

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 |
|-----------------------|---------|

Connection data

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

Ex data

| | |
|---------------------------------|----------------------------|
| Maximum inner capacitance C_i | 1.65 nF |
| Max. internal inductance L_i | 1 μ H |
| Max. input current I_i | 500 mA (T4 / ≤ 75 °C) |
| | 500 mA (T5 / ≤ 75 °C) |
| | 500 mA (T6 / ≤ 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 |
|-----------------|----|

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) μs (line-line) | 260 A |
| Nominal discharge current I_n (8/20) μs (line-ground) | 10 kA |
| Pulse discharge current I_{imp} (10/350) μs | 1 kA |
| Total discharge current I_{Total} (8/20) μs | 20 kA |
| Total discharge current I_{Total} (10/350) μs | 2 kA |
| Nominal pulse current I_{an} (10/1000) μs (line-line) | 50 A |
| Output voltage limitation at 1 kV/ μs (line-line) spike | $\leq 65 V$ |
| Output voltage limitation at 1 kV/ μs (line-earth) spike | $\leq 1.1 kV$ |
| Output voltage limitation at 1 kV/ μs (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) $\leq 1.1 kV$ (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 (1 MHz/50 Ω) typ. 0.1 dB (400 kHz / 150 Ω) |
| Cut-off frequency f_g (3 dB), sym. in 50 Ω system | typ. 5 MHz |

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2800040

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| | |
|---|-------------------|
| Cut-off frequency f_g (3 dB), sym. in 150 Ω 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 |

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2800040

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| | |
|--------------------------|--------------|
| Standards/specifications | IEC 60079-1 |
| 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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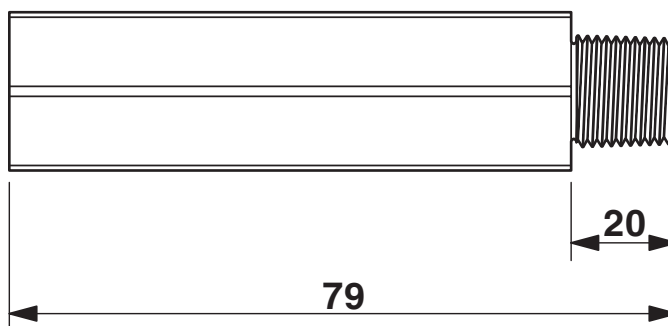
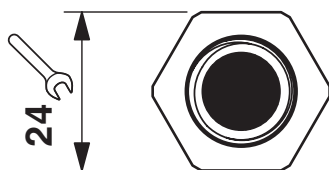


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Drawings

Dimensional drawing



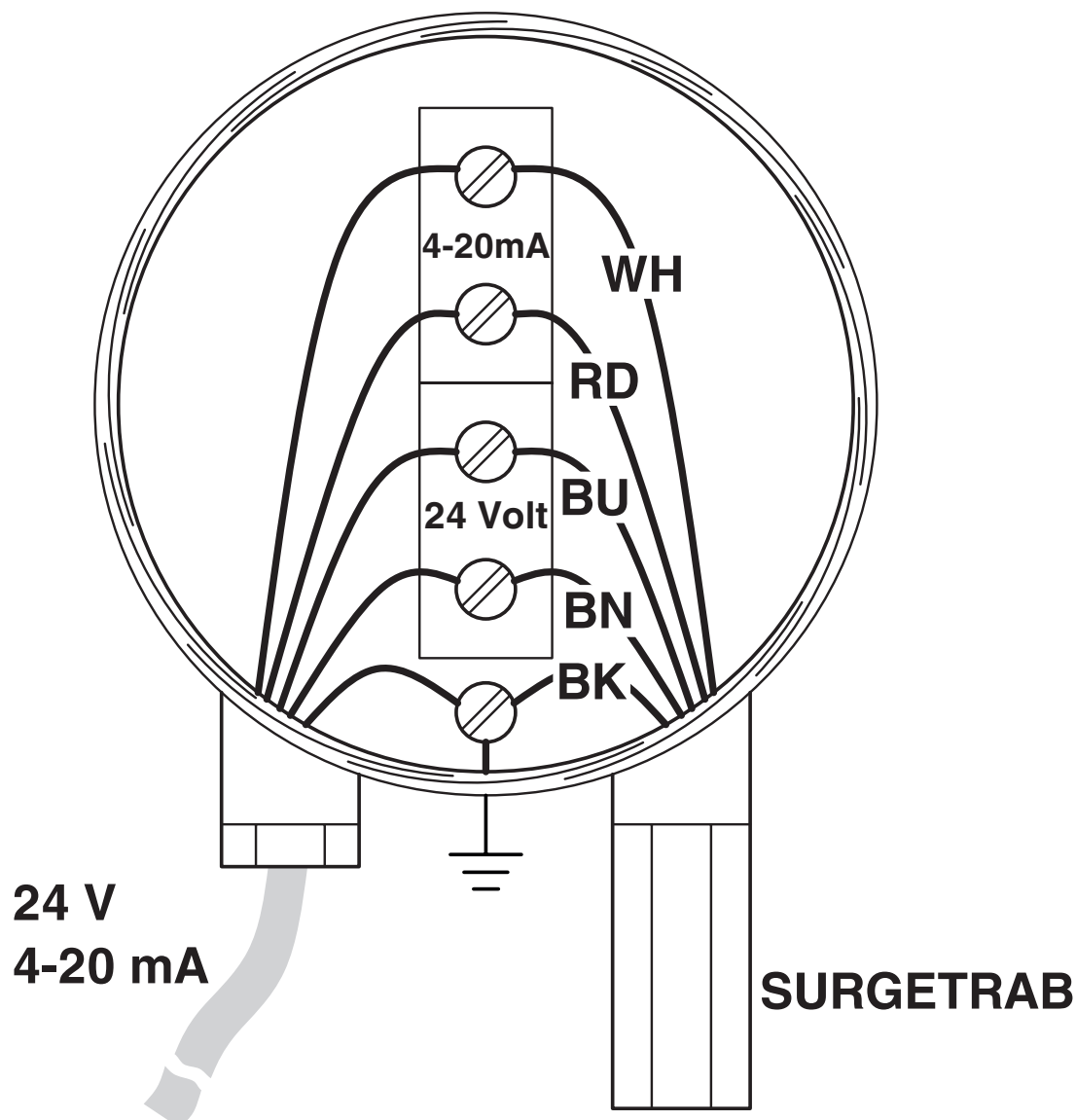
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Application drawing



Schematic diagram

| S-PT-2XEX-...DC-* | | | | | | | | | |
|---|--------------------------|---------------------------|--------------------------|-------|--------------------------|----------------------------|------|--------------------------|-------|
| Category | 1oo1 architecture, HFT=0 | | | | 1oo2 architecture, HFT=1 | | | | |
| | PFD _{AVG} | PFH | Used budget of SIL 2 SIF | | PFD _{AVG} | PFH | CCF | Used budget of SIL 3 SIF | |
| | | | PFD _{AVG} | PFH | | | | PFD _{AVG} | PFH |
| | 8.43·10 ⁻⁵ | 1.50·10 ⁻⁹ 1/h | 0.1 % | 0.2 % | 4.22·10 ⁻⁷ | 7.50·10 ⁻¹¹ 1/h | 5 % | 0.0 % | 0.1 % |
| | | | | | 8.43·10 ⁻⁷ | 1.50·10 ⁻¹⁰ 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 _{proof} : 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

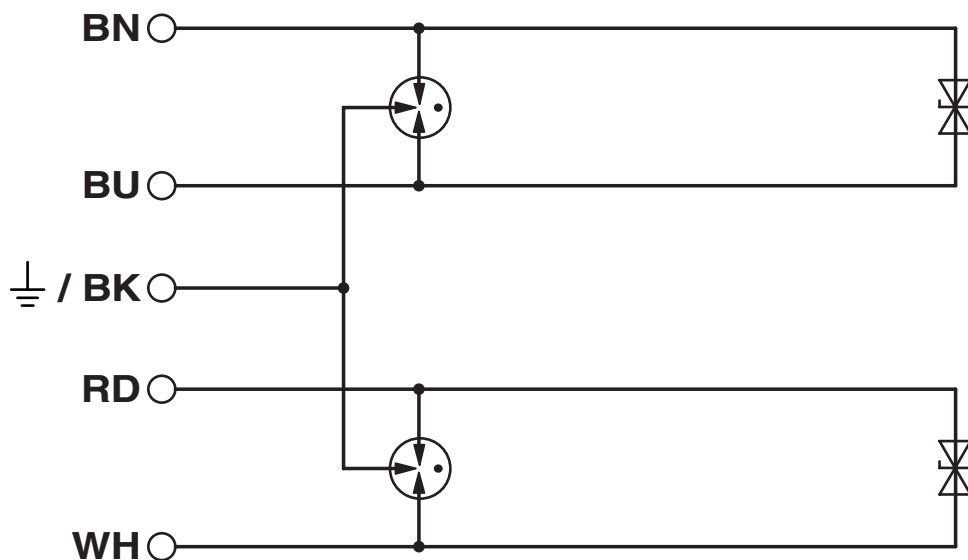
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Circuit diagram



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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



CCC

Approval ID: 2025322304006705

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Classifications

ECLASS

| | |
|-------------|----------|
| ECLASS-13.0 | 27171502 |
| ECLASS-15.0 | 27171502 |

ETIM

| | |
|-----------|----------|
| ETIM 10.0 | EC001625 |
|-----------|----------|

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 |

EF3.1 Climate Change

| | |
|---------|----------------|
| CO2e kg | 10.626 kg CO2e |
|---------|----------------|

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