

# VAL-MS 320/3+1/FM-UD - Type 2 surge arrester



2856689

<https://www.phoenixcontact.com/us/products/2856689>

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Surge voltage arrester consisting of base element with remote indicator contact and ground connectors, for mounting on NS 35/7.5, nominal voltage: 320 V AC, 3 + 1 circuit

## 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
- Wide range of applications due to various nominal voltages
- High degree of modularity provides individual solutions for every application

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2856689       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CL18          |
| Product key                          | CL1321        |
| GTIN                                 | 4017918877057 |
| Weight per piece (including packing) | 408 g         |
| Weight per piece (excluding packing) | 393.915 g     |
| Customs tariff number                | 85363030      |
| Country of origin                    | CN            |

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## Technical data

### Product properties

|                                |   |
|--------------------------------|---|
| Product type                   | Surge arrester                          |
| Product family                 | VALVETRAB MS                            |
| IEC test classification        | II                                      |
|                                | T2                                      |
| EN type                        | T2                                      |
| IEC power supply system        | TN-S                                    |
|                                | TT                                      |
| Type                           | DIN rail module, two-section, divisible |
| Number of positions            | 4                                       |
| 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            |
|                    | 30 V DC                        |
| Operating current  | 5 mA AC ... 750 mA 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 |
| Screw thread      | M2                                    |

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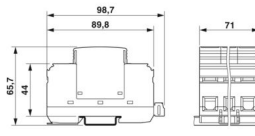


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|                                  |  |
|----------------------------------|--|
| Tightening torque                | 0.25 Nm                                      |
| Stripping length                 | 7 mm   |
| Conductor cross-section flexible | 0.14 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 mm  |
| Height              | 98.7 mm  |
| Depth               | 65.7 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    |

## 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)  | 260 V AC               |
| Rated load current $I_L$                           | 80 A                   |
| Protective conductor current $I_{PE}$              | $\leq 5 \mu A$         |
| Standby power consumption $P_C$                    | $\leq 450 \text{ mVA}$ |
| Nominal discharge current $I_n$ (8/20) $\mu s$     | 20 kA                  |
| Maximum discharge current $I_{max}$ (8/20) $\mu s$ | 40 kA                  |
| Follow current interrupt rating $I_{fi}$ (N-PE)    | 100 A                  |
| Short-circuit current rating $I_{SCCR}$            | 25 kA                  |

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|   |  |
|---|--|
| Voltage protection level $U_p$ (L-N)        | $\leq 1.6$ kV                          |
| Voltage protection level $U_p$ (L-PE)       | $\leq 1.9$ kV                          |
| Voltage protection level $U_p$ (N-PE)       | $\leq 1.5$ kV                          |
| Residual voltage $U_{res}$ (L-N)            | $\leq 1.6$ kV (at $I_n$ )              |
|   | $\leq 1.5$ kV (at 10 kA)               |
|   | $\leq 1.3$ kV (at 5 kA)                |
|   | $\leq 1.1$ kV (at 3 kA)                |
| Residual voltage $U_{res}$ (L-PE)           | $\leq 1.9$ kV (at $I_n$ )              |
|   | $\leq 1.5$ kV (at 10 kA)               |
|   | $\leq 1.3$ kV (at 5 kA)                |
|   | $\leq 1.2$ kV (at 3 kA)                |
| Residual voltage $U_{res}$ (N-PE)           | $\leq 0.4$ kV (at $I_n$ )              |
|   | $\leq 0.25$ kV (at 10 kA)              |
|   | $\leq 0.15$ kV (at 5 kA)               |
|   | $\leq 0.1$ kV (at 3 kA)                |
| TOV behavior at $U_T$ (L-N)                 | 415 V AC (5 s / withstand mode)        |
|   | 440 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)                   | $\leq 25$ ns                           |
| 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)                              |
| Max. backup fuse with branch wiring         | 125 A (gG)                             |

## 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)                       | 25g (Half-sine / 11 ms / 3x $\pm X$ , $\pm Y$ , $\pm Z$ ) |
| Vibration (operation)                   | 5g (10 ... 500 Hz / 2.5 h / X, Y, Z)                      |

## Approvals

### UL specifications

|   |          |
|---|----------|
| Maximum continuous operating voltage MCOV (L-L) | 640 V AC |
| Maximum continuous operating voltage MCOV (L-N) | 320 V AC |
| Maximum continuous operating voltage MCOV (L-G) | 320 V AC |
| Maximum continuous operating voltage MCOV (N-G) | 260 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    |

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|                                       |              |
|---------------------------------------|--------------|
| 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)   | 2900 V       |
| Measured limiting voltage MLV (L-N)   | 2030 V       |
| Measured limiting voltage MLV (L-G)   | 2720 V       |
| Measured limiting voltage MLV (N-G)   | 1370 V       |
| SPD Type                              | 4CA          |

## 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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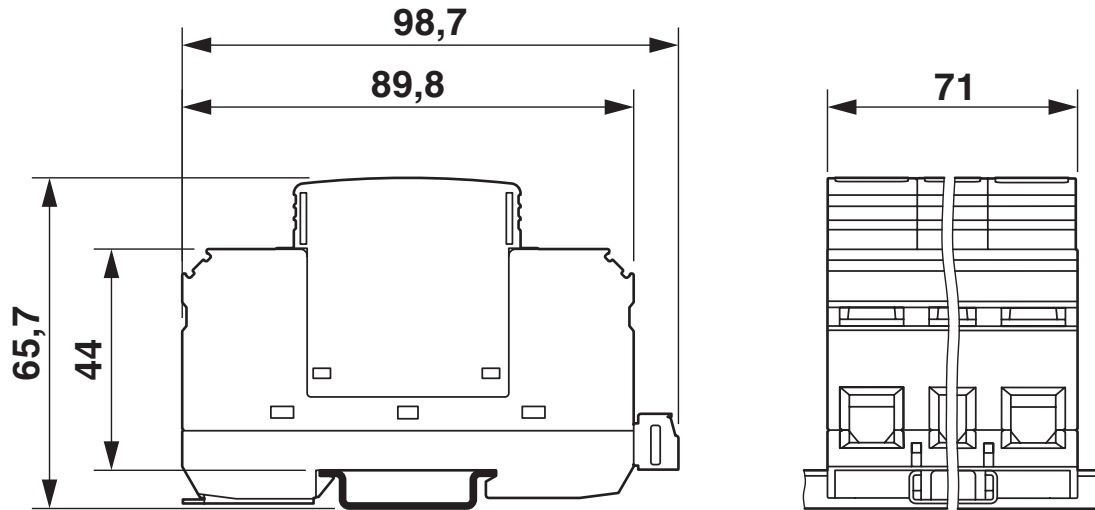


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## Drawings

Dimensional drawing

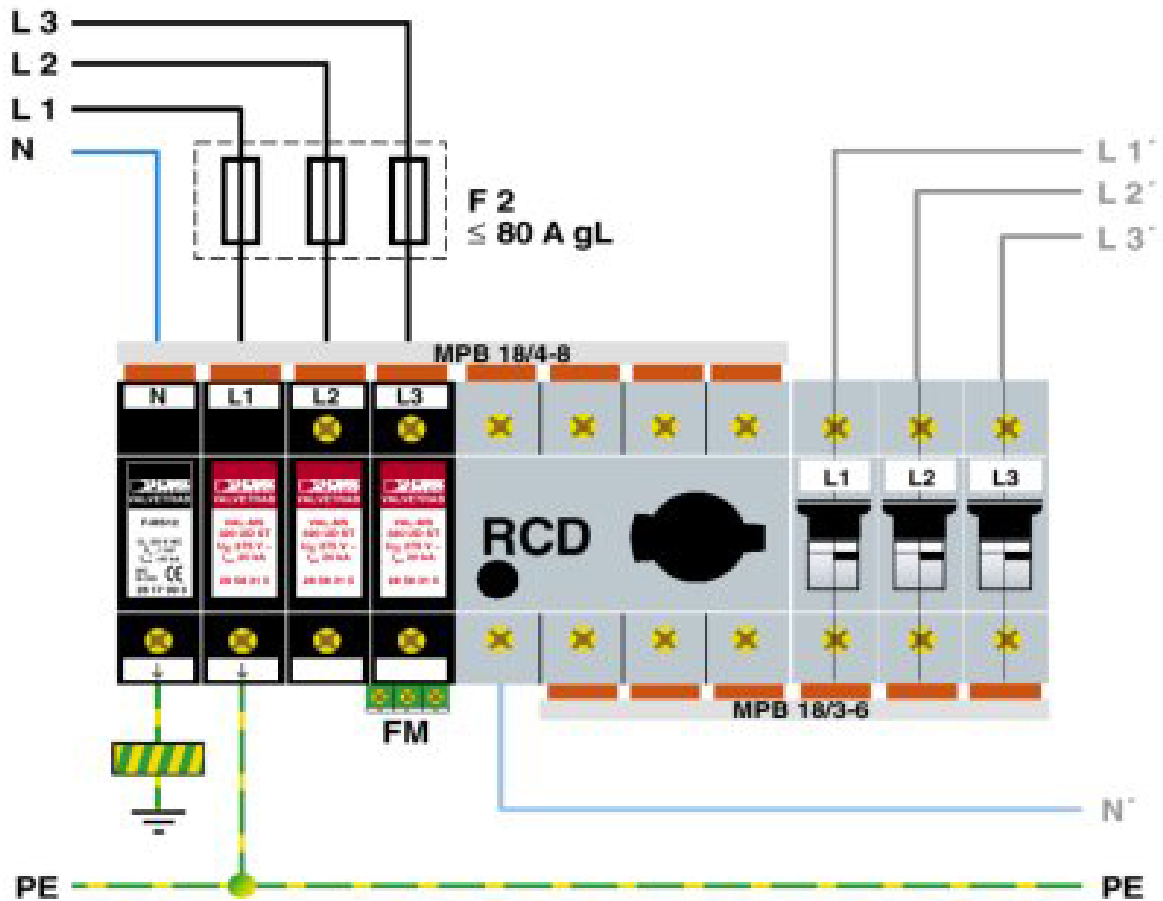


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Application drawing

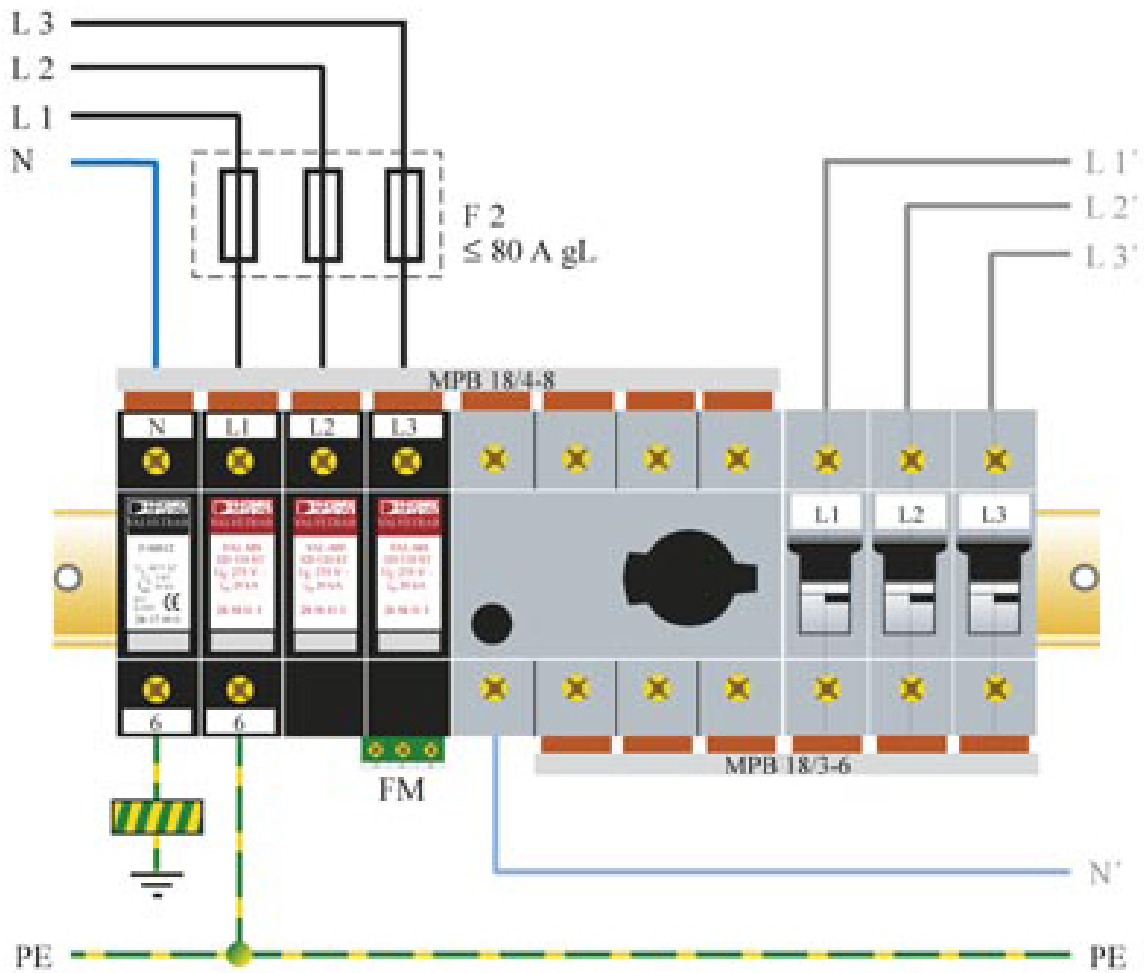


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Application drawing



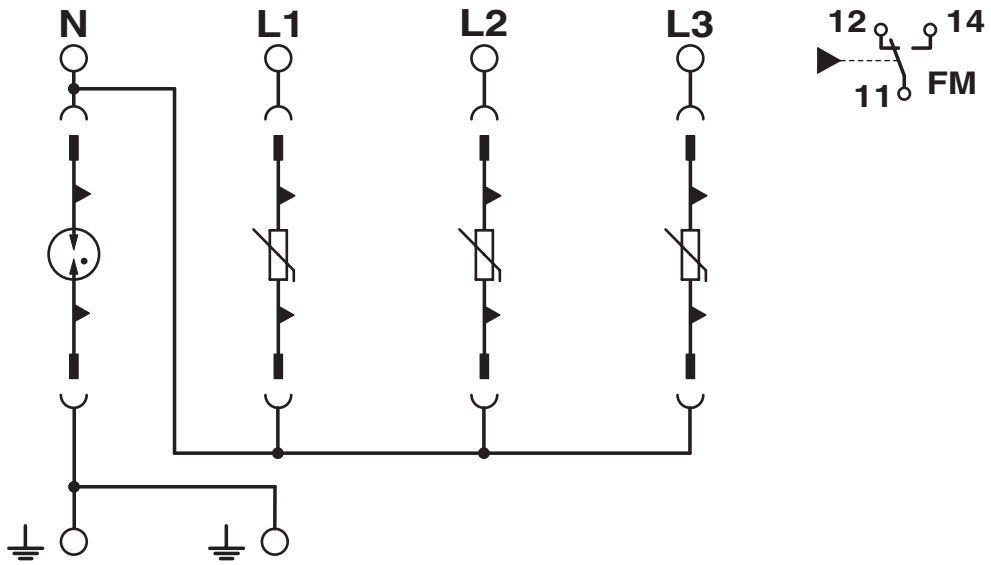
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Circuit diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2856689>



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



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



**IECEE CB Scheme**  
Approval ID: AT 2905/M1

**CCA**

Approval ID: NTR-AT 1947-A



**KEMA-KEUR**  
Approval ID: 71-148002



**CSA**  
Approval ID: 13631



**ÖVE**  
Approval ID: 18583-001-17

**UAE-RoHS**

Approval ID: 22-09-51250

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27171202 |
| ECLASS-15.0 | 27171202 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC000941 |
|-----------|----------|

### 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% |
|-------------------------------------|----------------------------|

### EF3.1 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 9.775 kg CO2e |
|---------|---------------|

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