

# TTC-6-3-HF-12DC-PT - Surge protection device



1065316

<https://www.phoenixcontact.com/us/products/1065316>

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Surge protection for three signal wires with common reference potential. For HF applications and telecommunications interfaces without supply voltage (up to 90 Mbps). Can be used in safety-related circuits up to SIL 3.

## Your advantages

- Space saving with a narrow overall width of just 6 mm
- Cost-optimized with tailored product features



## Commercial data

Item number	1065316
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL23
Product key	CL2262
GTIN	4055626725680
Weight per piece (including packing)	34 g
Weight per piece (excluding packing)	34 g
Customs tariff number	85363010
Country of origin	DE

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## Technical data

### Product properties

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

### Insulation characteristics

Overvoltage category	III
Pollution degree	2

### Electrical properties

Nominal voltage $U_N$	12 V DC
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### Connection data

Connection method	Push-in connection
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12

### Dimensions

Dimensional drawing	
Width	6.2 mm +0.1 mm
Height	105.8 mm
Depth	69.5 mm (incl. DIN rail 7.5 mm)

### Material specifications

Color	gray (RAL 7042)
	light gray (RAL 7035)
Flammability rating according to UL 94	V-0
Insulating material	PBT
Housing material	PBT

### Mechanical properties

#### Mechanical data

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Open side panel	No
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## Protective circuit

Direction of action	Line-Line & Line-Signal Ground/Shield & optional Signal Ground/Shield-Earth Ground
Nominal voltage $U_N$	12 V DC
Maximum continuous operating voltage $U_C$	15 V DC 10 V AC
Rated current	600 mA (40 °C)
Operating effective current $I_C$ at $U_C$	$\leq 100 \mu\text{A}$
Protective conductor current $I_{PE}$	$\leq 200 \mu\text{A}$
Nominal discharge current $I_n$ (8/20) $\mu\text{s}$ (line-line)	5 kA
Nominal discharge current $I_n$ (8/20) $\mu\text{s}$ (line-ground)	5 kA
Pulse discharge current $I_{imp}$ (10/350) $\mu\text{s}$ (line-earth)	0.5 kA
Total discharge current $I_{Total}$ (8/20) $\mu\text{s}$	10 kA
Voltage protection level $U_p$ (line-line)	$\leq 45 \text{ V}$ (C1 - 1 kV / 500 A) $\leq 85 \text{ V}$ (C2 - 10 kV / 5 kA) $\leq 30 \text{ V}$ (C3 - 100 A)
Voltage protection level $U_p$ (line-earth)	$\leq 50 \text{ V}$ (C1 - 1 kV / 500 A) $\leq 90 \text{ V}$ (C2 - 10 kV / 5 kA) $\leq 30 \text{ V}$ (C3 - 100 A)
Response time $t_A$ (line-line)	$\leq 1 \text{ ns}$
Response time $t_A$ (line-earth)	$\leq 1 \text{ ns}$
Input attenuation aE, sym.	typ. 0.3 dB ( $\leq 8.7 \text{ MHz}/150 \Omega$ )
Input attenuation aE, asym.	typ. 0.3 dB ( $\leq 10.5 \text{ MHz}/150 \Omega$ )
Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system	typ. 60 MHz
Cut-off frequency $f_g$ (3 dB), asym. (PE) in 150 $\Omega$ system	typ. 60 MHz
Capacity (Core-Core)	typ. 32 pF
Capacity (Core-Earth)	typ. 32 pF
Resistance per path	1.65 $\Omega \pm 20 \%$
Surge protection fault message	none
Max. required back-up fuse	630 mA (FF)
Impulse durability (line-line)	C1 - 1 kV / 500 A C2 - 10 kV / 5 kA C3 - 100 A
Impulse durability (line-earth)	C1 - 1 kV / 500 A C2 - 10 kV / 5 kA C3 - 100 A D1 - 500 A
Pulse reset time (line-line)	$\leq 30 \text{ ms}$
Pulse reset time (line-earth)	$\leq 30 \text{ ms}$

## Additional technical data

Max. total discharge current $I_{total \max}$ (8/20) $\mu\text{s}$	20 kA (1x)
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## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 85 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
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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# TTC-6-3-HF-12DC-PT - Surge protection device

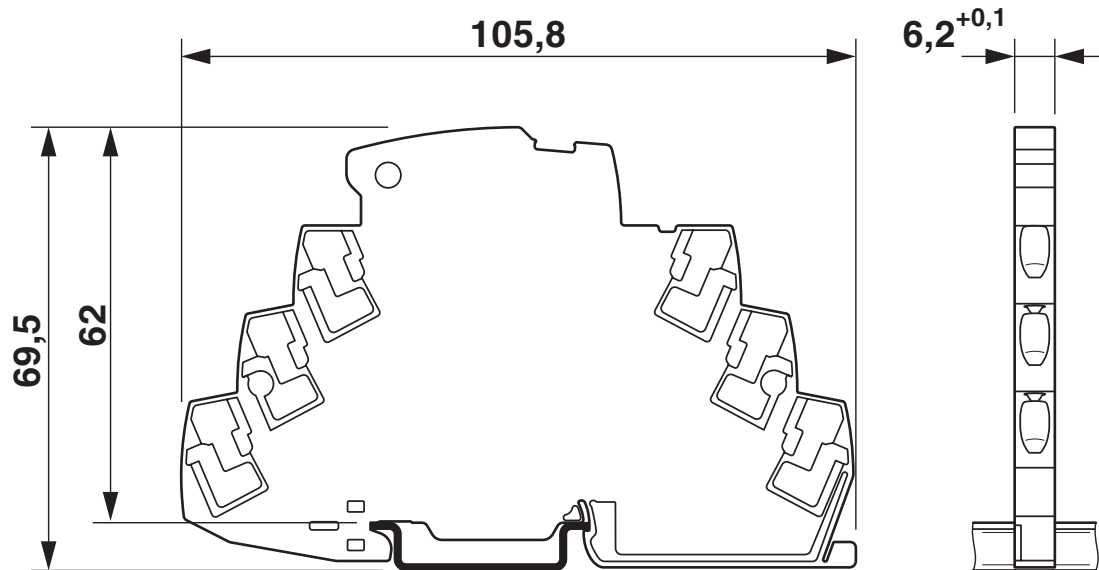


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## Drawings

Dimensional drawing



Schematic diagram

TTC-6-3-HF-...DC-PT									
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
	1.21·10 <sup>-4</sup>	2.16·10 <sup>-8</sup> 1/h	1.2 %	2.2 %	6.09·10 <sup>-6</sup>	1.08·10 <sup>-9</sup> 1/h	5 %	0.6 %	1.1 %
					1.22·10 <sup>-5</sup>	2.16·10 <sup>-9</sup> 1/h	10 %	1.2 %	2.2 %
Calculation based on exida report, Phoenix Contact 16/06-072 R023 V3R1 exida Profile 1, FMECA 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)									

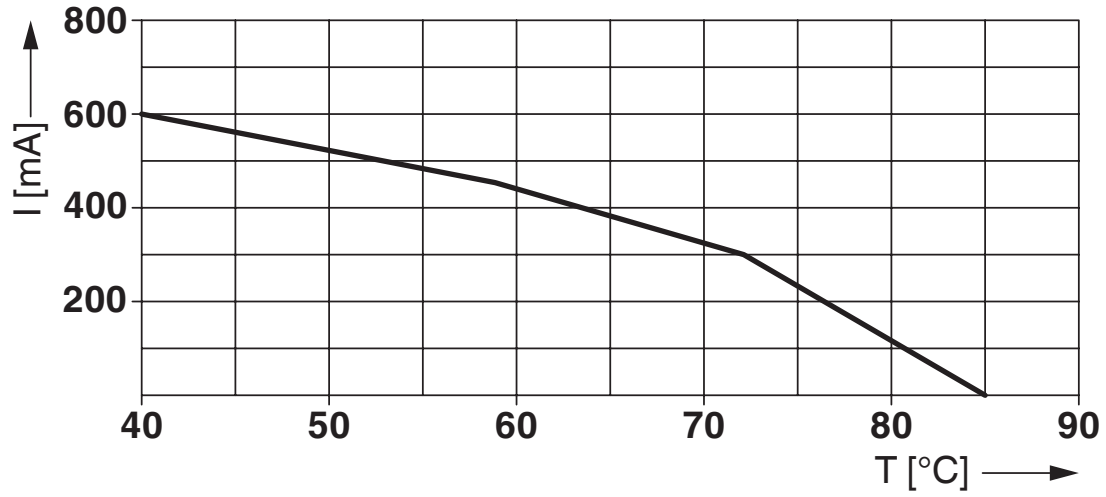
## Functional safety scenarios

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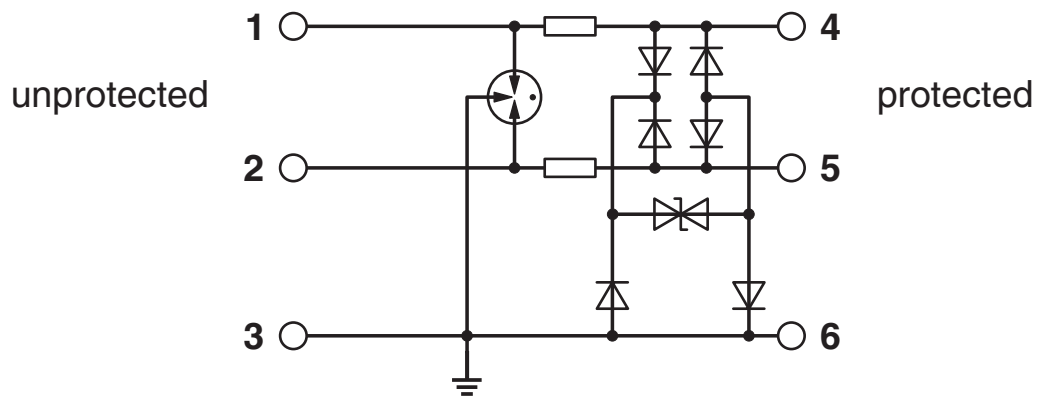
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Diagram



Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1065316>



**DNV GL**

Approval ID: TAE000027G



**UL Listed**

Approval ID: FILE E 138168

**UAE-RoHS**

Approval ID: 22-06-16191

**Functional Safety**

Approval ID: 16-06-072 R023 V3R1



**UL Listed**

Approval ID: FILE E 138168



**cUL Listed**

Approval ID: FILE E 333250



**UL Listed**

Approval ID: FILE E 333250



**cULus Listed**

Approval ID: File E 333250

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## Classifications

### ECLASS

ECLASS-13.0	27171503
ECLASS-15.0	27171503

### 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	c27f0443-56cd-4205-9d38-5b1c98c887f7

### EF3.1 Climate Change

CO2e kg	1.363 kg CO2e
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