

# S-PT-4-EX-24DC - Surge protection device



2800036

<https://www.phoenixcontact.com/au/products/2800036>

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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: 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, 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                          | 2800036             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | CL2232              |
| Product key                          | CL2232              |
| Catalog page                         | Page 141 (C-4-2019) |
| GTIN                                 | 4046356411042       |
| Weight per piece (including packing) | 239.7 g             |
| Weight per piece (excluding packing) | 207.02 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 |
|-----------------------|---------|

### 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 / $\leq 75^\circ\text{C}$ )             |
|                                 | 500 mA (T5 / $\leq 75^\circ\text{C}$ )             |
|                                 | 500 mA (T6 / $\leq 60^\circ\text{C}$ )             |
| 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 $^\circ\text{C}$ ... 75 $^\circ\text{C}$ (T4)  |
|                                 | -40 $^\circ\text{C}$ ... 75 $^\circ\text{C}$ (T5)  |
|                                 | -40 $^\circ\text{C}$ ... 60 $^\circ\text{C}$ (T6)  |
| Operating temperature range     | -40 $^\circ\text{C}$ ... 100 $^\circ\text{C}$ (T4) |
|                                 | -40 $^\circ\text{C}$ ... 75 $^\circ\text{C}$ (T5)  |
|                                 | -40 $^\circ\text{C}$ ... 60 $^\circ\text{C}$ (T6)  |
| Max. surface temperature        | 135 $^\circ\text{C}$ (T4)                          |
|                                 | 100 $^\circ\text{C}$ (T5)                          |
|                                 | 85 $^\circ\text{C}$ (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<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 $U_C$                    | $\leq 5 \mu A$                                                                                       |
| 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)<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 (30 MHz / 50 $\Omega$ )<br>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. 40 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  | Ex II 1 G Ex ia IIC T4...T6              |
|       | Ex II 2 G Ex d IIC T4...T6               |
|       | Ex II 1 D Ex iaD 20 IP6x T85 °C...135 °C |
|       | Ex 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         |

## Mounting

|               |     |
|---------------|-----|
| Mounting type | M20 |
|---------------|-----|

# S-PT-4-EX-24DC - Surge protection device

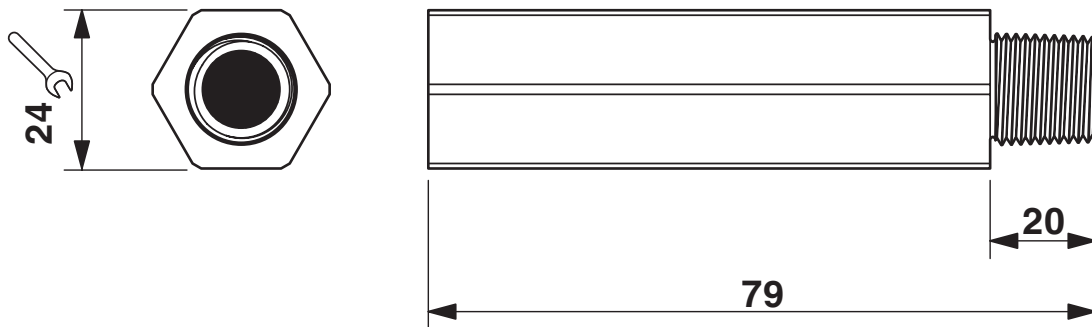


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## Drawings

### Dimensional drawing

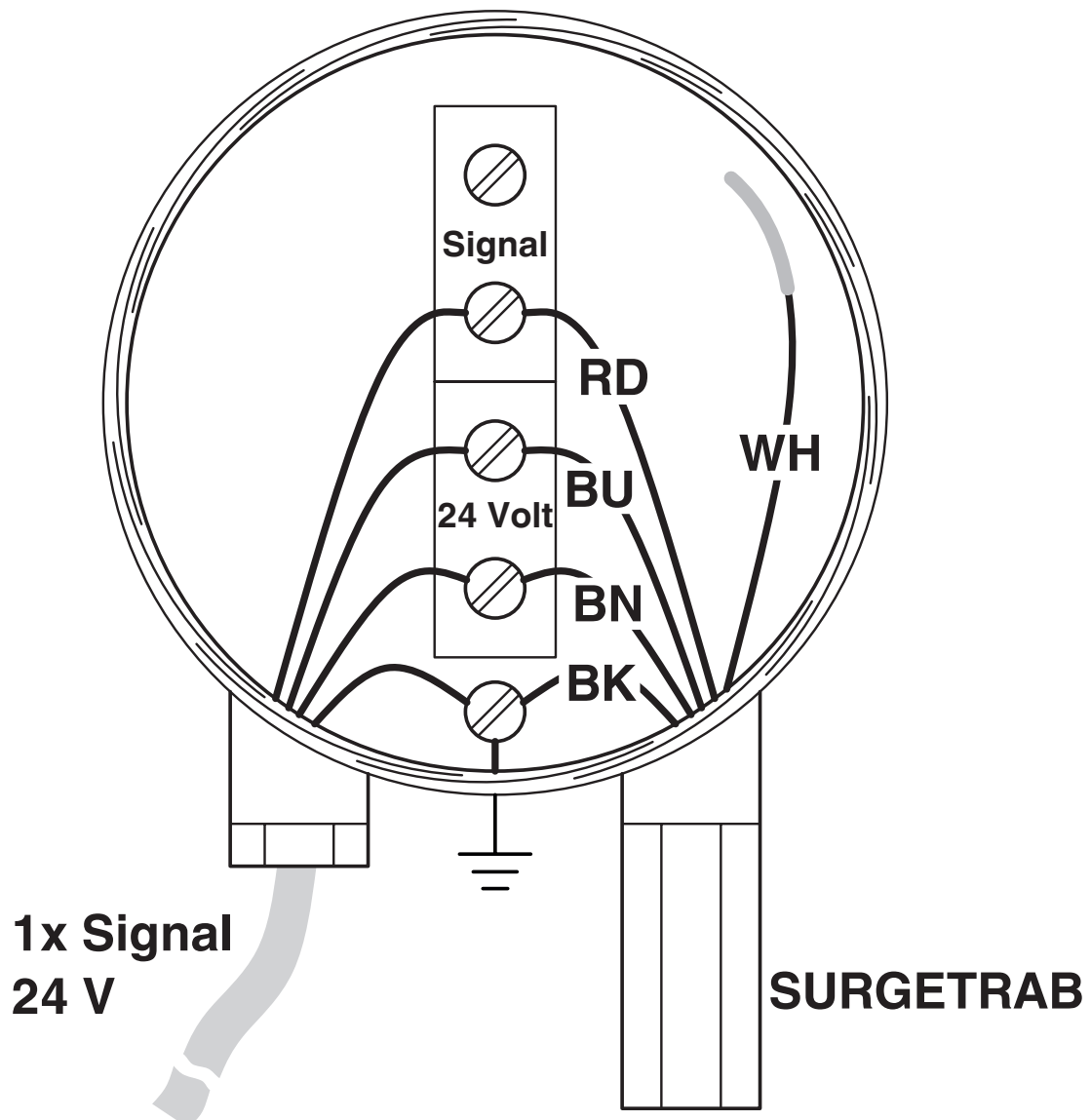


# S-PT-4-EX-24DC - Surge protection device

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Application drawing

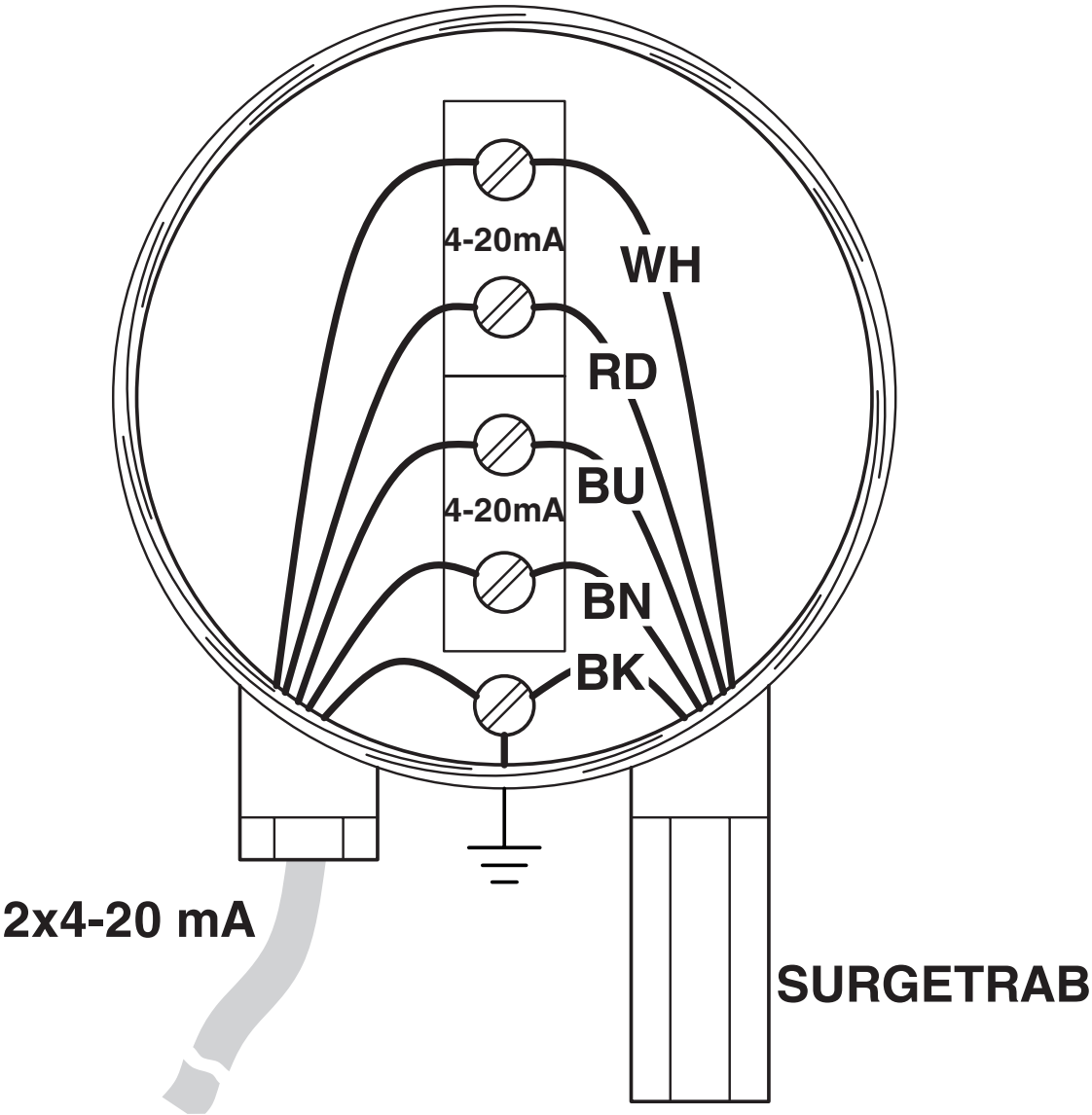


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Application drawing



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<sup>-5</sup></sub> | 2.80 <sub>x10<sup>-9</sup></sub> 1/h | 0.2 %                    | 0.3 % | 7.87 <sub>x10<sup>-7</sup></sub> | 1.40 <sub>x10<sup>-10</sup></sub> 1/h | 5 %  | 0.1 %                    | 0.1 % |
|                                                                                                                                                                                                                                                                                                                         |                                  |                                      |                          |       | 1.57 <sub>x10<sup>-6</sup></sub> | 2.80 <sub>x10<sup>-10</sup></sub> 1/h | 10 % | 0.2 %                    | 0.3 % |
| 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) |                                  |                                      |                          |       |                                  |                                       |      |                          |       |

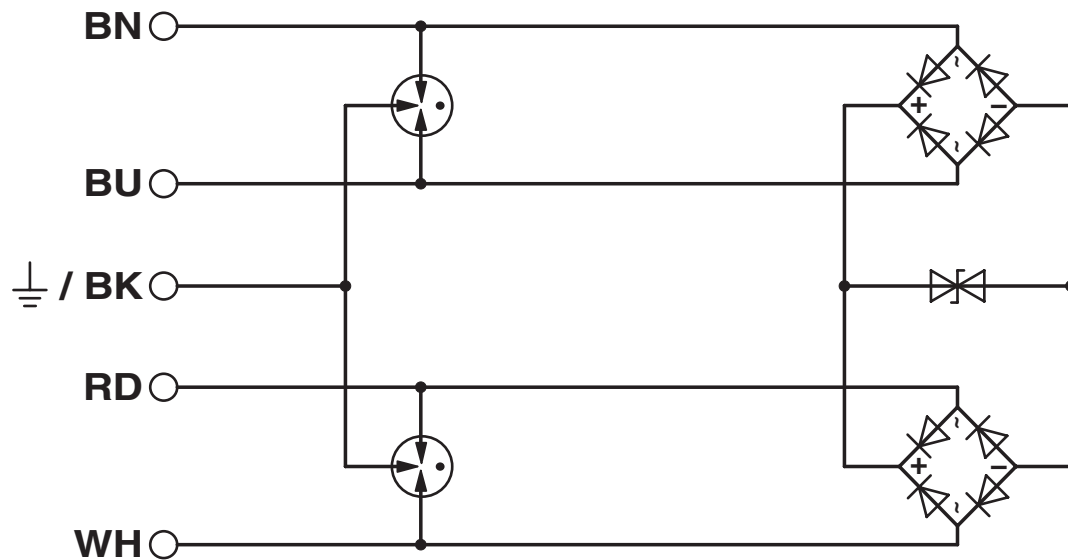
Functional safety scenarios

# S-PT-4-EX-24DC - Surge protection device

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Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/au/products/2800036>



**EAC**

Approval ID: EAC-Zulassung



**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



**NEPSI-EX**

Approval ID: GYJ20.1159X

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## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | 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                                | 6727f9e7-9f71-4ed5-a992-4c18e4abb130 |

### EF3.0 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 1.288 kg CO2e |
|---------|---------------|

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