

# VAL-MS-T1/T2 48/12.5/1+1V-FM - Lightning/surge arrester type 1/2



2801533

<https://www.phoenixcontact.com/us/products/2801533>

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Universal varistor-based plug-in lightning/surge arrester for 48 V DC applications with grounded return conductor (positive pole), without risk assessment for Lightning Protection Levels III and IV, with remote indication contact.

## 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
- Surge protection for (-) 48 V DC 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                          | 2801533            |
| Packing unit                         | 1 pc               |
| Minimum order quantity               | 1 pc               |
| Sales key                            | CL18               |
| Product key                          | CL1151             |
| Catalog page                         | Page 48 (C-4-2019) |
| GTIN                                 | 4046356811323      |
| Weight per piece (including packing) | 283.1 g            |
| Weight per piece (excluding packing) | 260.5 g            |
| Customs tariff number                | 85363030           |
| Country of origin                    | DE                 |

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## Technical data

### Product properties

|                                |                                         |
|--------------------------------|-----------------------------------------|
| Product type                   | Arrester combination                    |
| Product family                 | VALVETRAB MS                            |
| IEC test classification        | I / II                                  |
|                                | T1 / T2                                 |
| EN type                        | T1 / T2                                 |
| IEC power supply system        | TN-S                                    |
| Type                           | DIN rail module, two-section, divisible |
| Number of positions            | 2                                       |
| Surge protection fault message | Optical, remote indicator contact       |

### Data management status

|                  |    |
|------------------|----|
| Article revision | 12 |
|------------------|----|

### Insulation characteristics

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

### Electrical properties

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

### Indicator/remote signaling

|                    |                                |
|--------------------|--------------------------------|
| Connection name    | Remote fault indicator contact |
| Switching function | Changeover contact             |
| Operating voltage  | 5 V AC ... 250 V AC            |
|                    | 125 V DC (200 mA DC)           |
| Operating current  | 5 mA AC ... 1.5 A AC           |
|                    | 1 A DC (30 V DC)               |

### 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>          |

### Remote fault indicator contact

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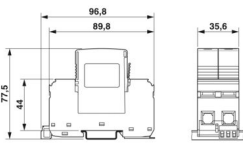


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|                                  |                                              |
|----------------------------------|----------------------------------------------|
| Connection method                | Plug-in/screw connection via COMBICON        |
| Screw thread                     | M2                                           |
| Tightening torque                | 0.25 Nm                                      |
| Stripping length                 | 7 mm                                         |
| 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      | 28 ... 16                                    |

## Dimensions

|                     |                                                                                    |
|---------------------|------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width               | 35.6 mm                                                                            |
| Height              | 96.8 mm                                                                            |
| Depth               | 77.5 mm (incl. DIN rail 7.5 mm)                                                    |
| Horizontal pitch    | 2 Div.                                                                             |

## 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<br>PBT    |

## Mechanical properties

### Mechanical data

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

## Protective circuit

|                                |                      |
|--------------------------------|----------------------|
| Mode of protection             | L-N                  |
|                                | L-PE                 |
|                                | N-PE                 |
|                                | (L+) - (L-)          |
|                                | (L+) - PE            |
|                                | (L-) - PE            |
| Direction of action            | L-L / L-PE           |
| Nominal voltage U <sub>N</sub> | 60 V AC ±10 % (TN-S) |
|                                | 60 V DC ±10 %        |

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|                                                                  |                                 |
|------------------------------------------------------------------|---------------------------------|
|                                                                  | -48 V DC $\pm 10\%$ (RRH)       |
| Nominal frequency $f_N$                                          | 50 Hz (60 Hz)                   |
| Maximum continuous voltage $U_C$                                 | 75 V AC                         |
|                                                                  | 100 V DC                        |
| Rated load current $I_L$                                         | 80 A                            |
| Residual current $I_{PE}$                                        | $\leq 0.6$ mA                   |
| Standby power consumption $P_C$                                  | $\leq 90.00$ mVA                |
| Nominal discharge current $I_n$ (8/20) $\mu$ s                   | 12.5 kA                         |
| Maximum discharge current $I_{max}$ (8/20) $\mu$ s               | 30 kA                           |
| Impulse discharge current (10/350) $\mu$ s, charge               | 6.25 As                         |
| Impulse discharge current (10/350) $\mu$ s, specific energy      | 39 kJ/ $\Omega$                 |
| Impulse discharge current (10/350) $\mu$ s, peak value $I_{imp}$ | 12.5 kA                         |
| Total discharge current $I_{total}$ (8/20) $\mu$ s               | 50 kA                           |
| Total discharge current $I_{total}$ (10/350) $\mu$ s             | 12.5 kA                         |
| Short-circuit current rating $I_{SCCR}$                          | 25 kA                           |
| Voltage protection level $U_p$ (L-N)                             | $\leq 0.4$ kV                   |
| Voltage protection level $U_p$ (L-PE)                            | $\leq 0.8$ kV                   |
| Voltage protection level $U_p$ (N-PE)                            | $\leq 0.4$ kV                   |
| Voltage protection level $U_p$ (L+) - (L-)                       | $\leq 0.4$ kV                   |
| Voltage protection level $U_p$ (L+) - PE                         | $\leq 0.4$ kV                   |
| Voltage protection level $U_p$ (L-) - PE                         | $\leq 0.8$ kV                   |
| Residual voltage $U_{res}$                                       | $\leq 0.4$ kV (at $I_n$ )       |
|                                                                  | $\leq 0.35$ kV (at 10 kA)       |
|                                                                  | $\leq 0.3$ kV (at 5 kA)         |
|                                                                  | $\leq 0.275$ kV (at 4 kA)       |
|                                                                  | $\leq 0.25$ kV (at 3 kA)        |
| TOV behavior at $U_T$                                            | 100 V AC (5 s / withstand mode) |
|                                                                  | 130 V DC (5 s / withstand mode) |
| Response time $t_A$                                              | $\leq 25$ 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 $I_{max}$ (8/20) $\mu$ 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                                | $\leq 2000$ m (amsl)                          |
| Permissible humidity (operation)        | 5 % ... 95 %                                  |

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|                       |                                         |
|-----------------------|-----------------------------------------|
| Shock (operation)     | 30g (Half-sine / 11 ms / 3x ±X, ±Y, ±Z) |
| Vibration (operation) | 7.5g (10 ... 500 Hz / 2.5 h / X, Y, Z)  |

## Approvals

### UL specifications

|                                                       |             |
|-------------------------------------------------------|-------------|
| Maximum continuous operating voltage MCOV (L+) - (L-) | 100 V DC    |
| Maximum continuous operating voltage MCOV (L+) - G    | 100 V DC    |
| Maximum continuous operating voltage MCOV (L-) - G    | 100 V DC    |
| Short-circuit current rating (SCCR)                   | 5 kA        |
| Voltage protection rating VPR (L+) - (L-)             | 400 V       |
| Voltage protection rating VPR (L+) - G                | 400 V       |
| Voltage protection rating VPR (L-) - G                | 600 V       |
| Nominal discharge current $I_n$ (L+) - (L-)           | 20 kA       |
| Nominal discharge current $I_n$ (L+) - G              | 20 kA       |
| Nominal discharge current $I_n$ (L-) - G              | 20 kA       |
| Mode of protection                                    | (L+) - (L-) |
|                                                       | (L+) - G    |
|                                                       | (L-) - G    |
| Nominal voltage                                       | 60 V DC     |
| SPD Type                                              | 1CA         |

### UL indicator/remote signaling

|                      |          |
|----------------------|----------|
| Operating voltage    | 125 V AC |
| AC operating current | 1 A AC   |

### 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 |
|---------------|-----------------|

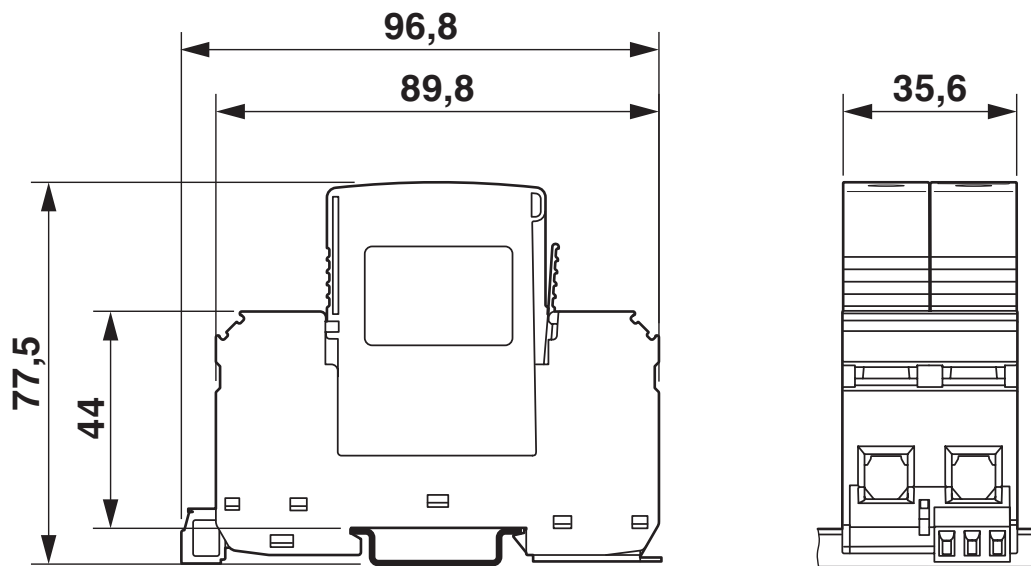
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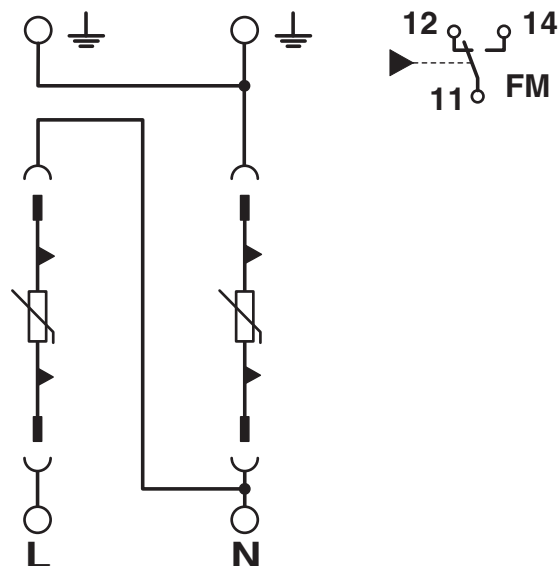
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## Drawings

Dimensional drawing



Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2801533>



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



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



**IECEE CB Scheme**  
Approval ID: DE1-54090



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

**CCA**

Approval ID: DE1-34421



**KEMA-KEUR**  
Approval ID: 2168290.01



**VDE Zeichengenehmigung**  
Approval ID: 40037097

**UAE-RoHS**

Approval ID: 23-10-88705

**cULus Recognized**

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-11.0 | 27130802 |
| ECLASS-13.0 | 27171201 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC000381 |
|----------|----------|

### UNSPSC

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



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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%               |

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