

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



2920971

<https://www.phoenixcontact.com/us/products/2920971>

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Type 2 surge protective device for 5-conductor power supply systems (L1, L2, L3, N, PE), with plug latching.

## Commercial data

Item number	2920971
Packing unit	1 pc
Minimum order quantity	1 pc
Product key	CL1322
GTIN	4046356280877
Weight per piece (including packing)	594.5 g
Weight per piece (excluding packing)	594.5 g
Country of origin	DE

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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	TT TN-C TN-S
Type	DIN rail module, two-section, divisible
Surge protection fault message	optical
Number of ports	One

### Insulation characteristics

Overvoltage category	III
Pollution degree	2

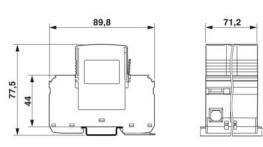
### Electrical properties

Nominal frequency $f_N$	50 Hz (60 Hz)
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### 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>

### Dimensions

Dimensional drawing	
Width	71.2 mm
Height	89.8 mm
Depth	77.5 mm (incl. DIN rail 7.5 mm)
Horizontal pitch	4 Div.

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## Material specifications

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

## 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)	385 V AC
Maximum continuous operating voltage $U_C$ (L-PE)	358 V AC
Maximum continuous operating voltage $U_C$ (N-PE)	264 V AC
Rated load current $I_L$	80 A
Protective conductor current $I_{PE}$	$\leq 5 \mu\text{A}$
Standby power consumption $P_C$	$\leq 690 \text{ mVA}$
Nominal discharge current $I_n$ (8/20) $\mu\text{s}$	40 kA
Maximum discharge current $I_{max}$ (8/20) $\mu\text{s}$	80 kA
Impulse discharge current (10/350) $\mu\text{s}$ (L-N), charge	1.25 As
Impulse discharge current (10/350) $\mu\text{s}$ (L-N), specific energy	1.56 kJ/ $\Omega$
Impulse discharge current (10/350) $\mu\text{s}$ (L-N), peak current value $I_{imp}$	2.5 kA
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 $I_{imp}$	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 $I_{imp}$	10 kA
Total discharge current $I_{Total}$ (8/20) $\mu\text{s}$	80 kA
Total discharge current $I_{Total}$ (10/350) $\mu\text{s}$	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)	$\leq 2 \text{ kV}$
Voltage protection level $U_p$ (L-PE)	$\leq 2 \text{ kV}$
Voltage protection level $U_p$ (N-PE)	$\leq 1.7 \text{ kV}$
	$\leq 2 \text{ kV}$ (at $I_n$ )

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Residual voltage $U_{res}$ (L-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)

## 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)	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
Nominal discharge current $I_n$	20 kA
Mode of protection	L-L
	L-N
	L-G
	N-G
Nominal voltage	415/240 V AC
Power distribution system	Wye

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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
SPD Type	4CA

## 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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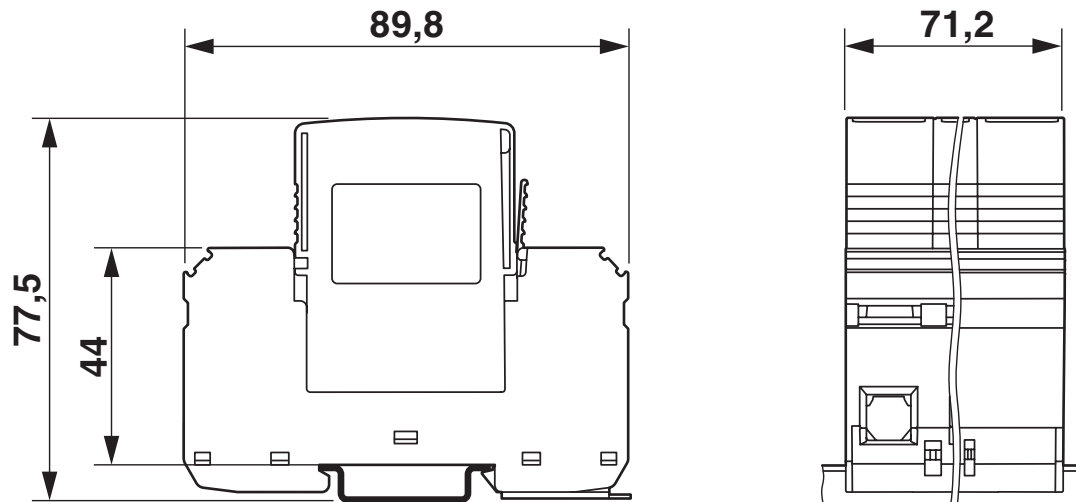
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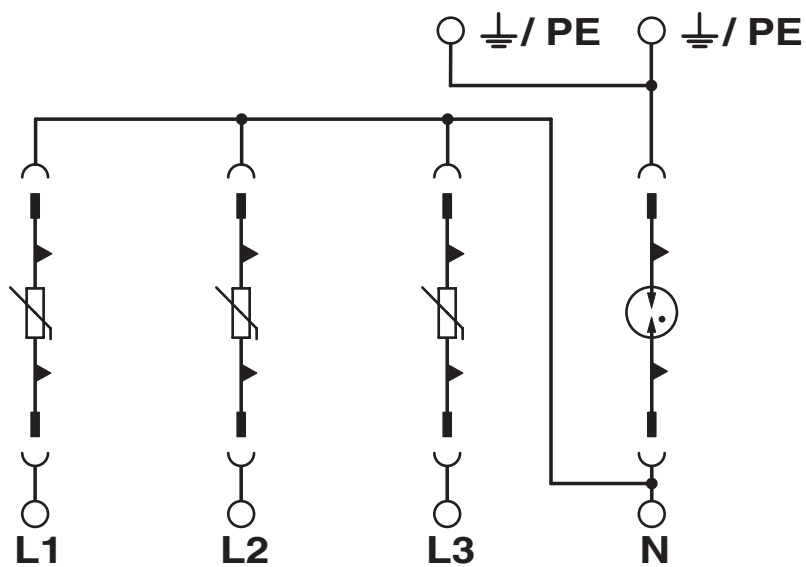
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## Drawings

Dimensional drawing



Circuit diagram



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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes, No exemptions
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### 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%
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