

# S-PT-1X2-24DC - Surge protection device



2880668

<https://www.phoenixcontact.com/us/products/2880668>

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Surge protection in the IP67 screw-on module for measuring sensors, direct mounting with M20 x 1.5 outer thread, cable gland for the signal line, two-stage protective circuit. 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                          | 2880668                        |
| Packing unit                         | 1 pc                           |
| Minimum order quantity               | 1 pc                           |
| Note                                 | Made to order (non-returnable) |
| Sales key                            | CL02                           |
| Product key                          | CL2231                         |
| Catalog page                         | Page 125 (C-4-2019)            |
| GTIN                                 | 4046356049009                  |
| Weight per piece (including packing) | 418.1 g                        |
| Weight per piece (excluding packing) | 352.52 g                       |
| Customs tariff number                | 85363010                       |
| Country of origin                    | DE                             |

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## Technical data

### Notes

|                    |                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|
| Notes on operation | When the bridge is disconnected, the shield connection is indirectly connected to the housing or reference potential. |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|

### 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            | 3                                   |
| Surge protection fault message | none                                |
| Wire pairs per module          | 1                                   |

### Data management status

|                  |    |
|------------------|----|
| Article revision | 15 |
|------------------|----|

### Insulation characteristics

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

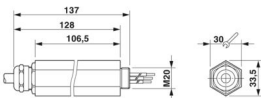
### Electrical properties

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

### Connection data

|                                  |                                              |
|----------------------------------|----------------------------------------------|
| Connection method                | Screw connection                             |
| Screw thread                     | M3                                           |
| Tightening torque                | 0.6 Nm                                       |
| Conductor cross section flexible | 0.14 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section rigid    | 0.14 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section AWG      | 26 ... 16                                    |

### Dimensions

|                     |                                                                                      |
|---------------------|--------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width               | 33.5 mm                                                                              |
| Height              | 33.5 mm                                                                              |
| Depth               | 137 mm                                                                               |

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## Material specifications

|                  |                                                  |
|------------------|--------------------------------------------------|
| Color            | Steel/stainless steel color                      |
| Housing material | Zinc die-cast, surface bronzed and nickel-plated |

## Mechanical properties

### Mechanical data

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

## Protective circuit

|                                                                          |                                               |
|--------------------------------------------------------------------------|-----------------------------------------------|
| Direction of action                                                      | Line-Line & Line-Earth Ground                 |
| Maximum continuous voltage $U_C$                                         | 40 V DC                                       |
|                                                                          | 28 V AC                                       |
| Rated current                                                            | 450 mA (55 °C)                                |
| Operating effective current $I_C$ at $U_C$                               | $\leq 10 \mu A$                               |
| Residual current $I_{PE}$                                                | $\leq 2 \mu A$                                |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (line-line)               | 10 kA                                         |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (line-ground)             | 10 kA (per path)                              |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (shield-ground)           | 10 kA (optional)                              |
| 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                                          |
| Max. discharge current $I_{max}$ (8/20) $\mu s$ maximum (line-line)      | 10 kA                                         |
| Max. discharge current $I_{max}$ (8/20) $\mu s$ maximum (line-earth)     | 10 kA (per path)                              |
| Discharge surge current $I_{max}$ (8/20) $\mu s$ maximum (shield-ground) | 10 kA                                         |
| Nominal pulse current $I_{an}$ (10/1000) $\mu s$ (line-line)             | 23 A                                          |
| Nominal pulse current $I_{an}$ (10/1000) $\mu s$ (line-earth)            | 100 A                                         |
| Nominal pulse current $I_{an}$ (10/1000) $\mu s$ (shield-ground)         | 100 A                                         |
| Output voltage limitation at 1 kV/ $\mu s$ (line-line) spike             | $\leq 55 V$                                   |
| Output voltage limitation at 1 kV/ $\mu s$ (line-earth) spike            | $\leq 450 V$ (Direct grounding)               |
| Output voltage limitation at 1 kV/ $\mu s$ (shield-ground) spike         | $\leq 600 V$ (optional)                       |
| Output voltage limitation at 1 kV/ $\mu s$ (line-line) static            | $\leq 55 V$                                   |
| Output voltage limitation at 1 kV/ $\mu s$ (line-earth) static           | $\leq 450 V$ (Direct grounding)               |
| Residual voltage at $I_n$ (conductor-conductor)                          | $\leq 55 V$                                   |
| Residual voltage with $I_{an}$ (10/1000) $\mu s$ (line-line)             | $\leq 65 V$                                   |
| Voltage protection level $U_p$ (line-line)                               | $\leq 80 V$ (C2 - 10 kV / 5 kA)               |
| Voltage protection level $U_p$ (line-earth)                              | $\leq 450 V$ (C2 - 10 kV / 5 kA)              |
| Voltage protection level $U_p$ (shield-ground)                           | $\leq 600 V$ (C2 - 10 kV / 5 kA)              |
| Voltage protection level $U_p$ static (line-line)                        | $\leq 50 V$ (C2 - 10 kV / 5 kA)               |
| Response time $t_A$ (line-line)                                          | $\leq 1 ns$                                   |
| Response time $t_A$ (line-earth)                                         | $\leq 100 ns$                                 |
| Response time $t_A$ (shield-ground)                                      | $\leq 100 ns$                                 |
| Input attenuation aE, sym.                                               | typ. 0.5 dB ( $\leq 1.5 MHz$ / 50 $\Omega$ )  |
|                                                                          | typ. 0.2 dB ( $\leq 300 kHz$ / 150 $\Omega$ ) |

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|                                                             |                       |
|-------------------------------------------------------------|-----------------------|
| Cut-off frequency $f_g$ (3 dB), sym. in 50 $\Omega$ system  | typ. 6 MHz            |
| Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system | typ. 2 MHz            |
| Resistance per path                                         | 2.2 $\Omega \pm 10\%$ |
| Surge protection fault message                              | none                  |
| Max. required back-up fuse                                  | 500 mA (T)            |
| Impulse durability (line-line)                              | C2 - 10 kV / 5 kA     |
|                                                             | D1 - 1 kA             |
| Impulse durability (line-earth)                             | C2 - 10 kV / 5 kA     |
|                                                             | D1 - 1 kA             |
| Impulse durability (shield-ground)                          | C2 - 10 kV/5 kA       |
|                                                             | D1 - 1 kA             |

## Environmental and real-life conditions

### Ambient conditions

|                                         |                      |
|-----------------------------------------|----------------------|
| Degree of protection                    | IP67                 |
| Ambient temperature (operation)         | -40 °C ... 85 °C     |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C     |
| Altitude                                | $\leq 2000$ m (amsl) |

## Standards and regulations

### Air clearances and creepage distances

|                          |                          |
|--------------------------|--------------------------|
| Standards/regulations    | IEC 60664-1 / VDE 0110-1 |
| Standards/specifications | IEC 61643-21             |
| Note                     | 2002                     |

## Mounting

|               |                         |
|---------------|-------------------------|
| Mounting type | direct screw connection |
|---------------|-------------------------|

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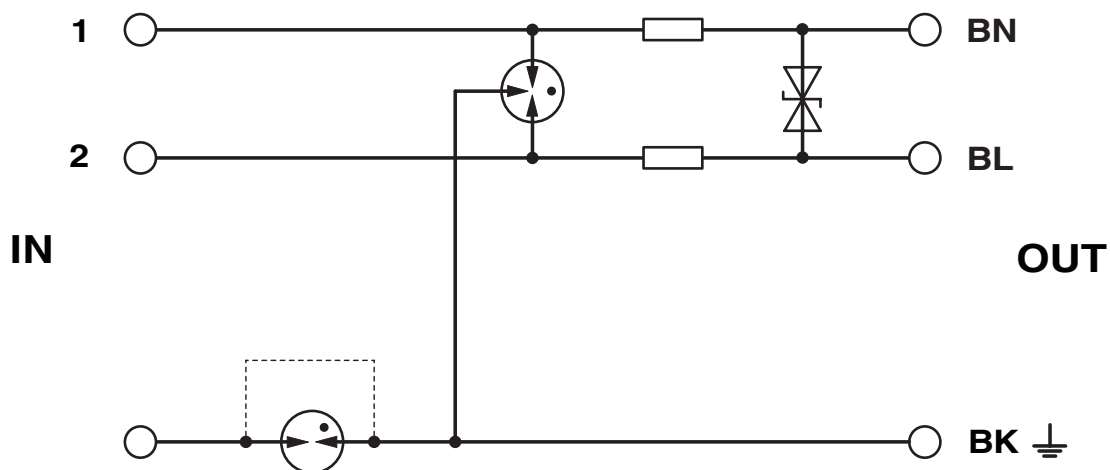
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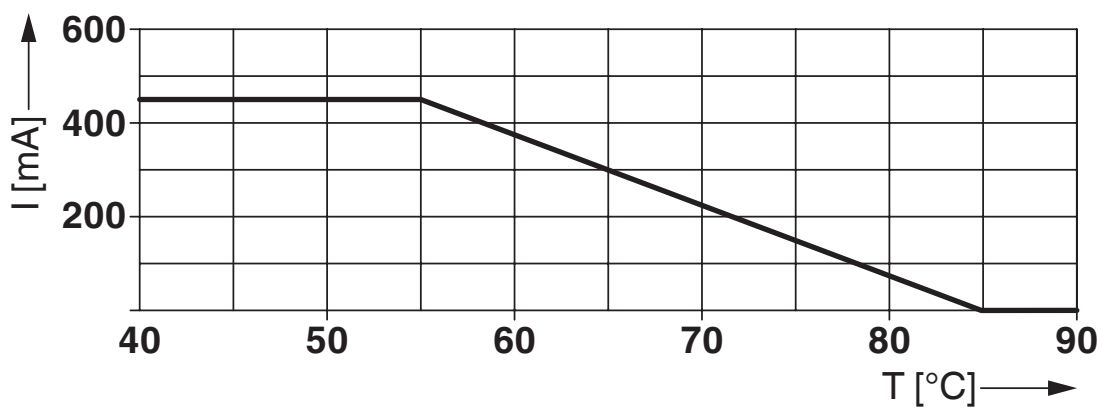


## Drawings

Circuit diagram



Diagram



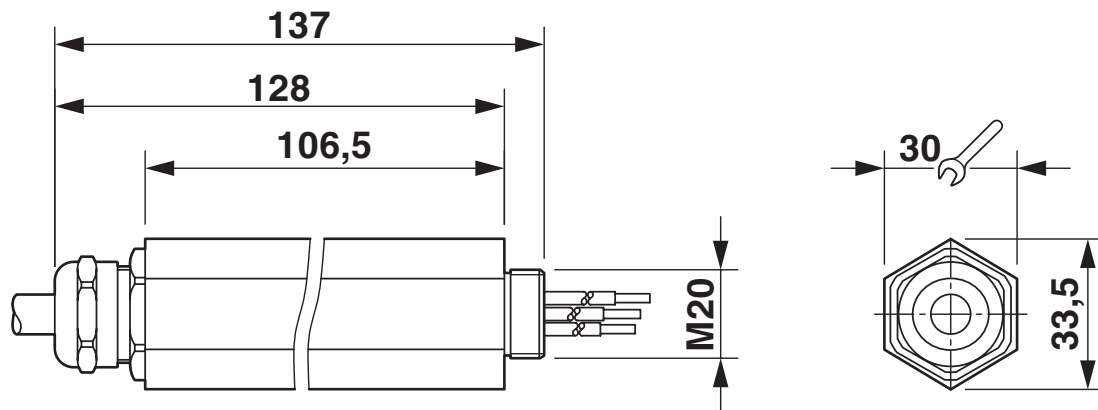
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Dimensional drawing



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## Approvals

 To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2880668>



**EAC**

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

### Functional Safety

Approval ID: 23-05-128 R029 V1R0

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-11.0 | 27130807 |
| ECLASS-13.0 | 27171501 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC000943 |
|----------|----------|

### UNSPSC

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

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## Environmental product compliance

|                                         |                                                                                                                                                                                                                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU RoHS                                 |                                                                                                                                                                                                                                   |
| Fulfills EU RoHS substance requirements | Yes                                                                                                                                                                                                                               |
| Exemption                               | 6(c), 7(a)                                                                                                                                                                                                                        |
| 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                                    | 4d77b868-fb3a-4416-952c-40f64197bc26                                                                                                                                                                                              |

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