

# S-PT-2XEX-24DC - Surge protection device



2800040

<https://www.phoenixcontact.com/us/products/2800040>

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Surge protection for two floating signal circuits in the screw-on module with IP67 degree of protection for sensor heads, connection: M20 x 1.5. Tested in accordance with the following types of protection in Ex areas: Ex d/Ex tD/Ex ia IIC/Ex iaD. Suitable for use in the fieldbus system in accordance with the FISCO concept. Can be used in safety-related circuits up to SIL 3.

## Your advantages

- Easiest field mounting with standardized thread
- Versatile in use with universal protective circuit
- Use under extreme ambient conditions with robust design

## Commercial data

Item number	2800040
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL02
Product key	CL2232
GTIN	4046356411028
Weight per piece (including packing)	239.6 g
Weight per piece (excluding packing)	203.9 g
Customs tariff number	85363010
Country of origin	DE

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## Technical data

### Product properties

Product type	Surge protection for MCR technology
Product family	SURGETRAB
IEC test classification	C1
	C2
	C3
	D1
Type	Screw-in module
Number of positions	4
Wire pairs per module	2

### 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	Individual wires
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### Ex data

Maximum inner capacitance $C_i$	1.65 nF
Max. internal inductance $L_i$	1 $\mu$ H
Max. input current $I_i$	500 mA (T4 / $\leq 75$ °C)
	500 mA (T5 / $\leq 75$ °C)
	500 mA (T6 / $\leq 60$ °C)
Max. input voltage $U_i$	36 V DC
max. input power $P_i$	3.00 W
Insulation voltage to ground	500 V AC
Ambient temperature (operation)	-40 °C ... 75 °C (T4)
	-40 °C ... 75 °C (T5)
	-40 °C ... 60 °C (T6)
Operating temperature range	-40 °C ... 100 °C (T4)
	-40 °C ... 75 °C (T5)
	-40 °C ... 60 °C (T6)
Max. surface temperature	135 °C (T4)
	100 °C (T5)
	85 °C (T6)

### Dimensions

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Dimensional drawing	
Width	28 mm
Height	28 mm
Depth	79 mm

## Material specifications

Color	Steel/stainless steel color
Seal material	NBR
Housing material	Stainless steel 1.4404 ASTM 316L

## Mechanical properties

### Mechanical data

Open side panel	No
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## Protective circuit

Direction of action	Line-Line & Line-Earth Ground
Maximum continuous operating voltage $U_C$	36 V DC
	25 V AC
Operating effective current $I_C$ at $U_C$	$\leq 5 \mu\text{A}$
Protective conductor current $I_{PE}$	$\leq 2 \mu\text{A}$
Nominal discharge current $I_n$ (8/20) $\mu\text{s}$ (line-line)	260 A
Nominal discharge current $I_n$ (8/20) $\mu\text{s}$ (line-ground)	10 kA
Pulse discharge current $I_{imp}$ (10/350) $\mu\text{s}$	1 kA
Total discharge current $I_{Total}$ (8/20) $\mu\text{s}$	20 kA
Total discharge current $I_{Total}$ (10/350) $\mu\text{s}$	2 kA
Nominal pulse current $I_{an}$ (10/1000) $\mu\text{s}$ (line-line)	50 A
Output voltage limitation at 1 kV/ $\mu\text{s}$ (line-line) spike	$\leq 65 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (line-earth) spike	$\leq 1.1 \text{ kV}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (line-line) static	$\leq 50 \text{ V}$
Voltage protection level $U_p$ (line-line)	$\leq 50 \text{ V}$ (C3 - 10 A)
Voltage protection level $U_p$ (line-earth)	$\leq 1.1 \text{ kV}$ (C3 - 100 A)
	$\leq 1.1 \text{ kV}$ (C1 - 1 kV / 500 A)
	$\leq 1.2 \text{ kV}$ (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. 0.1 dB (1 MHz/50 $\Omega$ )
	typ. 0.1 dB (400 kHz / 150 $\Omega$ )
Cut-off frequency $f_g$ (3 dB), sym. in 50 $\Omega$ system	typ. 5 MHz
Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system	typ. 2 MHz

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Capacity (Core-Core)	typ. 1.5 nF
Capacity (Core-Earth)	typ. 5 pF
Surge protection fault message	none
Impulse durability (line-line)	C3 - 25 A
Impulse durability (line-earth)	C1 - 1 kV / 500 A
	C2 - 10 kV / 5 kA
	C3 - 100 A
	D1 - 1 kA
Alternating current carrying capacity (line-earth)	10 A - 1 s

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP67
Ambient temperature (operation)	-40 °C ... 80 °C (non-Ex)
Altitude	≤ 2000 m (amsl)

## Approvals

### Conformity/Approvals

ATEX	Ⓢ II 1 G Ex ia IIC T4...T6
	Ⓢ II 2 G Ex d IIC T4...T6
	Ⓢ II 1 D Ex iaD 20 IP6x T85 °C...135 °C
	Ⓢ II 2 D Ex tD A21 IP6x T85 °C...135 °C
IECEX	Ga Ex ia IIC T4...T6
	Ex d IIC T4...T6
	Ex iaD IP6x T85 °C...135 °C
	Ex tD A21 IP6x T85 °C...135 °C

## Standards and regulations

### Air clearances and creepage distances

Standards/regulations	IEC 60664-1 / IEC 60079-11
Standards/specifications	EN 61643-21
Note	A2:2013
Standards/specifications	EN 60079-0
Note	2018
Standards/specifications	EN 60079-1
Note	2007
Standards/specifications	EN 60079-11
Note	2012
Standards/specifications	EN 60079-31
Note	2009
Standards/specifications	IEC 60079-0
Note	2017
Standards/specifications	IEC 60079-1

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Note	2007
Standards/specifications	IEC 60079-11
Note	2011
Standards/specifications	IEC 60079-31
Note	2008
Standards/specifications	GB/T 3836.1
Note	2021
Standards/specifications	GB/T 3836.2
Note	2021
Standards/specifications	GB/T 3836.4
Note	2021
Standards/specifications	GB/T 3836.31
Note	2021

## Mounting

Mounting type	M20
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# S-PT-2XEX-24DC - Surge protection device

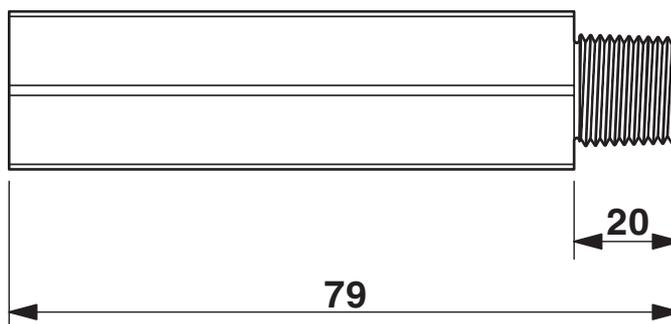
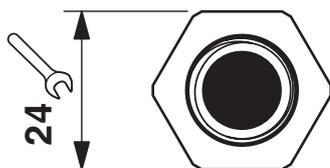


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## Drawings

### Dimensional drawing



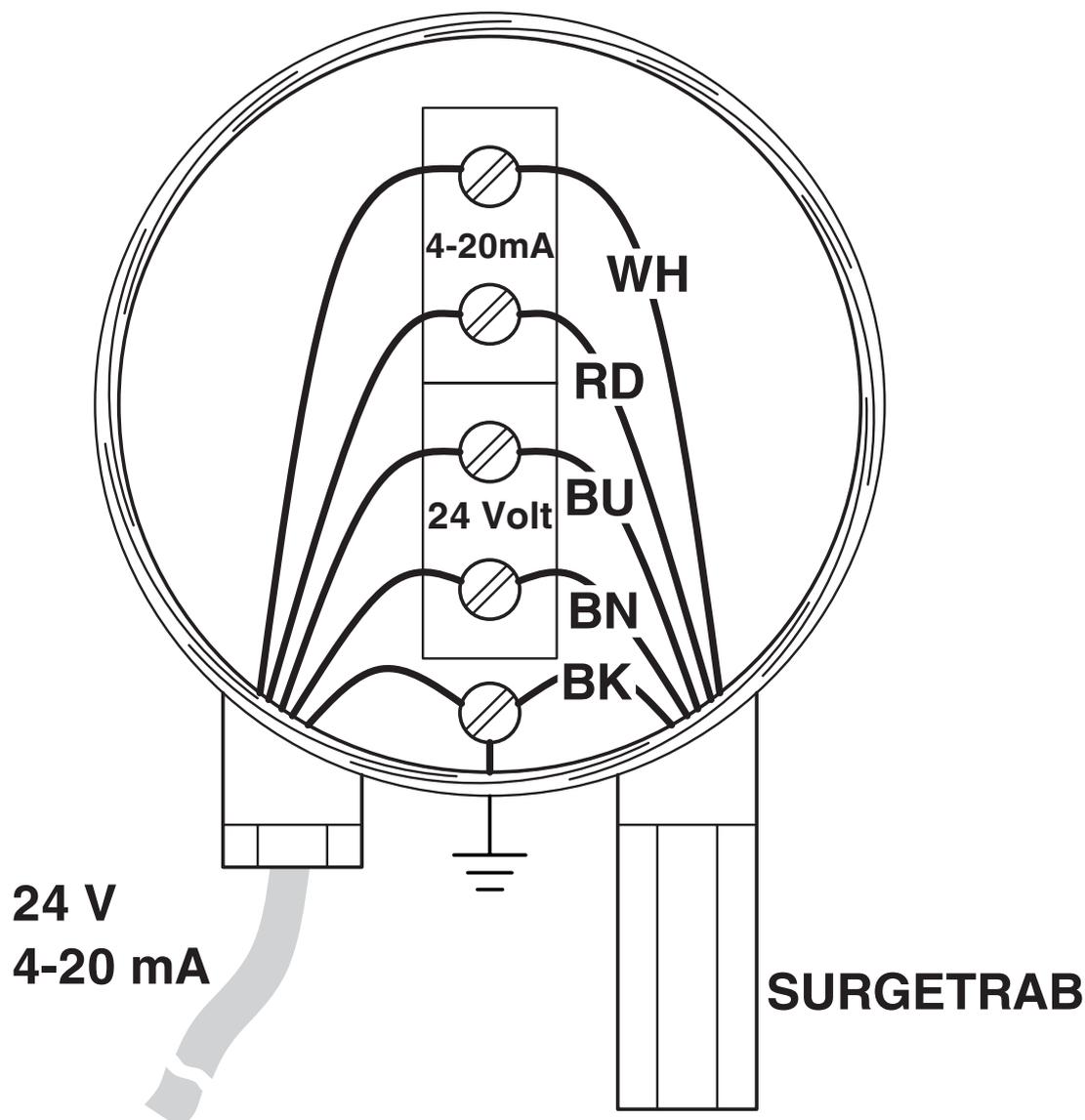
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Application drawing



Schematic diagram

S-PT-2XEX-...DC-*									
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
	8.43·10 <sup>-5</sup>	1.50·10 <sup>-9</sup> 1/h	0.1 %	0.2 %	4.22·10 <sup>-7</sup>	7.50·10 <sup>-11</sup> 1/h	5 %	0.0 %	0.1 %
					8.43·10 <sup>-7</sup>	1.50·10 <sup>-10</sup> 1/h	10 %	0.1 %	0.2 %
Calculation based on exida report, Phoenix Contact 09/08-42 R011 V4R1 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)									

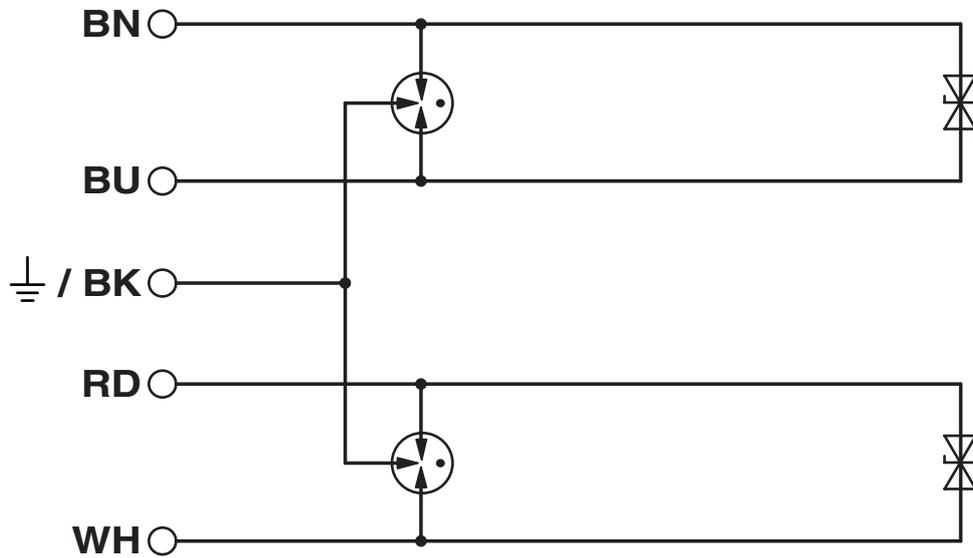
Functional safety scenarios

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Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2800040>

### Functional Safety

Approval ID: 09-08-42 R011 V4R1



### ATEX

Approval ID: KEMA 09ATEX0028 X



### IECEX

Approval ID: IECEX KEM 09.0014X



### CCC

Approval ID: 2020322316000794



### NEPSI-EX

Approval ID: GYJ20.1159X



### CCC

Approval ID: 2025322304006705

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## Classifications

### ECLASS

ECLASS-13.0	27171502
ECLASS-15.0	27171502

### ETIM

ETIM 9.0	EC001625
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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	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	77e4c354-cf9b-43ae-8016-f500835ba77f

### EF3.0 Climate Change

CO2e kg	10.626 kg CO2e
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