

# PT 1X2-12DC-ST - Surge protection plug



2856029

<https://www.phoenixcontact.com/us/products/2856029>

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PT protective connector with protective circuit for a 2-wire floating signal circuit. HART-compatible.

## Your advantages

- Easy testing and documentation with CHECKMASTER 2 with pluggable protective modules
- Maximum ease of maintenance, thanks to the 2-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

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2856029       |
| Packing unit                         | 10 pc         |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CL21          |
| Product key                          | CL2111        |
| GTIN                                 | 4017918599218 |
| Weight per piece (including packing) | 23.8 g        |
| Weight per piece (excluding packing) | 15.586 g      |
| Customs tariff number                | 85363010      |
| Country of origin                    | DE            |

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## Technical data

### Notes

|         |                                                                                    |
|---------|------------------------------------------------------------------------------------|
| General |                                                                                    |
| Note    | Technical data is valid in association with the following specified base elements: |
|         | PT 1X2+F-BE 2856126                                                                |
|         | PT 1X2-BE 2856113                                                                  |

### Product properties

|                                                                |                                     |
|----------------------------------------------------------------|-------------------------------------|
| Product type                                                   | Surge protection for MCR technology |
| Product family                                                 | PLUGTRAB PT                         |
| IEC test classification                                        | C1                                  |
|                                                                | C2                                  |
|                                                                | C3                                  |
|                                                                | D1                                  |
| Type                                                           | Male                                |
| Arrester can be tested with CHECKMASTER from software version: | From SW rev. 1.00                   |
| Wire pairs per module                                          | 1                                   |
| Insulation characteristics                                     |                                     |
| Overvoltage category                                           | III                                 |
| Pollution degree                                               | 2                                   |

### Electrical properties

|                       |         |
|-----------------------|---------|
| Nominal voltage $U_N$ | 12 V DC |
|-----------------------|---------|

### Connection data

|                                  |                                                        |
|----------------------------------|--------------------------------------------------------|
| Connection method                | Screw connection (in connection with the base element) |
| Screw thread                     | M3                                                     |
| Tightening torque                | 0.5 Nm                                                 |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm²                                    |
| Conductor cross-section rigid    | 0.2 mm² ... 4 mm²                                      |
| Conductor cross-section AWG      | 24 ... 12                                              |

### Dimensions

|                     |         |
|---------------------|---------|
| Dimensional drawing |         |
|                     |         |
| Width               | 17.7 mm |
| Height              | 45 mm   |

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|                        |         |
|------------------------|---------|
| Depth                  | 52 mm   |
| Horizontal pitch       | 1 Div.  |
| Complete module width  | 17.7 mm |
| Complete module height | 90 mm   |
| Complete module depth  | 65.5 mm |

## Material specifications

|                                        |                  |
|----------------------------------------|------------------|
| Color                                  | black (RAL 9005) |
|                                        | copper color     |
| Flammability rating according to UL 94 | V-0              |
| Housing material                       | PA 6.6           |

## Mechanical properties

### Mechanical data

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

## Protective circuit

|                                                                      |                                                                                    |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Direction of action                                                  | Line-Line & Line-Signal Ground/Shield & optional Signal Ground/Shield-Earth Ground |
| Maximum continuous operating voltage $U_C$                           | 13 V DC                                                                            |
|                                                                      | 9 V AC                                                                             |
| Rated current                                                        | 450 mA (45 °C)                                                                     |
| Operating effective current $I_C$ at $U_C$                           | $\leq 5 \mu A$                                                                     |
| Protective conductor current $I_{PE}$                                | $\leq 1 \mu A$ (with PT 1X2+F-BE)                                                  |
|                                                                      | $\leq 2 \mu A$ (with PT 1X2-BE)                                                    |
| 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                                                                              |
| Pulse discharge current $I_{imp}$ (10/350) $\mu s$                   | 2.5 kA                                                                             |
| Total discharge current $I_{Total}$ (8/20) $\mu s$                   | 20 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                                                                              |
| Nominal pulse current $I_{an}$ (10/1000) $\mu s$ (line-line)         | 67 A                                                                               |
| Output voltage limitation at 1 kV/ $\mu s$ (line-line) spike         | $\leq 20 V$                                                                        |
| Output voltage limitation at 1 kV/ $\mu s$ (line-earth) spike        | $\leq 450 V$ (with PT 1X2-BE)                                                      |
|                                                                      | $\leq 1 kV$ (with PT 1X2+F-BE)                                                     |
| Output voltage limitation at 1 kV/ $\mu s$ (line-line) static        | $\leq 18 V$                                                                        |
| Output voltage limitation at 1 kV/ $\mu s$ (line-earth) static       | $\leq 25 V$ (with PT 1X2-BE)                                                       |
|                                                                      | $\leq 50 V$ (with PT 1X2+F-BE)                                                     |
| Residual voltage at $I_n$ (conductor-conductor)                      | $\leq 18 V$                                                                        |
| Residual voltage with $I_{an}$ (10/1000) $\mu s$ (line-line)         | $\leq 23 V$                                                                        |
| Voltage protection level $U_p$ (line-line)                           | $\leq 50 V$ (C2 - 10 kV / 5 kA)                                                    |
| Voltage protection level $U_p$ (line-earth)                          | $\leq 450 V$ (C1 - 1 kV / 500 A with PT 1X2-BE)                                    |
|                                                                      | $\leq 1000 V$ (C2 - 10 kV / 5 kA with PT 1X2+F-BE)                                 |
| Voltage protection level $U_p$ static (line-line)                    | $\leq 18 V$ (C2 - 10 kV / 5 kA)                                                    |

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|                                                             |                                                   |
|-------------------------------------------------------------|---------------------------------------------------|
| Voltage protection level $U_p$ static (line-earth)          | $\leq 50$ V (C2 - 10 kV / 5 kA with PT 1X2-BE)    |
|                                                             | $\leq 100$ V (C2 - 10 kV / 5 kA with PT 1X2+F-BE) |
| Response time $t_A$ (line-line)                             | $\leq 1$ ns                                       |
| Response time $t_A$ (line-earth)                            | $\leq 100$ ns                                     |
| Input attenuation aE, sym.                                  | typ. 0.5 dB ( $\leq 600$ kHz / 50 $\Omega$ )      |
|                                                             | typ. 0.2 dB ( $\leq 200$ kHz / 150 $\Omega$ )     |
|                                                             | typ. 0.1 dB ( $\leq 50$ kHz/600 $\Omega$ )        |
| Cut-off frequency $f_g$ (3 dB), sym. in 50 $\Omega$ system  | typ. 3 MHz                                        |
| Cut-off frequency $f_g$ (3 dB), sym. in 150 $\Omega$ system | typ. 1 MHz                                        |
| Cut-off frequency $f_g$ (3 dB), sym. in 600 $\Omega$ system | typ. 300 kHz                                      |
| Capacity (Core-Core)                                        | typ. 3 nF                                         |
| Capacity (Core-Earth)                                       | typ. 4 pF (with PT 1X2-BE)                        |
|                                                             | typ. 2 pF (with PT 1X2+F-BE)                      |
| 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                                 |
|                                                             | C3 - 67 A                                         |
| Impulse durability (line-earth)                             | C1 - 1 kV / 500 A                                 |
|                                                             | C2 - 10 kV / 5 kA                                 |
|                                                             | D1 - 2.5 kA                                       |

## Environmental and real-life conditions

### Ambient conditions

|                                         |                      |
|-----------------------------------------|----------------------|
| Degree of protection                    | IP20                 |
| Ambient temperature (operation)         | -40 °C ... 85 °C     |
| Ambient temperature (storage/transport) | -40 °C ... 85 °C     |
| Altitude                                | $\leq 2000$ m (amsl) |

## Standards and regulations

|                          |                                                       |
|--------------------------|-------------------------------------------------------|
| Standards/specifications | IEC 61643-21                                          |
| Note                     | 2000 + corrigendum 2001 + A1:2008, modified + A2:2012 |
| Standards/specifications | EN 61643-21                                           |
| Note                     | 2001 + A1:2009 + A2:2013                              |
| Standards/specifications | GB/T 3836.1                                           |
| Note                     | 2021                                                  |
| Standards/specifications | GB/T 3836.3                                           |
| Note                     | 2021                                                  |

## Mounting

|               |                 |
|---------------|-----------------|
| Mounting type | on base element |
|---------------|-----------------|

# PT 1X2-12DC-ST - Surge protection plug

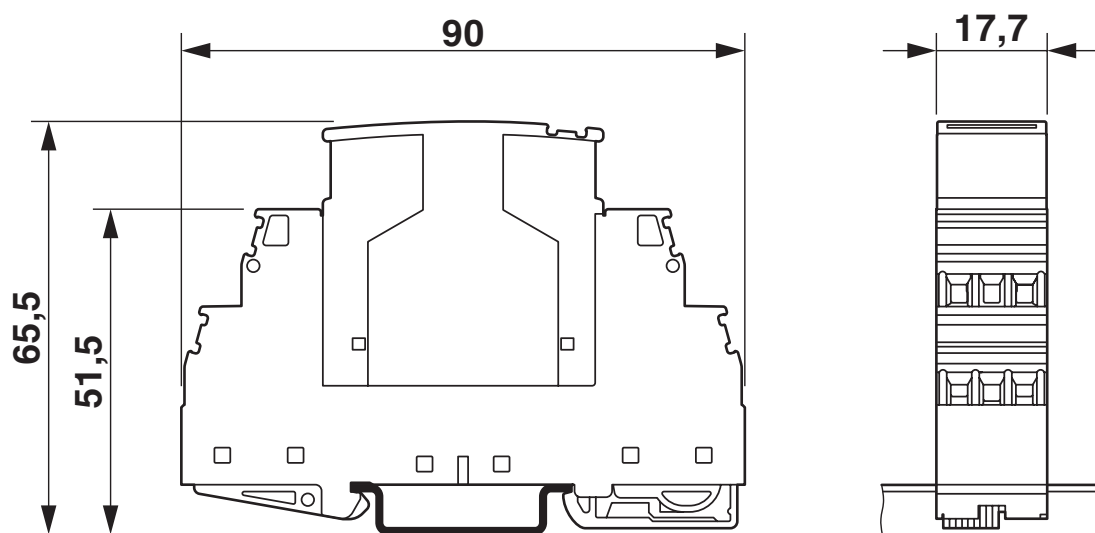
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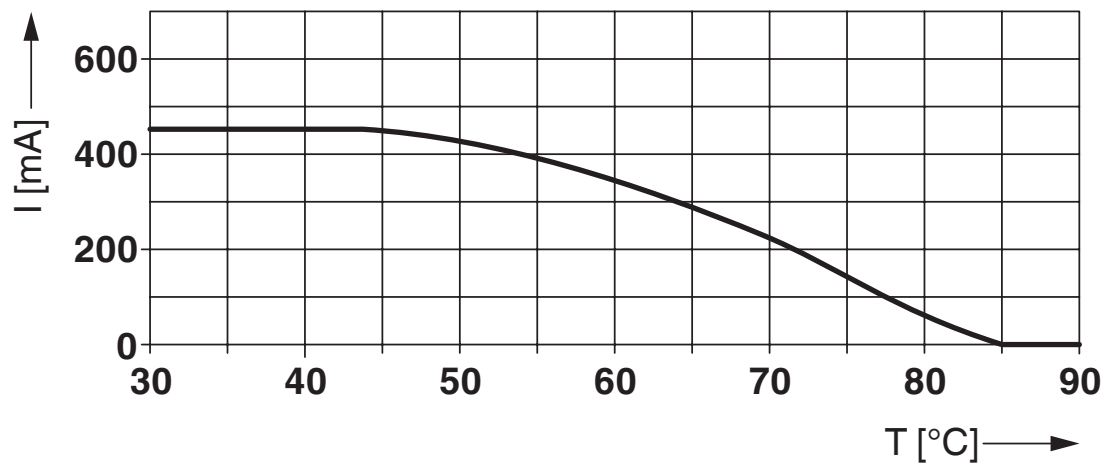
## Drawings

Dimensional drawing



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

Diagram



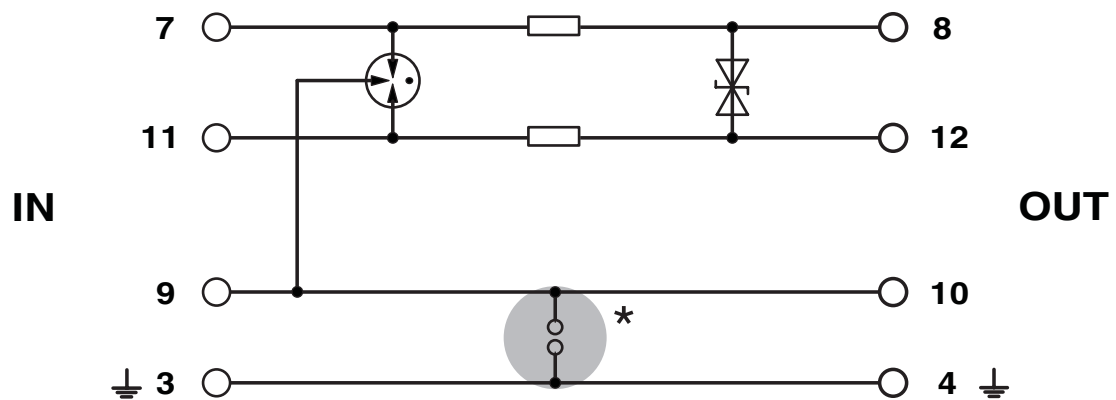
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Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2856029>



**DNV GL**

Approval ID: TAE00001N6



**UL Listed**

Approval ID: FILE E 138168

|       | Nominal voltage $U_N$ | Nominal current $I_N$ | Cross section AWG | Cross section $\text{mm}^2$ |
|-------|-----------------------|-----------------------|-------------------|-----------------------------|
| keine |                       |                       |                   |                             |
|       | 12 V                  | 0.45 A                | -                 | -                           |



**CCC**

Approval ID: 2020322316003150



**cUL Listed**

Approval ID: FILE E 333250



**UL Listed**

Approval ID: FILE E 333250



**ATEX**

Approval ID: DEKRA 22ATEX0044 X



**IECEx**

Approval ID: IECEx DEK 22.0031X



**UKCA-EX**

Approval ID: DEKRA 22UKEX6005X



**NEPSI-EX**

Approval ID: GYJ20.1180X

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27171501 |
| ECLASS-15.0 | 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                               | 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                                | 00147076-5464-45e4-accc-1a96b3d82c02 |

### EF3.0 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 0.896 kg CO2e |
|---------|---------------|

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