

## Surge protection plug - PT 2X1-24DC-ST - 2856087

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Surge protection plug for the base element, coarse and fine protection for two signal wires with common reference potential, common mode voltage coarse protection to ground. Design: 24 V DC

### Your advantages

- ✓ Easy testing and documentation with CHECKMASTER 2 with pluggable protective modules
- ✓ Maximum ease of maintenance thanks to the two-piece design
- ✓ Easy selection for all possible demands in MCR applications with a complete product portfolio
- ✓ The signal is not influenced during maintenance work, thanks to the impedance-neutral insertion and removal of protective plugs



### Key Commercial Data

|                                      |   |
|--------------------------------------|---|
| Packing unit                         | 1 pc  |
| GTIN                                 | <br>4 017918 599164 |
| GTIN                                 | 4017918599164   |
| Weight per Piece (excluding packing) | 20.700 g  |
| Custom tariff number                 | 85363010  |
| Country of origin                    | Germany   |

### Technical data

#### Dimensions

|                        |         |
|------------------------|---------|
| Height                 | 44.8 mm |
| Width                  | 17.5 mm |
| Depth                  | 51.7 mm |
| Horizontal pitch       | 1 Div.  |
| Complete module height | 90 mm   |

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## Technical data

### Dimensions

|                       |         |
|-----------------------|---------|
| Complete module width | 17.7 mm |
| Complete module depth | 65.5 mm |

### Ambient conditions

|                                 |                  |
|---------------------------------|------------------|
| Ambient temperature (operation) | -40 °C ... 85 °C |
| Degree of protection            | IP20             |

### General

|  |  |
|--|--|
| Housing material   | PA 6.6   |
| Flammability rating according to UL 94                         | V-0  |
| Color  | black  |
| Standards for clearances and creepage distances                | VDE 0110-1   |
|  | IEC 60664-1  |
| Mounting type  | on base element  |
| Type   | Male   |
| Direction of action  | Line-Line & Line-Signal Ground/Shield & optional Signal Ground/Shield-Earth Ground |
| Arrester can be tested with CHECKMASTER from software version: | From SW rev. 1.00  |

### Protective circuit

|  |                                     |
|--|-------------------------------------|
| IEC test classification  | C1                                  |
|  | C2                                  |
|  | C3                                  |
|  | D1                                  |
| VDE requirement class  | C1                                  |
|  | C2                                  |
|  | C3                                  |
|  | D1                                  |
| Nominal voltage $U_N$  | 24 V DC                             |
| Maximum continuous voltage $U_C$                                     | 28 V DC                             |
|  | 20 V AC                             |
| Rated current  | 300 mA (45 °C)                      |
| Operating effective current $I_C$ at $U_C$                           | $\leq 5 \mu A$                      |
| Residual current $I_{PE}$  | $\leq 1 \mu A$ (with PT 2X1+F-BE)   |
|  | $\leq 10 \mu A$ (Directly grounded) |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (line-earth)          | 10 kA                               |
| Pulse discharge current $I_{imp}$ (10/350) $\mu s$                   | 2.5 kA (per path)                   |
| Total discharge current $I_{total}$ (8/20) $\mu s$                   | 20 kA                               |
| Max. discharge current $I_{max}$ (8/20) $\mu s$ maximum (line-earth) | 10 kA                               |

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### Technical data

#### Protective circuit

|  |  |
|--|--|
| Nominal pulse current $I_{an}$ (10/1000) $\mu$ s (line-earth)    | 30 A                                     |
| Output voltage limitation at 1 kV/ $\mu$ s (line-earth) spike    | $\leq 45$ V                              |
|  | $\leq 600$ V (with PT 2X1+F-BE)          |
| Output voltage limitation at 1 kV/ $\mu$ s (line-earth) static   | $\leq 40$ V                              |
| Residual voltage at $I_n$ (line-earth)                           | $\leq 40$ V                              |
| Residual voltage with $I_{an}$ (10/1000) $\mu$ s (line-earth)    | $\leq 50$ V                              |
| Voltage protection level $U_p$ (line-earth)                      | $\leq 60$ V (C1 - 1 kV / 500 A)          |
|  | $\leq 80$ V (C2 - 10 kV / 5 kA)          |
|  | $\leq 70$ V (6 kV / 3 kA)                |
|  | $\leq 50$ V (C3 - 30 A)                  |
| Response time $t_A$ (line-earth)                                 | $\leq 1$ ns                              |
| Input attenuation aE, asym.                                      | 0.5 dB ( $\leq 1$ MHz)                   |
|  | 0.3 dB ( $\leq 400$ kHz / 150 $\Omega$ ) |
| Cut-off frequency $f_g$ (3 dB), asym. (PE) in 50 $\Omega$ system | typ. 4.5 MHz                             |
| Capacity (line-earth)  | typ. 0.7 nF                              |
| Resistance per path  | 4.7 $\Omega \pm 10\%$ (7-8/11-12)        |
| Surge protection fault message                                   | none                                     |
| Max. required back-up fuse                                       | 315 mA (T)                               |
| Impulse durability (line-earth)                                  | C2 - 10 kV / 5 kA                        |
|  | D1 - 2.5 kA                              |

#### Connection data

|                                  |  |
|----------------------------------|--|
| Connection method                | Screw connection (in connection with the base element) |
| Screw thread                     | M3   |
| Tightening torque                | 0.8 Nm   |
| Stripping length                 | 8 mm   |
| Conductor cross section flexible | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>            |
| Conductor cross section solid    | 0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>              |
| Conductor cross section AWG      | 24 ... 12  |

#### Connection, equipotential bonding

|                                       |                     |
|---------------------------------------|---------------------|
| Stripping length                      | 8 mm                |
| Conductor cross section flexible min. | 0.2 mm <sup>2</sup> |
| Conductor cross section flexible max. | 2.5 mm <sup>2</sup> |
| Conductor cross section solid min.    | 0.2 mm <sup>2</sup> |
| Conductor cross section solid max.    | 4 mm <sup>2</sup>   |
| Conductor cross section AWG min.      | 24                  |
| Conductor cross section AWG max.      | 12                  |

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## Technical data

### Standards and Regulations

|                          |                      |
|--------------------------|----------------------|
| Standards/specifications | EN 61643-21/A1 2009  |
|                          | IEC 61643-21/A1 2008 |
|                          | UL 497B              |

### Environmental Product Compliance

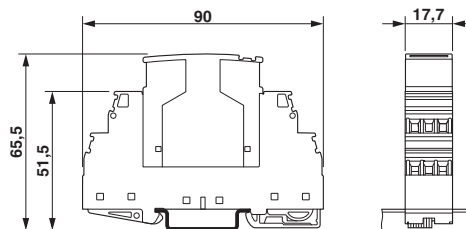
|            |   |
|------------|---|
| REACH SVHC | Lead 7439-92-1  |
| China RoHS | Environmentally Friendly Use Period = 50 years  |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

## Drawings

### Pictogram

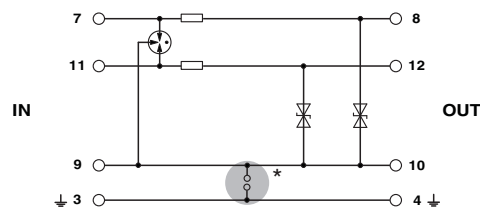


### Dimensional drawing



The figure shows the complete module consisting of a base element and connector

### Circuit diagram



## Classifications

### eCl@ss

|               |          |
|---------------|----------|
| eCl@ss 10.0.1 | 27130807 |
| eCl@ss 11.0   | 27130807 |
| eCl@ss 4.0    | 27130800 |
| eCl@ss 4.1    | 27130800 |

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## Classifications

### eCl@ss

|            |          |
|------------|----------|
| eCl@ss 5.0 | 27130800 |
| eCl@ss 5.1 | 27130800 |
| eCl@ss 6.0 | 27130800 |
| eCl@ss 7.0 | 27130807 |
| eCl@ss 9.0 | 27130807 |

### ETIM

|          |          |
|----------|----------|
| ETIM 2.0 | EC000943 |
| ETIM 3.0 | EC000943 |
| ETIM 4.0 | EC000943 |
| ETIM 6.0 | EC000943 |
| ETIM 7.0 | EC000943 |

### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 6.01   | 30212010 |
| UNSPSC 7.0901 | 39121610 |
| UNSPSC 11     | 39121610 |
| UNSPSC 12.01  | 39121610 |
| UNSPSC 13.2   | 39121620 |
| UNSPSC 18.0   | 39121620 |
| UNSPSC 19.0   | 39121620 |
| UNSPSC 20.0   | 39121620 |
| UNSPSC 21.0   | 39121620 |

## Approvals

### Approvals

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#### Approvals

DNV GL / UL Listed / EAC / EAC

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#### Ex Approvals

UL Listed / cUL Listed / cULus Listed

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### Approval details

# Surge protection plug - PT 2X1-24DC-ST - 2856087

## Approvals

|        |  |   |            |
|--------|--|---|------------|
| DNV GL |  | <a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a> | TAE00001N6 |
|--------|--|---|------------|

|                    |  |   |               |
|--------------------|--|---|---------------|
| UL Listed          |  | <a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> | FILE E 138168 |
| Nominal voltage UN |  | 24 V  |               |
| Nominal current IN |  | 0.3 A   |               |

|     |  |               |
|-----|--|---------------|
| EAC |  | EAC-Zulassung |
|-----|--|---------------|

|     |  |                         |
|-----|--|-------------------------|
| EAC |  | RU C-<br>DE.*09.B.00169 |
|-----|--|-------------------------|

## Accessories

### Accessories

#### Device marking

Zack marker strip - ZBN 18:UNBEDRUCKT - 2809128



Zack marker strip, Strip, white, unlabeled, can be labeled with: CMS-P1-PLOTTER, PLOTMARK, mounting type: snap into tall marker groove, for terminal block width: 18 mm, lettering field size: 18 x 5 mm, Number of individual labels: 5

#### Labeled terminal marker

Zack Marker strip, flat - ZBF 5,LGS:FORTL.ZAHLEN - 0808671



Zack Marker strip, flat, Strip, white, labeled, printed horizontally: consecutive numbers 1 ... 10, 11 ... 20, etc. up to 491 ... 500, mounting type: snap into flat marker groove, for terminal block width: 5 mm, lettering field size: 5.15 x 5.15 mm, Number of individual labels: 10

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### Accessories

Zack Marker strip, flat - ZBF 5,LGS:GERADE ZAHLEN - 0810821



Zack Marker strip, flat, Strip, white, labeled, printed horizontally: consecutive numbers 2 ... 20, 22 ... 40, etc. up to 82 ... 100, mounting type: snap into flat marker groove, for terminal block width: 5 mm, lettering field size: 5.15 x 5.15 mm, Number of individual labels: 10

Zack Marker strip, flat - ZBF 5,LGS:UNGERADE ZAHLEN - 0810863



Zack Marker strip, flat, Strip, white, labeled, printed horizontally: Odd numbers 1 - 19, 21 - 39, etc. up to 81 - 99, mounting type: snap into flat marker groove, for terminal block width: 5 mm, lettering field size: 5.15 x 5.15 mm, Number of individual labels: 10

Zack Marker strip, flat - ZBF 5,QR:FORTL.ZAHLEN - 0808697



Zack Marker strip, flat, Strip, white, labeled, Printed vertically: consecutive numbers 1 ... 10, 11 ... 20, etc. up to 91 ... 100, mounting type: snap into flat marker groove, for terminal block width: 5 mm, lettering field size: 5.15 x 5.15 mm, Number of individual labels: 10

### Marker pen

Marker pen - X-PEN 0,35 - 0811228



Marker pen without ink cartridge, for manual labeling of markers, labeling extremely wipe-proof, line thickness 0.35 mm

### Terminal marking

Zack Marker strip, flat - ZBF 5:UNBEDRUCKT - 0808642



Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: snap into flat marker groove, for terminal block width: 5 mm, lettering field size: 5.1 x 5.2 mm, Number of individual labels: 10

## Surge protection plug - PT 2X1-24DC-ST - 2856087

### Accessories

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Zack Marker strip, flat - ZBF 5/WH-100:UNBEDRUCKT - 0808668



Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: CMS-P1-PLOTTER, PLOTMARK, mounting type: snap into flat marker groove, for terminal block width: 5 mm, lettering field size: 5.15 x 5.15 mm, Number of individual labels: 10

### Necessary add-on products

Surge protection base element - PT 2X1-BE - 2856139



Base element for protective plug PT with protective circuit for 2 conductors of signal circuits grounded on one side. Mounting on NS 35/7.5 und NS 35/15, housing width: 17.5 mm.

Surge protection base element - PT 2X1+F-BE - 2856142



Base element for protective plug PT with protective circuit for 2 conductors of signal circuits grounded on one side. Integrated gas arrester as coarse protection between GND and PE. Mounting on NS 35/7.5 und NS 35/15, housing width: 17.5 mm.

### Additional products

Shield connection - SSA 3-6 - 2839295



Shield fast connection for 3 ... 6 mm cable diameter. Potential connecting cable: 200 mm, 1 mm<sup>2</sup>, color: black



## Surge protection plug - PT 2X1-24DC-ST - 2856087

### Accessories

Shield connection - SSA 5-10 - 2839512



Shield fast connection for 5 ... 10 mm cable diameter. Potential connecting cable: 200 mm, 1 mm<sup>2</sup>, color: black