

# VAL-MS 385/80/1+1-FM - Type 2 surge arrester



2921284

<https://www.phoenixcontact.com/us/products/2921284>

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Type 2 surge protective device for 3-conductor power supply systems (L1, N, PE), with plug latching and 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
- Wide range of applications due to various nominal voltages
- High degree of modularity provides individual solutions for every application

## Commercial data

|                                      |                    |
|--------------------------------------|--------------------|
| Item number                          | 2921284            |
| Packing unit                         | 1 pc               |
| Minimum order quantity               | 1 pc               |
| Product key                          | CL1322             |
| Catalog page                         | Page 49 (C-6-2013) |
| GTIN                                 | 4046356280006      |
| Weight per piece (including packing) | 330.8 g            |
| Weight per piece (excluding packing) | 330.9 g            |
| Country of origin                    | DE                 |

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## Technical data

### Product properties

|                                |   |
|--------------------------------|---|
| IEC test classification        | II                                      |
|                                | T2                                      |
| EN type                        | T2                                      |
| IEC power supply system        | TT                                      |
|                                | TN-C                                    |
|                                | TN-S                                    |
| Type                           | DIN rail module, two-section, divisible |
| Product type                   | Surge arrester                          |
| Product family                 | VALVETRAB MS                            |
| 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 |
| Screw thread      | M2                                    |
| Tightening torque | 0.25 Nm                               |

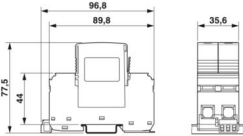
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|                                  |  |
|----------------------------------|--|
| Stripping length                 | 7 mm   |
| Conductor cross section flexible | 0.14 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section rigid    | 0.14 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    |

## Protective circuit

|   |                 |
|---|-----------------|
| Mode of protection  | L-N             |
|   | L-PE            |
|   | N-PE            |
| Direction of action   | 1L-N & N-PE     |
| Nominal voltage $U_N$   | 240 V AC (TN-S) |
|   | 240 V AC (TT)   |
| Nominal frequency $f_N$   | 50 Hz (60 Hz)   |
| Maximum continuous operating voltage $U_C$ (L-N)                          | 385 V AC        |
| Maximum continuous operating voltage $U_C$ (N-PE)                         | 264 V AC        |
| Rated load current $I_L$  | 80 A            |
| Residual current $I_{PE}$   | ≤ 5 μA          |
| Standby power consumption $P_C$   | ≤ 231.00 mVA    |
| Nominal discharge current $I_n$ (8/20) μs                                 | 40 kA           |
| Maximum discharge current $I_{max}$ (8/20) μs                             | 80 kA           |
| Impulse discharge current (10/350) μs (L-N), charge                       | 1.25 As         |
| Impulse discharge current (10/350) μs (L-N), specific energy              | 1.56 kJ/Ω       |
| Impulse discharge current (10/350) μs (L-N), peak current value $I_{imp}$ | 2.5 kA          |

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|  |                                     |
|--|-------------------------------------|
| Impulse discharge current (10/350) $\mu\text{s}$ (L-PE), charge                              | 1.25 As                             |
| Impulse discharge current (10/350) $\mu\text{s}$ (L-PE), specific energy                     | 1.56 kJ/ $\Omega$                   |
| Impulse discharge current (10/350) $\mu\text{s}$ (L-PE), peak current value $I_{\text{imp}}$ | 2.5 kA                              |
| Impulse discharge current (10/350) $\mu\text{s}$ (N-PE), charge                              | 5 As                                |
| Impulse discharge current (10/350) $\mu\text{s}$ (N-PE), specific energy                     | 25 kJ/ $\Omega$                     |
| Impulse discharge current (10/350) $\mu\text{s}$ (N-PE), peak current value $I_{\text{imp}}$ | 10 kA                               |
| Total discharge current $I_{\text{total}}$ (8/20) $\mu\text{s}$                              | 80 kA                               |
| Total discharge current $I_{\text{total}}$ (10/350) $\mu\text{s}$                            | 5 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)   | $\leq 2$ kV                         |
| Voltage protection level $U_p$ (L-PE)  | $\leq 2$ kV                         |
| Voltage protection level $U_p$ (N-PE)  | $\leq 1.7$ kV                       |
| Residual voltage $U_{\text{res}}$ (L-N)  | $\leq 2$ kV (at $I_n$ )             |
|  | $\leq 1.3$ kV (at 10 kA)            |
|  | $\leq 1.2$ kV (at 5 kA)             |
|  | $\leq 1.15$ kV (at 3 kA)            |
| Residual voltage $U_{\text{res}}$ (L-PE)   | $\leq 2$ kV (at $I_n$ )             |
|  | $\leq 1.5$ kV (at 10 kA)            |
|  | $\leq 1.4$ kV (at 5 kA)             |
|  | $\leq 1.3$ kV (at 3 kA)             |
| Residual voltage $U_{\text{res}}$ (N-PE)   | $\leq 0.6$ kV (at $I_n$ )           |
|  | $\leq 0.5$ kV (at 10 kA)            |
|  | $\leq 0.5$ kV (at 5 kA)             |
|  | $\leq 0.4$ kV (at 3 kA)             |
| TOV behavior at $U_T$ (L-N)  | 480 V AC (5 s / withstand mode)     |
|  | 457 V AC (120 min / withstand 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 - 16 mm <sup>2</sup> )     |
| Max. backup fuse with branch wiring  | 250 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)                       | 30g (Half-sine / 11 ms / 3x $\pm X$ , $\pm Y$ , $\pm Z$ ) |

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|                       |  |
|-----------------------|--|
| Vibration (operation) | 7.5g (10 ... 500 Hz / 2.5 h / X, Y, Z) |
|-----------------------|--|

## Approvals

### UL specifications

|   |                   |
|---|-------------------|
| Maximum continuous operating voltage MCOV (L-N) | 385 V AC          |
| Maximum continuous operating voltage MCOV (L-G) | 385 V AC          |
| Maximum continuous operating voltage MCOV (N-G) | 264 V AC          |
| 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-N<br>L-G<br>N-G |
| Nominal voltage                                 | 240 V AC          |
| Power distribution system                       | Single phase      |
| Nominal frequency                               | 50/60 Hz          |
| Measured limiting voltage MLV (L-N)             | 2710 V            |
| Measured limiting voltage MLV (L-G)             | 3730 V            |
| Measured limiting voltage MLV (N-G)             | 2590 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 | 10 ... 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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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-11.0 | 27130805 |
| ECLASS-13.0 | 27171202 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC000941 |
|----------|----------|

### UNSPSC

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

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## Environmental product compliance

|            |   |
|------------|---|
| China RoHS | Environmentally friendly use period: unlimited = EFUP-e<br>No hazardous substances above threshold values |
|------------|---|

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