# 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 |
| 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 |

## 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 |
| Number of ports | One |

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

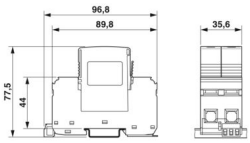
| | |
|---|---|
| Connection method | Screw connection |
| Screw thread | M5 |
| Tightening torque | 3 Nm (1.5 mm² ... 16 mm²) |
| | 4.5 Nm (25 mm² ... 35 mm²) |
| Stripping length | 16 mm |
| Conductor cross-section flexible | 1.5 mm² ... 25 mm² |
| Conductor cross-section rigid | 1.5 mm² ... 35 mm² |
| Conductor cross-section AWG | 15 ... 2 |
| Connection method | Fork-type cable lug |
| Conductor cross-section flexible | 1.5 mm² ... 16 mm² |

Remote fault indicator contact

| | |
|---|---|
| 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 mm² ... 1.5 mm² |
| Conductor cross-section rigid | 0.14 mm² ... 1.5 mm² |
| 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 HP |

## 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 |
| | (L+) - (L-) |
| | (L+) - PE |
| | (L-) - PE |
| Direction of action | L-L / L-PE |
| Nominal voltage $U_N$ | 60 V AC ±10 % (TN-S) |
| | 60 V DC ±10 % |
| | -48 V DC ±10 % (RRH) |

| | |
|---|---|
| Nominal frequency $f_N$ | 50 Hz (60 Hz) |
| Maximum continuous operating voltage $U_C$ | 75 V AC |
| | 100 V DC |
| Rated load current $I_L$ | 80 A |
| Protective conductor current $I_{PE}$ | ≤ 0.6 mA |
| Standby power consumption $P_C$ | ≤ 90 mVA |
| Nominal discharge current $I_n$ (8/20) µs | 12.5 kA |
| Maximum discharge current $I_{max}$ (8/20) µs | 30 kA |
| Impulse discharge current (10/350) µs, charge | 6.25 As |
| Impulse discharge current (10/350) µs, specific energy | 39 kJ/Ω |
| Impulse discharge current (10/350) µs, peak value $I_{imp}$ | 12.5 kA |
| Total discharge current $I_{Total}$ (8/20) µs | 50 kA |
| Total discharge current $I_{Total}$ (10/350) µs | 12.5 kA |
| Short-circuit current rating $I_{SCCR}$ | 25 kA |
| Voltage protection level $U_p$ (L-N) | ≤ 0.4 kV |
| Voltage protection level $U_p$ (L-PE) | ≤ 0.8 kV |
| Voltage protection level $U_p$ (N-PE) | ≤ 0.4 kV |
| Voltage protection level $U_p$ (L+) - (L-) | ≤ 0.4 kV |
| Voltage protection level $U_p$ (L+) - PE | ≤ 0.4 kV |
| Voltage protection level $U_p$ (L-) - PE | ≤ 0.8 kV |
| Residual voltage $U_{res}$ | ≤ 0.4 kV (at $I_n$) |
| | ≤ 0.35 kV (at 10 kA) |
| | ≤ 0.3 kV (at 5 kA) |
| | ≤ 0.275 kV (at 4 kA) |
| | ≤ 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 $t_A$ | ≤ 25 ns |
| Max. backup fuse with V-type through wiring | 80 A (gG - 16 mm²) |
| Max. backup fuse with branch wiring | 160 A (gG) |

Additional technical data

| | |
|---|---|
| Maximum discharge current $I_{max}$ (8/20) µs | 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 | ≤ 2000 m (amsl) |
| Permissible humidity (operation) | 5 % ... 95 % |
| 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 $lb_f$-in. |
| Conductor cross-section AWG | 14 ... 2 |

## Standards and regulations

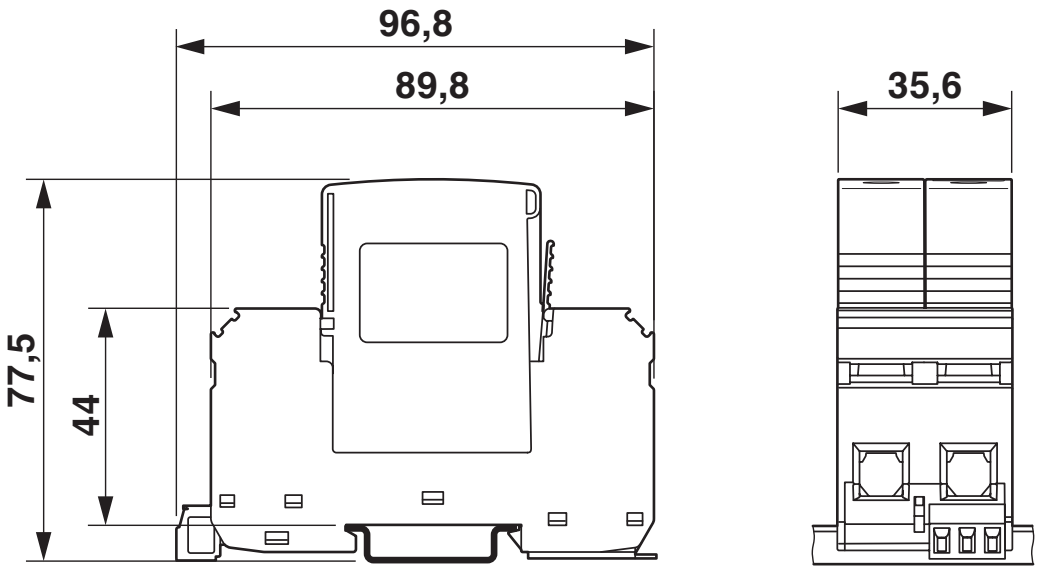
| | |
|---|---|
| Standards/specifications | IEC 61643-11 |
| Note | 2011 |
| Standards/specifications | EN 61643-11 |
| Note | 2012 |

## Mounting

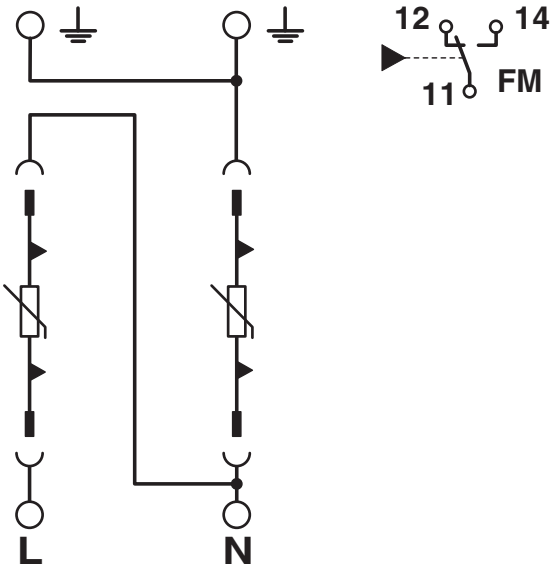
| | |
|---|---|
| Mounting type | DIN rail: 35 mm |

## Drawings

Dimensional drawing




Circuit diagram



## 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

**CCA**
Approval ID: DE1-34421

**KEMA-KEUR**
Approval ID: 2168290.01

**VDE Zeichengenehmigung**
Approval ID: 40037097

**UAE-RoHS**
Approval ID: 23-10-88705

## Classifications

### ECLASS

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

### ETIM

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

### UNSPSC

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

## 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 | 4.664 kg CO2e |

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