

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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

Please be informed that the data shown in this PDF document is generated from our online catalog. Please find the complete data in the user documentation. Our general terms of use for downloads are valid.



Surge protection for two floating signal circuits in the screw-on module with IP67 degree of protection for sensor heads, connection: 1/2 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. 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                          | 2800041             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | CL02                |
| Product key                          | CL2232              |
| Catalog page                         | Page 155 (C-4-2019) |
| GTIN                                 | 4046356411035       |
| Weight per piece (including packing) | 242.3 g             |
| Weight per piece (excluding packing) | 209.06 g            |
| Customs tariff number                | 85363010            |
| Country of origin                    | DE                  |

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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

## 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                                   |

### Data management status

|                  |    |
|------------------|----|
| Article revision | 08 |
|------------------|----|

### Insulation characteristics

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

### Electrical properties

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

### Connection data

|                   |                  |
|-------------------|------------------|
| Connection method | Individual wires |
|-------------------|------------------|

### 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)                 |

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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

## Dimensions

|                     |                                                                                    |
|---------------------|------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width               | 28 mm                                                                              |
| Height              | 28 mm                                                                              |
| Depth               | 79 mm                                                                              |

## Material specifications

|                  |                                     |
|------------------|-------------------------------------|
| Color            | Steel/stainless steel color         |
| Housing material | Stainless steel 1.4404<br>ASTM 316L |

## Mechanical properties

### Mechanical data

|                 |    |
|-----------------|----|
| Open side panel | No |
|-----------------|----|

## Protective circuit

|                                                               |                                                                                                      |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Direction of action                                           | Line-Line & Line-Earth Ground                                                                        |
| Maximum continuous voltage $U_C$                              | 36 V DC<br>25 V AC                                                                                   |
| Operating effective current $I_C$ at $U_C$                    | $\leq 5 \mu A$                                                                                       |
| Residual 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  | $\leq 65 V$                                                                                          |
| 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 | $\leq 50 V$                                                                                          |
| Voltage protection level $U_p$ (line-line)                    | $\leq 50 V$ (C3 - 10 A)                                                                              |
| Voltage protection level $U_p$ (line-earth)                   | $\leq 1.1 kV$ (C3 - 100 A)<br>$\leq 1.1 kV$ (C1 - 1 kV / 500 A)<br>$\leq 1.2 kV$ (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 (1 MHz/50 $\Omega$ )<br>typ. 0.1 dB (400 kHz / 150 $\Omega$ )                            |
| Cut-off frequency $f_g$ (3 dB), sym. in 50 $\Omega$ system    | typ. 5 MHz                                                                                           |

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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

|                                                             |                   |
|-------------------------------------------------------------|-------------------|
| Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system | typ. 2 MHz        |
| 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                       |

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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

|                          |              |
|--------------------------|--------------|
| Standards/specifications | IEC 60079-1  |
| Note                     | 2007         |
| Standards/specifications | IEC 60079-11 |
| Note                     | 2011         |
| Standards/specifications | IEC 60079-31 |
| Note                     | 2008         |

## Mounting

|               |          |
|---------------|----------|
| Mounting type | 1/2" NPT |
|---------------|----------|

S-PT-2XEX-24DC-1/2" - Surge protection device



2800041

<https://www.phoenixcontact.com/us/products/2800041>

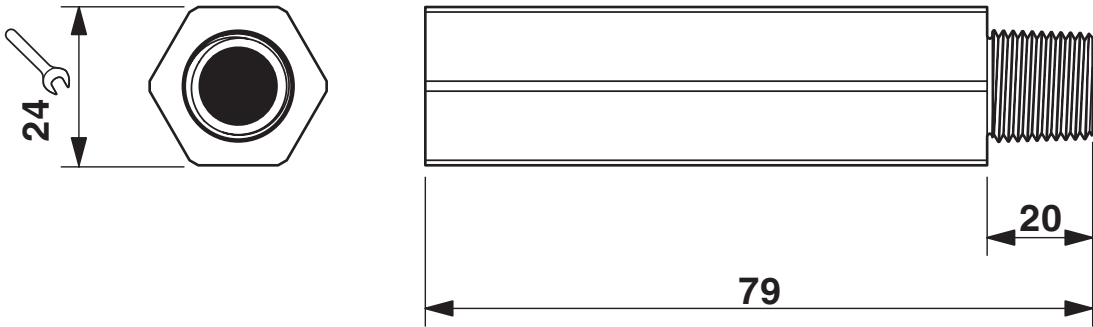
Drawings

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<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

Dimensional drawing



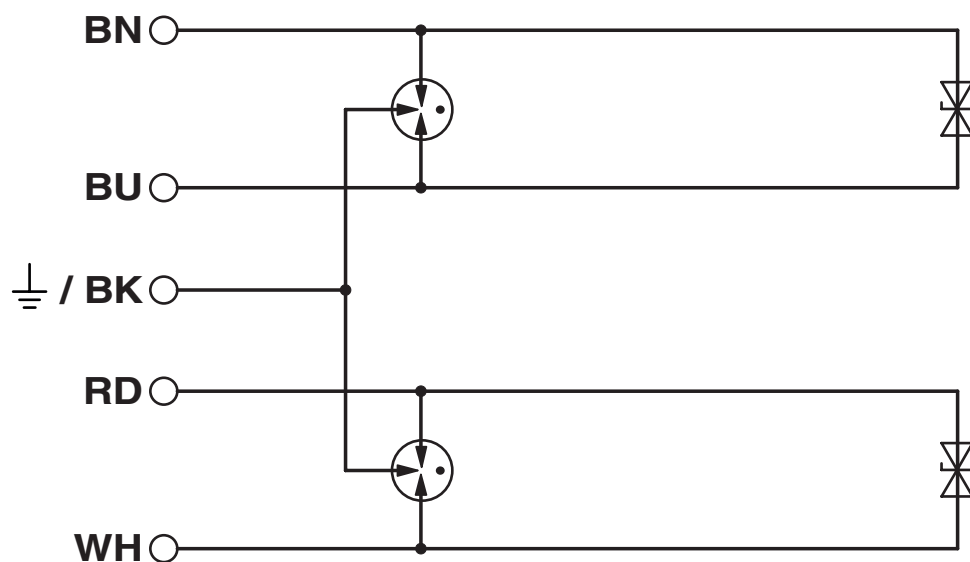
# S-PT-2XEX-24DC-1/2" - Surge protection device



2800041

<https://www.phoenixcontact.com/us/products/2800041>

Circuit diagram



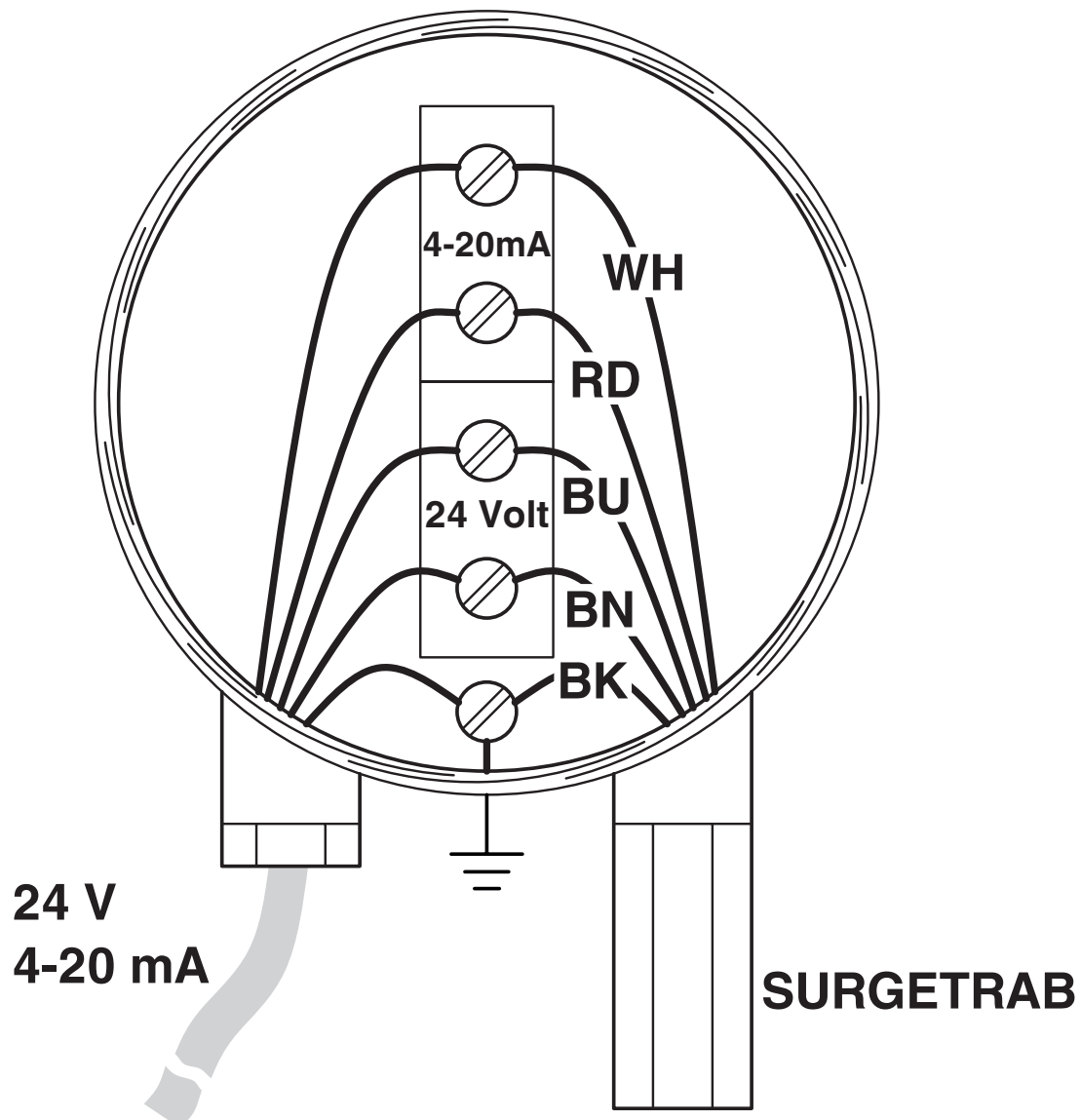
# S-PT-2XEX-24DC-1/2" - Surge protection device



2800041

<https://www.phoenixcontact.com/us/products/2800041>

Application drawing



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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2800041>



**EAC**

Approval ID: RU C-DE.\*09.B.00169

### Functional Safety

Approval ID: 09-08-42 R011 V4R1



**ATEX**

Approval ID: KEMA 09ATEX0028 X



**EAC Ex**

Approval ID: RU C-DE.\*\*87.B.00420



**IECEx**

Approval ID: IECEx KEM 09.0014X



**CCC**

Approval ID: 2020322316000794



**CCC**

Approval ID: 2020322316000794



**NEPSI-EX**

Approval ID: GYJ20.1159X

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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-11.0 | 27130807 |
| ECLASS-13.0 | 27171502 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC001625 |
|----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121600 |
|-------------|----------|

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



2800041

<https://www.phoenixcontact.com/us/products/2800041>

## 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                                | bfb34622-f030-4f7a-bf39-09d5727c158e |

Phoenix Contact 2024 © - all rights reserved

<https://www.phoenixcontact.com>

Phoenix Contact USA  
586 Fulling Mill Road  
Middletown, PA 17057, United States  
(+717) 944-1300  
[info@phoenixcon.com](mailto:info@phoenixcon.com)