

# TTC-3-1X2-24DC-PT - Surge protection device



2907325

<https://www.phoenixcontact.com/us/products/2907325>

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Surge protection for a 2-wire floating signal circuit, e.g., 0(4) mA ... 20 mA current loop, HART-compatible. Can be used in safety-related circuits up to SIL 3.



## Your advantages

- Extremely space-saving installation with the narrowest overall width of just 3.5 mm
- Cost-optimized with tailored product features
- Finding the right product for all possible requirements in MCR applications is easy, thanks to the complete range of products with customized features

## Commercial data

Item number	2907325
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL23
Product key	CL2266
GTIN	4055626199917
Weight per piece (including packing)	24.5 g
Weight per piece (excluding packing)	19.5 g
Customs tariff number	85363030
Country of origin	DE

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## Technical data

### Product properties

Product type	Surge protection for MCR technology
Product family	TERMITRAB complete
IEC test classification	C1
	C2
	C3
	D1
Type	DIN rail module, one-piece
Wire pairs per module	1

### Insulation characteristics

Overvoltage category	III
Pollution degree	2

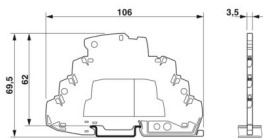
### Electrical properties

Nominal voltage $U_N$	24 V DC
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### Connection data

Connection method	Push-in connection
Conductor cross-section, flexible, with ferrule, with plastic sleeve	0.2 mm <sup>2</sup> ... 1 mm <sup>2</sup>
Conductor cross-section, flexible, with ferrule, without plastic sleeve	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 16

### Dimensions

Dimensional drawing	
Width	3.5 mm
Height	106 mm
Depth	69.5 mm (incl. DIN rail 7.5 mm)

### Material specifications

Color	gray (RAL 7042)
	gray (RAL 7042)
Flammability rating according to UL 94	V-0
Insulating material	PBT
Housing material	PBT

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## Mechanical properties

### Mechanical data

Open side panel	Yes
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## Protective circuit

Direction of action	Line-Line & Line-Signal Ground/Shield & optional Signal Ground/Shield-Earth Ground
Nominal voltage $U_N$	24 V DC
Maximum continuous operating voltage $U_C$	30 V DC 21 V AC
Rated current	250 mA (70 °C)
Operating effective current $I_C$ at $U_C$	$\leq 1 \mu A$
Protective conductor current $I_{PE}$	$\leq 1 \mu A$
Nominal discharge current $I_n$ (8/20) $\mu s$ (line-line)	5 kA
Nominal discharge current $I_n$ (8/20) $\mu s$ (line-ground)	5 kA
Pulse discharge current $I_{imp}$ (10/350) $\mu s$ (line-earth)	0.5 kA
Total discharge current $I_{Total}$ (8/20) $\mu s$	10 kA
Voltage protection level $U_p$ (line-line)	$\leq 50$ V (C1 - 500 V / 250 A) $\leq 70$ V (C2 - 10 kV / 5 kA) $\leq 45$ V (C3 - 30 A)
Voltage protection level $U_p$ (line-earth)	$\leq 1000$ V (C2 - 10 kV / 5 kA) $\leq 1000$ V (C3 - 100 A)
Voltage protection level $U_p$ static (line-line)	$\leq 50$ V (C1 - 1 kV / 500 A)
Response time $t_A$ (line-line)	$\leq 1$ ns
Input attenuation aE, sym.	typ. 0.3 dB ( $\leq 600$ kHz / 150 $\Omega$ )
Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system	typ. 2.4 MHz
Capacity (Core-Core)	typ. 1 nF
Resistance per path	2.2 $\Omega \pm 10$ %
Surge protection fault message	none
Max. required back-up fuse	250 mA (FF)
Impulse durability (line-line)	C1 - 500 V / 250 A C2 - 10 kV / 5 kA C3 - 30 A
Impulse durability (line-earth)	C2 - 10 kV / 5 kA C3 - 100 A D1 - 500 A
Pulse reset time (line-line)	$\leq 30$ ms

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20 (with end cover)
Ambient temperature (operation)	-40 °C ... 85 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C

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Altitude	≤ 4000 m (amsl)
Permissible humidity (operation)	5 % ... 95 %

## Standards and regulations

Standards/specifications	IEC 61643-21
Note	2000 + corrigendum 2001 + A1:2008, modified + A2:2012

### EN 61643-21

Standards/specifications	EN 61643-21
Note	2001 + A1:2009 + A2:2013

## Mounting

Mounting type	DIN rail: TH 35 - 7.5 mm
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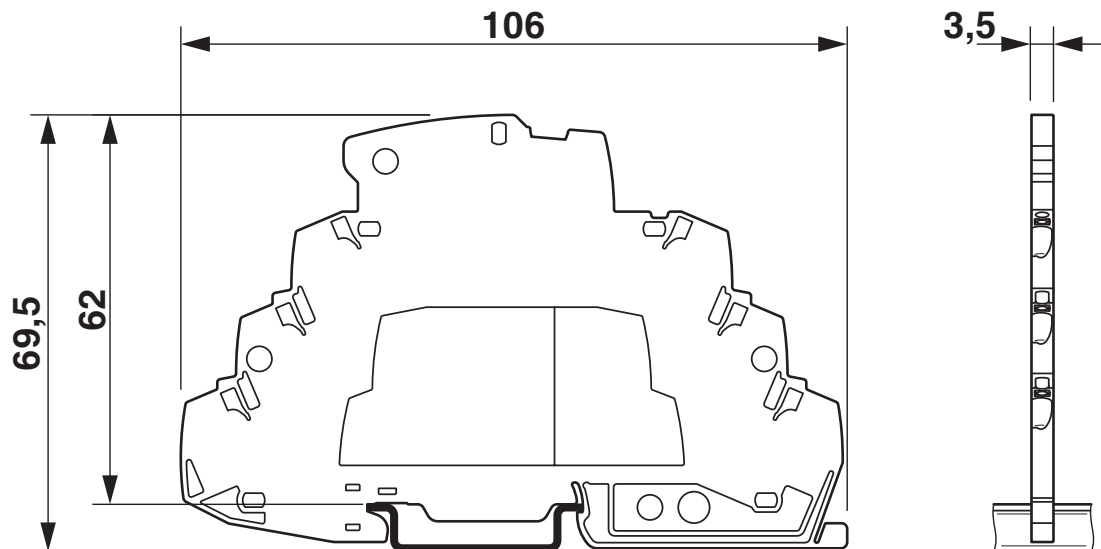


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## Drawings

Dimensional drawing

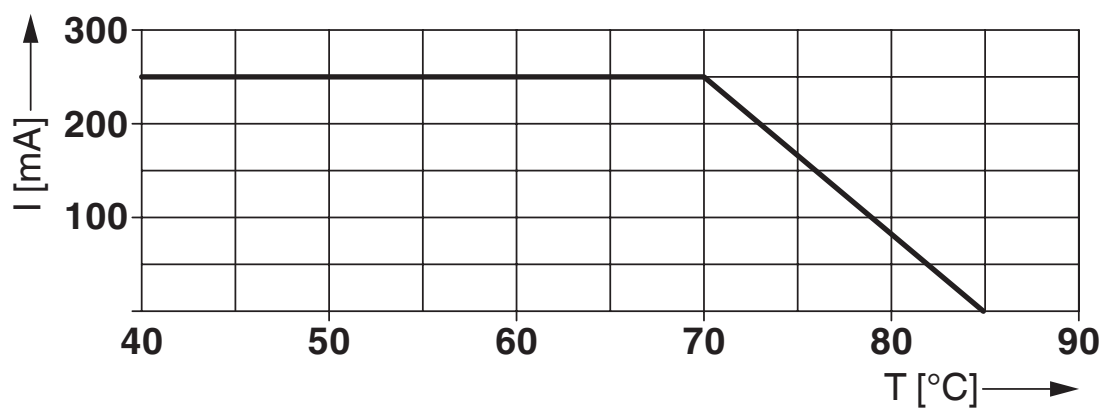


Schematic diagram

TTC-3-1X2-...									
Category	1oo1 architecture, HFT=0				1oo2 architecture, HFT=1				
	PFD <sub>AVG</sub>	PFH	Used budget of SIL 2 SIF		PFD <sub>AVG</sub>	PFH	CCF	Used budget of SIL 3 SIF	
			PFD <sub>AVG</sub>	PFH				PFD <sub>AVG</sub>	PFH
	9.44x10 <sup>-5</sup>	1.68x10 <sup>-8</sup> 1/h	0.9%	1.7 %	4.73x10 <sup>-6</sup>	8.43x10 <sup>-10</sup> 1/h	5 %	0.5 %	0.8%
					9.46x10 <sup>-6</sup>	1.68x10 <sup>-7</sup> 1/h	10 %	0.9 %	1.7 %
Calculation based on exida report, Phoenix Contact 16/06-072 R023 V3R1 exida Profile 1, FMEDA Analysis 2, T <sub>proof</sub> : 1 year, MT: 10 years, MTTR: 24 hours, PTC: 99% Used standards IEC/EN 61508, edition 2010 (device specific) IEC/EN 61511, edition 2016 + COR1:2016 + A1:2017 (system specific)									

## Functional safety scenarios

Diagram



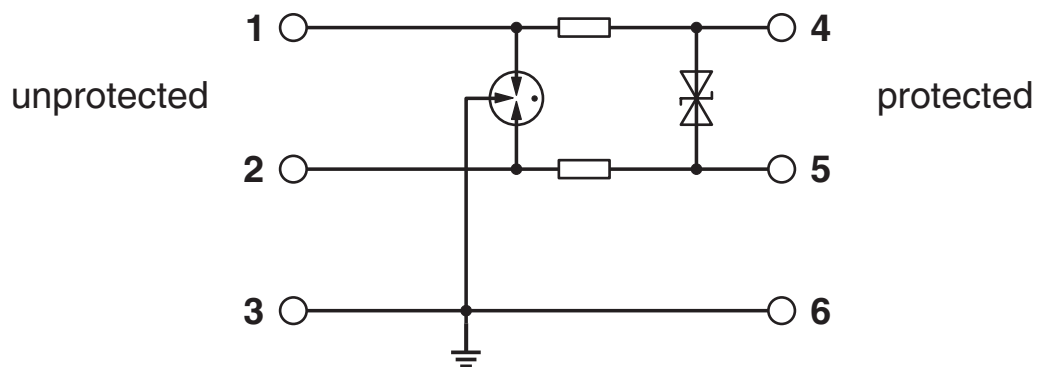
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Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2907325>



**CSA**

Approval ID: 70136717



**DNV GL**

Approval ID: TAE000027G



**UL Listed**

Approval ID: FILE E 138168



**CSAus**

Approval ID: 70136717

### **Functional Safety**

Approval ID: 16-06-072 R023 V3R1

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## Classifications

### ECLASS

ECLASS-13.0	27171501
ECLASS-15.0	27171501

### ETIM

ETIM 10.0	EC001466
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### UNSPSC

UNSPSC 21.0	39121600
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	d160e4e4-3b4f-4507-8019-35e3364d8151

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