

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



2906787

<https://www.phoenixcontact.com/us/products/2906787>

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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. 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                          | 2906787             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | CL23                |
| Product key                          | CL2161              |
| Catalog page                         | Page 171 (C-4-2019) |
| GTIN                                 | 4055626135441       |
| Weight per piece (including packing) | 57.4 g              |
| Weight per piece (excluding packing) | 47.4 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     |

Data management status

|                  |    |
|------------------|----|
| Article revision | 06 |
|------------------|----|

Insulation characteristics

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

Electrical properties

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

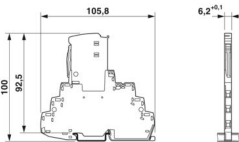
Connection data

|                                  |                                             |
|----------------------------------|---------------------------------------------|
| Connection method                | Screw connection                            |
| Screw thread                     | M3                                          |
| Tightening torque                | 0.5 Nm ... 0.6 Nm                           |
| 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                                   |

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                                                                       |

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|        |                                |
|--------|--------------------------------|
| Height | 105.8 mm                       |
| Depth  | 100 mm (incl. DIN rail 7.5 mm) |

## Material specifications

|                                        |                       |
|----------------------------------------|-----------------------|
| Color (Base element)                   | gray (RAL 7042)       |
| 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 |
| Maximum continuous voltage $U_C$                                       | 30 V DC                                                                            |
|                                                                        | 21 V AC                                                                            |
| Rated current                                                          | 600 mA (56 °C)                                                                     |
| Operating effective current $I_C$ at $U_C$                             | $\leq 5 \mu A$                                                                     |
| Residual 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                                                                               |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (line-signal ground)    | 5 kA                                                                               |
| Pulse discharge current $I_{imp}$ (10/350) $\mu s$ (line-line)         | 0.5 kA                                                                             |
| Pulse discharge current $I_{imp}$ (10/350) $\mu s$ (line-earth)        | 0.5 kA                                                                             |
| Pulse discharge current $I_{imp}$ (10/350) $\mu s$ (line-signalground) | 0.5 kA                                                                             |
| Total discharge current $I_{total}$ (8/20) $\mu s$                     | 10 kA                                                                              |
| Voltage protection level $U_p$ (line-line)                             | $\leq 150 V$ (C1 - 1 kV / 500 A)                                                   |
|                                                                        | $\leq 275 V$ (C2 - 10 kV / 5 kA)                                                   |
|                                                                        | $\leq 45 V$ (C3 - 25 A)                                                            |
|                                                                        | $\leq 55 V$ (C3 - 100 A)                                                           |
| Voltage protection level $U_p$ (line-earth)                            | $\leq 750 V$ (C1 - 1 kV / 500 A)                                                   |
|                                                                        | $\leq 750 V$ (C2 - 10 kV / 5 kA)                                                   |
|                                                                        | $\leq 1.1 kV$ (C3 - 25 A)                                                          |
|                                                                        | $\leq 1.2 kV$ (C3 - 100 A)                                                         |
| Voltage protection level $U_p$ (line-signalground)                     | $\leq 80 V$ (C1 - 1 kV / 500 A)                                                    |
|                                                                        | $\leq 125 V$ (C2 - 10 kV / 5 kA)                                                   |
|                                                                        | $\leq 45 V$ (C3 - 25 A)                                                            |
|                                                                        | $\leq 55 V$ (C3 - 100 A)                                                           |
| Voltage protection level $U_p$ static (line-line)                      | $\leq 75 V$ (C1 - 1 kV / 500 A)                                                    |
|                                                                        | $\leq 120 V$ (C2 - 10 kV / 5 kA)                                                   |
| Voltage protection level $U_p$ static (line-earth)                     | $\leq 750 V$ (C1 - 1 kV / 500 A)                                                   |

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|                                                                       |                                  |
|-----------------------------------------------------------------------|----------------------------------|
|                                                                       | ≤ 750 V (C2 - 10 kV / 5 kA)      |
| Voltage protection level $U_p$ static (line-signalground)             | ≤ 75 V (C1 - 1 kV / 500 A)       |
|                                                                       | ≤ 120 V (C2 - 10 kV / 5 kA)      |
| Response time $t_A$ (line-line)                                       | ≤ 1 ns                           |
| Response time $t_A$ (line-earth)                                      | ≤ 100 ns                         |
| Response time $t_A$ (line-signalground)                               | ≤ 1 ns                           |
| Input attenuation aE, sym.                                            | typ. 0.3 dB (≤ 8.7 MHz/150 Ω)    |
| Input attenuation aE, asym.                                           | typ. 0.3 dB (≤ 10.5 MHz / 150 Ω) |
| Cut-off frequency $f_g$ (3 dB), sym. in 150 Ω system                  | typ. 60 MHz                      |
| Cut-off frequency $f_g$ (3 dB), asym. (signal ground) in 150 Ω system | typ. 60 MHz                      |
| Capacity (Core-Core)                                                  | typ. 32 pF                       |
| Capacity (line-signalground)                                          | typ. 32 pF                       |
| Resistance per path                                                   | 1.65 Ω ±20 %                     |
| Surge protection fault message                                        | optical                          |
| 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                       |
| Impulse durability (line-signalground)                                | 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                          |
| Pulse reset time (line-signalground)                                  | ≤ 600 ms                         |

## Additional technical data

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

## Standards and regulations

|                          |              |
|--------------------------|--------------|
| Standards/specifications | IEC 61643-21 |
|--------------------------|--------------|

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|      |                                                       |
|------|-------------------------------------------------------|
| 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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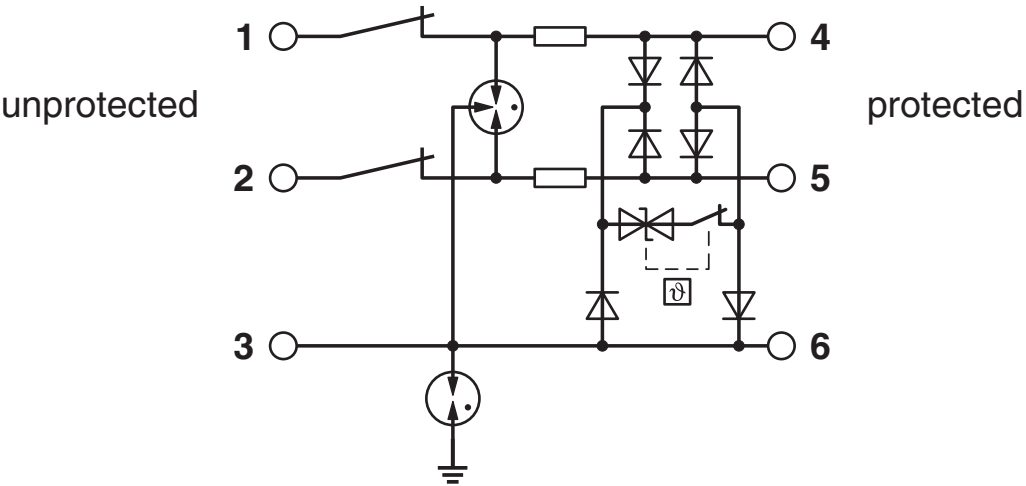
Drawings

Schematic diagram

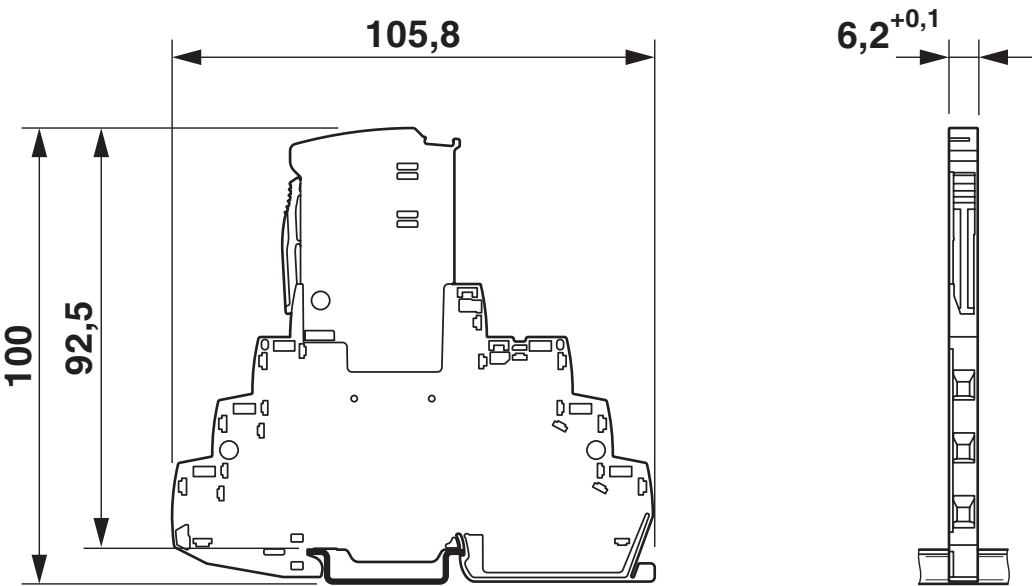
| TTC-6P-3-HF-F-M-...I                                                                                                                                                                                                                                                                                                     |                          |                           |                          |       |                          |                            |      |                          |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------|--------------------------|-------|--------------------------|----------------------------|------|--------------------------|-------|
| 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   |
|                                                                                                                                                                                                                                                                                                                          |                          |                           |                          |       |                          |                            |      |                          |       |
|                                                                                                                                                                                                                                                                                                                          | 3.32·10 <sup>-5</sup>    | 5.90·10 <sup>-9</sup> 1/h | 0.3 %                    | 0.6 % | 1.66·10 <sup>-6</sup>    | 2.95·10 <sup>-10</sup> 1/h | 5 %  | 0.2 %                    | 0.3 % |
|                                                                                                                                                                                                                                                                                                                          |                          |                           |                          |       | 3.32·10 <sup>-6</sup>    | 5.90·10 <sup>-10</sup> 1/h | 10 % | 0.3 %                    | 0.6 % |
| Calculation based on exida report, Phoenix Contact 16/06-072 R022 V4R2<br>exida Profile 1, FMEDA Analysis 2, T <sub>proof</sub> : 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

Circuit diagram



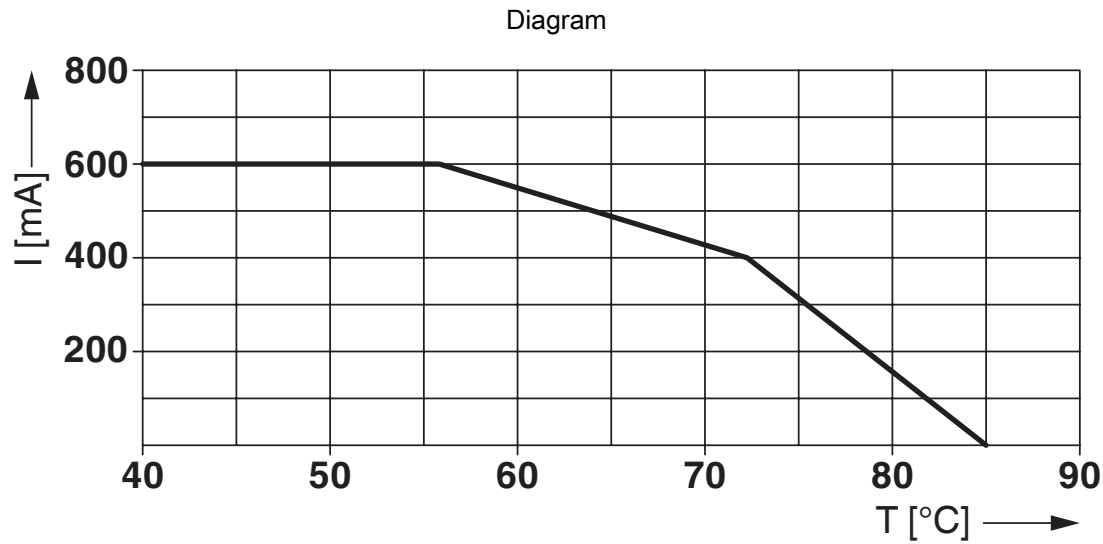
Dimensional drawing



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Diagram

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

| ϑ [°C]            | I [mA] |
|-------------------|--------|
| ≤ 30°C            | 600 mA |
| > 30°C ... ≤ 50°C | 500 mA |
| > 50°C ... ≤ 70°C | 400 mA |

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2906787>



**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 V4R2



**IECEx**

Approval ID: IECEx BVS 21.0057X



**ATEX**

Approval ID: BVS 21 ATEX E 052 X



**CCC**

Approval ID: 2022122304116080



**UKCA-EX**

Approval ID: DEKRA 23UKEX7003X

**cCSAus**



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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-11.0 | 27130807 |
| ECLASS-13.0 | 27171503 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | 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                                    | f3e721b8-f270-476b-9228-ca5787bd3ff0                                                                                                                                                                                              |

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



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## Accessories

### X-PEN 0,35 - Marker pen

0811228

<https://www.phoenixcontact.com/us/products/0811228>



Marker pen without ink cartridge, for manual labeling of markers, labeling extremely wipe-proof, line thickness 0.35 mm

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### ZBF 6 CUS - Zack Marker strip, flat

0825027

<https://www.phoenixcontact.com/us/products/0825027>



Zack Marker strip, flat, Strip, can be ordered: Strip, white, labeled according to customer specifications, mounting type: snap into flat marker groove, for terminal block width: 6.2 mm, lettering field size: 5.15 x 6.15 mm, Number of individual labels: 10

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## ZBF 6:UNBEDRUCKT - Zack Marker strip, flat

0808710

<https://www.phoenixcontact.com/us/products/0808710>



Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 5.15 x 6.15 mm, Number of individual labels: 10

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## ZBF 6/WH-100:UNBEDRUCKT - Zack Marker strip, flat

0808736

<https://www.phoenixcontact.com/us/products/0808736>



Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 5.15 x 6.15 mm, Number of individual labels: 1000

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



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## ZBF 6,QR:FORTL.ZAHLEN - Zack Marker strip, flat

0808765

<https://www.phoenixcontact.com/us/products/0808765>



Zack Marker strip, flat, Strip, white, labeled, Printed vertically: consecutive numbers 1 ... 10, 11 ... 20, etc. up to 91 ... 100, mounting type: snapped, for terminal block width: 6.2 mm, lettering field size: 5.15 x 6.15 mm, Number of individual labels: 10

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## CLIPFIX 35-5 - End bracket

3022276

<https://www.phoenixcontact.com/us/products/3022276>



Quick mounting end clamp for NS 35/7,5 DIN rail or NS 35/15 DIN rail, with marking option, with parking option for FBS...5, FBS...6, KSS 5, KSS 6, width: 5.15 mm, color: gray

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## TTC-6-FMRS-UT - Remote signaling set

2907810

<https://www.phoenixcontact.com/us/products/2907810>



Module set for the optical monitoring and floating remote signaling of adjacent surge protective devices in the TERMITRAB complete or CLIXTRAB product family. Suitable for directly grounded DIN rails.

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## TTC-6-FC-UT - Fuse holder

1054762

<https://www.phoenixcontact.com/us/products/1054762>



Fuse carrier for surge protective devices of the TERMITRAB complete product range with screw connection technology. Multi-level connection on TTC-6 housings possible. For conventional 5x20 mm miniature fuses.

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## SSA 3-6 - Shield connection

2839295

<https://www.phoenixcontact.com/us/products/2839295>

Shield fast connection for 3 ... 6 mm cable diameter. Potential connecting cable:  
200 mm, 1 mm<sup>2</sup>, color: black



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## SSA 5-10 - Shield connection

2839512

<https://www.phoenixcontact.com/us/products/2839512>

Shield fast connection for 5 ... 10 mm cable diameter. Potential connecting cable:  
200 mm, 1 mm<sup>2</sup>, color: black



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## SZS 0,6X3,5 VDE - Screwdriver

1212602

<https://www.phoenixcontact.com/us/products/1212602>



Screwdriver, slot-headed, VDE insulated, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip

## TTC-6P-3-HF-24DC-I-P - Surge protection plug

2907847

<https://www.phoenixcontact.com/us/products/2907847>



Surge protection plug with integrated status indicator on the module for three signal wires. For HF applications. Nominal voltage: 24 V DC

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