

# 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.
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### 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

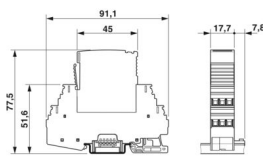
### Electrical properties

Nominal voltage $U_N$	24 V DC
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### 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.
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## 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
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## 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
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# PT-IQ-1X2+F-24DC-UT - Surge protection device

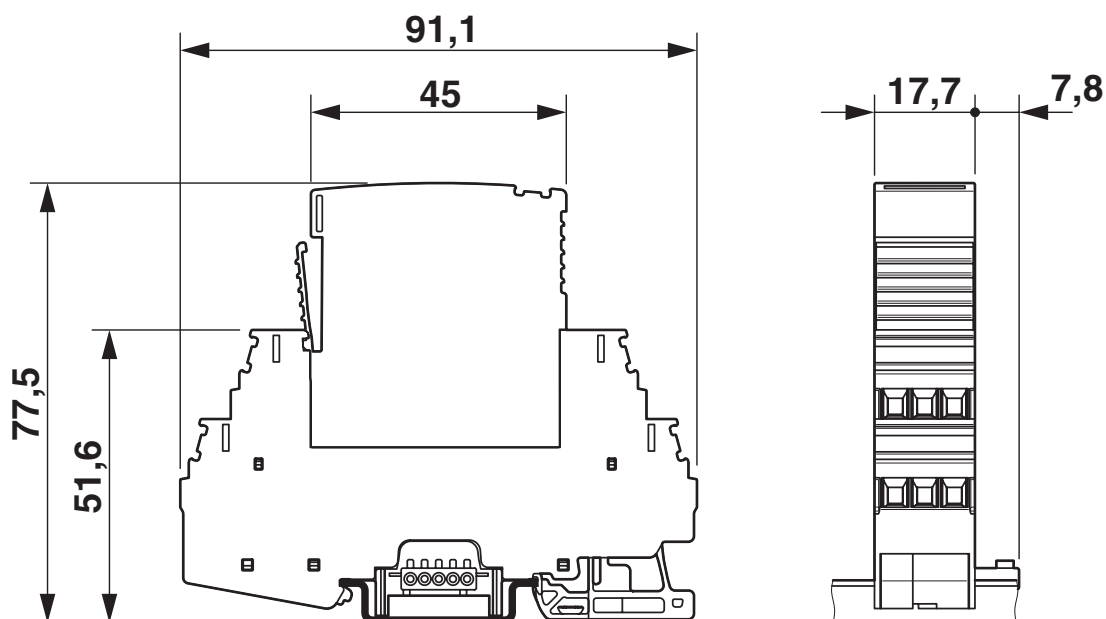


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## Drawings

Dimensional drawing



Schematic diagram

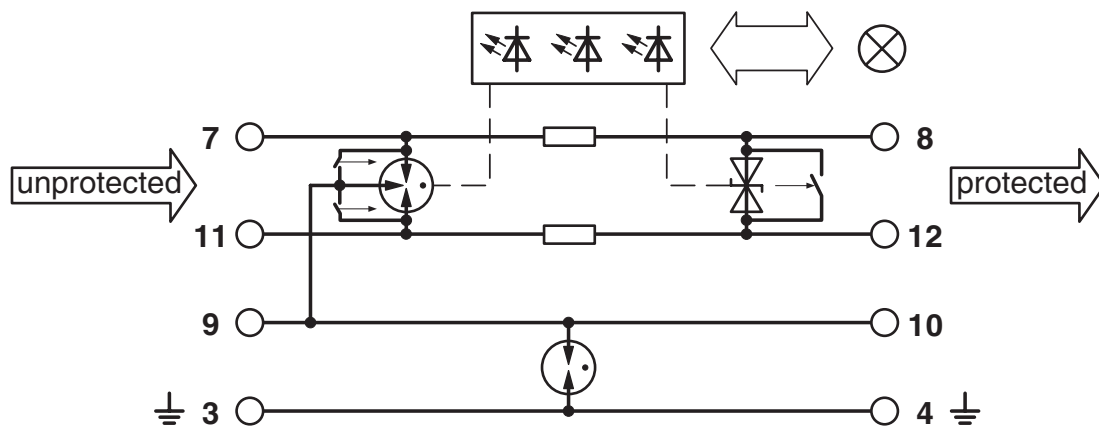
PT-IQ-1X2+F-...DC-UT(PT)									
Category	1oo1 architecture, HFT=0				1oo2 architecture, HFT=1				
	PFD <sub>AVG</sub>	PFH	Used budget of SIL 2 SIF		PFD <sub>AVG</sub>	PFH	CCF	Used budget of SIL 3 SIF	
			PFD <sub>AVG</sub>	PFH				PFD <sub>AVG</sub>	PFH
	1.07·10 <sup>-5</sup>	1.90·10 <sup>-9</sup> 1/h	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 exida Profile 1, FMEDA Analysis 2, T <sub>proof</sub> : 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



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
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### 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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