

# S-PT-4-EX-24DC-1/2" - Surge protection device



2800037

<https://www.phoenixcontact.com/us/products/2800037>

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Two-stage surge protection for three or four signals of floating signal circuits in the screw-on module with IP67 degree of protection for sensor heads, connection ½-inch 14 NPT. 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, HART-compatible. 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	2800037
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL02
Product key	CL2232
GTIN	4046356410984
Weight per piece (including packing)	242.1 g
Weight per piece (excluding packing)	209.67 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

### 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
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
Nominal voltage $U_N$	24 V DC
Maximum continuous operating voltage $U_C$	36 V DC 25 V AC
Operating effective current $I_C$ at $U_C$	$\leq 5 \mu A$
Protective conductor current $I_{PE}$	$\leq 2 \mu A$
Nominal discharge current $I_n$ (8/20) $\mu s$ (line-line)	260 A
Nominal discharge current $I_n$ (8/20) $\mu s$ (line-ground)	10 kA
Pulse discharge current $I_{imp}$ (10/350) $\mu s$	1 kA
Total discharge current $I_{Total}$ (8/20) $\mu s$	20 kA
Total discharge current $I_{Total}$ (10/350) $\mu s$	2 kA
Nominal pulse current $I_{an}$ (10/1000) $\mu s$ (line-line)	50 A
Output voltage limitation at 1 kV/ $\mu s$ (line-line) spike	$\leq 130 V$
Output voltage limitation at 1 kV/ $\mu s$ (line-earth) spike	$\leq 1.1 kV$
Output voltage limitation at 1 kV/ $\mu s$ (line-line) static	$\leq 60 V$
Voltage protection level $U_p$ (line-line)	$\leq 65 V$ (C3 - 10 A)
Voltage protection level $U_p$ (line-earth)	$\leq 1.1 kV$ (C3 - 100 A) $\leq 1.1 kV$ (C1 - 1 kV / 500 A) $\leq 1.2 kV$ (C2 - 10 kV / 5 kA)
Response time $t_A$ (line-line)	$\leq 1 ns$
Response time $t_A$ (line-earth)	$\leq 100 ns$
Input attenuation aE, sym.	typ. 0.1 dB (30 MHz / 50 $\Omega$ ) typ. 0.1 dB (6 MHz / 150 $\Omega$ )
Cut-off frequency $f_g$ (3 dB), sym. in 50 $\Omega$ system	typ. 70 MHz
Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system	typ. 70 MHz

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Capacity (Core-Core)	typ. 20 pF
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	1/2" NPT
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# S-PT-4-EX-24DC-1/2" - Surge protection device

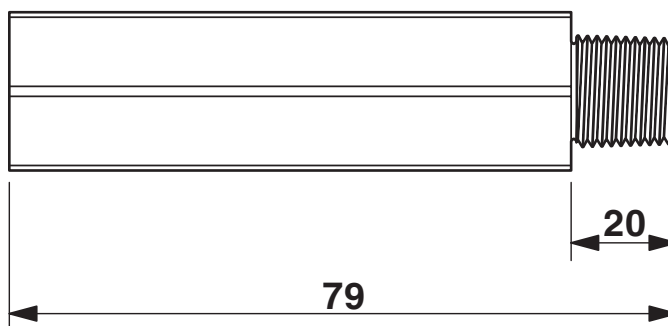
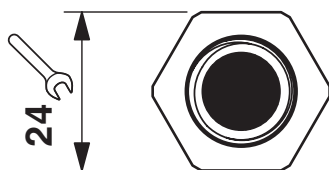


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## Drawings

### Dimensional drawing

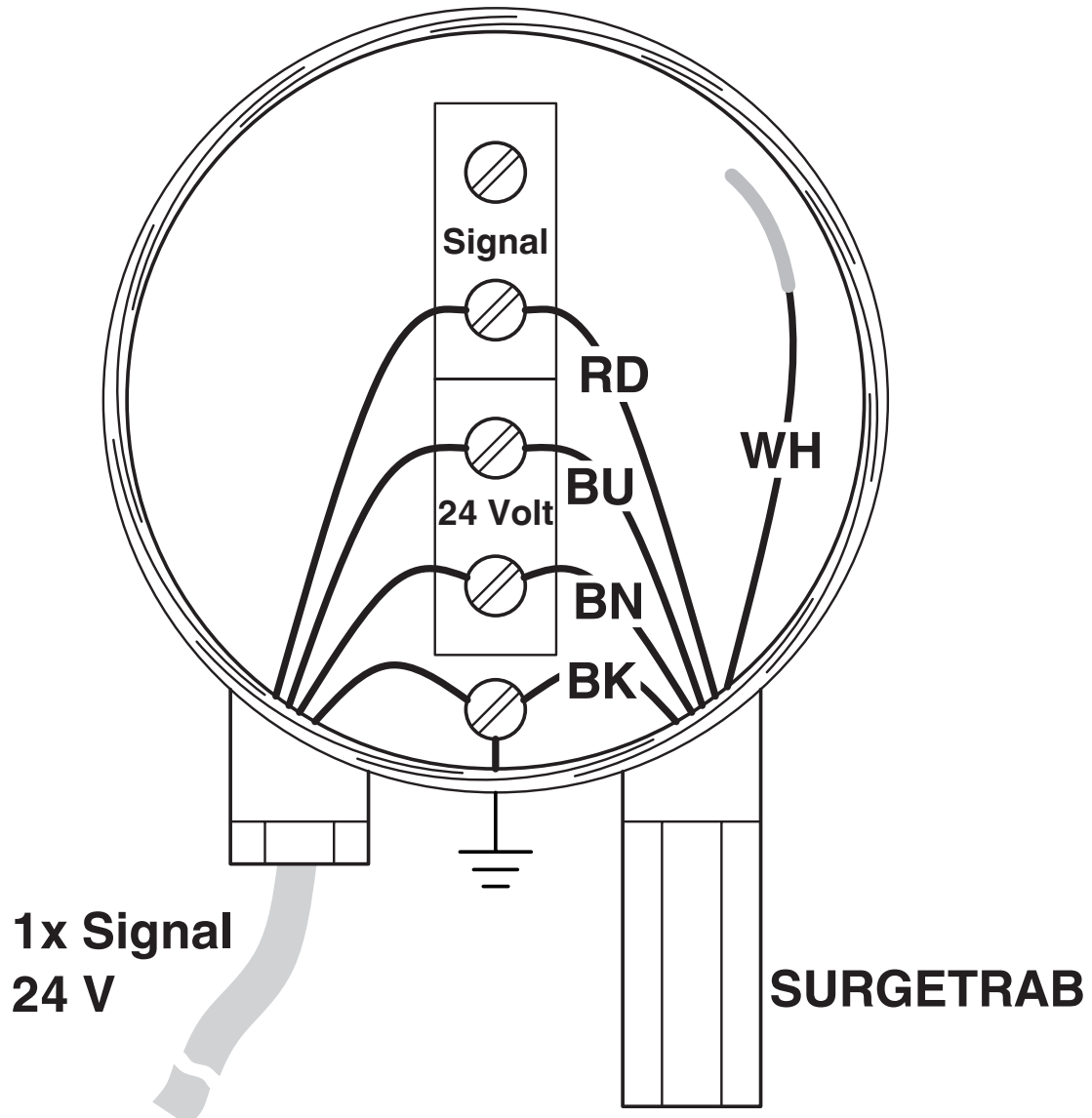


# S-PT-4-EX-24DC-1/2" - Surge protection device

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Application drawing



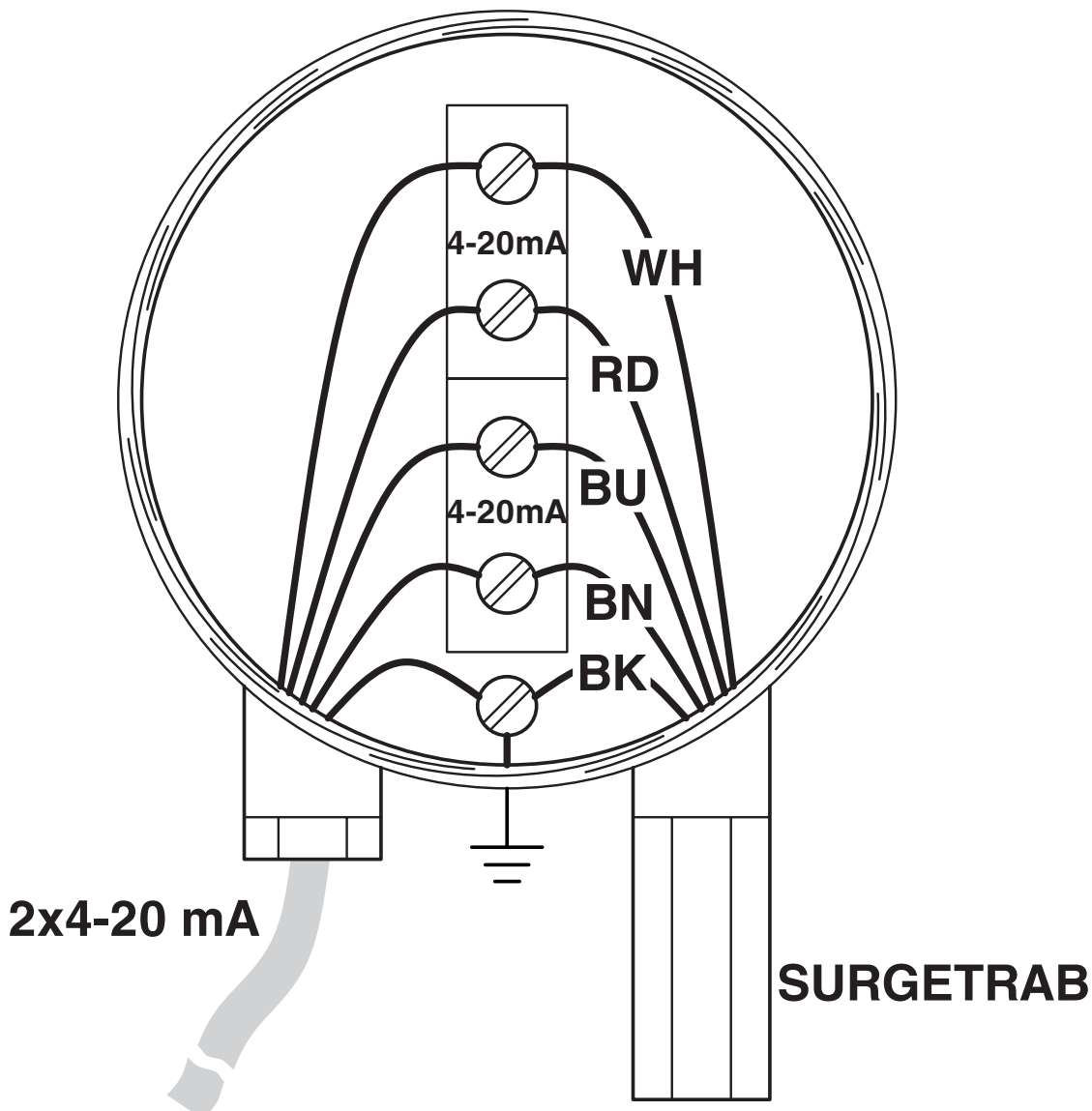
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Application drawing



Schematic diagram

S-PT-4-EX-...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
	1.57 <sub>x10</sub> <sup>-5</sup>	2.80 <sub>x10</sub> <sup>9</sup> 1/h	0.2 %	0.3 %	7.87 <sub>x10</sub> <sup>-7</sup>	1.40 <sub>x10</sub> <sup>10</sup> 1/h	5 %	0.1 %	0.1 %
					1.57 <sub>x10</sub> <sup>-6</sup>	2.80 <sub>x10</sub> <sup>10</sup> 1/h	10 %	0.2 %	0.3 %
<small>                     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)                 </small>									

Functional safety scenarios

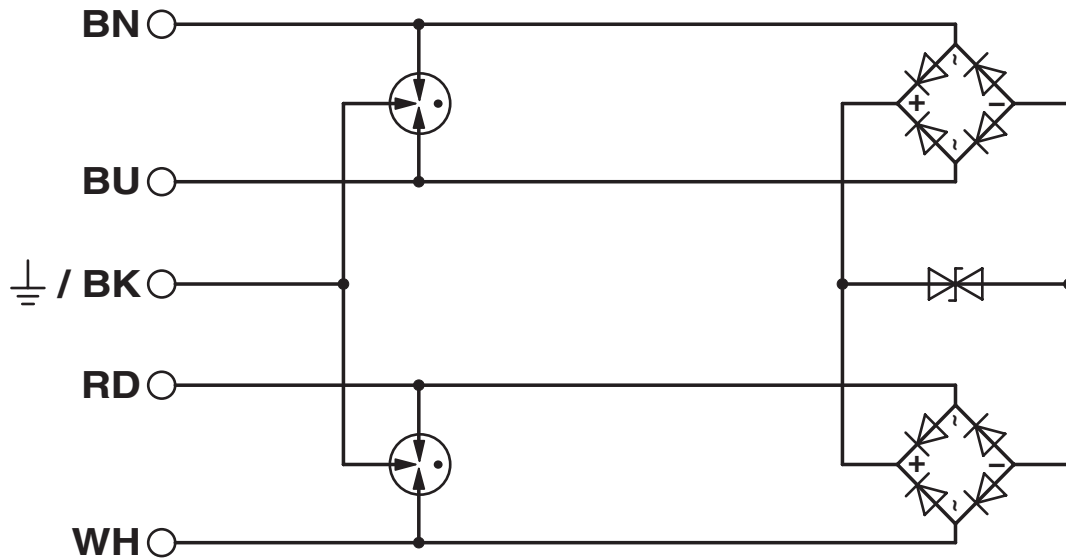
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Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2800037>

### 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



### CCC

Approval ID: 2025322304006705



### KC-s

Approval ID: 25-KA4BO-0698X



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Approval ID: 25-KA4BO-0697X

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## Classifications

### ECLASS

ECLASS-13.0	27171502
ECLASS-15.0	27171502

### 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	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	ec1cbf8d-dfb9-44c0-bff1-6ad194da8227

### EF3.1 Climate Change

CO2e kg	11.256 kg CO2e
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