

TTC-6-2X1-24DC-UT - Surge protection device



2906799

<https://www.phoenixcontact.com/us/products/2906799>

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Surge protection for two signal wires with common reference potential, e.g., Digital IN/OUT. 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
- Easy selection for all possible demands in MCR applications with a complete product portfolio

Commercial data

Item number	2906799
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL23
Product key	CL2261
GTIN	4055626135540
Weight per piece (including packing)	39.1 g
Weight per piece (excluding packing)	39 g
Customs tariff number	85363010
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

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	Screw connection
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm
Conductor cross-section flexible	0.2 mm ² ... 2.5 mm ²
Conductor cross-section rigid	0.2 mm ² ... 4 mm ²
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

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2906799

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Mechanical data

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	24 V DC
Maximum continuous operating voltage U_C	30 V DC 21 V AC
Rated current	600 mA (40 °C)
Operating effective current I_C at U_C	$\leq 5 \mu\text{A}$
Protective conductor current I_{PE}	$\leq 10 \mu\text{A}$
Nominal discharge current I_n (8/20) μs (line-ground)	5 kA
Pulse discharge current I_{imp} (10/350) μs (line-earth)	0.5 kA
Total discharge current I_{Total} (8/20) μs	10 kA
Voltage protection level U_p (line-earth)	$\leq 140 \text{ V}$ (C1 - 1 kV / 500 A) $\leq 130 \text{ V}$ (C2 - 10 kV / 5 kA) $\leq 45 \text{ V}$ (C3 - 25 A) $\leq 50 \text{ V}$ (C3 - 100 A)
Voltage protection level U_p static (line-earth)	$\leq 55 \text{ V}$ (C1 - 1 kV / 500 A) $\leq 80 \text{ V}$ (C2 - 10 kV / 5 kA)
Response time t_A (line-earth)	$\leq 1 \text{ ns}$
Input attenuation aE, asym.	typ. 0.3 dB ($\leq 270 \text{ kHz}/150 \Omega$) typ. 0.3 dB ($\leq 407 \text{ kHz} / 100 \Omega$)
Cut-off frequency f_g (3 dB), asym. (PE) in 100 Ω system	typ. 1280 kHz
Cut-off frequency f_g (3 dB), asym. (PE) in 150 Ω system	typ. 960 kHz
Capacity (Core-Earth)	typ. 2.2 nF
Resistance per path	1.65 $\Omega \pm 20 \%$
Surge protection fault message	none
Max. required back-up fuse	630 mA (FF)
Impulse durability (line-earth)	C1 - 1 kV / 500 A C2 - 10 kV / 5 kA C3 - 100 A D1 - 500 A
Pulse reset time (line-earth)	$\leq 300 \text{ ms}$

Additional technical data

Max. total discharge current $I_{total \max}$ (8/20) μs	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

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

Approvals

Conformity/Approvals

UL, USA / Canada	Class I, Div. 2, Groups A, B, C, D T4
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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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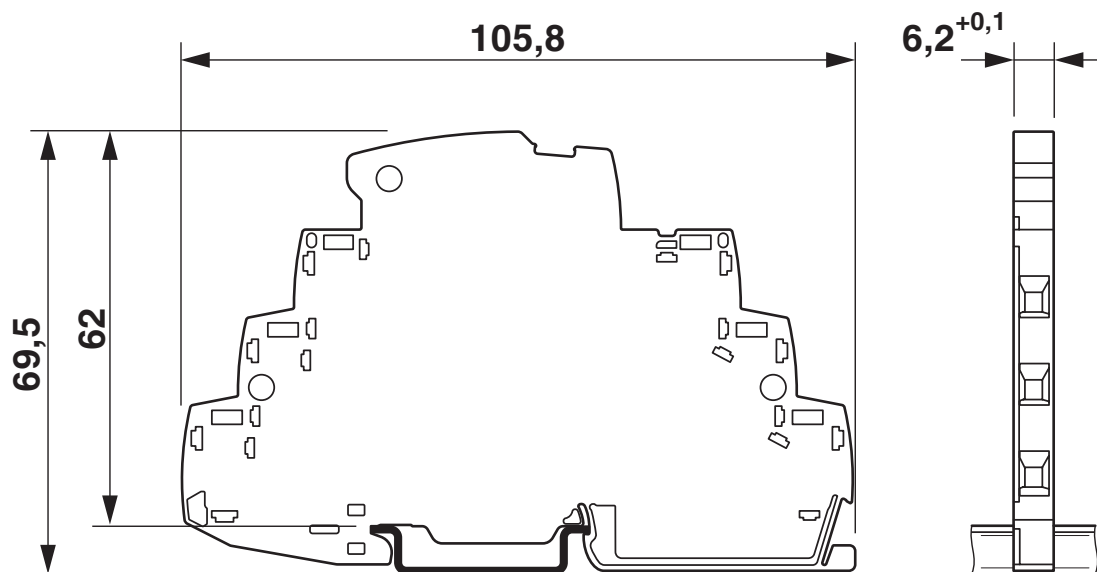


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Drawings

Dimensional drawing



Schematic diagram

TTC-6-2X1-...									
Category	1001 architecture, HFT=0				1002 architecture, HFT=1				
	PFD _{AVG}	PFH	Used budget of SIL 2 SIF		PFD _{AVG}	PFH	CCF	Used budget of SIL 3 SIF	
			PFD _{AVG}	PFH				PFD _{AVG}	PFH
	1.69 _{x10} ⁻⁵	3.00 _{x10} ⁻⁹ 1/h	0.2 %	0.3 %	8.44 _{x10} ⁻⁷	1.50 _{x10} ⁻¹⁰ 1/h	5 %	0.1 %	0.2 %
					1.69 _{x10} ⁻⁶	3.00 _{x10} ⁻¹⁰ 1/h	10 %	0.2 %	0.3 %
Calculation based on exida report, Phoenix Contact 16/06-072 R023 V3R1 exida Profile 1, FMEDA Analysis 2, T _{proof} : 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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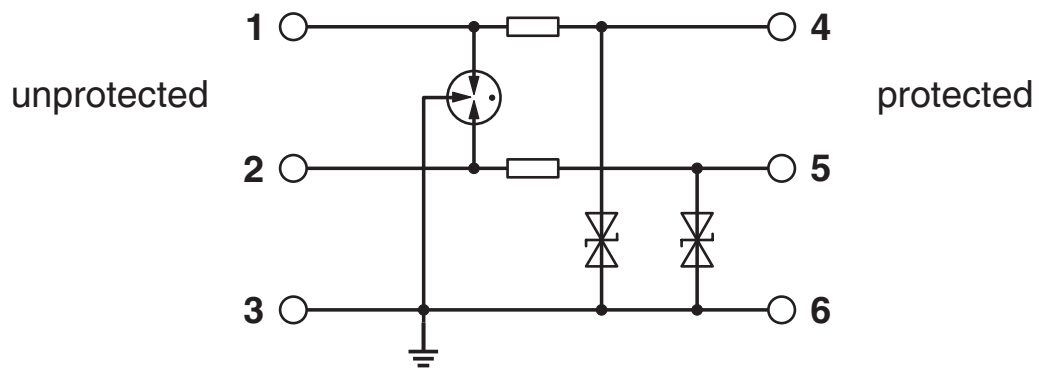
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Diagram



Circuit diagram



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Approvals

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 **CSA**
Approval ID: 70136717


 **DNV GL**
Approval ID: TAE000027G


 **UL Listed**
Approval ID: FILE E 138168

 **CSAus**
Approval ID: 70136717

UAE-RoHS
Approval ID: 22-06-16191

Functional Safety
Approval ID: 16-06-072 R023 V3R1

 **cUL Listed**
Approval ID: FILE E 333250

 **cULus Listed**
Approval ID: File E 333250

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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	575f446e-ca3e-42f4-aa25-16b370c81407

EF3.1 Climate Change

CO2e kg	1.27 kg CO2e
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