

TTC-6P-3-HF-F-M-24DC-PT-I - Surge protection device



2906797

<https://www.phoenixcontact.com/us/products/2906797>

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Surge protection, consisting of protective plug and base element, with integrated status indicator and knife disconnection for three signal wires with common reference potential. For HF applications and telecommunications interfaces without supply voltage. Indirect grounding via gas discharge tube, EX e approval for zone 2, HART-compatible. Can be used in safety-related circuits up to SIL 3.

Your advantages

- Space-saving and cost-saving with a narrow overall width of just 6 mm
- Continuous monitoring of protective devices, plus mechanical status indicator with optional remote signaling
- Finding the right product for all possible requirements in MCR applications is easy, thanks to the complete range of products with customized features
- Easy testing and documentation with CHECKMASTER 2 with pluggable protective modules
- The signal is not influenced during maintenance work, thanks to the impedance-neutral insertion and removal of protective plugs

Commercial data

| | |
|--------------------------------------|---------------|
| Item number | 2906797 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CL23 |
| Product key | CL2162 |
| GTIN | 4055626135526 |
| Weight per piece (including packing) | 52.8 g |
| Weight per piece (excluding packing) | 42.5 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, two-section, divisible |

Insulation characteristics

| | |
|----------------------|-----|
| Overvoltage category | III |
| Pollution degree | 2 |

Electrical properties

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

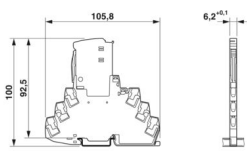
Connection data

| | |
|----------------------------------|---|
| Connection method | Push-in connection |
| Conductor cross-section flexible | 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 |

Ex data

| | |
|---------------------------------|--|
| Maximum input current | 600 mA (T4 / ≤ 30 °C) |
| | 500 mA (T4 / > 30 °C ... ≤ 50 °C) |
| | 400 mA (T4 / > 50 °C ... ≤ 70 °C) |
| Maximum input voltage | 30 V DC |
| Altitude | ≤ 2000 m (amsl) |
| Ambient temperature (operation) | -40 °C ... 70 °C (T4) |

Dimensions

| | |
|---------------------|--|
| Dimensional drawing |  |
| Width | 6.2 mm +0.1 mm |
| Height | 105.8 mm |
| Depth | 100 mm (incl. DIN rail 7.5 mm) |

Material specifications

| | |
|----------------------|-----------------|
| Color (Base element) | gray (RAL 7042) |
|----------------------|-----------------|

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

Mechanical properties

Mechanical data

| | |
|-----------------|----|
| Open side panel | No |
|-----------------|----|

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 (56 °C) |
| Operating effective current I_C at U_C | $\leq 5 \mu\text{A}$ |
| Protective conductor current I_{PE} | $\leq 1 \mu\text{A}$ |
| Nominal discharge current I_n (8/20) μs (line-line) | 5 kA |
| Nominal discharge current I_n (8/20) μs (line-ground) | 5 kA |
| Pulse discharge current I_{imp} (10/350) μs (line-line) | 0.5 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-line) | $\leq 150 \text{ V}$ (C1 - 1 kV / 500 A) |
| | $\leq 275 \text{ V}$ (C2 - 10 kV / 5 kA) |
| | $\leq 45 \text{ V}$ (C3 - 25 A) |
| | $\leq 55 \text{ V}$ (C3 - 100 A) |
| Voltage protection level U_p (line-earth) | $\leq 750 \text{ V}$ (C1 - 1 kV / 500 A) |
| | $\leq 750 \text{ V}$ (C2 - 10 kV / 5 kA) |
| | $\leq 1.1 \text{ kV}$ (C3 - 25 A) |
| | $\leq 1.2 \text{ kV}$ (C3 - 100 A) |
| Voltage protection level U_p static (line-line) | $\leq 75 \text{ V}$ (C1 - 1 kV / 500 A) |
| | $\leq 120 \text{ V}$ (C2 - 10 kV / 5 kA) |
| Voltage protection level U_p static (line-earth) | $\leq 750 \text{ V}$ (C1 - 1 kV / 500 A) |
| | $\leq 750 \text{ V}$ (C2 - 10 kV / 5 kA) |
| Response time t_A (line-line) | $\leq 1 \text{ ns}$ |
| Response time t_A (line-earth) | $\leq 100 \text{ ns}$ |
| 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 Ω system | typ. 60 MHz |
| Capacity (Core-Core) | typ. 32 pF |
| Resistance per path | 1.65 $\Omega \pm 20 \%$ |
| Surge protection fault message | optical |
| Max. required back-up fuse | 630 mA (FF) |

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| | |
|---------------------------------|-------------------|
| 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) | ≤ 600 ms |
| Pulse reset time (line-earth) | ≤ 30 ms |

Additional technical data

| | |
|--|---------------------|
| Max. total discharge current $I_{\text{total max}} (8/20) \mu\text{s}$ | 20 kA (1x - non Ex) |
|--|---------------------|

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 % |

Approvals

Conformity/Approvals

| | |
|------------------|--|
| UL, USA / Canada | Class I, Div. 2, Groups A, B, C, D T4A |
|------------------|--|

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 |
| Standards/specifications | IEC 60079-0 |
| Note | 2017 |
| Standards/specifications | IEC 60079-7 |
| Note | 2017 |
| Standards/specifications | EN IEC 60079-0 |
| Note | 2018 |
| Standards/specifications | EN IEC 60079-7 |
| Note | 2015 + A1:2018 |

Mounting

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

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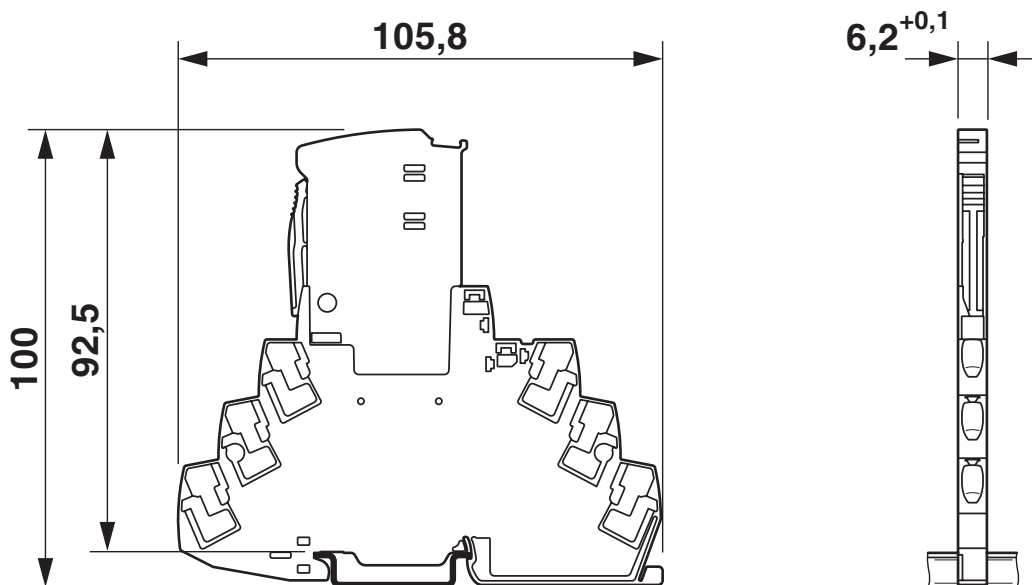


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Drawings

Dimensional drawing

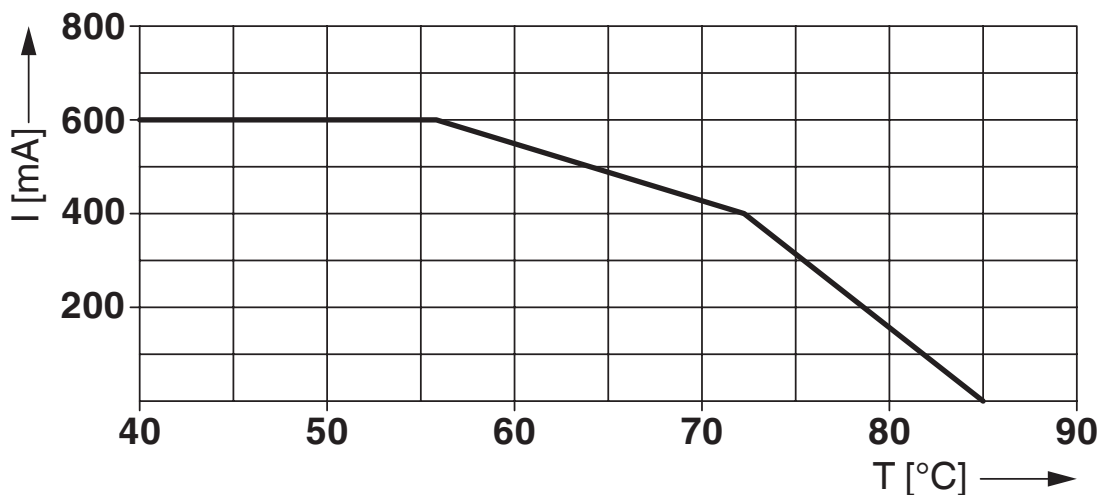


Schematic diagram

| TTC-6P-3-HF-F-M-...-I | | | | | | | | | |
|--|--------------------------|---------------------------|--------------------------|-------|--------------------------|----------------------------|------|--------------------------|-------|
| 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 |
| | 3.32·10 ⁻⁵ | 5.90·10 ⁻⁹ 1/h | 0.3 % | 0.6 % | 1.66·10 ⁻⁶ | 2.95·10 ⁻¹⁰ 1/h | 5 % | 0.2 % | 0.3 % |
| | | | | | 3.32·10 ⁻⁶ | 5.90·10 ⁻¹⁰ 1/h | 10 % | 0.3 % | 0.6 % |
| Calculation based on exida report, Phoenix Contact 16/06-072 R022 V4R2 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

Diagram



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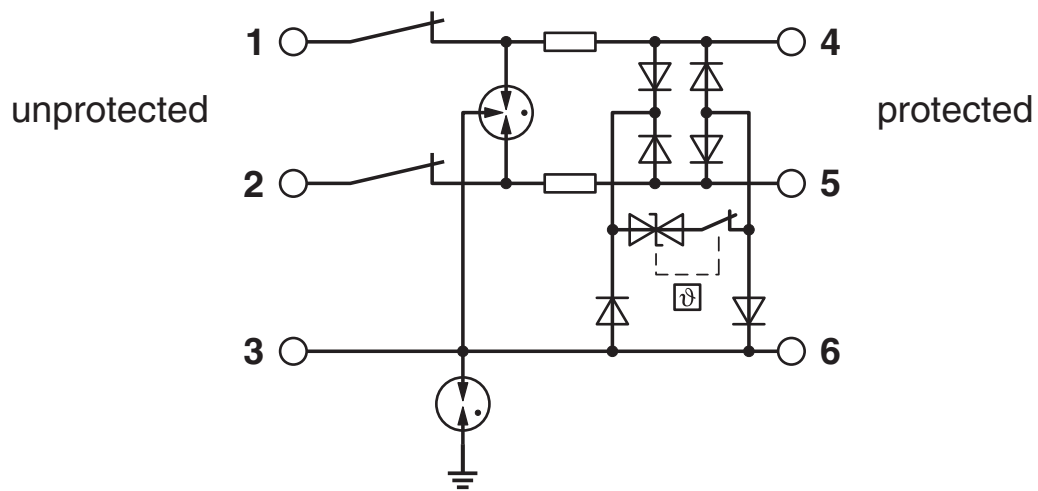
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Diagram

Derating for Ex-areas (Zone 2, EX ec)

| ϑ [°C] | I [mA] |
|--|--------|
| $\leq 30^{\circ}\text{C}$ | 600 mA |
| $> 30^{\circ}\text{C} \dots \leq 50^{\circ}\text{C}$ | 500 mA |
| $> 50^{\circ}\text{C} \dots \leq 70^{\circ}\text{C}$ | 400 mA |

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: 22-06-16783


Functional Safety
Approval ID: 16-06-072 R022 V4R3

 **IECEX**
Approval ID: IECEX BVS 21.0057X

 **ATEX**
Approval ID: BVS 21 ATEX E 052 X

 **UKCA-EX**
Approval ID: DEKRA 23UKEX7003X

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

 **CCC**
Approval ID: 2022122304116080

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NEPSI-EX

Approval ID: HT25-037

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-13.0 | 27171503 |
| ECLASS-15.0 | 27171503 |

ETIM

| | |
|-----------|----------|
| ETIM 10.0 | EC001466 |
|-----------|----------|

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 | aec00f10-7725-4612-a40a-6a527b37196a |

EF3.1 Climate Change

| | |
|---------|--------------|
| CO2e kg | 1.56 kg CO2e |
|---------|--------------|

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