

## Type 2 surge arrester - VAL-MS 385/80/3+1-FM - 2920968

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Type 2 surge arrester for 5-wire power supply systems (L1, L2, L3, N, PE), with connector latching and remote indication contact.

### Your advantages

- ✓ With or without floating remote indication contact
- ✓ Plugs can be checked with CHECKMASTER
- ✓ Secure hold of plugs in the event of high lightning current loads and strong vibrations thanks to new latching
- ✓ Multi-channel type 2 arresters
- ✓ Mechanical coding of all slots
- ✓ Disconnect device on each individual plug
- ✓ Type 2 consistent plug-in surge arresters
- ✓ Optical, mechanical status indication for the individual arresters



### Key Commercial Data

|              |   |
|--------------|---|
| Packing unit | 1 pc  |
| GTIN         | <br>4 046356 280983 |
| GTIN         | 4046356280983   |

### Technical data

#### Dimensions

|                  |                                 |
|------------------|---------------------------------|
| Height           | 98.7 mm                         |
| Width            | 71.2 mm                         |
| Depth            | 77.5 mm (incl. DIN rail 7.5 mm) |
| Horizontal pitch | 4 Div.                          |

#### 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                              |

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## Technical data

### Ambient conditions

|                                  |   |
|----------------------------------|---|
| Altitude                         | ≤ 2000 m (amsl (above mean sea level))  |
| 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)  |

### General

|  |   |
|--|---|
| IEC test classification                | II                                      |
|  | T2                                      |
| EN type                                | T2                                      |
| IEC power supply system                | TT                                      |
|  | TN-C                                    |
|  | TN-S                                    |
| Mode of protection                     | L-N                                     |
|  | L-PE                                    |
|  | N-PE                                    |
| Mounting type                          | DIN rail: 35 mm                         |
| Color                                  | jet black RAL 9005                      |
| Housing material                       | PA 6.6                                  |
|  | PBT                                     |
| Degree of pollution                    | 2                                       |
| Flammability rating according to UL 94 | V-0                                     |
| Type                                   | DIN rail module, two-section, divisible |
| Surge protection fault message         | Optical, remote indicator contact       |

### Protective circuit

|   |                     |
|---|---------------------|
| 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)                          | 385 V AC            |
| Maximum continuous operating voltage $U_C$ (L-PE)                         | 385 V AC            |
| Maximum continuous voltage $U_C$ (N-PE)                                   | 264 V AC            |
| Rated load current $I_L$  | 80 A                |
| Residual current $I_{PE}$   | ≤ 5 μA              |
| Standby power consumption $P_C$   | ≤ 690 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              |
| Impulse discharge current (10/350) μs (L-PE), charge                      | 1.25 As             |
| Impulse discharge current (10/350) μs (L-PE), specific energy             | 1.56 kJ/Ω           |

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## Technical data

### Protective circuit

|   |                                     |
|---|-------------------------------------|
| Impulse discharge current (10/350) $\mu$ s (L-PE), peak current value $I_{imp}$ | 2.5 kA                              |
| Impulse discharge current (10/350) $\mu$ s (N-PE), charge                       | 5 As                                |
| Impulse discharge current (10/350) $\mu$ s (N-PE), specific energy              | 25 kJ/ $\Omega$                     |
| Impulse discharge current (10/350) $\mu$ s (N-PE), peak current value $I_{imp}$ | 10 kA                               |
| Total discharge current $I_{total}$ (8/20) $\mu$ s                              | 80 kA                               |
| Total discharge current $I_{total}$ (10/350) $\mu$ s                            | 10 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)  | $\leq 2$ kV                         |
| Voltage protection level $U_p$ (L-PE)   | $\leq 2$ kV                         |
| Voltage protection level $U_p$ (N-PE)   | $\leq 1.7$ kV                       |
| Residual voltage $U_{res}$ (L-N)  | $\leq 2$ kV (at $I_n$ )             |
|   | $\leq 1.4$ kV (at 10 kA)            |
|   | $\leq 1.25$ kV (at 5 kA)            |
|   | $\leq 1.2$ kV (at 3 kA)             |
| Residual voltage $U_{res}$ (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 $U_{res}$ (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)                          |

### Indicator/remote signaling

|                    |                                       |
|--------------------|---------------------------------------|
| Switching function | PDT 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 method  | Plug-in/screw connection via COMBICON |
| Screw thread       | M2                                    |

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## Technical data

### Indicator/remote signaling

|                                  |  |
|----------------------------------|--|
| 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 solid    | 0.14 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section AWG      | 28 ... 16                                    |

### Connection data

|                                  |   |
|----------------------------------|---|
| Connection method                | Screw connection  |
| Screw thread                     | M5  |
| Tightening torque                | 3 Nm (1.5 mm <sup>2</sup> ... 16 mm <sup>2</sup> )<br>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 solid    | 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>  |

### UL specifications

|   |                          |
|---|--------------------------|
| SPD Type  | 4CA                      |
| Maximum continuous operating voltage MCOV (L-L) | 770 V AC                 |
| 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                 |
| Nom. voltage                                    | 240/415 V AC             |
| Mode of protection                              | L-L<br>L-N<br>L-G<br>N-G |
| Power distribution system                       | Wye                      |
| Nominal frequency                               | 50/60 Hz                 |
| Measured limiting voltage MLV (L-L)             | 3860 V                   |
| Measured limiting voltage MLV (L-N)             | 2710 V                   |
| Measured limiting voltage MLV (L-G)             | 3730 V                   |
| Measured limiting voltage MLV (N-G)             | 2590 V                   |
| Nominal discharge current I <sub>n</sub>        | 20 kA                    |

### UL indicator/remote signaling

|                             |                        |
|-----------------------------|------------------------|
| Operating voltage           | 125 V AC               |
| Operating current           | 1 A AC                 |
| Tightening torque           | 4 lb <sub>f</sub> -in. |
| Conductor cross section AWG | 30 ... 14              |

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## Technical data

### UL connection data

|                             |                         |
|-----------------------------|-------------------------|
| Conductor cross section AWG | 10 ... 2                |
| Tightening torque           | 30 lb <sub>r</sub> -in. |

### Standards and Regulations

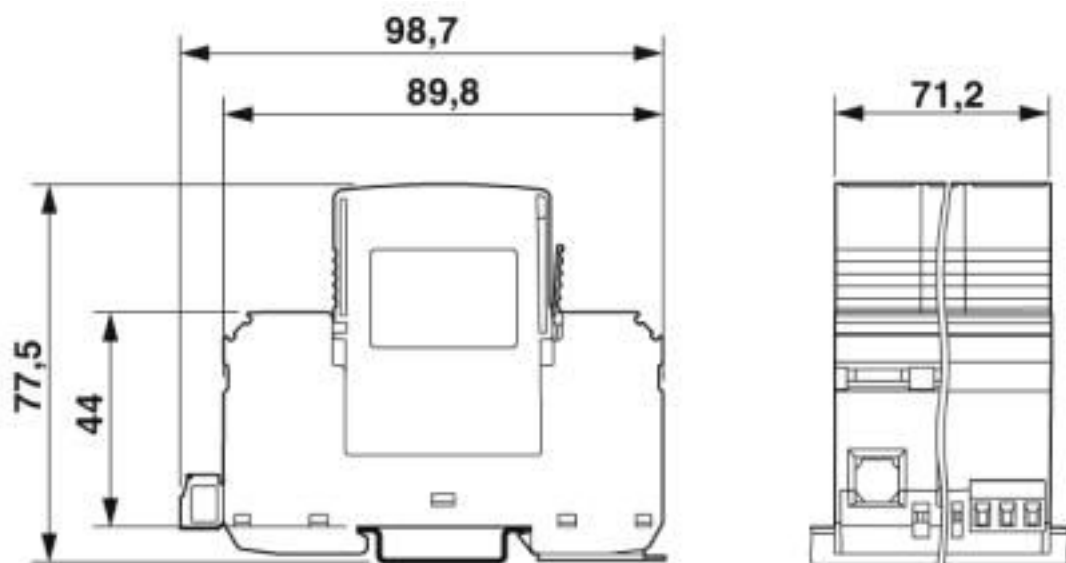
|                       |                   |
|-----------------------|-------------------|
| Standards/regulations | IEC 61643-11 2011 |
|                       | EN 61643-11 2012  |

### Environmental Product Compliance

|            |   |
|------------|---|
| REACH SVHC | Lead 7439-92-1  |
| China RoHS | Environmentally Friendly Use Period = 50 years  |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

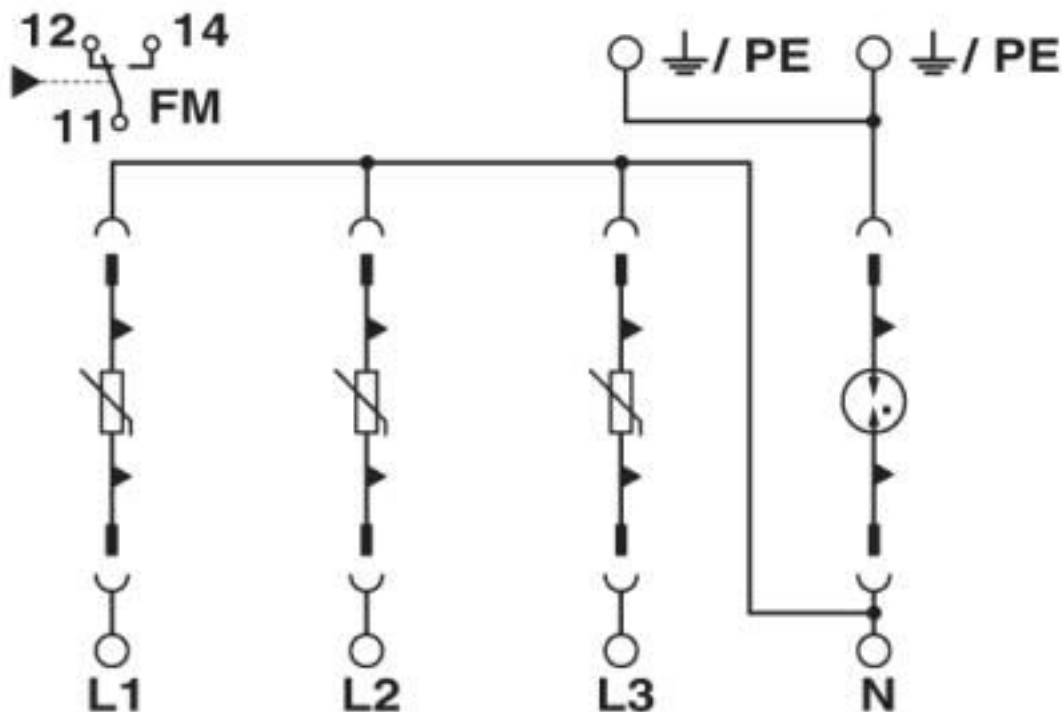
## Drawings

Dimensional drawing



# Type 2 surge arrester - VAL-MS 385/80/3+1-FM - 2920968

Circuit diagram



## Classifications

### eCl@ss

|               |          |
|---------------|----------|
| eCl@ss 10.0.1 | 27130805 |
| eCl@ss 4.0    | 27130800 |
| eCl@ss 4.1    | 27130800 |
| eCl@ss 5.0    | 27130800 |
| eCl@ss 5.1    | 27130800 |
| eCl@ss 6.0    | 27130800 |
| eCl@ss 7.0    | 27130805 |
| eCl@ss 8.0    | 27130805 |
| eCl@ss 9.0    | 27130805 |

### ETIM

|          |          |
|----------|----------|
| ETIM 2.0 | EC000941 |
| ETIM 3.0 | EC000941 |
| ETIM 4.0 | EC000941 |
| ETIM 5.0 | EC000941 |
| ETIM 6.0 | EC000941 |
| ETIM 7.0 | EC000941 |

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 6.01 | 30212010 |
|-------------|----------|

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## Classifications

### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 7.0901 | 39121610 |
| UNSPSC 11     | 39121610 |
| UNSPSC 12.01  | 39121610 |
| UNSPSC 13.2   | 39121620 |
| UNSPSC 18.0   | 39121620 |
| UNSPSC 19.0   | 39121620 |
| UNSPSC 20.0   | 39121620 |
| UNSPSC 21.0   | 39121620 |

## Approvals

### Approvals

#### Approvals

DNV GL / CCA / UL Recognized / KEMA-KEUR / cUL Recognized / IECEE CB Scheme / EAC / cULus Recognized

#### Ex Approvals

### Approval details

|                |  |   |               |
|----------------|--|---|---------------|
| DNV GL         |  | <a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a>   | TAE00001N9    |
| CCA            |  |   | NTR-AT 1955   |
| UL Recognized  |  | <a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> | FILE E 330181 |
| KEMA-KEUR      |  | <a href="http://www.dekra-certification.com">http://www.dekra-certification.com</a>   | 2171147.01    |
| cUL Recognized |  | <a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> | FILE E 330181 |

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## Approvals

|                 |  |   |         |
|-----------------|--|---|---------|
| IECEE CB Scheme |  | <a href="http://www.iecee.org/">http://www.iecee.org/</a> | AT 3003 |
|-----------------|--|---|---------|

|     |  |  |                         |
|-----|--|--|-------------------------|
| EAC |  |  | RU C-<br>DE.*09.B.00169 |
|-----|--|--|-------------------------|

|                  |  |  |  |
|------------------|--|--|--|
| cULus Recognized |  |  |  |
|------------------|--|--|--|

## Accessories

### Accessories

#### Replacement plug

Type 2 surge protection plug - VAL-MS 385/80 ST - 2920353



Type 2 surge protection plug with varistor for VAL-MS 385/80/..., thermal monitoring, visual fault warning.

Type 2 surge protection plug - F-MS 80 ST - 2921307



Type 2 surge protection plug with N-PE total current spark gap.

## Spare parts

Type 2 surge protection plug - VAL-MS 385/80 ST - 2920353



Type 2 surge protection plug with varistor for VAL-MS 385/80/..., thermal monitoring, visual fault warning.



## Type 2 surge arrester - VAL-MS 385/80/3+1-FM - 2920968

### Accessories

Type 2 surge protection plug - F-MS 80 ST - 2921307



Type 2 surge protection plug with N-PE total current spark gap.

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PHOENIX CONTACT GmbH & Co. KG  
Flachsmarktstr. 8  
32825 Blomberg  
Germany  
Tel. +49 5235 300  
Fax +49 5235 3 41200  
<http://www.phoenixcontact.com>

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