

# PT-IQ-1X2+F-24DC-UT - Surge protection device



2800977

<https://www.phoenixcontact.com/us/products/2800977>

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Surge protection, consisting of protective plug and base element, with integrated multi-stage status indicator on the module, for one 2-wire floating signal circuit. 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                          | 2800977       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CL22          |
| Product key                          | CL2151        |
| GTIN                                 | 4046356665179 |
| Weight per piece (including packing) | 110.9 g       |
| Weight per piece (excluding packing) | 106 g         |
| Customs tariff number                | 85363010      |
| 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                    |
| Wire pairs per module          | 1                                       |

#### Insulation characteristics

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

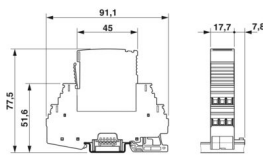
### Electrical properties

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

### Connection data

|                                  |   |
|----------------------------------|---|
| Connection method                | Screw connection                            |
| Screw thread                     | M3  |
| Tightening torque                | 0.5 Nm                                      |
| 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              | 91.1 mm  |
| Depth               | 77.5 mm (incl. DIN rail 7.5 mm)  |

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|                  |        |
|------------------|--------|
| Horizontal pitch | 1 Div. |
|------------------|--------|

## Material specifications

|  |                  |
|--|------------------|
| Color                                  | black (RAL 9005) |
|  | 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  |
|   | 21 V AC  |
| Rated current   | 1000 mA (40 °C)  |
| Operating effective current $I_C$ at $U_C$                      | $\leq 1$ mA (in the signal circuit)  |
| Protective conductor current $I_{PE}$                           | $\leq 1$ $\mu$ A   |
| Nominal discharge current $I_n$ (8/20) $\mu$ s (line-line)      | 10 kA  |
| Nominal discharge current $I_n$ (8/20) $\mu$ s (line-ground)    | 10 kA  |
| Pulse discharge current $I_{imp}$ (10/350) $\mu$ s (line-earth) | 2.5 kA   |
| Total discharge current $I_{Total}$ (8/20) $\mu$ s              | 20 kA  |
| Voltage protection level $U_p$ (line-line)                      | $\leq 80$ V (C1 - 1 kV / 500 A)  |
|   | $\leq 130$ V (C2 - 10 kV / 5 kA)   |
|   | $\leq 150$ V (C2 - 10 kA)  |
|   | $\leq 55$ V (C3 - 25 A)  |
|   | $\leq 60$ V (C3 - 100 A)   |
| Voltage protection level $U_p$ (line-earth)                     | $\leq 900$ V (C1 - 1 kV / 500 A)   |
|   | $\leq 1300$ V (C2 - 10 kV / 5 kA)  |
|   | $\leq 1200$ V (C2 - 10 kA)   |
|   | $\leq 1000$ V (C3 - 25 A)  |
|   | $\leq 1300$ V (C3 - 100 A)   |
| Voltage protection level $U_p$ static (line-line)               | $\leq 65$ V (C1 - 1 kV / 500 A)  |
|   | $\leq 65$ V (C2 - 10 kA)   |
| Response time $t_A$ (line-line)                                 | $\leq 1$ ns  |
| Response time $t_A$ (line-earth)                                | $\leq 100$ ns  |
| Input attenuation aE, sym.                                      | typ. 0.3 dB ( $\leq 270$ kHz/150 $\Omega$ )  |
| Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system     | typ. 1.1 MHz   |
| Capacity (Core-Earth)   | typ. 2 nF  |
| Resistance per path   | 1.2 $\Omega \pm 5$ %   |
| Surge protection fault message                                  | Optical, multi-stage   |

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|                                 |                   |
|---------------------------------|-------------------|
| Max. required back-up fuse      | 1 A (FF)          |
| Impulse durability (line-line)  | C1 - 1 kV / 500 A |
|                                 | C2 - 10 kV / 5 kA |
|                                 | C2 - 10 kA        |
|                                 | C3 - 100 A        |
| Impulse durability (line-earth) | C1 - 1 kV / 500 A |
|                                 | C2 - 10 kV / 5 kA |
|                                 | C2 - 10 kA        |
|                                 | C3 - 100 A        |
|                                 | D1 - 2.5 kA       |
| Pulse reset time (line-line)    | ≤ 4000 ms         |
| Pulse reset time (line-earth)   | ≤ 30 ms           |

## Environmental and real-life conditions

### 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)  |
| Permissible humidity (operation)        | 5 % ... 95 %     |

## Standards and regulations

|                          |                          |
|--------------------------|--------------------------|
| Standards/specifications | IEC 61643-21             |
| Note                     | 2000 + A1:2008, modified |
| Standards/specifications | EN 61643-21              |
| Note                     | 2001 + A1:2009           |
| 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-1X2+F-24DC-UT - Surge protection device

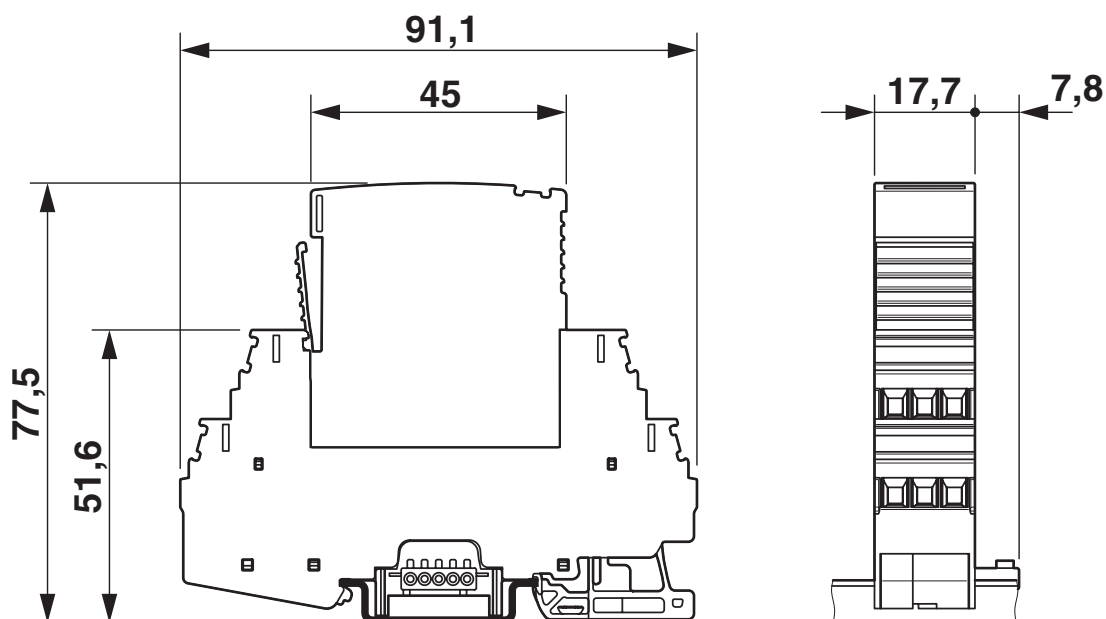


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## Drawings

Dimensional drawing

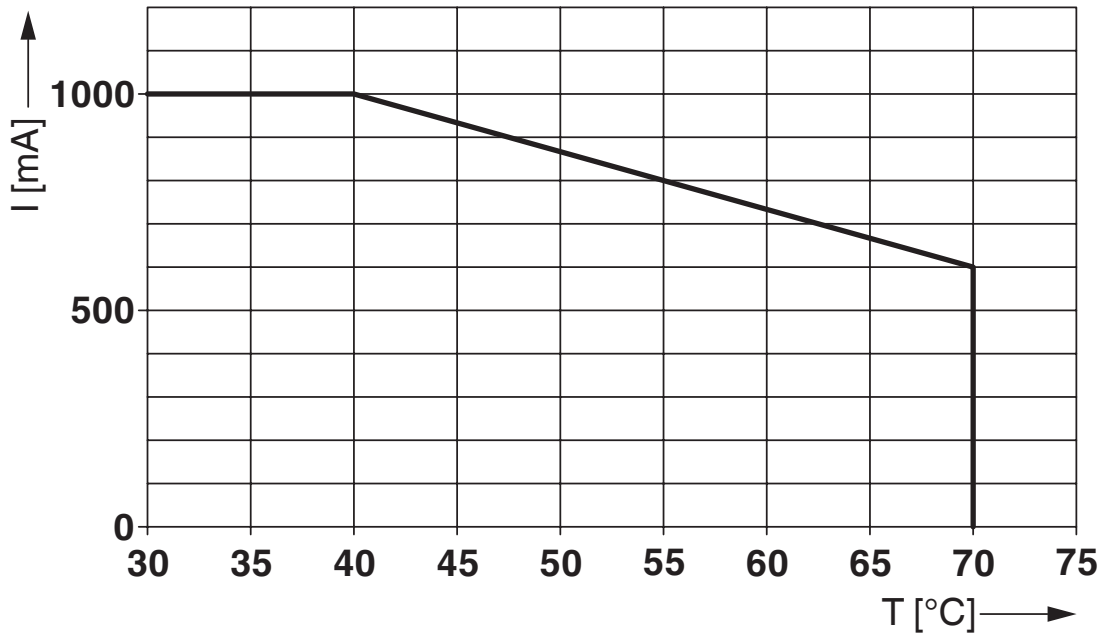


Schematic diagram

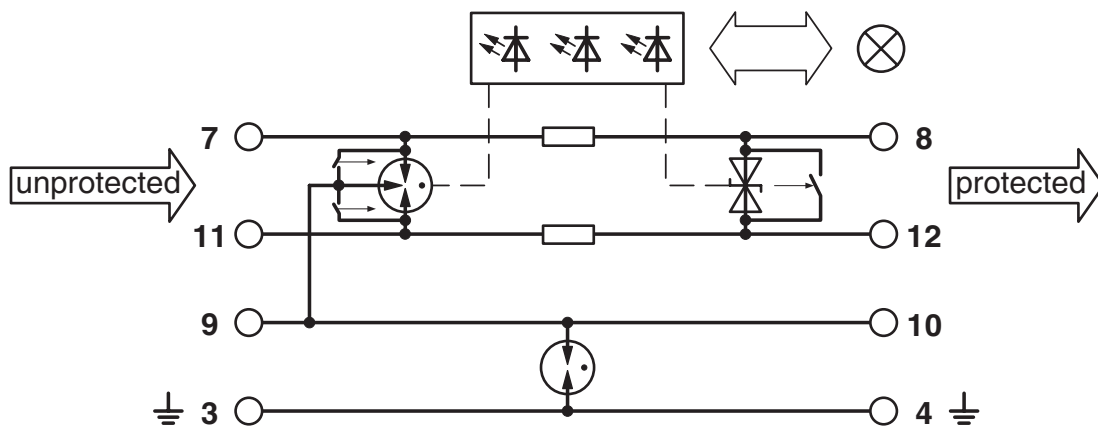
| PT-IQ-1X2+F-...DC-UT(PT)   |                          |                           |                          |       |                          |                            |      |                          |       |
|--|--------------------------|---------------------------|--------------------------|-------|--------------------------|----------------------------|------|--------------------------|-------|
| 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   |
|  | 1.07·10 <sup>-5</sup>    | 1.90·10 <sup>-9</sup> 1/h | 0.1 %                    | 0.2 % | 5.34·10 <sup>-7</sup>    | 9.50·10 <sup>-11</sup> 1/h | 5 %  | 0.1 %                    | 0.1 % |
|  |                          |                           |                          |       | 1.07·10 <sup>-6</sup>    | 1.90·10 <sup>-10</sup> 1/h | 10 % | 0.1 %                    | 0.2 % |
| 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

Diagram



Circuit diagram



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## Approvals

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**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                                | 53f68426-3d22-4f8c-b538-6c1cd5bc149f                           |

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