

# VAL-MS-T1/T2 335/12.5/3+1 - Lightning/surge arrester type 1/2



2800184

<https://www.phoenixcontact.com/pc/products/2800184>

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Universal varistor-based plug-in lightning/surge arrester for 3-phase power supply networks with separate N and PE (5-conductor system: L1, L2, L3, N, PE), for Lightning Protection Levels III and IV.

## Your advantages

- Quality proven millions of times over in the widest range of applications
- Rapid installation with bridges, thanks to industry-standard overall width of 1 HP
- Easy testing and insulation measurement, thanks to pluggable protection modules
- Can be used in lightning protection level III and IV due to discharge capacity of 12.5 kA per position
- Vibration-resistant latching ensures the plug remains firmly in place

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2800184       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Product key                          | CL1151        |
| GTIN                                 | 4046356518567 |
| Weight per piece (including packing) | 672.4 g       |
| Weight per piece (excluding packing) | 638 g         |
| Customs tariff number                | 85363030      |
| Country of origin                    | DE            |

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## Technical data

### Product properties

|                                |                                         |
|--------------------------------|-----------------------------------------|
| Product family                 | VALVETRAB MS                            |
| IEC test classification        | I / II                                  |
|                                | T1 / T2                                 |
| EN type                        | T1 / T2                                 |
| IEC power supply system        | TT                                      |
|                                | TN-S                                    |
| Type                           | DIN rail module, two-section, divisible |
| Number of positions            | 4                                       |
| Surge protection fault message | optical                                 |

### Insulation characteristics

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

### Electrical properties

|                         |               |
|-------------------------|---------------|
| Nominal frequency $f_N$ | 50 Hz (60 Hz) |
|-------------------------|---------------|

### Connection data

|                                  |                                                     |
|----------------------------------|-----------------------------------------------------|
| Connection method                | Screw connection                                    |
| Screw thread                     | M5                                                  |
| Tightening torque                | 3 Nm (1.5 mm <sup>2</sup> ... 16 mm <sup>2</sup> )  |
|                                  | 4.5 Nm (25 mm <sup>2</sup> ... 35 mm <sup>2</sup> ) |
| Stripping length                 | 16 mm                                               |
| Conductor cross-section flexible | 1.5 mm <sup>2</sup> ... 25 mm <sup>2</sup>          |
| Conductor cross-section rigid    | 1.5 mm <sup>2</sup> ... 35 mm <sup>2</sup>          |
| Conductor cross-section AWG      | 15 ... 2                                            |
| Connection method                | Fork-type cable lug                                 |
| Conductor cross-section flexible | 1.5 mm <sup>2</sup> ... 16 mm <sup>2</sup>          |

### Dimensions

|                     |                                 |
|---------------------|---------------------------------|
| Dimensional drawing |                                 |
| Width               | 71.2 mm                         |
| Height              | 89.8 mm                         |
| Depth               | 77.5 mm (incl. DIN rail 7.5 mm) |
| Horizontal pitch    | 4 Div.                          |

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## Material specifications

|                                        |                  |
|----------------------------------------|------------------|
| Color                                  | black (RAL 9005) |
| Flammability rating according to UL 94 | V-0              |
| CTI value of material                  | 600              |
| Insulating material                    | PA 6.6/PBT       |
| Material group                         | I                |
| Housing material                       | PA 6.6           |
|                                        | PBT              |

## Mechanical properties

### Mechanical data

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

## Protective circuit

|                                                                                 |                        |
|---------------------------------------------------------------------------------|------------------------|
| Mode of protection                                                              | L-N                    |
|                                                                                 | L-PE                   |
|                                                                                 | N-PE                   |
| Direction of action                                                             | 3L-N & N-PE            |
| Nominal voltage $U_N$                                                           | 240/415 V AC (TN-S)    |
|                                                                                 | 240/415 V AC (TT)      |
| Nominal frequency $f_N$                                                         | 50 Hz (60 Hz)          |
| Maximum continuous operating voltage $U_C$ (L-N)                                | 335 V AC               |
| Maximum continuous operating voltage $U_C$ (L-PE)                               | 335 V AC               |
| Maximum continuous operating voltage $U_C$ (N-PE)                               | 264 V AC               |
| Rated load current $I_L$                                                        | 80 A                   |
| Protective conductor current $I_{PE}$                                           | $\leq 5 \mu A$         |
| Standby power consumption $P_C$                                                 | $\leq 810 \text{ mVA}$ |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (L-N)                            | 12.5 kA                |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (L-PE)                           | 12.5 kA                |
| Nominal discharge current $I_n$ (8/20) $\mu s$ (N-PE)                           | 50 kA                  |
| Maximum discharge current $I_{max}$ (8/20) $\mu s$                              | 50 kA                  |
| Impulse discharge current (10/350) $\mu s$ (L-N), charge                        | 6.25 As                |
| Impulse discharge current (10/350) $\mu s$ (L-N), specific energy               | 39 kJ/ $\Omega$        |
| Impulse discharge current (10/350) $\mu s$ (L-N), peak current value $I_{imp}$  | 12.5 kA                |
| Impulse discharge current (10/350) $\mu s$ (L-PE), charge                       | 6.25 As                |
| Impulse discharge current (10/350) $\mu s$ (L-PE), specific energy              | 39 kJ/ $\Omega$        |
| Impulse discharge current (10/350) $\mu s$ (L-PE), peak current value $I_{imp}$ | 12.5 kA                |
| Impulse discharge current (10/350) $\mu s$ (N-PE), charge                       | 25 As                  |
| Impulse discharge current (10/350) $\mu s$ (N-PE), specific energy              | 625 kJ/ $\Omega$       |

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|                                                                                              |                                                                                                                                             |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Impulse discharge current (10/350) $\mu\text{s}$ (N-PE), peak current value $I_{\text{imp}}$ | 50 kA                                                                                                                                       |
| Total discharge current $I_{\text{Total}}$ (8/20) $\mu\text{s}$                              | 50 kA                                                                                                                                       |
| Total discharge current $I_{\text{Total}}$ (10/350) $\mu\text{s}$                            | 50 kA                                                                                                                                       |
| Follow current interrupt rating $I_{\text{fi}}$ (N-PE)                                       | 100 A                                                                                                                                       |
| Short-circuit current rating $I_{\text{SCCR}}$                                               | 25 kA                                                                                                                                       |
| Voltage protection level $U_p$ (L-N)                                                         | $\leq 1.2 \text{ kV}$<br>$\leq 1.6 \text{ kV}$ (30 kA - 8/20 $\mu\text{s}$ )                                                                |
| Voltage protection level $U_p$ (L-PE)                                                        | $\leq 2 \text{ kV}$                                                                                                                         |
| Voltage protection level $U_p$ (N-PE)                                                        | $\leq 1.7 \text{ kV}$                                                                                                                       |
| Residual voltage $U_{\text{res}}$ (L-N)                                                      | $\leq 1.2 \text{ kV}$ (at $I_n$ )<br>$\leq 1.1 \text{ kV}$ (at 10 kA)<br>$\leq 1 \text{ kV}$ (at 5 kA)<br>$\leq 0.9 \text{ kV}$ (at 3 kA)   |
| Residual voltage $U_{\text{res}}$ (L-PE)                                                     | $\leq 2 \text{ kV}$ (at $I_n$ )<br>$\leq 1.5 \text{ kV}$ (at 10 kA)<br>$\leq 1.2 \text{ kV}$ (at 5 kA)<br>$\leq 1.1 \text{ kV}$ (at 3 kA)   |
| Residual voltage $U_{\text{res}}$ (N-PE)                                                     | $\leq 0.6 \text{ kV}$ (at $I_n$ )<br>$\leq 0.5 \text{ kV}$ (at 10 kA)<br>$\leq 0.5 \text{ kV}$ (at 5 kA)<br>$\leq 0.4 \text{ kV}$ (at 3 kA) |
| TOV behavior at $U_T$ (L-N)                                                                  | 415 V AC (5 s / withstand mode)<br>457 V AC (120 min / safe failure mode)                                                                   |
| TOV behavior at $U_T$ (N-PE)                                                                 | 1200 V AC (200 ms / withstand mode)                                                                                                         |
| Response time $t_A$ (L-N)                                                                    | $\leq 25 \text{ ns}$                                                                                                                        |
| Response time $t_A$ (L-PE)                                                                   | $\leq 100 \text{ ns}$                                                                                                                       |
| Response time $t_A$ (N-PE)                                                                   | $\leq 100 \text{ ns}$                                                                                                                       |
| Max. backup fuse with V-type through wiring                                                  | 80 A (gG - 16 mm <sup>2</sup> )                                                                                                             |
| Max. backup fuse with branch wiring                                                          | 160 A (gG)                                                                                                                                  |

## Additional technical data

|                                                                 |       |
|-----------------------------------------------------------------|-------|
| Maximum discharge current $I_{\text{max}}$ (8/20) $\mu\text{s}$ | 65 kA |
|-----------------------------------------------------------------|-------|

## Environmental and real-life conditions

### Ambient conditions

|                                         |                                                           |
|-----------------------------------------|-----------------------------------------------------------|
| Degree of protection                    | IP20 (only when all terminal points are used)             |
| Ambient temperature (operation)         | -40 °C ... 80 °C                                          |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C                                          |
| Altitude                                | $\leq 2000 \text{ m}$ (amsl)                              |
| Permissible humidity (operation)        | 5 % ... 95 %                                              |
| Shock (operation)                       | 30g (Half-sine / 11 ms / 3x $\pm X$ , $\pm Y$ , $\pm Z$ ) |
| Vibration (operation)                   | 7.5g (10 ... 500 Hz / 2.5 h / X, Y, Z)                    |

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## Approvals

### UL specifications

|                                                 |              |
|-------------------------------------------------|--------------|
| Maximum continuous operating voltage MCOV (L-L) | 670 V AC     |
| Maximum continuous operating voltage MCOV (L-N) | 335 V AC     |
| Maximum continuous operating voltage MCOV (L-G) | 335 V AC     |
| Maximum continuous operating voltage MCOV (N-G) | 264 V AC     |
| Nominal discharge current $I_n$ (L-L)           | 20 kA        |
| Nominal discharge current $I_n$ (L-N)           | 20 kA        |
| Nominal discharge current $I_n$ (L-G)           | 20 kA        |
| Nominal discharge current $I_n$ (N-G)           | 20 kA        |
| Mode of protection                              | L-L          |
|                                                 | L-N          |
|                                                 | L-G          |
|                                                 | N-G          |
| Nominal voltage                                 | 415/240 V AC |
| Power distribution system                       | Wye          |
| Nominal frequency                               | 50/60 Hz     |
| Measured limiting voltage MLV (L-L)             | 3570 V       |
| Measured limiting voltage MLV (L-N)             | 2630 V       |
| Measured limiting voltage MLV (L-G)             | 3600 V       |
| Measured limiting voltage MLV (N-G)             | 2600 V       |
| SPD Type                                        | 4CA          |

### UL connection data

|                             |                         |
|-----------------------------|-------------------------|
| Tightening torque           | 30 lb <sub>f</sub> ·in. |
| Conductor cross-section AWG | 14 ... 2                |

## Standards and regulations

|                          |              |
|--------------------------|--------------|
| Standards/specifications | IEC 61643-11 |
| Note                     | 2011         |
| Standards/specifications | EN 61643-11  |
| Note                     | 2012         |

## Mounting

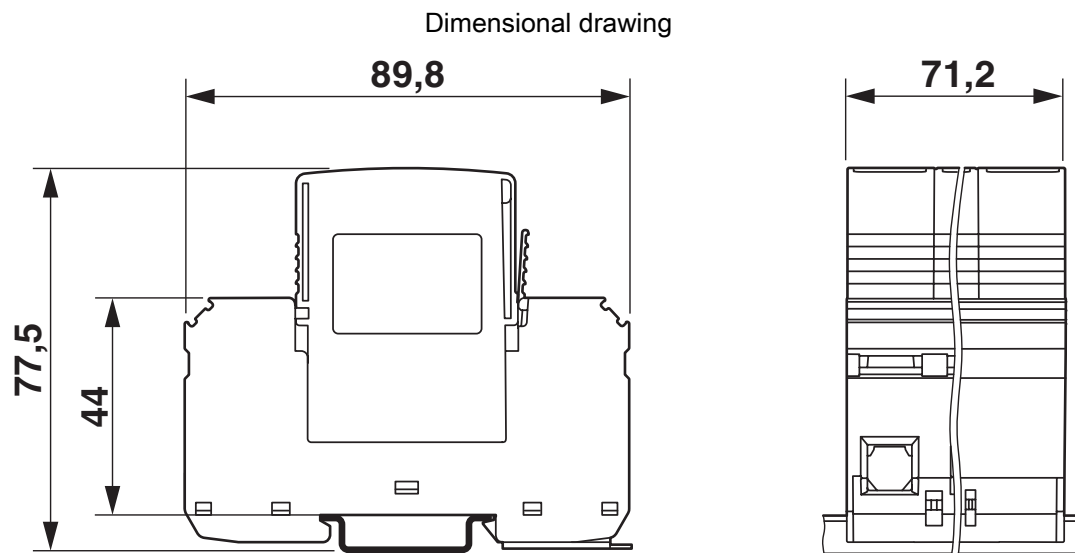
|               |                 |
|---------------|-----------------|
| Mounting type | DIN rail: 35 mm |
|---------------|-----------------|

# VAL-MS-T1/T2 335/12.5/3+1 - Lightning/surge arrester type 1/2

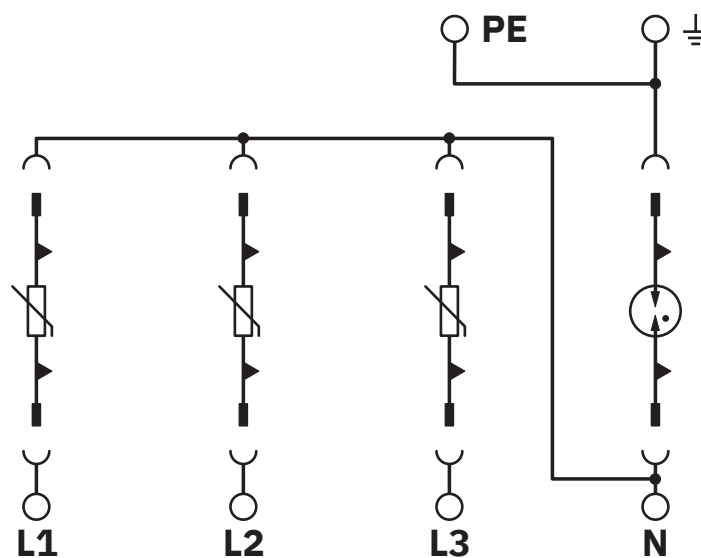
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## Drawings



Circuit diagram



# VAL-MS-T1/T2 335/12.5/3+1 - Lightning/surge arrester type 1/2



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/pc/products/2800184>



**cUL Recognized**  
Approval ID: FILE E 330181



**UL Recognized**  
Approval ID: FILE E 330181



**IECEE CB Scheme**  
Approval ID: AT 2584

**CCA**

Approval ID: NTR-AT 1906



**KEMA-KEUR**  
Approval ID: 2162496-01



**DNV GL**  
Approval ID: TAE00001N9



**ÖVE**  
Approval ID: 18583-009-09

**UAE-RoHS**

Approval ID: 23-10-88705

# VAL-MS-T1/T2 335/12.5/3+1 - Lightning/surge arrester type 1/2



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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27171201 |
| ECLASS-15.0 | 27171201 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC000381 |
|-----------|----------|

### UNSPSC

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

# VAL-MS-T1/T2 335/12.5/3+1 - Lightning/surge arrester type 1/2



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## Environmental product compliance

|                                         |                                          |
|-----------------------------------------|------------------------------------------|
| EU RoHS                                 |                                          |
| Fulfills EU RoHS substance requirements | Yes, No exemptions                       |
| China RoHS                              |                                          |
| Environment friendly use period (EFUP)  | EFUP-E                                   |
|                                         | No hazardous substances above the limits |
| EU REACH SVHC                           |                                          |
| REACH candidate substance (CAS No.)     | No substance above 0.1 wt%               |
| EF3.1 Climate Change                    |                                          |
| CO2e kg                                 | 10.249 kg CO2e                           |

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## Accessories

### MPB 18/1-10/1.0.0 - Wiring bridge

2830443

<https://www.phoenixcontact.com/pc/products/2830443>



Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 10 pitches with contact sequence 1-0-0

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### MPB 18/4- 8 - Wiring bridge

2809283

<https://www.phoenixcontact.com/pc/products/2809283>



Wiring bridge for modules with connecting pitch 17.5 mm, 4-phase, 8-pos.

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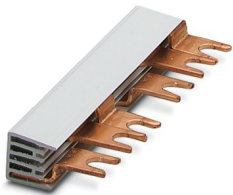
<https://www.phoenixcontact.com/pc/products/2800184>

## MPB 18/3- 6 - Wiring bridge

2809241

<https://www.phoenixcontact.com/pc/products/2809241>

Wiring bridge for modules with connecting pitch 17.5 mm, 3-phase, 6-pos.



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## MPB 18/1-57 - Wiring bridge

2809238

<https://www.phoenixcontact.com/pc/products/2809238>

Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 57-pos.



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## MPB 18/1-12 - Wiring bridge

2748593

<https://www.phoenixcontact.com/pc/products/2748593>



Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 12-pos.

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## MPB 18/1- 9 - Wiring bridge

2748580

<https://www.phoenixcontact.com/pc/products/2748580>



Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 9-pos.

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## MPB 18/1- 8 - Wiring bridge

2748577

<https://www.phoenixcontact.com/pc/products/2748577>



Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 8-pos.

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## MPB 18/1- 6 - Wiring bridge

2748564

<https://www.phoenixcontact.com/pc/products/2748564>



Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 6-pos.

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<https://www.phoenixcontact.com/pc/products/2800184>

## MPB 18/1- 4 - Wiring bridge

2809225

<https://www.phoenixcontact.com/pc/products/2809225>

Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 4-pos.



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## MPB 18/1- 3 - Wiring bridge

2809212

<https://www.phoenixcontact.com/pc/products/2809212>

Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 3-pos.



# VAL-MS-T1/T2 335/12.5/3+1 - Lightning/surge arrester type 1/2



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## MPB 18/1- 2 - Wiring bridge

2809209

<https://www.phoenixcontact.com/pc/products/2809209>

Wiring bridge for modules with connecting pitch 17.5 mm, 1-phase, 2-pos.



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## ZBN 18,LGS:ERDE - Marker for terminal blocks

2749589

<https://www.phoenixcontact.com/pc/products/2749589>

Marker for terminal blocks, Strip, white, labeled, horizontal: Grounding symbol, mounting type: latching, for terminal block width: 18 mm, Number of individual labels: 5, text field height: 5 mm, text field width: 18 mm



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## ZBN 18,LGS:L1-N,ERDE - Marker for terminal blocks

2749576

<https://www.phoenixcontact.com/pc/products/2749576>



Marker for terminal blocks, Strip, white, labeled, horizontal: L1, L2, L3, N, GND, mounting type: latching, for terminal block width: 18 mm, Number of individual labels: 5, text field height: 5 mm, text field width: 18 mm

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## ZBN 18:UNBEDRUCKT - Zack marker strip

2809128

<https://www.phoenixcontact.com/pc/products/2809128>



Zack marker strip, Strip, white, unmarked, can be labeled with: CMS-P1-PLOTTER, PLOTMARK, mounting type: latching, for terminal block width: 18 mm, Number of individual labels: 5, text field height: 5 mm, text field width: 18 mm

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## DK-BIC-35 - Feed-through terminal block

2749880

<https://www.phoenixcontact.com/pc/products/2749880>

Feed-through terminal block for VAL and FLT applications



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## ZBN 18 CUS - Zack marker strip

0825059

<https://www.phoenixcontact.com/pc/products/0825059>



Zack marker strip, can be ordered: Strip, white, labeled according to customer specifications, mounting type: snap into tall marker groove, for terminal block width: 18 mm, Number of individual labels: 5, text field height: 5 mm, text field width: 18 mm

# VAL-MS-T1/T2 335/12.5/3+1 - Lightning/surge arrester type 1/2



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## B-STIFT - Marker pen

1051993

<https://www.phoenixcontact.com/pc/products/1051993>



Marker pen, for manual labeling of unprinted Zack strips, smear-proof and waterproof, line thickness 0.5 mm

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## SZK PZ2 VDE - Screwdriver

1206463

<https://www.phoenixcontact.com/pc/products/1206463>



Screwdriver, PZ crosshead, VDE insulated, size: PZ 2 x 100 mm, 2-component grip, with non-slip grip

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## SZS 0,4X2,5 VDE - Screwdriver

1205037

<https://www.phoenixcontact.com/pc/products/1205037>



Screwdriver, slot-headed, VDE insulated, size: 0.4 x 2.5 x 80 mm, 2-component grip, with non-slip grip

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## VAL-MS-T1/T2 335/12.5 ST - Type 1/2 surge protection plug

2800190

<https://www.phoenixcontact.com/pc/products/2800190>



L-N replacement plug for VAL-MS-T1/T2 335/12.5 plug-in lightning/surge arrester.

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## F-MS-T1/T2 50 ST - Type 1/2 surge protection plug

2800191

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N-PE replacement plug for VAL-MS-T1/T2 335/12.5 plug-in lighting/surge arrester.

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