# TTC-3-2X1-24DC-PT - Surge protection device

2907326

https://www.phoenixcontact.com/us/products/2907326

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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

- 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 | 2907326 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CL23 |
| Product key | CL2266 |
| GTIN | 4055626199924 |
| Weight per piece (including packing) | 24.3 g |
| Weight per piece (excluding packing) | 24.2 g |
| Customs tariff number | 85363010 |
| Country of origin | DE |

## 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 |

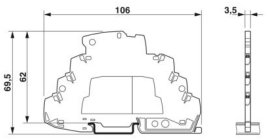
### Electrical properties

| | |
|---|---|
| Nominal voltage $U_N$ | 24 V DC |

### Connection data

| | |
|---|---|
| Connection method | Push-in connection |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve | 0.2 mm² ... 1 mm² |
| Conductor cross-section flexible, with ferrule without plastic sleeve | 0.2 mm² ... 1.5 mm² |
| Conductor cross-section flexible | 0.2 mm² ... 1.5 mm² |
| Conductor cross-section rigid | 0.2 mm² ... 1.5 mm² |
| 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 |

## Mechanical properties

Mechanical data

| | |
|---|---|
| Open side panel | Yes |

## Protective circuit

| | |
|---|---|
| Direction of action | Line-Line & Line-Signal Ground/Shield & optional Signal Ground/Shield-Earth Ground |
| Maximum continuous operating voltage $U_C$ | 30 V DC |
| | 21 V AC |
| Rated current | 250 mA (70 °C) |
| Operating effective current $I_C$ at $U_C$ | ≤ 1 µA |
| Protective conductor current $I_{PE}$ | ≤ 2 µA |
| 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) | ≤ 50 V (C1 - 500 V / 250 A) |
| | ≤ 100 V (C2 - 10 kV / 5 kA) |
| | ≤ 50 V (C3 - 30 A) |
| Response time $t_A$ (line-earth) | ≤ 1 ns |
| Input attenuation aE, asym. | typ. 0.3 dB (≤ 600 kHz / 150 Ω) |
| Cut-off frequency fg (3 dB), asym. (signal ground) in 150 Ω system | typ. 2.4 MHz |
| Capacity (Core-Earth) | typ. 1 nF |
| Resistance per path | 2.2 Ω ±10 % |
| Surge protection fault message | none |
| Max. required back-up fuse | 250 mA (FF) |
| Impulse durability (line-earth) | C1 - 500 V / 250 A |
| | C2 - 10 kV / 5 kA |
| | C3 - 30 A |
| | D1 - 500 A |
| Pulse reset time (line-earth) | ≤ 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 |
| 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

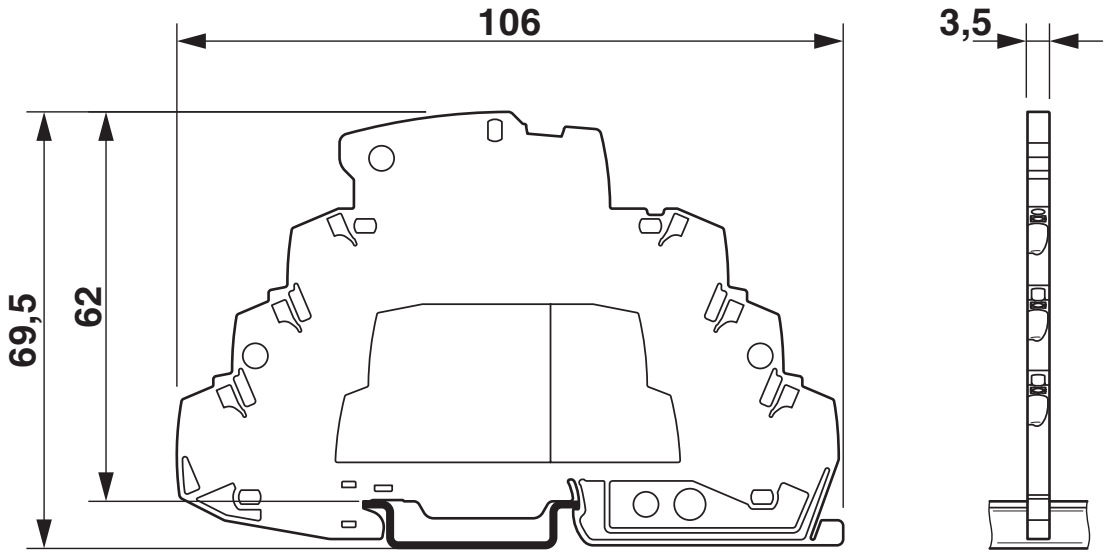
| | |
|---|---|
| Standards/specifications | EN 61643-21 |
| Note | 2001 + A1:2009 + A2:2013 |

## Mounting

| | |
|---|---|
| Mounting type | DIN rail: TH 35 - 7.5 mm |

## Drawings

Dimensional drawing

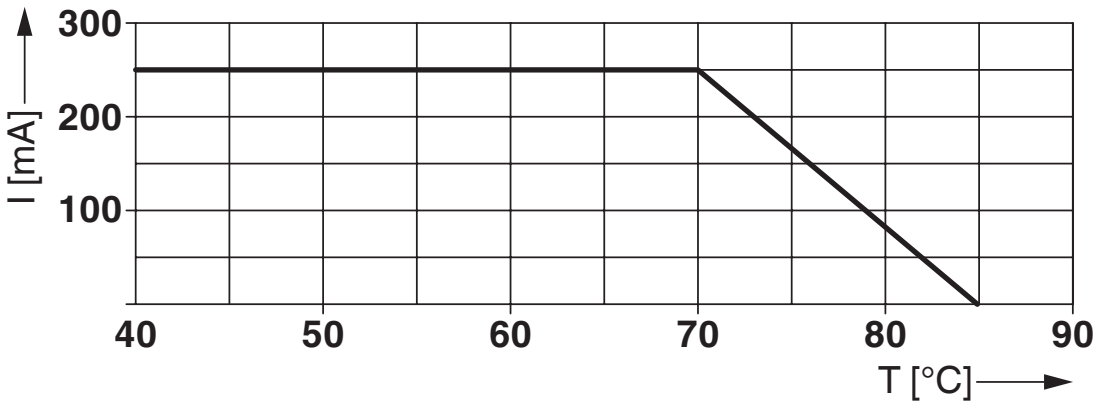



Schematic diagram

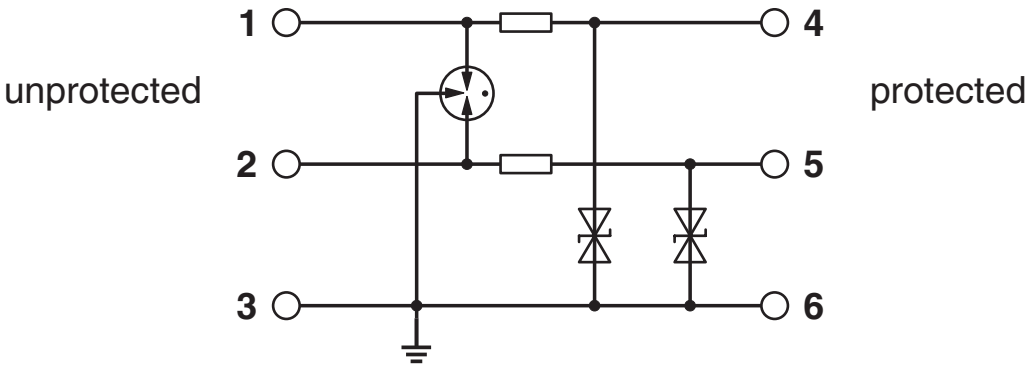
| TTC-3-2x1-... | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Category | 1oo1 architecture, HFT=0 | | | | 1oo2 architecture, HFT=1 | | | | |
| | $PFD_{AVG}$ | PFH | Used budget of SIL 2 SIF | | $PFD_{AVG}$ | PFH | CCF | Used budget of SIL 3 SIF | |
| | | | $PFD_{AVG}$ | PFH | | | | $PFD_{AVG}$ | PFH |
| | $3.82_{x10^{-5}}$ | $6.80_{x10^{-9}}$ 1/h | 0.4 % | 0.7 % | $1.91_{x10^{-6}}$ | $3.40_{x10^{-10}}$ 1/h | 5 % | 0.2 % | 0.3 % |
| | | | | | $3.82_{x10^{-6}}$ | $6.80_{x10^{-10}}$ 1/h | 10 % | 0.4 % | 0.7 % |
| | Calculation based on exida report, Phoenix Contact 16/06-072 R023 V3R1<br>exida Profile 1, FMEDA Analysis 2, $T_{proof}$: 1 year, MT: 10 years, MTTR: 24 hours, PTC: 99%<br>Used standards<br>IEC/EN 61508, edition 2010 (device specific)<br>IEC/EN 61511, edition 2016 + COR1:2016 + A1:2017 (system specific) | | | | | | | | |

Functional safety scenarios

Diagram



Circuit diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2907326

**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

## Classifications

### ECLASS

| | |
|---|---|
| ECLASS-13.0 | 27171501 |
| ECLASS-15.0 | 27171501 |

### ETIM

| | |
|---|---|
| ETIM 9.0 | EC000943 |

### UNSPSC

| | |
|---|---|
| UNSPSC 21.0 | 39121600 |

## 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 | aceb1338-524f-4f13-809c-6b7154e574be |

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