

# PT-IQ-2X1+F-24DC-PT - Surge protection device



2801248

<https://www.phoenixcontact.com/us/products/2801248>

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Surge protection, consisting of protective plug and base element, with integrated multi-stage status indicator on the module for two signal wires with common reference potential. Indirect grounding via gas discharge tube. Can be used in safety-related circuits up to SIL 3.

## Your advantages

- Predictive monitoring with 3-stage LED display
- Integration of the status message into the system controller via group remote signaling
- Install quickly and error-free with DIN rail connectors
- Maximum ease of maintenance, thanks to the 2-piece design
- Maximum protection for MCR applications with high discharge capacity

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2801248       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CL22          |
| Product key                          | CL2153        |
| GTIN                                 | 4046356766319 |
| Weight per piece (including packing) | 116 g         |
| Weight per piece (excluding packing) | 111.3 g       |
| Customs tariff number                | 85363030      |
| Country of origin                    | DE            |

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## Technical data

### Notes

#### General

|      |   |
|------|---|
| Note | Remote signaling as well as the power supply of the DIN rail connector are established by snapping the module into place on the DIN rail connector. |
|------|---|

### Product properties

|                                |   |
|--------------------------------|---|
| Product type                   | Surge protection for MCR technology     |
| Product family                 | PLUGTRAB IQ                             |
| IEC test classification        | C1                                      |
|                                | C2                                      |
|                                | C3                                      |
|                                | D1                                      |
| Type                           | DIN rail module, two-section, divisible |
| Surge protection fault message | Optical, multi-stage                    |

#### Insulation characteristics

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

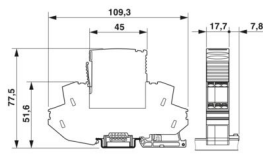
### Electrical properties

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

### Connection data

|                                  |   |
|----------------------------------|---|
| Connection method                | Push-in connection                          |
| Conductor cross-section flexible | 0.2 mm <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               | 17.7 mm  |
| Height              | 109.3 mm   |
| Depth               | 77.5 mm (incl. DIN rail 7.5 mm)  |
| Horizontal pitch    | 1 Div.   |

### Material specifications

|       |                  |
|-------|------------------|
| Color | black (RAL 9005) |
|-------|------------------|

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|  |                  |
|--|------------------|
|  | black (RAL 9005) |
| Flammability rating according to UL 94 | V-0              |
| Housing material                       | PA 6.6           |

## 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<br>21 V AC   |
| Rated current  | 1000 mA (40 °C)  |
| Operating effective current $I_C$ at $U_C$                 | ≤ 1 mA (per path)  |
| Protective conductor current $I_{PE}$                      | ≤ 1 μA   |
| Nominal discharge current $I_n$ (8/20) μs (line-ground)    | 10 kA  |
| Pulse discharge current $I_{imp}$ (10/350) μs (line-earth) | 2.5 kA   |
| Total discharge current $I_{Total}$ (8/20) μs              | 20 kA  |
| Voltage protection level $U_p$ (line-earth)                | ≤ 800 V (C1 - 1 kV / 500 A)<br>≤ 950 V (C2 - 10 kV / 5 kA)<br>≤ 780 V (C3 - 25 A)<br>≤ 950 V (C3 - 50 A) |
| Voltage protection level $U_p$ (line-signal ground)        | ≤ 75 V (C1 - 1 kV / 500 A)<br>≤ 135 V (C2 - 10 kV / 5 kA)<br>≤ 55 V (C3 - 25 A)<br>≤ 60 V (C3 - 50 A)    |
| Voltage protection level $U_p$ static (line-earth)         | ≤ 90 V (C3 - 25 A)<br>≤ 90 V (C3 - 50 A)   |
| Response time $t_A$ (line-earth)                           | ≤ 100 ns   |
| Input attenuation aE, asym.                                | typ. 0.3 dB (≤ 300 kHz / 150 Ω)  |
| Resistance per path  | 1.2 Ω ±5 %   |
| Surge protection fault message                             | Optical, multi-stage   |
| Max. required back-up fuse                                 | 1 A (FF)   |
| Impulse durability (line-earth)                            | C1 - 1 kV / 500 A<br>C2 - 10 kV / 5 kA<br>C2 - 10 kA<br>C3 - 50 A<br>D1 - 2.5 kA                         |
| Pulse reset time (line-earth)                              | ≤ 30 ms  |
| Pulse reset time (line-signal ground)                      | ≤ 350 ms   |

## Environmental and real-life conditions

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## Ambient conditions

|   |                  |
|---|------------------|
| Degree of protection                    | IP20             |
| Ambient temperature (operation)         | -40 °C ... 70 °C |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Altitude                                | ≤ 4000 m (amsl)  |

## Standards and regulations

|                          |                          |
|--------------------------|--------------------------|
| Standards/specifications | IEC 61643-21             |
| Note                     | 2000 + A1:2008 + A2:2012 |
| Standards/specifications | EN 61643-21              |
| Note                     | 2001 + A1:2009 + A2:2013 |
| Standards/specifications | EN 61000-6-3             |
| Note                     | 2007 + A1:2011           |
| Standards/specifications | EN 61000-6-2             |
| Note                     | 2005                     |

## Mounting

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

# PT-IQ-2X1+F-24DC-PT - Surge protection device

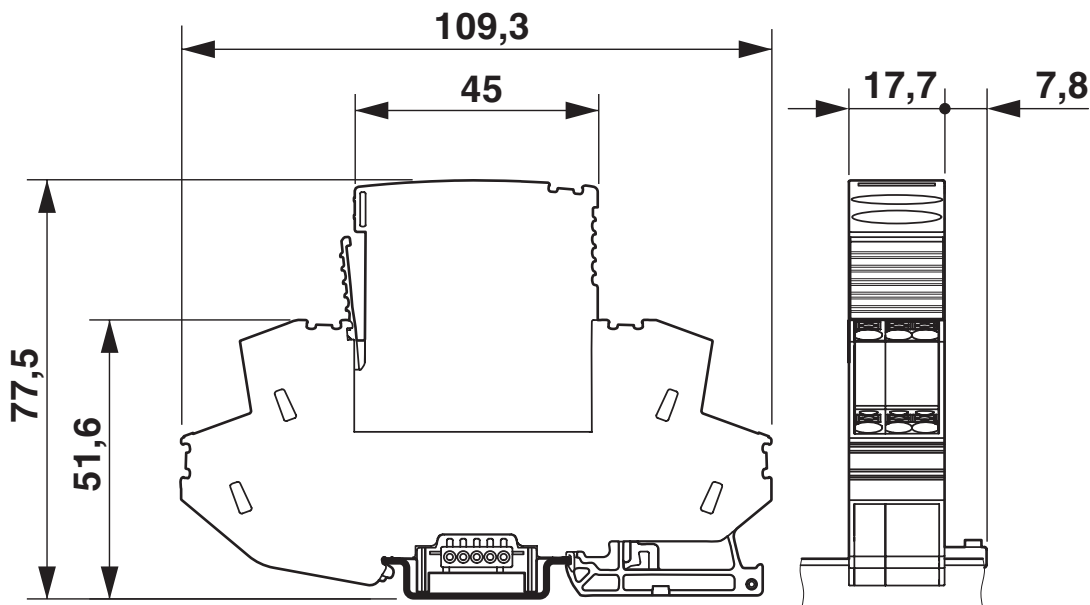


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## Drawings

Dimensional drawing



Schematic diagram

| Category   | PT-IQ-4X1+F-...DC-UT(PT) |                           |                          |                    |                          |                            |      |                          |       |
|--|--------------------------|---------------------------|--------------------------|--------------------|--------------------------|----------------------------|------|--------------------------|-------|
|  | 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                      |       |
|  | 1.46 $\times 10^{-5}$    | 2.60 $\times 10^{-9}$ 1/h | 0.1 %                    | 0.3 %              | 7.31 $\times 10^{-7}$    | 1.30 $\times 10^{-10}$ 1/h | 5 %  | 0.1 %                    | 0.1 % |
|  |                          |                           |                          |                    | 1.46 $\times 10^{-6}$    | 2.60 $\times 10^{-10}$ 1/h | 10 % | 0.1 %                    | 0.3 % |
| Calculation based on exida report, Phoenix Contact 13/04-032 R017 V4R0<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) |                          |                           |                          |                    |                          |                            |      |                          |       |

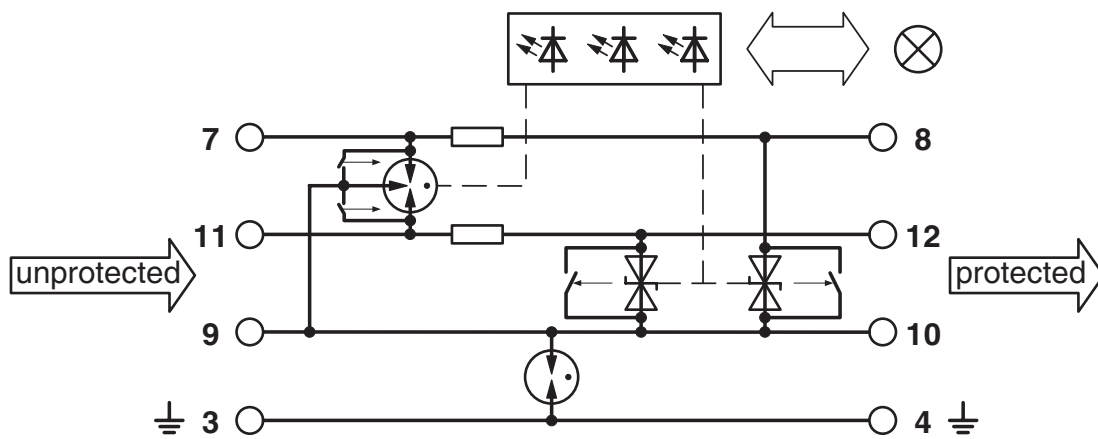
Functional safety scenarios.

Table also applies to the PT-IQ-2X1+F-...DC-UT(PT) item group

Diagram



Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2801248>



**CSA**

Approval ID: 2761632



**UL Listed**

Approval ID: FILE E 138168



**CSAus**

Approval ID: 2761632

**Functional Safety**

Approval ID: 13-04-032 R017 V4R0

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## Classifications

### ECLASS

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

### 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                               | 6(c), 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)   |
|                                     | 2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol(CAS: 79-94-7) |
| SCIP                                | 199211bb-b31c-44f9-8740-60d10c6df4b8                           |

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