

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



2800183

<https://www.phoenixcontact.com/us/products/2800183>

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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, 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
- 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                          | 2800183       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CL18          |
| Product key                          | CL1151        |
| GTIN                                 | 4046356518550 |
| Weight per piece (including packing) | 677 g         |
| Weight per piece (excluding packing) | 643.8 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        | TT                                      |
|                                | TN-S                                    |
| Type                           | DIN rail module, two-section, divisible |
| Number of positions            | 4                                       |
| Surge protection fault message | Optical, remote indicator contact       |

### 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            |
|                    | 30 V DC                        |
| Operating current  | 5 mA AC ... 1.5 A AC           |
|                    | 1 A 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

|                   |                                       |
|-------------------|---------------------------------------|
| Connection method | Plug-in/screw connection via COMBICON |
|-------------------|---------------------------------------|

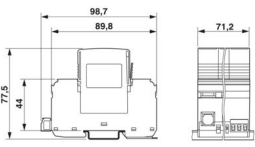
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|                                  |                                              |
|----------------------------------|----------------------------------------------|
| Screw thread                     | M2                                           |
| 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               | 71.2 mm                                                                            |
| Height              | 98.7 mm                                                                            |
| Depth               | 77.5 mm (incl. DIN rail 7.5 mm)                                                    |
| Horizontal pitch    | 4 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                |
| 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            |

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|                                                                                 |                                                                                                                                             |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 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/ $\Omega$                                                                                                                            |
| Impulse discharge current (10/350) $\mu s$ (N-PE), peak current value $I_{imp}$ | 50 kA                                                                                                                                       |
| Total discharge current $I_{Total}$ (8/20) $\mu s$                              | 50 kA                                                                                                                                       |
| Total discharge current $I_{Total}$ (10/350) $\mu s$                            | 50 kA                                                                                                                                       |
| Follow current interrupt rating $I_{fi}$ (N-PE)                                 | 100 A                                                                                                                                       |
| Short-circuit current rating $I_{SCCR}$                                         | 25 kA                                                                                                                                       |
| Voltage protection level $U_p$ (L-N)                                            | $\leq 1.2 \text{ kV}$<br>$\leq 1.6 \text{ kV}$ (30 kA - 8/20 $\mu s$ )                                                                      |
| 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 $U_{res}$ (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 $U_{res}$ (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 $U_{res}$ (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)                                                       | $\leq 25 \text{ ns}$                                                                                                                        |

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|                                             |                                 |
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| Response time $t_A$ (L-PE)                  | $\leq 100$ ns                   |
| Response time $t_A$ (N-PE)                  | $\leq 100$ 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 %                                           |
| 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)                 |

## 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                                 | 240/415 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 indicator/remote signaling

|                   |          |
|-------------------|----------|
| Operating voltage | 125 V AC |
|-------------------|----------|

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|                      |        |
|----------------------|--------|
| 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 |
|---------------|-----------------|

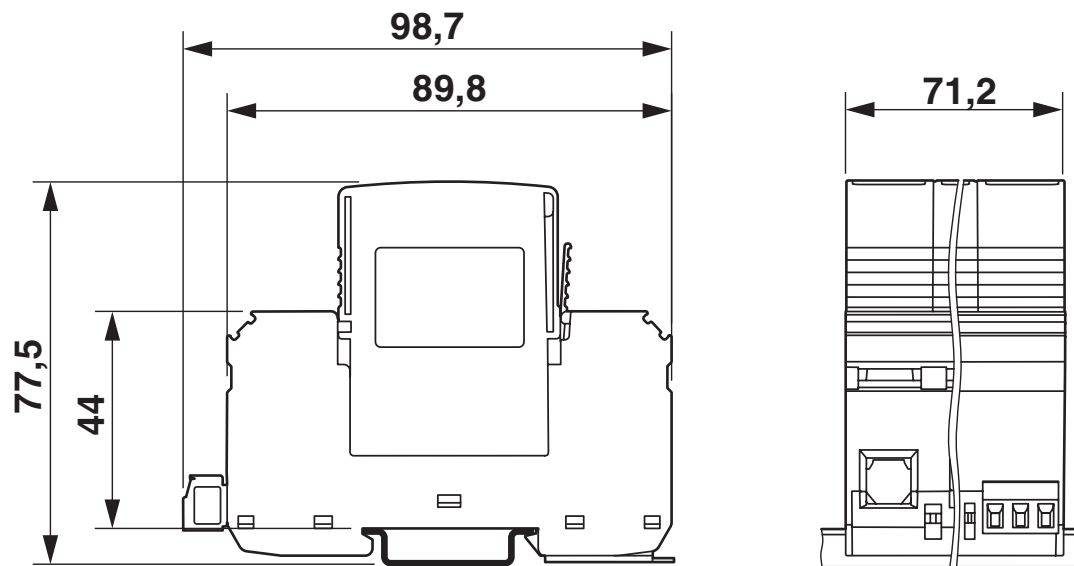
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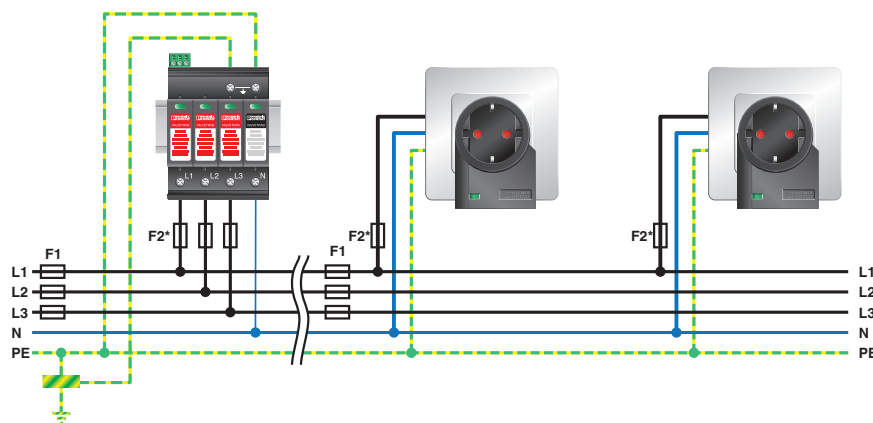
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## Drawings

Dimensional drawing



Application drawing

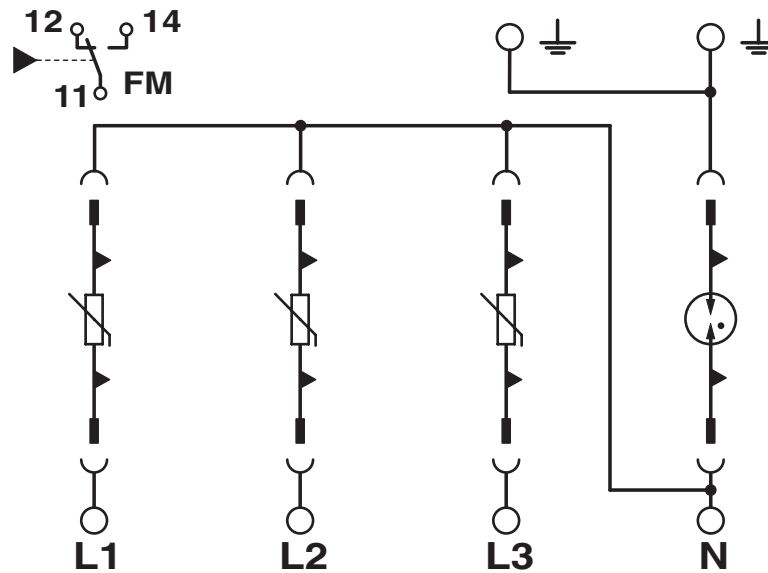


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Circuit diagram



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## Approvals

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**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

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## Classifications

### ECLASS

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

### EF3.0 Climate Change

|         |                |
|---------|----------------|
| CO2e kg | 12.948 kg CO2e |
|---------|----------------|

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