



Surge protection

Solutions for every application

Interference-free mains supply and signal transmission

A constant energy supply and secure data links are especially important for the operational reliability of electrical systems, installations, and devices.

Phoenix Contact meets all of these requirements with the TRABTECH product line. Coordinated solutions consisting of surge protection, monitoring, device circuit breakers, and EMC products offer consistently high power and signal quality for maximum availability.



Protective devices for limiting high-energy surge voltages and high-frequency interference voltages.

Surge voltages – an underestimated danger

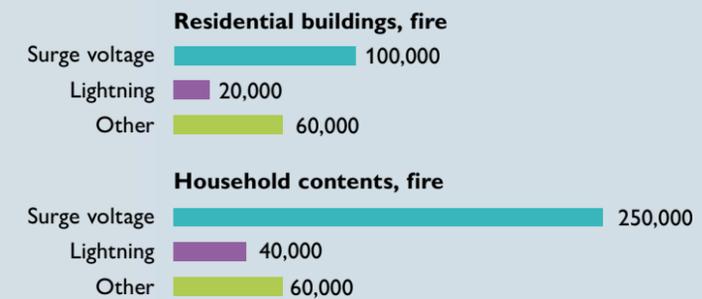


Each day over four million lightning strikes are discharged all over the world.*

Ten percent of these are cloud-to-ground lightning strikes with surge currents up to 200,000 A. In addition to these 4,000,000 lightning strikes that are discharged each day due to thunderstorms, surge voltages also occur within local power grids. These are caused, for example, by switching operations, errors or switched-mode power supply units.

Whatever their cause, time and again surge voltages lead to unexpected device faults or system failures. TRABTECH surge protection provides comprehensive and effective protection against such effects.

* Source: de.wikipedia.org > Blitze (lightning)



Device failure or defects caused by surge voltages are **more frequent than expected**. According to the statistics of the German Insurance Association (GDV), surge voltages are the most common cause of damage. These figures only apply to damage that resulted in fire.

Source: GDV - German Insurance Association 2013

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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. Surge protective devices that correspond to the nominal data of the relevant power supply or signal type should be installed at all points where cables intersect this circle. In order to provide objects with consistent protection against conducted surge voltage couplings, the following areas should be taken into consideration:

■ Power supply

Optimally coordinated arresters for supplies, distributors, and terminal devices safeguard the power supply.

■ MCR technology

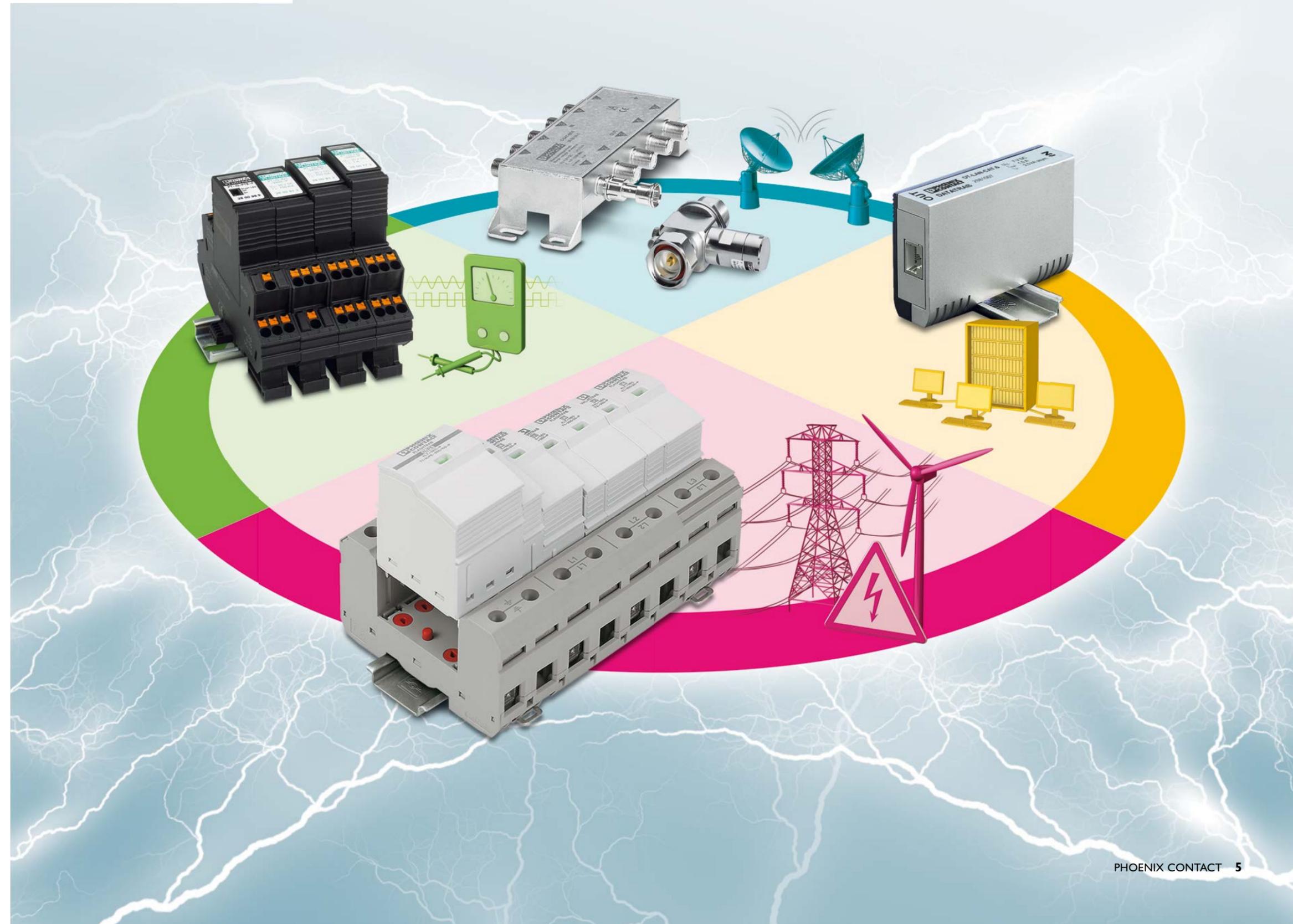
Optimized arresters are available for a wide range of signal types and measuring principles.

■ Information technology

High-speed protection (CAT.6+) for data and communication technology.

■ Transceiver technology

So that private mobile radio and mobile communication, as well as satellite or radio systems, still have reception whatever the weather.



Surge protection for the power supply

Safe Energy Control, or SEC for short, represents non-reactive, powerful surge protection technology. The protective devices work discreetly in the background, providing consistent safeguarding for the entire system – including the backup fuses – even in cases where high lightning surge currents are being discharged.

The SEC family can be found as part of the extensive product range and includes type 1, type 2, and type 3 protective devices for all applications.

Besides its compact design and plug-in capability, the SEC family's numerous user-friendly product features create an overall package that is easy to install.



Plugging instead of screwing
Consistent plug-in capability ensures a high degree of comfort, e.g., for insulation measurements in the system. Instead of accessing the installation, just pull out the plug.



Just one turn
The protective devices support variable installation. This avoids unnecessarily long cables and offers optimum protection for every installation environment.



Status at a glance
Each arrester plug has its own display to indicate its function status. What's more, a large area for applying your own labeling is provided.



Remote signaling
A common floating changeover contact enables remote signaling without taking up extra space.



Plugging without risk of mix-up
The mechanical coding between the plug and the base element ensures that each plug always finds the right socket.

Type 1 lightning arrester



FLASHTRAB-SEC-HYBRID:

Powerful lightning arrester with integrated arrester backup fuse

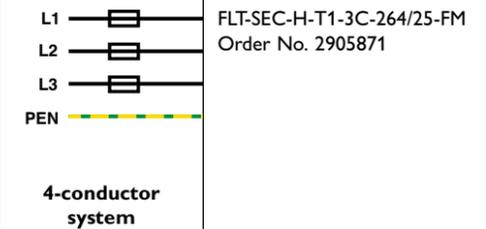
- Combination of spark gap without line follow current and surge-proof fuse
- Can be used without separate backup fuse thanks to integrated overcurrent protection
- Arrester free of leakage, suitable for use in the pre-meter area
- Can be plugged in with innovative push-pull locking mechanism
- Low voltage protection level of ≤ 1.5 kV



1-phase TN-C systems



3-phase TN-C systems



FLT-SEC-H...	...-T1-1C-264/25	...-T1-3C-264/25
IEC test classification/EN type		I/II, T1/T2
Nominal voltage U_N		240 V AC
Maximum continuous voltage U_c		264 V AC
Follow current quenching capacity I_{fi}		50 kA
Lightning impulse current I_{imp} (10/350) μ s/channel		25 kA
Nominal discharge current I_n (8/20) μ s/channel		25 kA
Voltage protection level U_p		≤ 1.5 kV
Maximum backup fuse according to IEC 61643-1		Integrated

Type 1 lightning arrester



FLASHTRAB-SEC-PLUS-440:

The compact power package for 400/690 V

- Spark gap has no line follow current
- Arrester free of leakage, suitable for use in the pre-meter area
- Satisfies TOV requirements for use in IT systems
- Option to use without a fuse up to 315 A gG
- Low voltage protection level of ≤ 2.5 kV
- Plugs can be checked with CHECKMASTER



Type 1 lightning arrester



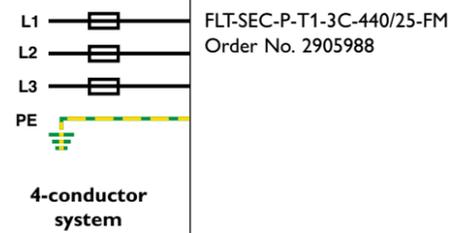
FLASHTRAB-SEC-PLUS-350:

Powerful lightning arrester for higher nominal voltages

- Spark gap has no line follow current
- Arrester free of leakage, suitable for use in the pre-meter area
- Option to use without a fuse up to 315 A gG
- Low voltage protection level ≤ 1.5 kV
- Plugs can be checked with CHECKMASTER



3-phase TN and IT systems



FLT-SEC-P-T1-3C-440/25-FM
Order No. 2905988



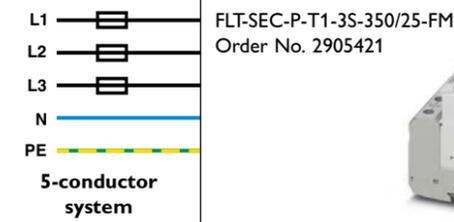
1-phase systems



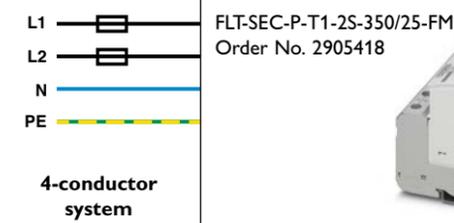
FLT-SEC-P-T1-1C-440/25-FM
Order No. 2905987



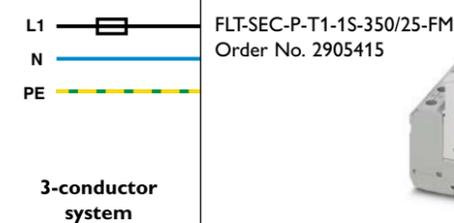
TN-S/TT systems



FLT-SEC-P-T1-3S-350/25-FM
Order No. 2905421



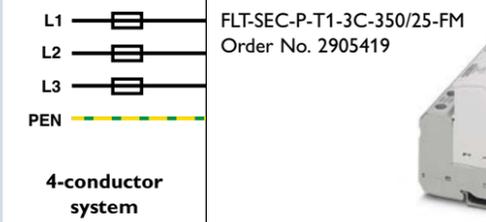
FLT-SEC-P-T1-2S-350/25-FM
Order No. 2905418



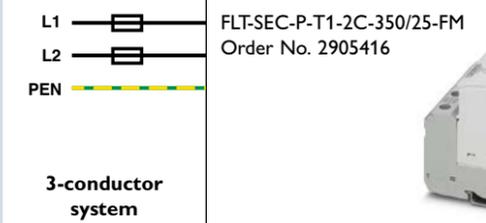
FLT-SEC-P-T1-1S-350/25-FM
Order No. 2905415



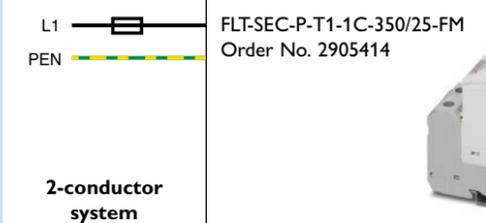
TN-C systems



FLT-SEC-P-T1-3C-350/25-FM
Order No. 2905419



FLT-SEC-P-T1-2C-350/25-FM
Order No. 2905416



FLT-SEC-P-T1-1C-350/25-FM
Order No. 2905414



FLT-SEC-P...	...-T1-3C-440/25-FM	...-T1-1C-440/25-FM
IEC test classification/EN type	I/II, T1/T2	
Nominal voltage U_N	400 V AC (TN-C)/400 V AC (IT)	
Maximum continuous voltage U_c	440 V AC	
Follow current quenching capacity I_{fi}	50 kA	
Lightning impulse current I_{imp} (10/350) μ s/channel	25 kA	
Nominal discharge current I_n (8/20) μ s/channel	25 kA	
Voltage protection level U_p	≤ 2.5 kV	
Maximum backup fuse according to IEC 61643-1	315 A gG	

FLT-SEC-P...	...-T1-3S-350	...-T1-3C-350	...-T1-2S-350	...-T1-1S-350	...-T1-1S-350	...-T1-1C-350
IEC test classification/EN type	I/II, T1/T2					
Nominal voltage U_N	230/400 V AC ... 240/415 V AC			230 V AC ... 240 V AC		
Maximum continuous voltage U_c	350 V AC L-N (L-PEN)					
Follow current quenching capacity I_{fi}	50 kA					
Lightning impulse current I_{imp} (10/350) μ s	100 kA	75 kA	75 kA	50 kA	50 kA	25 kA
Nominal discharge current I_n (8/20) μ s	100 kA	75 kA	75 kA	50 kA	50 kA	25 kA
Voltage protection level U_p	≤ 1.5 kV					
Maximum backup fuse according to IEC 61643-1	315 A gL/gG					

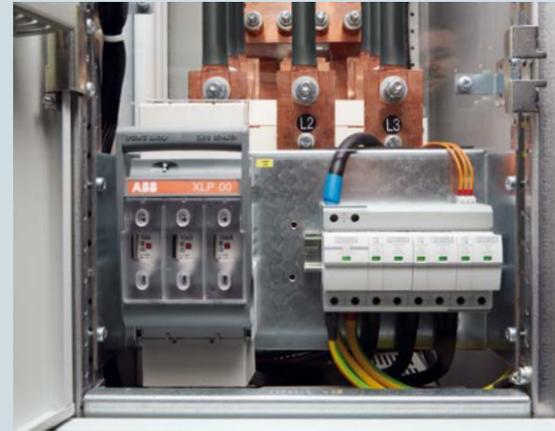
Type 1 + type 2 lightning arrester and surge protective device



FLASHTRAB-SEC-T1+T2:

Combined lightning arrester and surge protective device

- Type 1 and type 2 protective devices directly coordinated
- For use in main current distribution/industrial distribution, within the post-meter area
- Option to use without a fuse up to 315 A gG
- Installation work reduced to a minimum
- Low voltage protection level of ≤ 1.5 kV
- Plugs can be checked with CHECKMASTER



TN-S/TT systems



TN-C systems



FLT-CP-...	...3S-350	...3C-350	...2S-350	...2C-350	...1S-350	...1C-350
IEC test classification/EN type	I + II, T1 + T2					
Nominal voltage U_N	230/400 V AC ... 240/415 V AC			230 V AC ... 240 V AC		
Maximum continuous voltage U_c	350 V AC L-N (L-PEN)					
Follow current quenching capacity I_f	25 kA (264 V AC)					
Lightning impulse current I_{imp} (10/350) μ s	100 kA	75 kA	75 kA	50 kA	50 kA	25 kA
Nominal discharge current I_n (8/20) μ s	100 kA	75 kA	75 kA	50 kA	50 kA	25 kA
Voltage protection level U_p	≤ 1.5 kV					
Maximum backup fuse according to IEC 61643-1	315 A gL/gG					

Type 2 surge protective device



VALVETRAB-SEC-T2:

Space-saving surge protection

- Type 2 surge protective device
- For use in sub-distributions and level distributions upstream of the residual current device
- Option to use without a fuse up to 315 A gG
- Overall width of just 12 mm per channel
- Low voltage protection level of ≤ 1.5 kV
- Plugs can be checked with CHECKMASTER



TN-S/TT systems



TN-C systems



VAL-CP-...	...3S-350	...3C-350	...2S-350	...2C-350	...1S-350
IEC test classification/EN type	II, T2				
Nominal voltage U_N	230/400 V AC ... 240/415 V AC			230 V AC ... 240 V AC	
Maximum continuous voltage U_c	350 V AC L-N (L-PEN)				
Nominal discharge current I_n (8/20) μ s/channel	20 kA				
Max. discharge current I_{max} (8/20) μ s/channel	40 kA				
Voltage protection level U_p	≤ 1.5 kV				
Maximum backup fuse according to IEC 61643-1	315 A gG				

Note: VALVETRAB SEC is also available for 120 V power supply systems.

Type 2 surge protective device – combined solutions



Combi-RCD*: surge protection with residual current device



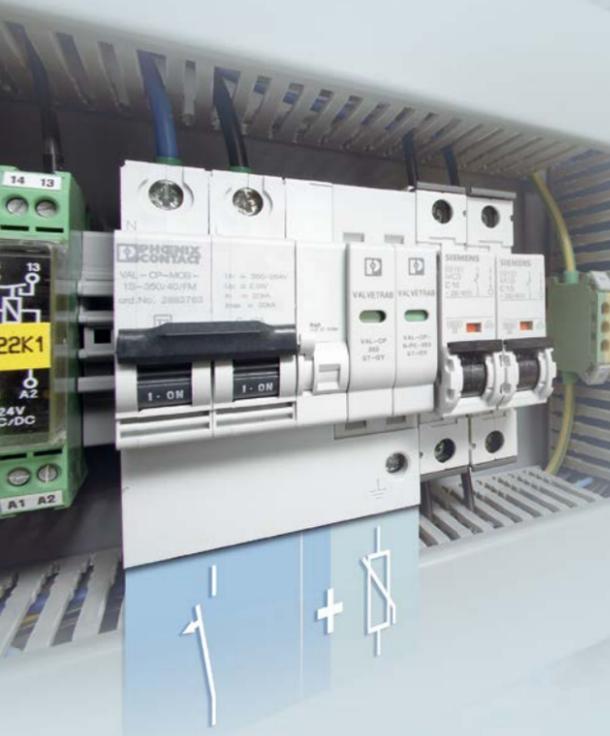
Residual current device (RCD)	Surge protective device (VAL-CP)
Sensitive to residual currents: Type A	IEC test classification/EN type: II, T2
Rated residual current $I_{\Delta n}$: 30 mA/300 mA	Discharge current I_{max} (8/20) μ s: 30 kA/path
Release time at $I_{\Delta n}$: ≤ 300 ms	Maximum continuous voltage U_c : 350 V AC

VAL-CP-RCD-3S/40/0.03 Order No. 2882802
VAL-CP-RCD-3S/40/0.3/SEL Order No. 2808001
Nominal voltage U_N : 230/400 ... 240/415 V AC
Nominal load current I_n : 40 A
Dimensions (W x H x D): 120 mm x 90 mm x 75 mm

The Combi-RCD combines the properties of a residual current device* with those of a type 2 surge protective device in the same housing. This innovative 2-in-1-concept provides simultaneous protection for people and devices.

* Residual current device = RCD

Combi-MCB**: surge protection with coordinated backup fuse



		
VAL-CP-MCB-3S-350/40/FM Order No. 2882750	VAL-CP-MCB-3C-350/40/FM Order No. 2882776	VAL-CP-MCB-1S-350/40/FM Order No. 2882763
IEC test classification/EN type: II, T2		
Nominal voltage U_N : 230/400 V AC ... 240/415 V AC		
Maximum continuous voltage U_c : 350 V AC		
Nominal discharge current I_n (8/20) μ s: 20 kA/path		
Voltage protection level U_p : ≤ 2.5 kV		

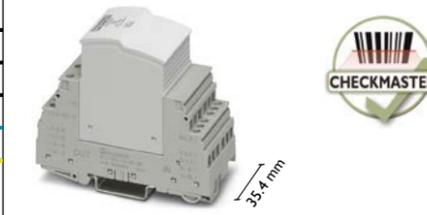
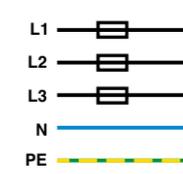
The integrated arrester backup fuses of the VAL-CP-MCB ensure the maximum utilization of the performance capabilities of the surge protection. Their use is not dependent on the operating current fuses in the system – faults relating to the safeguarding of surge protection are therefore prevented.

** Mains circuit breaker = MCB

Type 3 device protection

PLUGTRAB

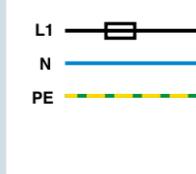
TN-S/TT systems



230 V / 400 V	PLT-SEC-T3-3S-230-FM	Order No. 2905230
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PLUGTRAB

TN-S/TT/IT systems

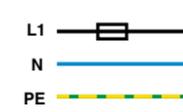


230 V	PLT-SEC-T3-230-FM	Order No. 2905229
120 V	PLT-SEC-T3-120-FM	Order No. 2905228
24 V	PLT-SEC-T3-24-FM	Order No. 2905223
60 V	PLT-SEC-T3-60-FM	Order No. 2905225

PLT-SEC...	...T3-3S-230...	...T3-230...	...T3-120...	...T3-24...
Nominal voltage U_N	230 V AC	230 V AC	120 V AC	24 V AC
Maximum continuous voltage U_c	275 V AC	253 V AC	150 V AC	34 V AC/44 V DC
Nominal current I_N	26 A	26 A	26 A	26 A
Nominal discharge current I_n (8/20) μ s	1.5 kA (per channel L-N)	3 kA	2.5 kA	1 kA
Max. discharge current I_{max} (8/20) μ s	4.5 kA (per channel L-N)	10 kA	10 kA	2 kA
Voltage protection level U_p : L-N / L(N)-PE	≤ 1.2 kV/ ≤ 1.5 kV	≤ 1.1 kV/ ≤ 1.5 kV	≤ 620 V/ ≤ 850 V	≤ 180 V/ ≤ 550 V

MAINTRAB

TN-S/TT systems

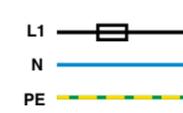


230 V

D, A, NL, E, S	MNT-1D	Order No. 2882200
B, F, CZ, PL, SVK, PL	MNT-NET B/F	Order No. 2882226
CH	MNT-1 CH II	Order No. 2882255

MAINTRAB PLUS

TN-S/TT systems



230 V

D, A, NL, FIN, E, S	MNT-TV-SAT D	Order No. 2882284
...with SAT connection	MNT-ISDN D	Order No. 2882336
...with ISDN connection	MNT-TAE D	Order No. 2882381
...with TAE connection	MNT-TELE E	Order No. 2882417
...with RJ12 connection	MNT-NET B/F	Order No. 2882226
B, F, CZ, SVK, PL	MNT-TV-SAT B/F	Order No. 2882307
...with SAT connection	MNT-TEL B/F	Order No. 2882404
...with RJ12 connection		

BLOCKTRAB

TN-S/TT/IT systems



230 V

BT-1S-230AC/A
Order No. 2803409



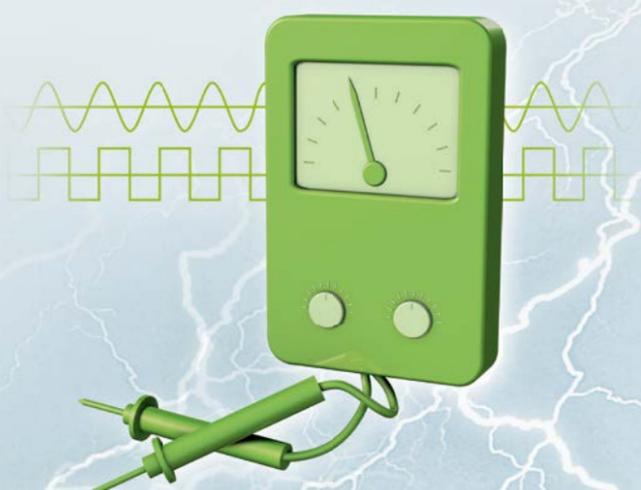
BT-1S-230AC/O
Order No. 2800625

Surge protection for measurement and control technology

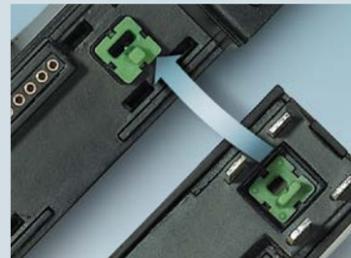
Signal interfaces are particularly sensitive to surge voltages. Combined protective circuits with components which are powerful and respond quickly are the right solution in these cases.

The protective devices in the PLUGTRAB range also impress thanks to their practical functions. The plug-in capability of the arresters enables function checks to be performed easily and replacements made quickly – even during system operation.

This selection guide helps you find the right protection for your application quickly and easily – providing you with greater availability.



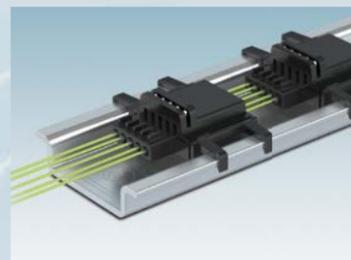
Vibration-resistant installation
The latching guarantees a secure fit for installations in harsh environments. It holds the plug in place in the base element even in the event of strong vibrations.



Error-free installation
Voltage coding and protection against polarity reversal make incorrect connection impossible.



Space-saving installation
Up to five signal lines can be protected with one device. This requires an overall width of just 17.5 mm on the DIN rail, meaning only 3.5 mm per signal line.



Fast installation
Individual DIN rail connectors can be converted into a bus. This transmits the power supply and status information. Conventional wiring is not used.



Variable connection technology
Choose between the classic screw connection or push-in connection technology which is even faster to wire.

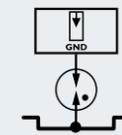
Intelligent and systematic surge protection

PLUGTRAB PT-IQ is a range of self-monitoring surge protective devices with multi-stage status indicator. A controller supplies up to 28 protection modules with voltage via a DIN rail connector, collects the status of all connected protective devices, and provides the connection for central remote signaling. A surge protective device consists of the plug, base element, and DIN rail connector adapter.

Energy efficiency

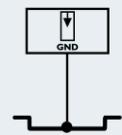
The green LEDs on all protection modules can be switched off centrally at the controller.

PT-IQ-PTB-P



Indirect grounding

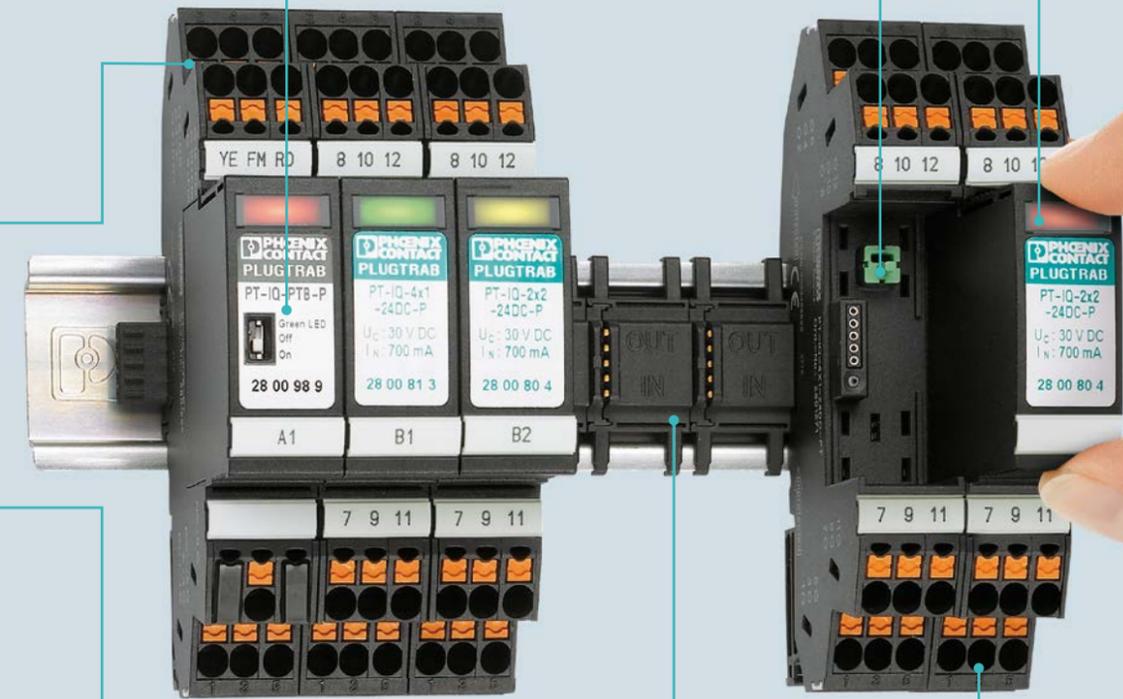
In the case of the **PT...+F... and +F-BE** modules, the connections for the shield and the reference potential are connected to the metal mounting foot and therefore the DIN rail via a gas-filled surge arrester.



Direct grounding

In the case of the **PT...-UT and -BE** modules, the connections for the shield and the reference potential are connected to the DIN rail via the metal mounting foot.

- OK
- Performance limit reached, replacement recommended
- Overloaded, replacement required



Surge protection with push-in and screw connection technology

Controller for power supply and remote signaling

One controller for each of the PT-IQ... protective devices (maximum 28)



2801296	PT-IQ-PTB-PT	Push-in connection
2800768	PT-IQ-PTB-UT	Screw connection

Telecommunications



2801290	PT-IQ-1X2-TELE-PT	Push-in connection
2800769	PT-IQ-1X2-TELE-UT	Screw connection

Protection for two conductors

Binary switching signals



Indirect grounding		Direct grounding		
2801244	PT-IQ-2X1+F-5DC-PT	2801243	PT-IQ-2X1-5DC-PT	
2801246	PT-IQ-2X1+F-12DC-PT	2801245	PT-IQ-2X1-12DC-PT	
2801248	PT-IQ-2X1+F-24DC-PT	2801247	PT-IQ-2X1-24DC-PT	
2801250	PT-IQ-2X1+F-48DC-PT	2801249	PT-IQ-2X1-48DC-PT	
2800779	PT-IQ-2X1+F-5DC-UT	2800778	PT-IQ-2X1-5DC-UT	Screw connection
2800781	PT-IQ-2X1+F-12DC-UT	2800780	PT-IQ-2X1-12DC-UT	
2800788	PT-IQ-2X1+F-24DC-UT	2800787	PT-IQ-2X1-24DC-UT	
2800790	PT-IQ-2X1+F-48DC-UT	2800789	PT-IQ-2X1-48DC-UT	

Protection for four conductors

Binary switching signals



Indirect grounding		Direct grounding		
2801268	PT-IQ-4X1+F-5DC-PT	2801267	PT-IQ-4X1-5DC-PT	
2801270	PT-IQ-4X1+F-12DC-PT	2801269	PT-IQ-4X1-12DC-PT	
2801272	PT-IQ-4X1+F-24DC-PT	2801271	PT-IQ-4X1-24DC-PT	
2801274	PT-IQ-4X1+F-48DC-PT	2801273	PT-IQ-4X1-48DC-PT	
2801216	PT-IQ-4X1+F-5DC-UT	2801215	PT-IQ-4X1-5DC-UT	Screw connection
2801218	PT-IQ-4X1+F-12DC-UT	2801217	PT-IQ-4X1-12DC-UT	
2800983	PT-IQ-4X1+F-24DC-UT	2800982	PT-IQ-4X1-24DC-UT	
2801220	PT-IQ-4X1+F-48DC-UT	2801219	PT-IQ-4X1-48DC-UT	

Protection for one double wire

Standard signals
0... 10 V
0/4... 20 mA



Indirect grounding		Direct grounding		
2801252	PT-IQ-1X2+F-5DC-PT	2801251	PT-IQ-1X2-5DC-PT	
2801254	PT-IQ-1X2+F-12DC-PT	2801253	PT-IQ-1X2-12DC-PT	
2801256	PT-IQ-1X2+F-24DC-PT	2801255	PT-IQ-1X2-24DC-PT	
2801258	PT-IQ-1X2+F-48DC-PT	2801257	PT-IQ-1X2-48DC-PT	
2800792	PT-IQ-1X2+F-5DC-UT	2800791	PT-IQ-1X2-5DC-UT	Screw connection
2800975	PT-IQ-1X2+F-12DC-UT	2800793	PT-IQ-1X2-12DC-UT	
2800977	PT-IQ-1X2+F-24DC-UT	2800976	PT-IQ-1X2-24DC-UT	
2800979	PT-IQ-1X2+F-48DC-UT	2800978	PT-IQ-1X2-48DC-UT	

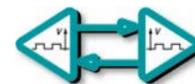
Protection for two double wires

Standard signals
0... 10 V
0/4... 20 mA



Indirect grounding		Direct grounding		
2801260	PT-IQ-2X2+F-5DC-PT	2801259	PT-IQ-2X2-5DC-PT	
2801262	PT-IQ-2X2+F-12DC-PT	2801261	PT-IQ-2X2-12DC-PT	
2801264	PT-IQ-2X2+F-24DC-PT	2801263	PT-IQ-2X2-24DC-PT	
2801266	PT-IQ-2X2+F-48DC-PT	2801265	PT-IQ-2X2-48DC-PT	
2800809	PT-IQ-2X2+F-5DC-UT	2800807	PT-IQ-2X2-5DC-UT	Screw connection
2800985	PT-IQ-2X2+F-12DC-UT	2800984	PT-IQ-2X2-12DC-UT	
2800981	PT-IQ-2X2+F-24DC-UT	2800980	PT-IQ-2X2-24DC-UT	
2800987	PT-IQ-2X2+F-48DC-UT	2800986	PT-IQ-2X2-48DC-UT	

Data technology



Indirect grounding		Direct grounding		
2801287	PT-IQ-3-PB+F-PT	2801286	PT-IQ-3-PB-PT	
2801289	PT-IQ-3-HF+F-12DC-PT	2801288	PT-IQ-3-HF-12DC-PT	
2801292	PT-IQ-5-HF+F-5DC-PT	2801291	PT-IQ-5-HF-5DC-PT	
2801295	PT-IQ-5-HF+F-12DC-PT	2801293	PT-IQ-5-HF-12DC-PT	
2800994	PT-IQ-3-PB+F-UT	2800785	PT-IQ-3-PB-UT	Screw connection
2800995	PT-IQ-3-HF+F-12DC-UT	2800786	PT-IQ-3-HF-12DC-UT	
2800798	PT-IQ-5-HF+F-5DC-UT	2800797	PT-IQ-5-HF-5DC-UT	
2800801	PT-IQ-5-HF+F-12DC-UT	2800799	PT-IQ-5-HF-12DC-UT	

Surge protection for the Ex area

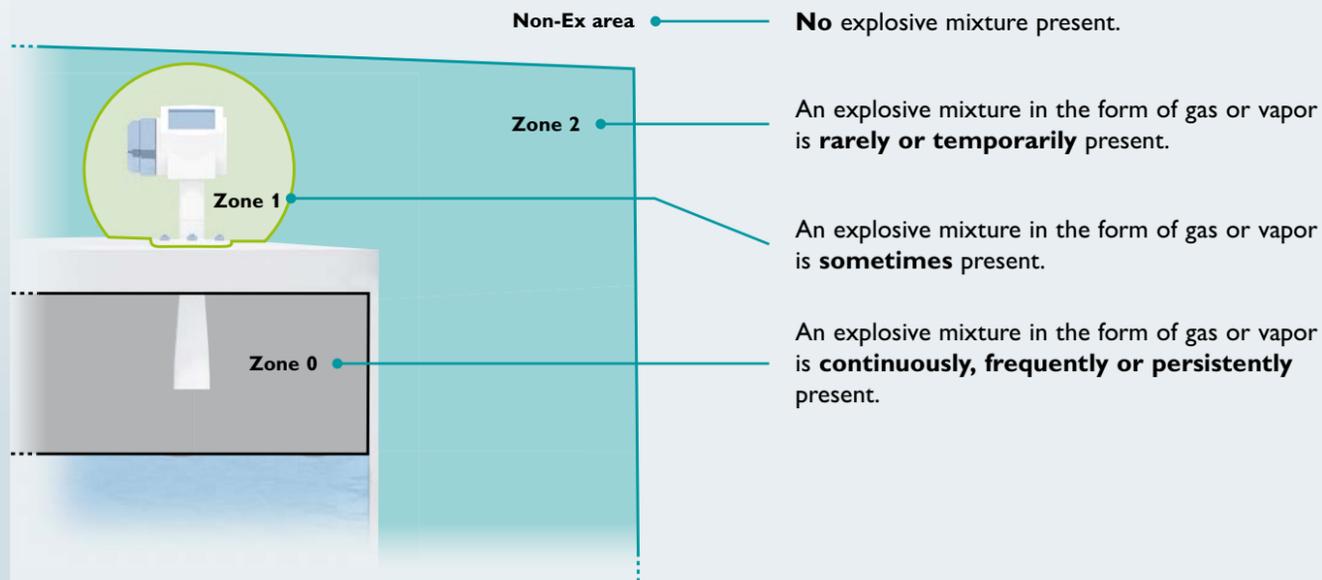
With the PLUGTRAB PT-IQ Ex protective devices, it is possible for the first time to install protective devices with multi-stage monitoring and remote signaling directly in Ex zone 2. The intrinsically safe protective circuits can be led up to Ex zone 0.

Your advantage: you can check the status of your protective devices directly on site or in the control room, even in intrinsically safe areas. You can replace the modules before a failure occurs.



Benefit from all the advantages of the surge protection system, even in the Ex area. You can monitor up to ten PT-IQ Ex surge protective devices using a central controller.

Zone classification in the Ex area



Intelligent surge protection for the Ex area

Controller for power supply and remote signaling

One controller for each of the PT-IQ...EX... protective devices (maximum 10)



2800768

PT-IQ-PTB-UT

Protection for one double wire

Standard signals
0... 10 V
0/4... 20 mA



2801512

PT-IQ-1X2-EX-24DC-UT

Protection for two double wires

Standard signals
0... 10 V
0/4... 20 mA

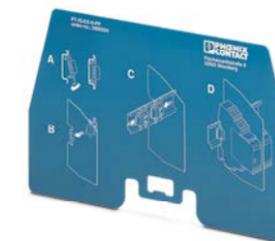


2801513

PT-IQ-2X2-EX-24DC-UT

Necessary accessories: partition plates

Partition plates for maintaining the minimum distance of 50 mm between the controller and Ex protection modules.



For flat DIN rails (7.5 mm)

2905023

PT-IQ-EX-L-PP

For isolated DIN rails

2905024

PT-IQ-EX-H-PP

Plug-in surge protection – PLUGTRAB PT

PLUGTRAB PT consists of a base element and a protective plug. Various grounding options are implemented via the corresponding base element. Each protective plug can be tested using the CHECKMASTER arrester testing device. All the PLUGTRAB PT devices listed below are available for any application – and that includes the convenient PT-IQ type.



Floating signal circuits

The products on this page support the HART protocol**	Plug	Base element	
		Indirect grounding	Direct grounding
	Protection for 1 double wire*, e.g., standard signals 0/4 ... 20 mA PT 1x2-12DC-ST Order No. 2856029 + PT 1x2-24DC-ST Order No. 2856032	PT 1x2+F-BE Order No. 2856126 + PT 1x2-BE Order No. 2856113	
	Protection for 2 double wires*, e.g., standard signals 0/4 ... 20 mA PT 2x2-12DC-ST Order No. 2838254 + PT 2x2-24DC-ST Order No. 2838228	PT 2x2+F-BE Order No. 2839224 + PT 2x2-BE Order No. 2839208	
	Protection for intrinsically safe circuits, one or two double wires PT 2xEX(I)-24DC-ST Order No. 2838225 + -	- + PT 2xEX(I)-BE Order No. 2839279	
	Protection for temperature, 2, 3 or 4-conductor measurements PT 4-24DC-ST Order No. 2839240 + PT 4+F-BE Order No. 2839415	PT 4-BE Order No. 2839402 + -	
	Protection for intrinsically safe circuits, 2, 3 or 4-conductor measurements PT 4-EX(I)-24DC-ST Order No. 2839253 + -	- + PT 4-EX(I)-BE Order No. 2839486	

* Other voltage levels are available at www.phoenixcontact.com

** HART = Highway Addressable Remote Transducer Protocol (Phoenix Contact is a registered member of the HART Communication Foundation)

Signal circuits with common reference potential



	Plug	Base element	
		Indirect grounding	Direct grounding
	Protection for two conductors*, e.g., binary switching signals PT 2x1-24DC-ST Order No. 2856087 + PT 2x1-24AC-ST Order No. 2856100	PT 2x1+F-BE Order No. 2856142 + PT 2x1-BE Order No. 2856139	
	Protection for four conductors*, e.g., binary switching signals PT 4x1-24DC-ST Order No. 2838322 + PT 4x1-24AC-ST Order No. 2838351	PT 4x1+F-BE Order No. 2839376 + PT 4x1-BE Order No. 2839363	
	Protection for high signal voltages* PT 2x1VA-120AC-ST Order No. 2839185 + PT 2x1VA-230AC-ST Order No. 2839198	- + PT-BE/FM Order No. 2839282	

Single-stage protection with gas-filled surge arrester as coarse protection



	Protection for two conductors PT 2-F-ST Order No. 2859000 + -	- + PT-BE/FM Order No. 2839282
	Protection for four conductors PT 4-F-ST Order No. 2858441 + -	- + PT 4-BE Order No. 2839402

Other surge protective devices for MCR technology

LINETRAB
The standard in the 6.2 mm class

SURGETRAB
Protection directly at the measuring head

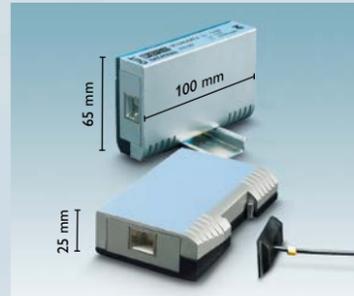
TERMITRAB
Protection in the terminal block

Surge protection for information technology

Reliable data and telecommunications are indispensable in today's industry.

The sensitive systems used in these cases work with high frequencies at low signal levels and are networked over a wide area. Surge voltages here quickly lead to large-scale failures and, in worst-case scenarios, to data loss.

This selection guide helps you find the right protection for your application quickly and easily – providing you with greater availability.



The perfect fit
The DATATRAB series can be used as an adapter or DIN rail module.



Modular, small, and easy
Protective plugs for telecommunications and data distributors. The COMTRAB product range for LSA-PLUS disconnect strips.



Numerous applications, one solution
Solutions based on the PLUGTRAB series provide the ideal protection for installation in the control cabinet.



Information and data technology (bus systems)

	Plug	Base element
PROFIBUS DP		+ PT 1X2-BE Order No. 2856113
INTERBUS Inline (I/O) Digital		+ PT 4X1-24AC-ST Order No. 2838351
INTERBUS Inline (I/O) Analog		+ PT 2X2-24AC-ST Order No. 2838283
PROFIBUS PA FOUNDATION Fieldbus		+ PT 2XEX(I)-24DC-ST Order No. 2838225

Ethernet (incl. PoE) - 100Base-T - 1000Base-T - 10GBase-T		 DT-LAN-CAT.6+ Order No. 2881007
Token ring		
VG-AnyLAN		
PROFINET		
Ethernet - 100Base-T - 1000Base-T		DT-LAN-19"-24 Order No. 2838791
Token ring		DT-LAN-19"-16 Order No. 2880147
INTERBUS Inline remote bus		DT-UFB-485/BS Order No. 2920612
		DT-UFB-IB-RB0 Order No. 2800056
		DT-UFB-IB-RBI Order No. 2800055

Accessories

RJ45 patch cable, length: 0.5 m		FL CAT6 PATCH 0.5 Order No. 2891288
RJ45 patch cable, length: 3 m		FL CAT6 PATCH 3.0 Order No. 2891686



High-speed data protection
The DATATRAB family represents effective surge protection for high-speed data transmission.
DT-LAN-CAT.6+ offers universal protection without affecting the signal at network speeds of up to 10 Gbps.

Telecommunications

DSL

ADSL, HDSL, VDSL
Analog telephony
ISDN U_{K0}



PT 2-TELE
Order No. 2882828

ADSL, HDSL, VDSL
Analog telephony
ISDN U_{K0}



DT-TELE-RJ45
Order No. 2882925

SHDSL

DT-TELE-SHDSL
Order No. 2801593

Analog telephony, ADSL, VDSL
LSA-PLUS technology
Coarse protection with failsafe contact

CTM 2X1-180DC-GS
Order No. 2838636

Analog telephony, ADSL, VDSL
LSA-PLUS technology
Coarse protection with failsafe contact and power cross protection

CTM 2X1-180DC-GS-P
Order No. 2838623

Analog telephony, ADSL, VDSL
LSA-PLUS technology
Coarse protection and fine protection

CTM 1X2-110AC
Order No. 2838539

Analog telephony, ADSL, VDSL
LSA-PLUS technology

Coarse protection

Magazine – CT
10-2/2-GS/3E-110AC
Order No. 2920829

ISDN S₀
ISDN S_{2M}
LSA-PLUS technology



CTM ISDN
Order No. 2838555

Data technology (serial interfaces)



Data systems
RS-485
RS-422A

Plug



PT 5-HF-12DC-ST
Order No. 2838775

Data systems
RS-232C

PT 5-HF-24DC-ST
Order No. 2906002

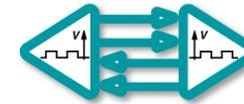
Base element

+ PT 2X2+F-BE
Order No. 2839224

+ PT 2X2+F-BE
Order No. 2839224

RS-485

DT-UFB-485/BS
Order No. 2920612



RS-232 C/V.24
with D-SUB 9 connection

DT-UFB-V24/S-9-SB
Order No. 2803069

RS-232 C/V.24
with adapter cable from D-SUB 9 to D-SUB 25

DT-UFB-V24/S-SB-SET
Order No. 2803072

Accessories

Magazine with grounding rail
- For accommodating up to 10 CTM plugs

CTM 10-MAG
Order No. 2838610

Disconnect strip screw terminal block
- For NS-32 and NS-35/7.5 DIN rails
- Compatible with the CTM 10-MAG with connections for 20 conductors up to 4 mm² and with disconnect contacts for CTM protective plugs

CT-TERMBLOCK 10 DA
Order No. 0441711

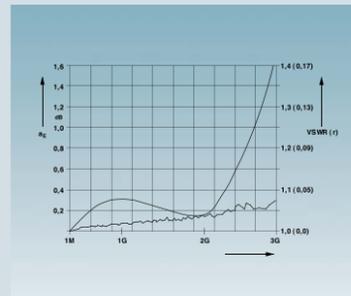
LSA-PLUS disconnect strip
- For accommodating CTM and CT 10 protection modules
- 10 double wires

Disconnect strip –
CT 10-TL
Order No. 2765356

Surge protection for transceiver systems

The high frequencies of wireless transmission require the use of protective devices with low insertion loss. COAXTRAB satisfies this requirement.

The coaxial arresters are suitable for all common transmission systems in mobile communication networks and radio networks used by the authorities, as well as in video or television transmission.



Customized products

Thanks to their very low attenuation values, the surge protective devices ensure interference-free transmission of signals in all standard applications.



Shielding

Good shielding properties are vital for clean transmission. Robust metal housings provide the perfect shielding and are suitable for use in harsh environments.



Connection technology

The right connection technology to suit the application: F and N connector, TV connector, and 7/16, UHF, BNC connections.



Numerous applications, one solution

Solutions based on the PLUGTRAB series provide the ideal protection for installation in the control cabinet.



Protection for transceiver technology

GSM
UMTS
LTE
WiMAX



GPS or GSM (900, 1800, 1900 MHz)
UMTS/3G (1.9 ... 2.2 GHz)
- With N connector



CN-UB-280DC-3-BB
Order No. 2801050

CN-UB-280DC-3-SB
Order No. 2801051

GSM (900, 1800, 1900 MHz)
UMTS/3G (1.9 ... 2.2 GHz)
- Without supply voltage on the coaxial cable
- Very low voltage protection level
- With N connector



CN-LAMBDA/4-2.25-BB
Order No. 2801057

CN-LAMBDA/4-2.25-SB
Order No. 2801056

GSM (900, 1800, 1900 MHz)
UMTS/3G (1.9 ... 2.2 GHz)
- Without supply voltage on the coaxial cable
- Very low voltage protection level
- With 7/16 connector



C7/16-LAMBDA/4-2.25-BB
Order No. 2801060

C7/16-LAMBDA/4-2.25-SB
Order No. 2801059

WiMAX (2.4 ... 6 GHz)
or Industrial Wireless (2.4 GHz)
- Without supply voltage on the coaxial cable
- Very low voltage protection level
- With N connector



CN-LAMBDA/4-5.9-BB
Order No. 2838490

CN-LAMBDA/4-5.9-SB
Order No. 2800023

Accessories

Mounting plate

- For individual fixing of CN-UB-280DC



CN-UB/MP
Order No. 2818135

Mounting plate, angled 90°

- For individual fixing of CN-UB-280DC, e.g., for wall mounting



CN-UB/MP-90DEG-50
Order No. 2803137

Protection for video monitoring systems

	With BNC connection	50 ohms		C-UFB- 5DC/E Order No. 2782300
		75 ohms		C-UFB- 5DC/E 75 Order No. 2763604
	With screw connection	For one video signal		PT 3-PB-ST Order No. 2858030 PT 1X2+F-BE Order No. 2856126
		For two video signals		PT 2X2-HF- 5DC-ST Order No. 2839567 PT 2X2-BE Order No. 2839208

Protection for TV and radio systems

		Satellite television Upstream of the distributor (multi-switch)		C-SAT-BOX Order No. 2880561
		Satellite television Upstream of the SAT receiver or television		C-TV-SAT Order No. 2856993
		Cable/terrestrial television Upstream of the television, radio or tuner for the hi-fi system		C-TV/HIFI Order No. 2857002

Accessories

<p>F connector adapter (plug-to-plug)</p> <ul style="list-style-type: none"> - Ideal for directly connecting the C-SAT-BOX to a multi-switch with the same pitch - Threadless plug-in coupling enables fast connection - More secure hold thanks to the clamping ring 		ADAPTER KOAX TYP F Order No. 2880972
<p>F connector cable (plug-to-plug)</p> <ul style="list-style-type: none"> - For flexibly connecting the C-SAT-BOX to a multi-switch with a different pitch 		KBL-SAT/20 Order No. 2880985

Combined protection for TV/radio connections and the power supply

Satellite television

Used upstream of the SAT receiver or television with simultaneous protection for the power supply.



MAINTRAB
MNT...



Country: D, A, NL
MNT-TV-SAT D
Order No. 2882284
MNT-TV-SAT D/WH
Order No. 2882297

Country: B, F, CZ, SVK, PL
MNT-TV-SAT B/F
Order No. 2882307

Country: E, P
MNT-TV-SAT E
Order No. 2882310



Country: S, FIN, N
MNT-TV-SAT S/WH
Order No. 2880888

Cable/terrestrial television

Used upstream of the television, radio or tuner for the hi-fi system with simultaneous protection for the power supply.



MAINTRAB
MNT...



Country: D, A, NL
MNT-TV-SAT D
Order No. 2882284
MNT-TV-SAT D/WH
Order No. 2882297

Country: B, F, CZ, SVK, PL
MNT-TV-SAT B/F
Order No. 2882307

Country: E, P
MNT-TV-SAT E
Order No. 2882310



Country: S, FIN, N
MNT-TV-SAT S/WH
Order No. 2880888

CHECKMASTER – the arrester test system

Lightning protection systems must be tested in accordance with the requirements of IEC 62305-3 and official regulations. Here, a basic visual check is not enough to identify surge protective devices that were previously damaged.

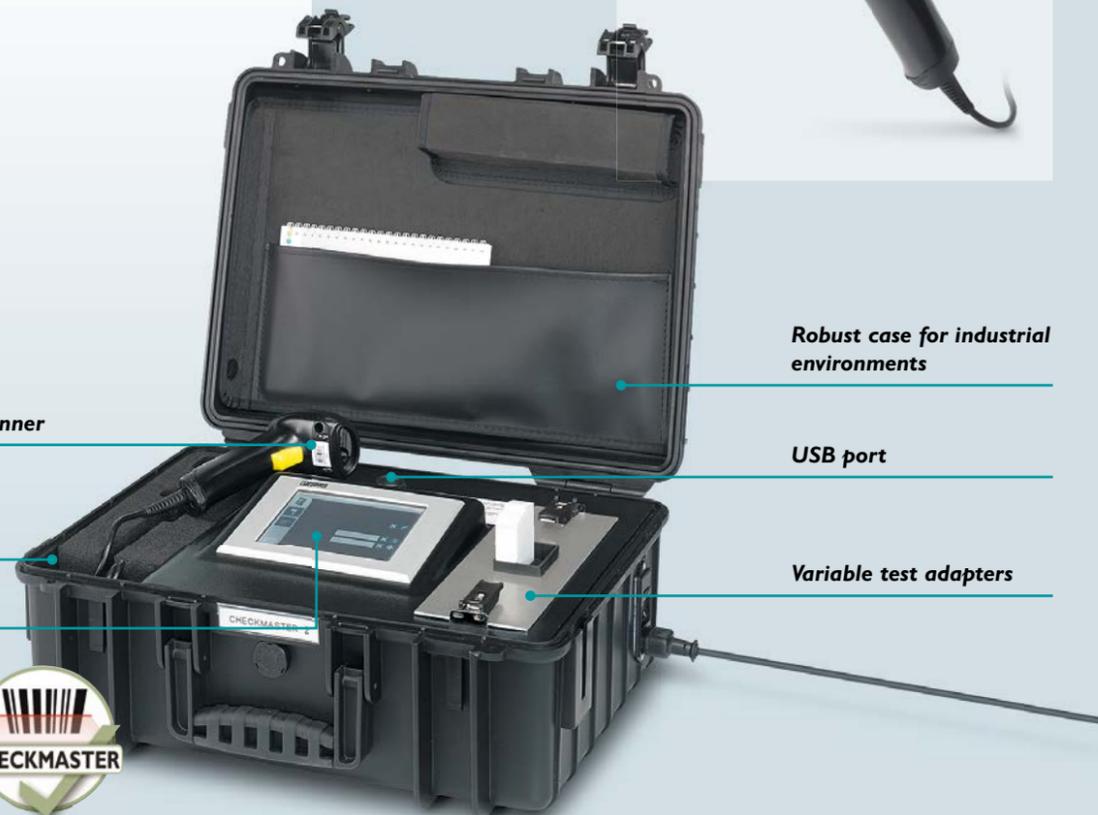
Only an electrical check using the CHECKMASTER produces meaningful results. It checks all the relevant components of an arrester. The nominal data of protective elements, such as spark gaps, varistors, gas discharge tubes, and suppressor diodes, is tested in a single test cycle.

CHECKMASTER 2
Order No. 2905256

Convenient hand-held scanner

Storage compartment for test adapter

LC color display



Robust case for industrial environments

USB port

Variable test adapters

The CHECKMASTER –

everything you need for testing

1. Detecting a test object

The barcodes on the surge protective devices provide you with a fast, accurate option to enter an item. System-specific abbreviations or user-defined IDs can be entered via the operator interface or read in from the individually created barcode labels.



2. Inserting a test object

The test object is simply inserted into the associated test adapter. If the scanner has already detected the device type, the test is started automatically upon insertion. Alternatively, the order number of the test object can be entered via the touch panel after insertion in the test adapter.



3. Safe testing

All relevant components of the protective plug are electrically tested in an automatic test process. The results of these tests are shown on the color display.

- Protective plug functional
- Protective plug damaged – replacement recommended
- Protective plug defective – must be replaced



4. Easy, verifiable saving of the results

The tests must be documented in accordance with IEC 62305. The CHECKMASTER saves all test results to the internal memory with power supply failure protection. The test reports are available via USB stick for convenient further processing in Office programs.



Test adapter for product ranges

FLT-CP, FLT-SEC, VAL-CP, and VAL-SEC
CM 2-PA-FLT/VAL-CP/SEC
Order No. 2905283

PT and PLT-SEC
CM 2-PA-PT/PLT
Order No. 2905284

VAL-MS
CM 2-PA-VAL-MS
Order No. 2905265

CTM
CM 2-PA-CTM
Order No. 2905282

The top features at a glance:

- Convenient, safe, and fast testing
- The "Tolerance barrier is reached" test status prevents unnecessary service calls
- Automatic log function for test results
- The internal memory also enables subsequent processing of the test results on the computer
- The update function always keeps the CHECKMASTER up to date with the latest developments
- High level of investment security thanks to variable test sockets
- Increased system availability, thanks to screening test
- IEC 62305-3-compliant testing
- High quality and safety standard

LM-S lightning monitoring system – Optimum maintenance planning

Get online information about lightning strikes in your system.

LM-S is the live monitoring system for the continuous detection and evaluation of lightning strikes. It detects and analyzes all the important parameters associated with lightning surge currents. This allows you to assess the actual load of the system. Based on this information, you can determine whether any checks or maintenance are required.



Acquisition and evaluation

The sensors are mounted on the lightning current arrester cables. They record the magnetic field that occurs around the conductor due to the lightning surge current. The measured result is transmitted via fiber optics to the O/E module of the evaluation unit, where the optical signal is converted into an electrical signal. Based on the values obtained, the evaluation unit determines the lightning characteristics with their typical parameters, such as the maximum lightning current strength, lightning current rate of rise, charge, and energy.

Remote monitoring in realtime

The evaluation unit can be easily integrated into standard network systems via the RJ45 Ethernet interface. Access to the data acquired as well as configuration of the system is via an internal web server.

Using standard network technologies enables flexible system integration and offers users a wide range of options for using existing management or remote control systems.

Other fields of application

- Buildings
- Telecommunications technology
- High and extra-high voltage technology
- Transportation technology
- Industry

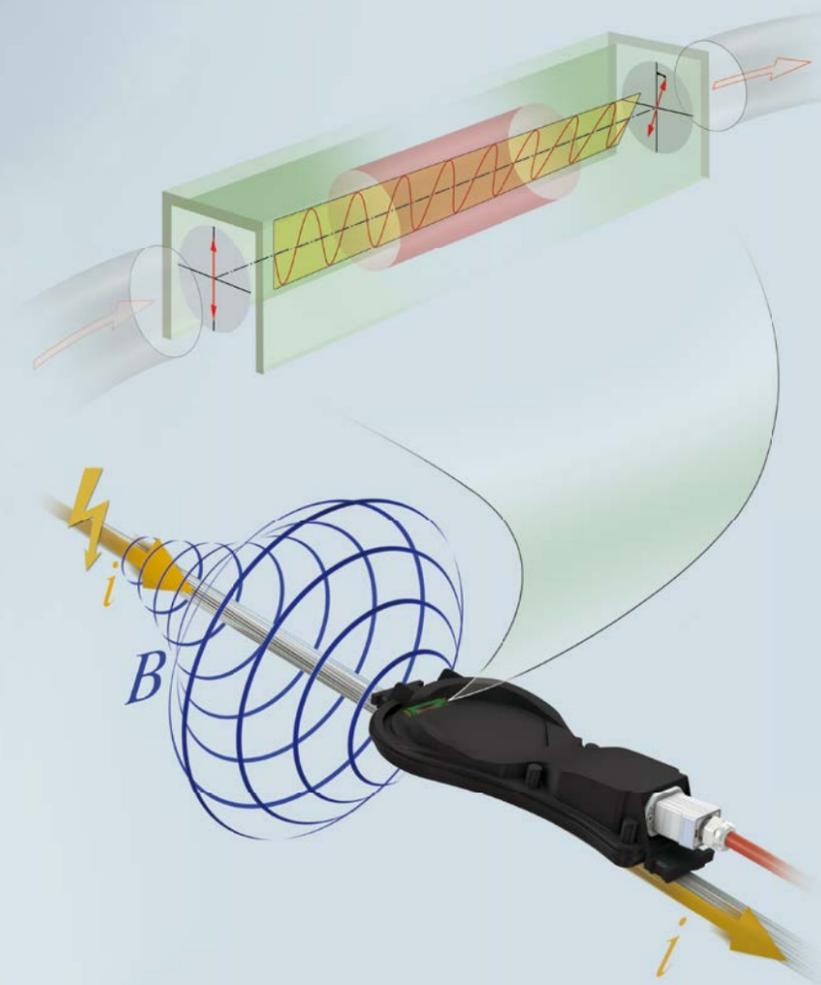


LM-S lightning monitoring system – Selection guide

A complete measuring system application consists of a maximum of three sensors, fiber optic cables, and the analysis module. A sensor is installed on each of the lightning arresters on an object. Fiber optics connect the sensors to the O/E converter on the analysis module.



Faraday effect as a reliable measuring method



The internal measuring principle of the LM-S is based on the Faraday effect. Polarized light in a specific medium is rotated through a magnetic field over a defined length and measured.

The lightning monitoring system detects this change in the light signal and uses it as the basis for obtaining the measured value results.

Evaluation unit



LM-S-A/C-3S-ETH
Order No. 2800618

Sensor



LM-S-LS-H
Order No. 2800616

Connecting cable



Matching connecting leads available on request.

O/E module



LM-S-C-3LS
Order No. 2800617

Interference voltage filters for power supplies and measuring signals

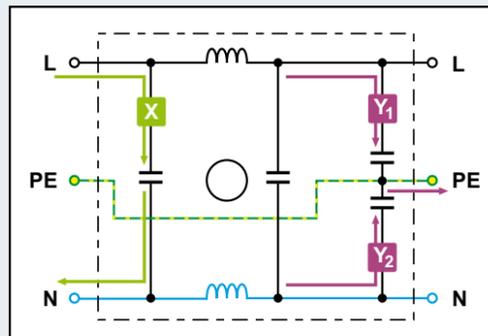
Interference suppression filters limit conductive, high-frequency interference voltages. Devices used in data processing or automation particularly benefit from a clean power supply.

The end result is safe operation and reliable measured results.

Reliable signals with mains interference filter

Switching operations triggered mechanically or electronically generate pulse-like and high-frequency interference voltages. These voltages spread in an unimpeded manner across the cable network. All the devices within this cable network are affected. Data errors, uncontrolled functions, and system crashes can result, with data-processing devices at particular risk.

Mains interference filters – operating principle and range



Operating principle of filter circuits

Filtering of symmetrical disturbance variables

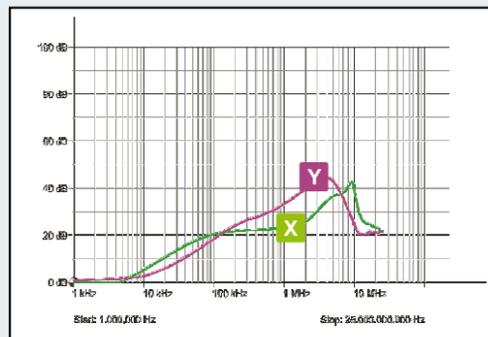
X Interference voltages between the phase and neutral conductor are filtered.

Filtering of asymmetrical disturbance variables

Y₁ The opposite grounded interference voltages from phase to PE and from the neutral conductor to PE are filtered.
Y₂

Operating range of filters

An attenuation curve diagram illustrates the effective range of mains interference filters. The relevant frequency-dependent attenuation can be read according to the symmetrical or asymmetrical filter circuit.

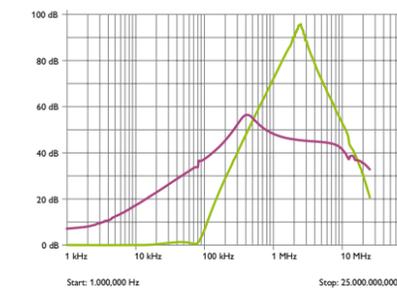


Mains interference filters with 1 to 10 A rated load current

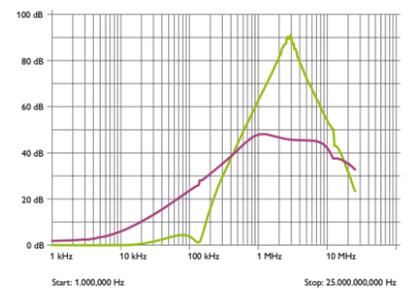
FILTRAB devices are mains interference filters for single-phase circuits and limit both asymmetrical and symmetrical interference voltages. As with all filter devices, ideally they should be installed directly upstream of the device requiring protection.



a_E symmetrical: ≥ 65 dB (1 MHz/50 Ω)
a_E asymmetrical: ≥ 45 dB (1 MHz/50 Ω)



a_E symmetrical: ≥ 55 dB (1 MHz/50 Ω)
a_E asymmetrical: ≥ 35 dB (1 MHz/50 Ω)



FILTRAB

Nominal voltage U_N
 Rated frequency f_N
 Rated load current I_L
 Backup fuse max. according to IEC
 Test standards

NEF 1-1

Order No. 2794123

240 V AC
 50 Hz | 60 Hz
 1 A (≤ 40°C)
 1 A (gL)
 IEC 60939-2 | EN 60939-2

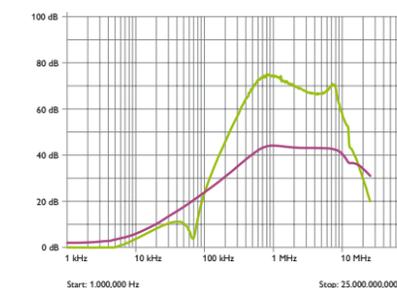
NEF 1-3

Order No. 2794110

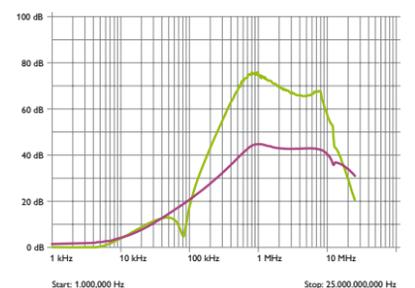
240 V AC
 50 Hz | 60 Hz
 3 A (≤ 40°C)
 3 A (gL)
 IEC 60939-2 | EN 60939-2



a_E symmetrical: ≥ 80 dB (1 MHz/50 Ω)
a_E asymmetrical: ≥ 40 dB (1 MHz/50 Ω)



a_E symmetrical: ≥ 55 dB (1 MHz/50 Ω)
a_E asymmetrical: ≥ 35 dB (1 MHz/50 Ω)



FILTRAB

Nominal voltage U_N
 Rated frequency f_N
 Rated load current I_L
 Backup fuse max. according to IEC
 Test standards

NEF 1-6

Order No. 2783082

240 V AC
 50 Hz | 60 Hz
 6 A (≤ 40°C)
 6.3 A (gL)
 IEC 60939-2 | EN 60939-2

NEF 1-10

Order No. 2788977

240 V AC
 50 Hz | 60 Hz
 10 A (≤ 40°C)
 10 A (gL)
 IEC 60939-2 | EN 60939-2

Type 3 combined mains interference filters with surge protection

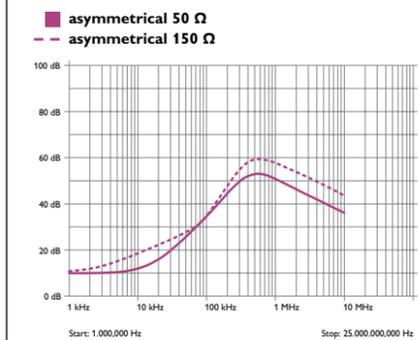
SURGE FILTER PROTECTION

Rail-mountable mains interference filter with integrated device protection, optical status indicator, and floating remote indication contact.

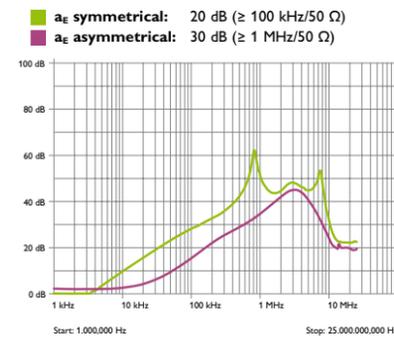
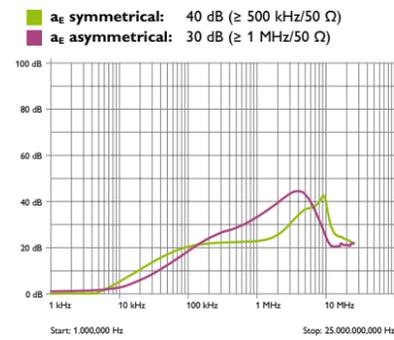


TERMITRAB

Combination of mains interference filter and surge protection for two signal wires with a shared reference potential.



With floating remote indication contact



SURGE FILTER PROTECTION	SFP 1-5/120AC Order No. 2920667	SFP 1-10/120AC Order No. 2920670	SFP 1-20/230AC Order No. 2859987
Nominal voltage U_N Phases	120 V AC 1-phase		230 V AC 1-phase
Rated load current I_L	5 A ($\leq 72^\circ\text{C}$)		20 A ($\leq 40^\circ\text{C}$)
Rated frequency f_N	50 Hz 60 Hz		50 Hz 60 Hz
Nominal discharge current I_N (8/20) μs	3 kA (L-N) 3 kA (L-PE)		5 kA (L-N) 5 kA (L-PE)
Voltage protection level U_p	≤ 450 V (L-N) ≤ 450 V (L(N)-PE)		≤ 1 kV (L-N) ≤ 1 kV (L(N)-PE)
Backup fuse max. according to IEC	20 A (gL gG)	20 A (gL gG)	20 A (gL gG)
IEC test classifications EN types	III T3	III T3	III T3
IEC 61643-1 EN 61643 UL 1449	• • •	• • •	• • -

TERMITRAB	TT-ST-M-SFP-24AC Order No. 2858946	TT-D-STTCO-BK Order No. 2858894
Nominal voltage U_N Phases	24 V AC	
Rated frequency f_N	50 Hz 60 Hz	
Rated load current I_L	500 mA ($\leq 55^\circ\text{C}$)	
Nominal discharge current I_N (8/20) μs	350 A (L-PE)	
Voltage protection level U_p	≤ 80 V (C1 (500 V/250 A)) (L-PE)	
Backup fuse max. according to IEC	500 mA (e.g., T acc. to 127-2/III)	
IEC test classifications EN types	C1 C3	
Test standards	IEC 61643-21	
		Accessories: Cover for terminating a row of terminal blocks

	SFP 1-15/120AC Order No. 2920683	SFP 1-20/120AC Order No. 2856702
Nominal voltage U_N Phases	120 V AC 1-phase	120 V AC 1-phase
Rated load current I_L	15 A ($\leq 52^\circ\text{C}$)	20 A ($\leq 40^\circ\text{C}$)
Rated frequency f_N	50 Hz 60 Hz	50 Hz 60 Hz
Nominal discharge current I_N (8/20) μs	3 kA (L-N) 3 kA (L-PE)	
Voltage protection level U_p	≤ 450 V (L-N) ≤ 450 V (L(N)-PE)	
Backup fuse max. according to IEC	20 A (gL gG)	20 A (gL gG)
IEC test classifications EN types	III T3	III T3
IEC 61643-1 EN 61643 UL 1449	• • •	• • -



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