line-signal ground/shield Optional signal ground/shield-earth ground	
Push-in connection	PT-IQ-1X2-24DC-PT 2801255	PT-IQ-2X2-24DC-PT 2801263
Screw connection	PT-IQ-1X2-24DC-UT 2800976	PT-IQ-2X2-24DC-UT 2800980

Isolated signal circuits, indirectly grounded		
		
Pluggable	Yes	Yes
Number of signal wires	2	4
Rated current	1000 mA (40°C)	700 mA (50°C)
Maximum continuous voltage U_c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I_{imp} (10/350) μ s	2.5 kA	
Total discharge current I_{total} (8/20) μ s	20 kA	
Cut-off frequency	Type 1.1 MHz	
Resistance per path	1.2 Ω $\pm$ 5%	
Direction of action	Line-line Line-signal ground/shield Optional signal ground/shield-earth ground	
Push-in connection	PT-IQ-1X2+F-24DC-PT 2801256	PT-IQ-2X2+F-24DC-PT 2801264
Screw connection	PT-IQ-1X2+F-24DC-UT 2800977	PT-IQ-2X2+F-24DC-UT 2800981

PLUGTRAB PT-IQ – intelligent and predictive

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Surge protection for measurement and control technology

Common reference potential, directly grounded

		
Pluggable	Yes	Yes
Number of signal wires	3	5
Rated current	1000 mA (40°C)	700 mA (50°C)
Maximum continuous voltage U_c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I_{imp} (10/350) μ s	2.5 kA	
Total discharge current I_{total} (8/20) μ s	20 kA	
Resistance per path	1.2 Ω $\pm$ 5%	
Direction of action	Line-line Line-signal ground/shield Optional signal ground/shield-earth ground	
Push-in connection	PT-IQ-2X1-24DC-PT 2801247	PT-IQ-4X1-24DC-PT 2801271
Screw connection	PT-IQ-2X1-24DC-UT 2800787	PT-IQ-4X1-24DC-UT 2800982

Common reference potential, indirectly grounded

		
Pluggable	Yes	Yes
Number of signal wires	3	5
Rated current	1000 mA (40°C)	700 mA (50°C)
Maximum continuous voltage U_c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I_{imp} (10/350) μ s	2.5 kA	
Total discharge current I_{total} (8/20) μ s	20 kA	
Resistance per path	1.2 Ω $\pm$ 5%	
Direction of action	Line-line Line-signal ground/shield Optional signal ground/shield-earth ground	
Push-in connection	PT-IQ-2X1+F-24DC-PT 2801248	PT-IQ-4X1+F-24DC-PT 2801272
Screw connection	PT-IQ-2X1+F-24DC-UT 2800788	PT-IQ-4X1+F-24DC-UT 2800983

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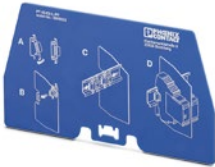
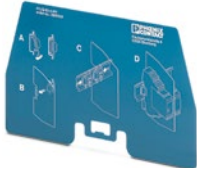
Surge protection for measurement and control technology

PLUGTRAB PT-IQ – intelligent and predictive

For potentially explosive applications		
		
Pluggable	Yes	Yes
Knife disconnection	No	No
Number of signal wires	2	4
Rated current	350 mA	
Maximum continuous voltage U_c	30 V DC / 21 V AC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I_{imp} (10/350) μ s	2 kA	
Total discharge current I_{total} (8/20) μ s	20 kA	
Cut-off frequency	Type 1.1 MHz	
Resistance per path	1.2 Ω $\pm$ 5%	
Direction of action	Line-line Line-signal ground/shield Optional signal ground/shield-earth ground	
Screw connection	PT-IQ-1X2-EX-24DC-UT 2801512	PT-IQ-2X2-EX-24DC-UT 2801513

Supply and remote signaling modules		
		
Connection technology	Screw connection	Push-in connection
Type	PT-IQ-PTB-UT	PT-IQ-PTB-PT
Item no.	2800768	2801296

PLUGTRAB PT-IQ – intelligent and predictive

Accessories: partition plates		
		
Product type	Partition plate	
Description	Partition plate for NS 35/7,5 DIN rails	Partition plate for NS 35/7,5 isolated DIN rails (DIN rail is isolated via the "AB/NS" support bracket)
Type	PT-IQ-EX-L-PP	PT-IQ-EX-H-PP
Item no.	2905023	2905024

Surge protection and terminal blocks

Space-saving for high signal voltages

The combination of terminal block and surge protection plug provides safe and space-saving protection for your system. Comprehensive diagnostic and remote signaling options enable easy maintenance. The powerful protective circuit featuring integrated overload protection provides superior system availability.



Your advantages

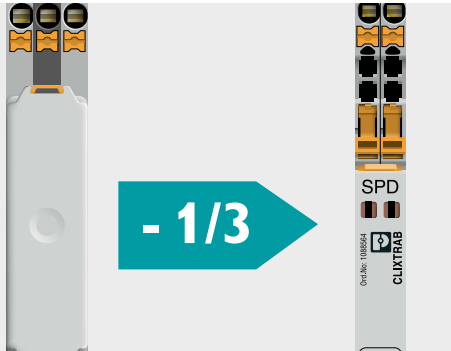
- ✓ Easy installation with Push-in terminal blocks with pluggable surge protection
- ✓ High system availability thanks to a high-performance protective circuit with integrated overload protection
- ✓ Quick and easy diagnostics with optional remote signaling for integration into digital infrastructures

CLIXTRAB – space-saving for high signal voltages



Easy handling

Easy installation with the combination of Push-in terminal blocks and pluggable surge protection.



Narrow overall width

Three become two. Use just two terminal blocks to protect two signal paths in an overall width of 10.3 mm.



Fast error identification

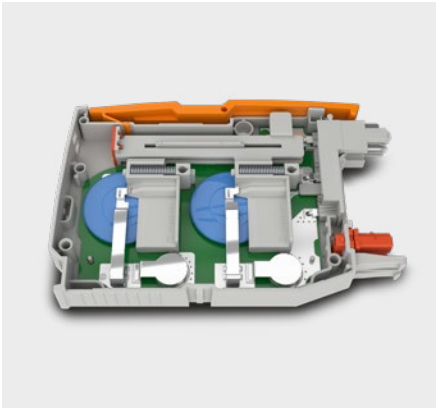
Rapid diagnostics with mechanical status indicator and optional remote signaling for integration into digital infrastructures.

Overload protection and remote signaling

CLIXTRAB features a mechanical disconnect device as overload protection. In the event of overload, the device ensures that faulty components are disconnected from the mode of protection – without auxiliary energy. It is easy to identify faulty protective plugs, as the overload protection is connected to the visual status indicator.

Visual remote signaling is also possible in addition to indication on the plug. The optional remote signaling modules simplify error diagnostics since regular on-site testing is not possible for all components, especially in distributed

structures. Here, the status of the surge protective devices is transferred to subsequent systems via a floating contact. Monitoring is easily incorporated in the control center technology and this transfers the status to the control room. Targeted maintenance can be performed easily and efficiently.



Mechanical disconnect device for permanent availability

Item designation key		
CLT-10P/2-VF-230V-I-P	Example	Further options
Design	Connectors	-
Indicator	With indicator (status indicator)	-
Nominal voltage	230 V	12 V DC / 24 V DC / 60 V DC
Protective circuit	VF	2 / MOV
Signal circuits	2-wire	4-wire
Housing width	10 mm, pluggable	20 mm, pluggable
Product family	CLIXTRAB	

CLIXTRAB – space-saving for high signal voltages

Protective plugs			
			
Nominal voltage	12 V DC	24 V DC	60 V DC
Type in accordance with IEC	C1, C2, C3, D1		
Maximum continuous voltage U_c	15 V DC / 10 V AC	30 V DC / 21 V AC	75 V DC / 53 V AC
Rated current	600 mA (80°C)	200 mA (80°C)	
Total discharge current I_{total} (8/20) μ s	10 kA		
Number of disconnect terminal blocks needed	2		
Type	CLT-10P/2-2-12V-I-P	CLT-10P/2-2-24V-I-P	CLT-10P/2-2-60V-I-P
Item no.	1088569	1088570	1088573

Protective plugs for high nominal voltage			
			
Nominal voltage	240 V AC		240 V AC NEW
Type in accordance with IEC	C1, C2, C3, D1		
Maximum continuous operating voltage U_c	230 V DC / 264 V AC		250 V DC / 275 V AC
Rated current	10 A AC (80°C / 10 A AC C) / 6 A DC (80°C / 6.3 A DC F) / 10 A DC (80°C / 10 A DC D01 gR)		
Total discharge current I_{total} (8/20) μ s	6 kA	12 kA	6 kA
Number of disconnect terminal blocks needed	2	4	2
Type	CLT-10P/2-VF-230V-I-P	CLT-20P/4-VF-230V-I-P	CLT-10P/2-MOV-230V-I-P
Item no.	1088564	1088567	1669983

Accessories – remote signaling modules		
		
Description	Remote signaling module – transmitter	Remote signaling module – receiver
Push-in connection	TTC-6-FMTX-PT 1193565	TTC-6-FMRX-PT 1193571
Screw connection	TTC-6-FMTX-UT 1193555	TTC-6-FMRX-UT 1193557

CLIXTRAB – space-saving for high signal voltages

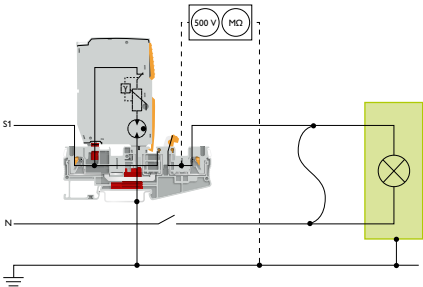
Base element for protective plugs			
			
Description	Disconnect terminal block	Disconnect terminal block	Disconnect terminal block
Nominal current IN	20 A	20 A	20 A
Nominal voltage UN	400 V	400 V	400 V
Cross-section range	0.14 mm² ... 4 mm² / 26 ... 12	0.14 mm² ... 4 mm² / 26 ... 12	0.14 mm² ... 4 mm² / 26 ... 12
DIN rail type	NS 35/7.5 / NS 35/15	NS 35/7.5 / NS 35/15	NS 35/7.5 / NS 35/15
Connection technology	Push-in connection	Push-in connection	Push-in connection
Number of positions	1-pos.	1-pos.	1-position
Type	PT 2,5-MT-CLT	PT 2,5-QUATTRO-MT-CLT	PT 2,5-TWIN-MT-CLT
Item no.	1087698	1251103	1251104

Accessories for base element			
			
Description	End cover	End cover	End cover
Type	D-PT 2,5-MT-CLT	D-PT 2,5-QUATTRO-MT-CLT	D-PT 2,5-TWIN-MT-CLT
Item no.	1088502	1251101	1251102

Simplify maintenance work

CLIXTRAB includes several features that will make maintenance work much easier. The terminal block's integrated knife disconnection can be used to disconnect the signal circuit without accessing the signal lines. This function is not just useful for maintenance work or troubleshooting, but also during startup. When the knife disconnection is opened, it is very easy to perform a measurement of the operating current or the insulation. Testing the lightning and surge protective devices at regular intervals is not only recommended, but indeed prescribed in many areas of application. Due to the surge protection

plug, which can be removed and inserted without causing any interruption, the signal lines in the terminal block remain untouched. System availability is maintained while the plug is being tested or replaced.



Simple dielectric test

Robust surge protection

Fuse protection directly on the measuring head

Screw in, connect, done – SURGETRAB protective devices are designed for all common standard signals that are attached directly to the measuring head via their connecting threads. This mounting type saves time and money, and there is no need for an additional connection box for installing the surge protection.



Your advantages

- ✓ Easy field mounting with standardized thread
- ✓ Versatile in use with universal protective circuit
- ✓ Use under extreme ambient conditions thanks to robust design

SURGETRAB – robust for applications in the field



Installation

Screw in, connect, done – the products feature a connection thread for direct installation on the measuring head.



Shield fast connection

The conductor shield can be secured reliably in the shield clamp using a cable tie.



Connection versions

The product family features versions for through-wiring as well as for parallel wiring.

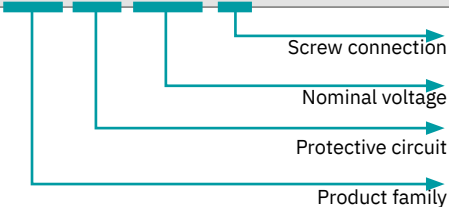
For universal use

This SURGETRAB product family is designed specially for use in the field. Various circuit versions have been optimized for measuring circuits and actuators. Screw connections with metric threads or 1/2" enable use in practically all field device systems available around the world.

These products are also ideal for harsh industrial environments. A stable hexagonal tube made of V4A stainless steel acts as the IP67 housing.

This means that certain SURGETRAB versions are also suitable for use in explosion-proofed areas.



Item designation key		
S-PT-1X2-24DC-1/2	Example	Further options
	1/2"	3/4" / none = M20
	24 V DC	48 V DC
	1X2 ONEPAIR (isolated)	2X / 4 / for Ex areas
	SURGETRAB	

SURGETRAB – robust for applications in the field

Isolated signal circuits, directly grounded	
COMPLETE line 	
Number of signal wires	2
Rated current	450 mA (55°C)
Maximum continuous voltage U _c	40 V DC / 28 V AC
IEC test classification	C1, C2, C3, D1
Max. short-circuit current at the installation location	1 A
Total discharge current I _{total} (8/20) µs	20 kA
Resistance per path	2.2 Ω ±10%
Mounting threads: M20	S-PT-1X2-24DC 2880668
Mounting threads: 1/2"	S-PT-1X2-24DC-1/2" 2882569

Isolated signal circuits for potentially explosive application (Ex i)	
COMPLETE line 	
Number of signal wires	2
Rated current	350 mA (50°C)
Maximum continuous voltage U _c	30 V DC / 21 V AC
IEC test classification	C1, C2, C3, D1
Max. short-circuit current at the installation location	350 mA
Resistance per path	2.2 Ω ±10%
Mounting threads: M20	S-PT-EX(I)-24DC 2880671
Mounting threads: 1/2"	S-PT-EX(I)-24DC-1/2" 2882572

SURGETRAB – robust for applications in the field

For potentially explosive applications (Ex i / Ex d)			
COMPLETE line			
Number of signal wires	2	4	5
Maximum continuous voltage U_c	36 V DC / 25 V AC		
IEC test classification	C1, C2, C3, D1		
Max. short-circuit current at the installation location	1 A (non-Ex) / 500 mA (Ex)		
Total discharge current I_{total} (8/20) μ s	20 kA		
Mounting threads: M20	S-PT-EX-24DC 2800034	S-PT-2XEX-24DC 2800040	S-PT-4-EX-24DC 2800036
Mounting threads: 1/2"	S-PT-EX-24DC-1/2" 2800035	S-PT-2XEX-24DC-1/2" 2800041	S-PT-4-EX-24DC-1/2" 2800037

Surge protection for information technology

3

Secure signal transmission in IT networks

Communication via data networks is a part of daily life in all areas of society. The interfaces operate with low signal levels at high frequencies. This makes them particularly sensitive to surge voltages and can lead to the destruction of electronic components in IT systems.



Universal protection for information technology

The DATATRAB DT product family provides surge protection for many applications:

- High-speed networks up to 10 Gigabit Ethernet
- Networks with RS-485 interface
- Analog and digital interfaces for telecommunications, including DSL

➤ More information starting on page 78



Compact protection for telecommunications applications

With an overall width of just 6 mm, TERMITRAB complete provides narrow and reliable protection for telecommunications interfaces in the form of the TTC-6-1X2-TELE solution.

- More information starting on page 82
- TERMITRAB complete product family:
More information starting on page 52



Intelligent protection for data interfaces

The intelligent PLUGTRAB PT-IQ surge protection solution reliably protects your data cables against surge voltages. The protective circuit has been tailored specially to HF applications.

- More information starting on page 84
- PLUGTRAB IQ product family:
More information starting on page 62

Ideal protection for every interface

Simple protection of all network interfaces

With the DATATRAB family, you can easily protect your networks and telecommunications systems against damage due to overvoltage. Whether connected directly to the computer as an adapter or with just a click onto the DIN rail, DATATRAB is installed in no time.



Your advantages

- ✓ Conformance with all standards – both for surge protection and for high-speed networks
- ✓ Protection for all common applications and signals with the complete product portfolio
- ✓ Versatile use with application-specific designs and connection technologies

DATATRAB – universal protection for information technology



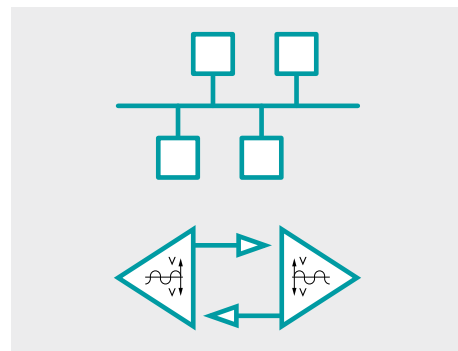
Versatile

The DATATRAB product family features protective devices ideal for the RJ11/12, RJ45, and D-SUB interfaces.



Fast

Used in IT systems with up to 10 Gbps (CAT6 / CLASS Ea) and in telecommunications networks with 50 Mbps (VDSL).



Universal

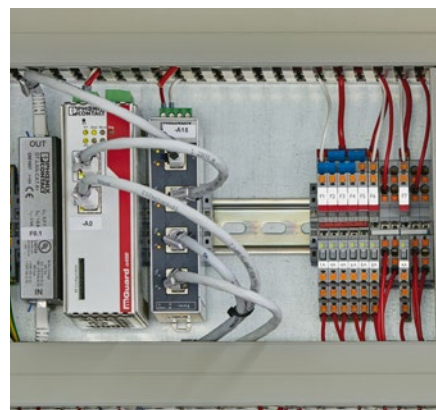
For all common applications: Ethernet, Profinet, DS1, DSL, analog telecommunications, RS-485, V.24, etc.

Universal protection for data interfaces

DATATRAB DT reliably protects high-speed networks against damage caused by surge voltages. In just one device, the DT-LAN-CAT.6+ can manage various data protocols at high transmission rates such as Ethernet, “Power over Ethernet” (PoE), PROFINET, and DS1.

The housing has a ground connection snap-on foot into which the ground connection cover with equipotential bonding line is inserted. DATATRAB can therefore be used as an adapter or as a DIN rail module, after removing the ground connection cover.

The protective devices must guarantee short response times to quickly limit surge voltages to safe values, without impairing signal quality. In addition, the protective devices support system-specific connections, such as RJ45 or D-SUB connectors, and all types of network topologies.



DATATRAB in use

Ultra-slim or also pluggable

The TERMITRAB complete (starting on page 44) and PLUGTRAB IQ (starting on page 56) product families also include products for protecting your analog and digital telecommunications interfaces.

With an overall width of just 6.2 mm, the TTC-6-1X2-TELE is ideal for VDSL and G.fast applications with up to 300 Mbps with VDSL and 1.5 Gbps with G.fast. Both product families also include products with protective circuits specially tailored to HF applications.



TERMITRAB complete



PLUGTRAB-IQ

Surge protection for information technology / DATATRAB

Ethernet/PROFINET

			
Connection technology	RJ45	RJ45	RJ45
Type in accordance with IEC	B2, C1	B2, C2, D1, C1	B2, C1, C2, C3, D1
Maximum continuous operating voltage U_c	$\pm 5 \text{ V DC } (\pm 57 \text{ V DC/PoE+})$		$\leq 3.3 \text{ V DC } (\pm 60 \text{ V DC/PoE+})$
Rated current	$\leq 1.5 \text{ A } (25^\circ\text{C})$	$\leq 1.5 \text{ A } (25^\circ\text{C})$	$\leq 1.5 \text{ A } (25^\circ\text{C})$
Total discharge surge current I_{total}	—	8 kA	10 kA
Type	D-LAN-CAT.5-FP	D-LAN-CAT.5-HC	DT-LAN-CAT.6+
Item no.	2800723	2800763	2881007

RS-485/PROFIBUS

		
Connection technology	D-SUB-9	Screw connection and D-SUB-9
Type in accordance with IEC	B2, C1, C2, C3, D1	C1, C3, B2
Max. Continuous voltage U_c	12 V DC	5.2 V DC
Rated current	$\leq 380 \text{ mA } (25^\circ\text{C})$	250 mA (25°C)
Total discharge surge current I_{total}	10 kA	350 A
Resistance per path	3.3 Ω 10%	—
Type	DT-UFB-485/BS	D-UFB-PB
Item no.	2920612	2880642

Surge protection for information technology / DATATRAB

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Surge protection for information technology

TELEKOM				
COMPLETE line				
Connection technology	Push-in connection NEW	RJ45 / COMBICON	RJ45 / COMBICON	Push-in connection
Type in accordance with IEC	B2, C1, C2, C3, D1			
Maximum continuous operating voltage U_c	60 V DC	185 V DC / 130 V AC		60 V DC
Rated current	200 mA (30 V DC, 70°C) / 100 mA (>30 V DC)	≤ 380 mA (25°C)		200 mA
Total discharge current I_{total} (8/20) μs	12 kA (terminal)	10 kA		
Resistance per path	6 Ω	3.3 Ω 10%	3.3 Ω 20%	6 Ω
Type	DT-TELE-WM-RJ45-PT-I	DT-TELE-RJ45	DT-TELE-SHDSL	TTC-6-1X2-TELE-PT
Item no.	1464188	2882925	2801593	1077106

Surge protection for information technology / TERMITRAB complete

RS-485/PROFIBUS, directly grounded				
				
Pluggable	Yes	Yes	No	No
Knife disconnection	Yes	No	Yes	No
Number of signal wires	3	3	3	3
Rated current	600 mA (56°C)		600 mA (40°C)	
Maximum continuous voltage U _c	15 V DC / 10 V AC			
IEC test classification	C1, C2, C3, D1			
Pulse discharge current I _{imp} (10/350) μs	0.5 kA			
Total discharge current I _{total} (8/20) μs	10 kA			
Resistance per path	1.65 Ω ±20%			
Push-in connection	TTC-6P-3-HF-M-12DC-PT-I 2906756	TTC-6P-3-HF-12DC-PT-I 1065313	TTC-6-3-HF-M-12DC-PT-I 2906732	TTC-6-3-HF-12DC-PT 1065316
Screw connection	TTC-6P-3-HF-M-12DC-UT-I 2906744		TTC-6-3-HF-M-12DC-UT-I 2906721	

RS-485/PROFIBUS, indirectly grounded		
		
Pluggable	Yes	No
Knife disconnection	No	No
Number of signal wires	3	3
Rated current	600 mA (56°C)	600 mA (40°C)
Maximum continuous voltage U _c	15 V DC / 10 V AC	15 V DC
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I _{imp} (10/350) µs	0.5 kA	
Total discharge current I _{total} (8/20) µs	10 kA	
Resistance per path	1.65 Ω ±20%	
Push-in connection	TTC-6P-3-HF-F-12DC-PT-I 1065314	TTC-6-3-HF-F-12DC-PT 1109712

Surge protection for information technology / TERMITRAB complete

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Surge protection for information technology

For potentially explosive applications, PROFIBUS PA fieldbus systems

COMPLETE line		
Pluggable	Yes	No
Knife disconnection	Yes	Yes
Number of signal wires	3	3
Rated current	600 mA (40°C)	
Maximum continuous voltage U_c	30 V DC	
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I_{imp} (10/350) μ s	0.5 kA	
Total discharge current I_{total} (8/20) μ s	10 kA	
Resistance per path	1.65 Ω $\pm$ 20%	
Screw connection	TTC-6P-3-HF-F-M-EX-24DC-UT-I 2906828	TTC-6-3-HF-F-M-EX-24DC-UT-I 2906823

Remote signaling sets and modules

COMPLETE line		
Description	Remote signaling module – transmitter	Remote signaling module – receiver
Push-in connection	TTC-6-FMTX-PT 1193565	TTC-6-FMRX-PT 1193571
Screw connection	TTC-6-FMTX-UT 1193555	TTC-6-FMRX-UT 1193557

Surge protection for information technology / PLUGTRAB-IQ

RS-485/PROFIBUS, directly grounded		
		
		
Number of signal wires	3	5
Rated current	600 mA (40°C)	
Maximum continuous voltage U_c	6 V DC / 4 V AC	15 V DC / 10 V AC
IEC test classification	C1, C2, C3, D1	
Pulse discharge current I_{imp} (10/350) μ s	2.5 kA	
Total discharge current I_{total} (8/20) μ s	20 kA	
Cut-off freq. fg (3dB) 150 ohms	Type 60 MHz	
Resistance per path	1.2 Ω $\pm$ 5%	
Push-in connection	PT-IQ-3-PB-PT 2801286	PT-IQ-5-HF-12DC-PT 2801293

RS-485/PROFIBUS, indirectly grounded			
			
			
Number of signal wires	3	3	5
Rated current	600 mA (40°C)		
Maximum continuous voltage U_c	6 V DC / 4 V AC	15 V DC / 10 V AC	15 V DC / 10 V AC
IEC test classification	C1, C2, C3, D1		
Pulse discharge current I_{imp} (10/350) μ s	2.5 kA		
Total discharge current I_{total} (8/20) μ s	20 kA		
Cut-off freq. fg (3dB) 150 ohms	Type 60 MHz		
Resistance per path	1.2 Ω $\pm$ 5%		
Push-in connection		PT-IQ-3-HF+F-12DC-PT 2801289	PT-IQ-5-HF+F-12DC-PT 2801295
Screw connection	PT-IQ-3-PB+F-UT 2800994		

Surge protection for information technology / PLUGTRAB-IQ

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Surge protection for information technology

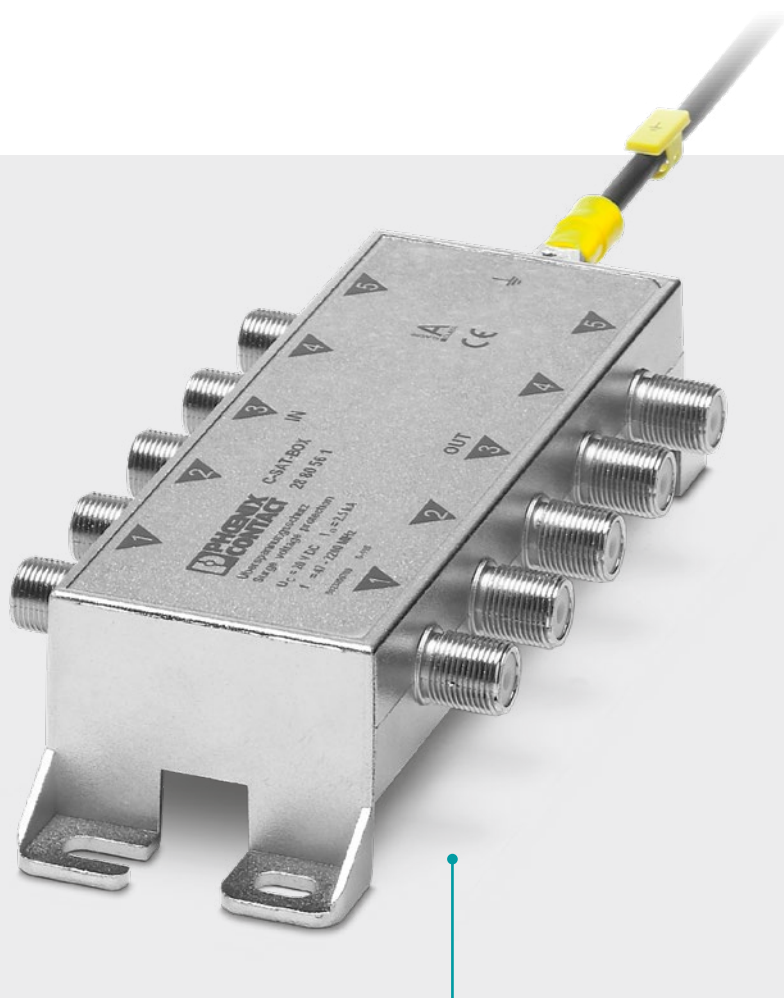
TELEKOM	
	
Connection technology	Push-in connection
Description	Double wire (loop), floating, connection 9/10 directly grounded, e.g., for DSL applications
Type in accordance with IEC	B2, C1, C2, C3, D1
Maximum continuous operating voltage U_c	180 V DC
Rated current	150 mA (25°C)
Pulse discharge current I_{imp} (10/350) μ s	2.5 kA
Total discharge current I_{total} (8/20) μ s	20 kA
Resistance per path	1.2 Ω $\pm$ 5%
Type	PT-IQ-1X2-TELE-PT
Item no.	2801290

Supply and remote signaling modules		
		
Connection technology	Push-in connection	Screw connection
Type	PT-IQ-PTB-PT	PT-IQ-PTB-UT
Item no.	2801296	2800768

Protection for transmitter and receiver systems

High availability for exposed antenna systems

Transmitting and receiving systems are particularly at risk of overvoltages because long antenna cables, which often span several buildings, and the antennas themselves are directly exposed to atmospheric discharges. This means that overvoltages can reach sensitive interfaces.



Protection for satellite receiver technology antenna inputs

Good shielding properties are vital for “clean” transmission. The robust metal housings provide ideal shielding properties and are also suitable for use in harsh industrial environments.

➤ More information starting on page 88



Protection for antennas with N, F, and SMA connection

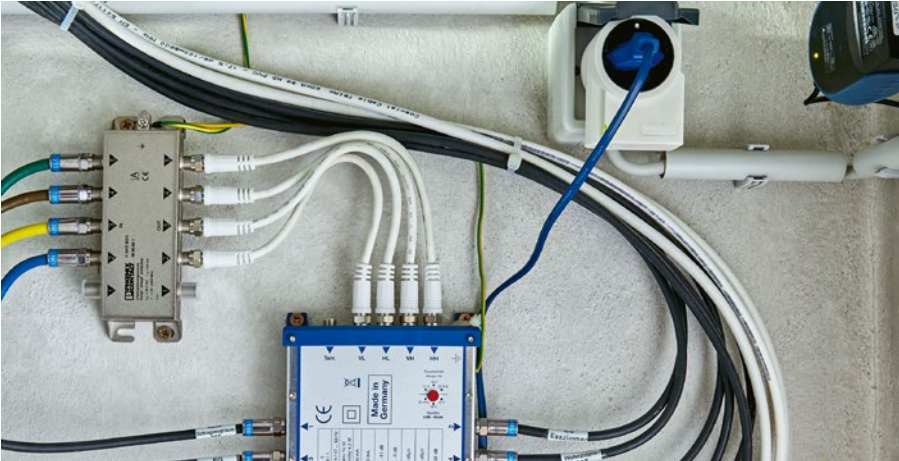
The protective devices conform to standards in all performance classes. This applies for coarse protection in accordance with Category D1 and for fine protection in accordance with Category C2 and C1.

➤ More information starting on page 89

Surge protection for transmitter and receiver systems

Protection for home applications

Satellite systems for TV reception are installed in very many residential homes, whether for single families or several families. The C-SAT-Box can be connected directly to the multi-switch to prevent the antenna splitter on satellite equipment from failing due to overvoltage.



Your advantages

- ✔ No signal interference with optimum transmission properties
- ✔ Protection of digital and analog signals with universal protective circuit
- ✔ Easy installation with surface mounting

TV	
COMPLETE line 	
Connection method	F connector
Frequency range	47 MHz ... 2.5 GHz
Type in accordance with IEC	B2, C1, C2, C3, D1
Maximum continuous voltage U_c	20 V DC
Rated current	400 mA
Pulse discharge current I_{imp} (10/350) μ s	0.5 kA
Total discharge current I_{total} (8/20) μ s	10 kA
Resistance per path	3.3 Ω $\pm$ 20%
Connection type: Female to female	C-SAT-BOX 2880561

Surge protection for transmitter and receiver systems

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Protection for transmitter and receiver systems

Protection for industrial applications

Cables with a coaxial structure and therefore favorable EMC properties are also primarily used in industrial antenna systems. However, the danger of surge voltage coupling in antenna cables and potential transfer through to the sensitive interfaces of transmitter and receiver systems is not eliminated. The COAXTRAB product family enables you to significantly increase the availability and operability of the devices in question.



Your advantages

- ✓ Easy installation with system-compliant connection
- ✓ Use under extreme ambient conditions thanks to robust design
- ✓ Exceptional protective properties with Lambda/4 technology

GSM/LTE/WiMAX

				
	N connector 50 Ω	N connector 50 Ω	N connector 50 Ω	N connector 50 Ω
Frequency range	0.8 GHz ... 2.25 GHz	2.4 GHz ... 7.6 GHz	0 Hz ... 6 GHz	0 Hz ... 3 GHz
Type in accordance with IEC	C2, C3, D1	C2, C3, D1	C2, C3, D1	C2, C3, D1
Maximum continuous voltage U_c	—	—	70 V DC / 50 V AC	280 V DC
Rated current	5 A (25°C)	5 A (25°C)	10 A	5 A (25°C)
Pulse discharge current I_{imp} (10/350) μs	20 kA	20 kA	1 kA	2.5 kA
Total discharge current I_{total} (8/20) μs	60 kA	60 kA	10 kA	20 kA
Connection type: Female to female	CN-LAMBDA/4-2.25-BB 2801057	CN-LAMBDA/4-5.9-BB 2838490	CN-UB-70DC-6-BB 2803166	CN-UB-280DC-3-BB 2801050
Connection type: Male to female	CN-LAMBDA/4-2.25-SB 2801056	CN-LAMBDA/4-5.9-SB 2800023	CN-UB-70DC-6-SB 2803153	CN-UB-280DC-3-SB 2801051

EMC filters

5

For a reliable power supply

Filters limit high-frequency interference voltages and currents generated by equipment during normal operation and occurring under fault conditions. Using our EMC filters, you ensure smooth operation in environments subject to interference.



Double protection, one device

SFP2-... products are type 2 surge protective devices with integrated filter circuit. The metal housings improve the protective effect in case of HF interference, and at the same time protect against transient overvoltages.

➤ More information starting on page 95



EMC protection at just 6 mm

Our ultra-compact EMC filters with a width of just 6 mm offer reliable protection with minimal space requirements – ideal for applications in MCR technology.

➤ More information starting on page 97



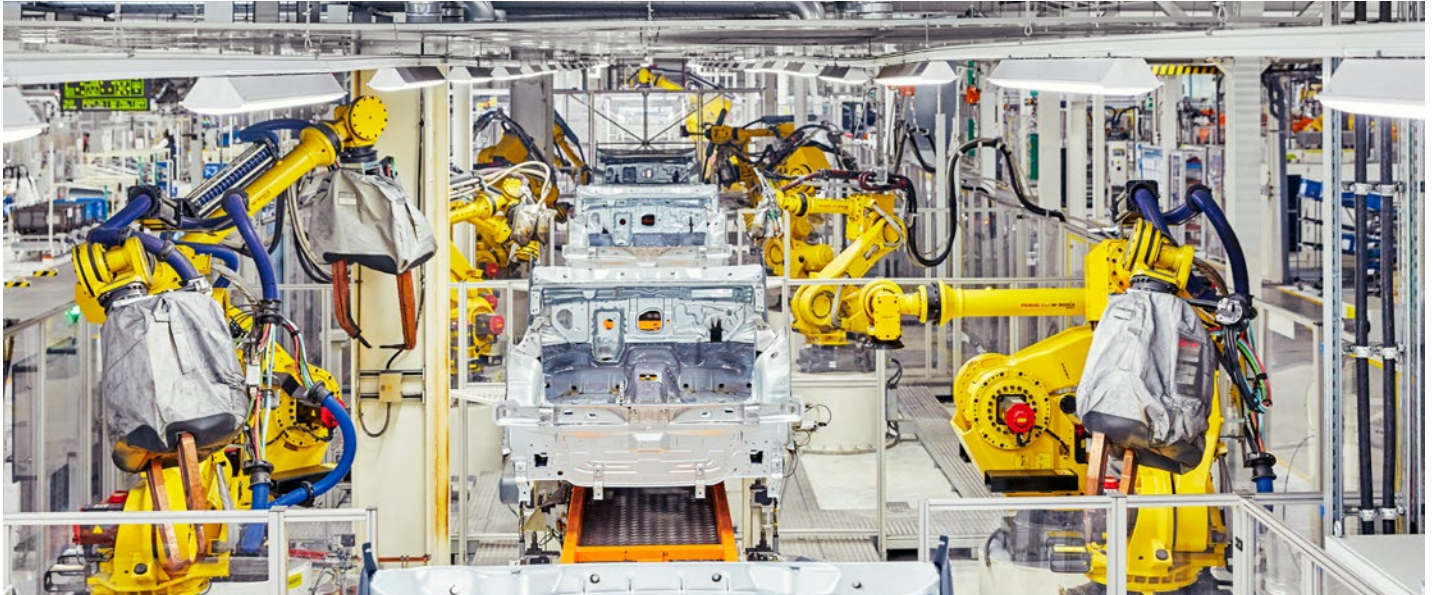
Effective EMC protection for devices

The FIL-... mains filters provide reliable protection against HF interference. With current-coupled coil, X/Y capacitors, additional PE terminal blocks, and screw or Push-in connection, they offer a wide range of possible applications.

➤ More information starting on page 97

Reliable system operation in environments where interference is an issue

Sources of interference and its effects



Conducted interference

Energy efficiency plays an important role in modern electrical systems. Power electronics equipment is increasingly being used to achieve a high level of energy efficiency. Power electronics equipment (e.g., switched-mode power supply units, frequency converters) usually contains switched electronic components. High energy efficiency is achieved due to the high switching frequencies of the electronic components.

High switching frequencies do not only have advantages in energy technology equipment. Frequently, there is also an increase in the generation of high-frequency conducted interference. Power electronics equipment does not just consume electricity. It is usually also a source of high-frequency conducted interference.

Conducted interference is distributed via power cables in the power supply system and can result in malfunctions on sensitive equipment. The conducted interference generated by a single item of power electronics equipment does not usually negatively impact other equipment.

In power supply systems, many items of power electronics equipment are often used together at the same time. The resulting high-frequency conducted interference that is generated quickly mounts up. The extent of this interference can be so great that other items of sensitive equipment can suffer temporary or permanent

malfunctions. In this context, the problem is one of electromagnetic compatibility (EMC).

EMC filters help against conducted interference

In real-life electrical systems, it is often not possible to replace equipment that causes interference with less disruptive equipment. Nevertheless, it is possible to ensure the satisfactory operation of sensitive equipment by using EMC filters.

In power supply systems, EMC filters help reduce high-frequency conducted interference. This allows sensitive equipment to be operated without malfunctions.

FIL-1S-1 type EMC filters (up to 230 V AC, up to 220 V DC, 1 ... 20 A) are used to protect sensitive single-phase equipment against high-frequency conducted interference.

SFP2-1S-1 type EMC filters (120 V AC, 230 V AC, 5 ... 20 A) are additionally equipped with an integrated surge protective device (SPD). These mains filters are used when sensitive single-phase equipment also needs to be protected against man-made or lightning-related surge voltage or surge current pulses.

Protection of MCR circuits

High-frequency conducted interference does not just occur in power supply systems, it also occurs in MCR circuits. For example, this interference can be coupled into MCR circuits galvanically, inductively,

or capacitively. These days, high-frequency interference is a common cause of malfunctions in MCR systems. MCR circuits, with a voltage up to 24 V, can be protected effectively by using TTC-6-SFP type EMC filters. These EMC filters also have an integrated surge protective device (SPD).

Typical applications for EMC filters

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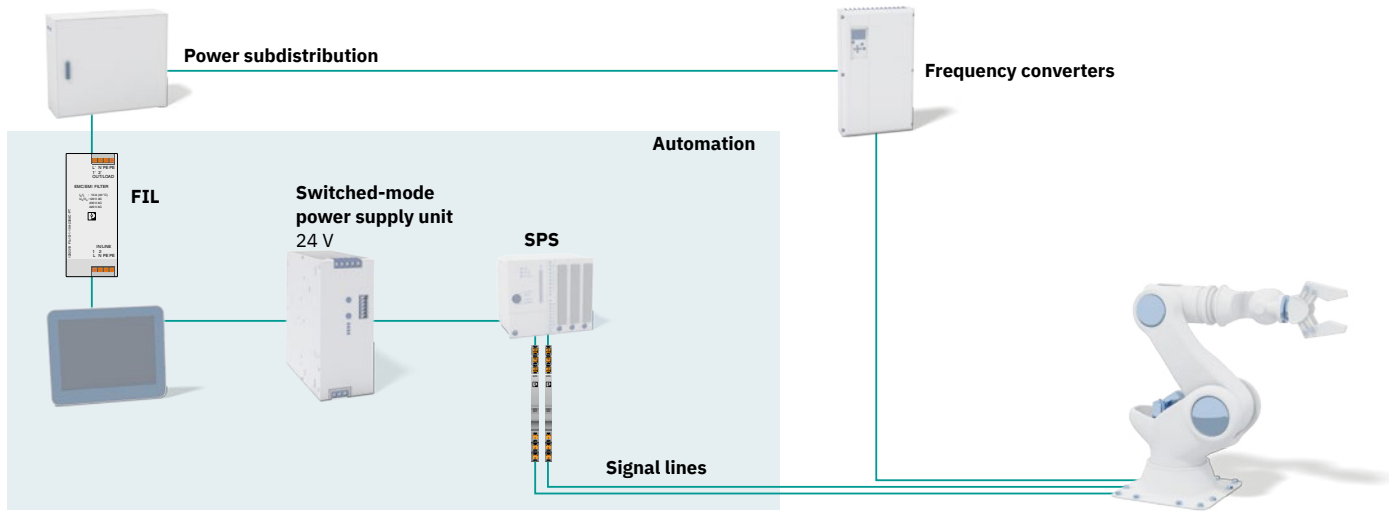
EMC filters

Interference from frequency converters

In industrial applications, the drive motors in robots are controlled via frequency converters. These frequency converters generate high-frequency interference that can affect sensitive equipment. FIL-1S-1 mains filters are used to protect against conducted high-frequency

interference on power supply lines.

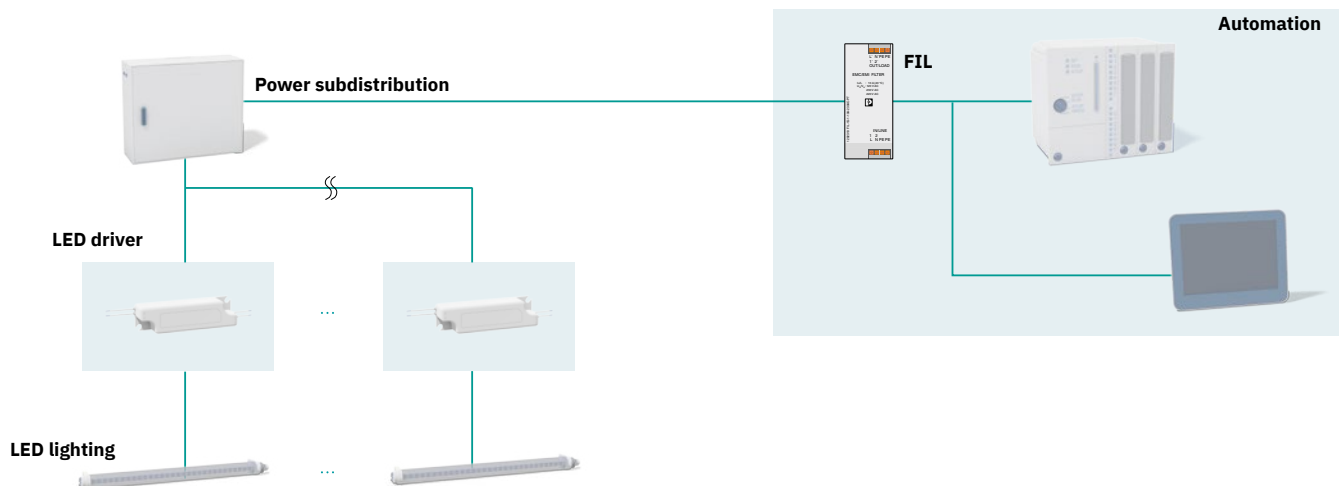
If power cables are laid in parallel with MCR circuits, there is a danger of RF interference being coupled into the MCR circuits. Filters of the type TTC-6-SFP protect against this.



Interference from LED drivers

These days, LEDs are used in a variety of ways in energy-efficient lighting systems. LEDs always require an LED driver. Depending on their technical design, LED drivers can be a major source of high-frequency conducted interference. The interference generated by LED drivers

can result in malfunctions on sensitive equipment such as automation technology equipment. FIL-1S-1 type EMC filters are used to protect against high-frequency conducted interference on power supply cables.



EMC filters with surge protection

For the reliable operation of your systems

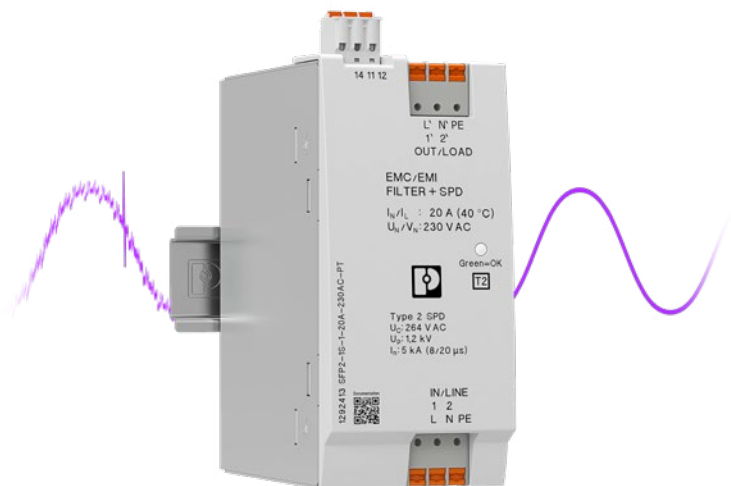
SFP2 ... are EMC filters with integrated surge protection in metal housing for an improved filter effect and EMC-optimized installation. They provide protection against high-frequency interference and transient overvoltages on the input and output side of the filter.



Product overview

Double protection

Conventional filters only protect against high-frequency interferences, but not against overvoltage pulses. For effective protection, additional surge protection components are needed. SFP2 filters provide effective protection against overvoltage and high-frequency interference due to a surge protection circuit that protects both the input and output side of the filter.



EMC filters with surge protection

				
Nominal load current	5 A	10 A	15 A	20 A
Type	SFP2-1-5A-120AC	SFP2-1-10A-120AC	SFP2-1-15A-120AC	SFP2-1-20A-120AC
Push-in connection	1292458	1292455	1292450	1292419
Screw connection	1292315	1292457	1292453	1292421

			
Nominal load current	6 A	10 A	20 A
Type	SFP2-1-6A-230AC	SFP2-1-10A-230AC	SFP2-1-20A-230AC
Push-in connection	1292417	1292414	1292413
Screw connection	1292418	1292416	1292605

EMC filters provide an improved filter effect

Against high-frequency interference

Thanks to the additional PE terminals for the separate connection to the local protective bonding, the FIL... EMC filters provide an improved filter effect against the ground potential. This means that a good level of protection against high-frequency interference can be achieved even with filters in plastic housing.



Simple and flexible installation

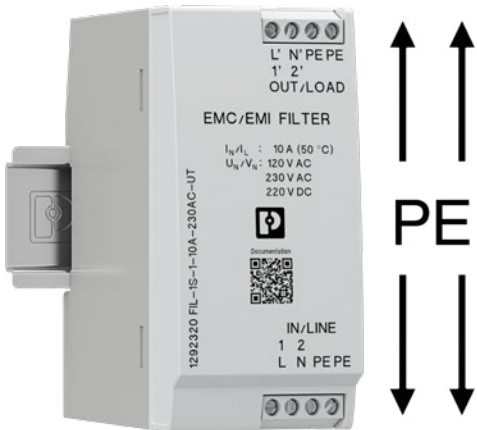
Thanks to the simple DIN rail mounting and the variable connection technology, using the filters in the control cabinet is child's play. To connect the EMC filters, you can choose between fast Push-in connection technology or proven screw connection.



Product overview

EMC-optimized installation

The connection of the EMC filters to the local protective bonding is realized by additional PE terminal points. This improves the filter effect for high-frequency interferences between the active conductors and the ground potential. This way, an EMC-optimized installation and an improved protective effect is also achieved for EMC filters in plastic housings.



EMC filters					
					
Nominal load current	1 A	3 A	6 A	10 A	20 A
Type	FIL-1S-1-1A-230AC	FIL-1S-1-3A-230AC	FIL-1S-1-6A-230AC	FIL-1S-1-10A-230AC	FIL-1S-1-20A-230AC
Push-in connection	1292328	1292326	1292321	1292319	1292316
Screw connection	1292329	1292327	1292323	1292320	1292318

EMC filters with integrated surge protection for applications in MCR technology

With an overall width of just 6 mm, the filters in the TERMITRAB complete family provide the ideal protection against high-frequency interference for applications in measurement and control technology. Due to the integrated surge protection circuit, the narrow filters enable additional fine protection against transient overvoltages.

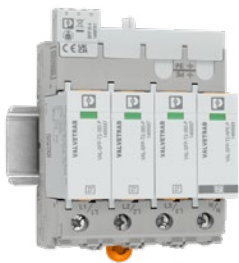
TTC-6-SFP-24AC-PT
Item no. [1316312](#)



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Increasing electrification, networking, and automation means a growing dependency on reliable power supply solutions. For efficient system operation, we offer you solutions that combine surge protection, EMC filters, energy measuring devices, power supplies, and device circuit breakers. Choose Phoenix Contact, a partner who provides you with holistic concepts for high system availability.



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Our coordinated product portfolio for surge protection enables the implementation of protection concepts for almost any application.



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Power Reliability



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