

# VAL-MS-T1/T2 1000DC-PV/2+V-FM - Lightning/surge arrester type 1/2



2801161

<https://www.phoenixcontact.com/no/products/2801161>

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Lightning current arrester / surge protective device for 2-pos. isolated and grounded 1,000 V DC PV voltage systems, for DIN rail mounting, 3-pos. base element with remote indication contact, three pluggable temperature-monitored protective elements, status message at each plug.

## 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

## Commercial data

Item number	2801161
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	31BCL
Product key	CL1152
Catalog page	Page 50 (C-4-2019)
GTIN	4046356714327
Weight per piece (including packing)	408.5 g
Weight per piece (excluding packing)	384.96 g
Customs tariff number	85363030
Country of origin	DE

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## Technical data

### Notes

#### General

Note	The device is intended for touch proof installation in a housing. Ensure that there is a gap of at least 8 mm between the active and grounded parts in the connection area.
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### Product properties

IEC test classification	PV I / II PV T1 / T2
EN type	T1 / T2
IEC power supply system	DC
Type	DIN rail module, two-section, divisible
Distance between live and grounded parts	8 mm
Product type	PV arrester
Product family	VALVETRAB MS
Installation location	Interior
Installation location of the disconnect device	Internal
Accessibility	Accessible
Connection configuration	Y configuration
SPD failure behavior	OCFM (Open-Circuit Failure Mode)
Surge protection fault message	Optical, remote indicator contact

#### Insulation characteristics

Overvoltage category	III
Pollution degree	2

### Electrical properties

#### 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> )

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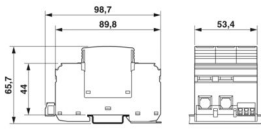
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Stripping length	16 mm
Conductor cross section flexible	1.5 mm <sup>2</sup> ... 25 mm <sup>2</sup>
Conductor cross section rigid	1.5 mm <sup>2</sup> ... 35 mm <sup>2</sup>
Conductor cross section AWG	15 ... 2
Connection method	Fork-type cable lug
Conductor 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
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	53.4 mm
Height	98.7 mm
Depth	65.7 mm (incl. DIN rail 7.5 mm)
Horizontal pitch	3 Div.

## Material specifications

Color	black (RAL 9005)
	black (RAL 9005)
Flammability rating according to UL 94	V-0
CTI value of material	600
Insulating material	PA 6.6-FR
	PBT-FR
Material group	I
Housing material	PA 6.6-FR
	PBT-FR

## Mechanical properties

### Mechanical data

Open side panel	No
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## Protective circuit

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Mode of protection	(DC+) - (DC-)
	(DC+/DC-) - PE
Direction of action	(L+)-PE & (L-)-PE & (L+)-(L-)
Rated load current $I_L$	80 A
Residual current $I_{PE}$	$\leq 20 \mu\text{A DC}$
	$\leq 350 \mu\text{A AC}$
Standby power consumption $P_C$	$\leq 25.00 \text{ mVA}$
Nominal discharge current $I_n$ (8/20) $\mu\text{s}$	15 kA
Maximum discharge current $I_{max}$ (8/20) $\mu\text{s}$	40 kA
Impulse discharge current (10/350) $\mu\text{s}$ , charge	2.5 As
Impulse discharge current (10/350) $\mu\text{s}$ , specific energy	6.25 kJ/ $\Omega$
Impulse discharge current (10/350) $\mu\text{s}$ , peak value $I_{imp}$	5 kA
Total discharge current $I_{total}$ (8/20) $\mu\text{s}$	40 kA
Total discharge current $I_{total}$ (10/350) $\mu\text{s}$	5 kA
Voltage protection level $U_p$	$\leq 3.5 \text{ kV}$
Residual voltage $U_{res}$	$\leq 3.5 \text{ kV}$ (at $I_n$ )
	$\leq 2.9 \text{ kV}$ (at 5 kA)
	$\leq 3.2 \text{ kV}$ (at 10 kA)
	$\leq 3.7 \text{ kV}$ (at 20 kA)
	$\leq 4.1 \text{ kV}$ (at 30 kA)
	$\leq 4.6 \text{ kV}$ (at 40 kA)
Response time $t_A$	$\leq 25 \text{ ns}$

## PV protective circuit

Connection configuration	Y configuration
SPD failure behavior	OCFM (Open-Circuit Failure Mode)

## Protective circuit DC voltage side (DC)

Open circuit voltage $U_{OCSTC}$	$\leq 975 \text{ V DC}$
Maximum discharge current $I_{max}$ (8/20) $\mu\text{s}$	40 kA
Response time $t_A$	$\leq 25 \text{ ns}$
Impulse discharge current (10/350) $\mu\text{s}$ , charge	2.5 As
Impulse discharge current (10/350) $\mu\text{s}$ , specific energy	6.25 kJ/ $\Omega$
Impulse discharge current (10/350) $\mu\text{s}$ , peak value $I_{imp}$	5 kA
Total discharge current $I_{total}$ (8/20) $\mu\text{s}$	40 kA
Total discharge current $I_{total}$ (10/350) $\mu\text{s}$	5 kA
Insulation resistance $R_{iso}$	$> 5 \text{ G}\Omega$ (at 500 V DC)
Nominal discharge current $I_n$ (8/20) $\mu\text{s}$	15 kA
Rated load current $I_L$	80 A
Continuous operating current $I_{CPV}$	$< 20 \mu\text{A}$
Maximum continuous operating voltage $U_{CPV}$	1170 V DC
Short-circuit current rating $I_{SCPV}$	2000 A
	$\leq 3.5 \text{ kV}$ (at $I_n$ )

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Residual voltage $U_{res}$	$\leq 2.9$ kV (at 5 kA)
	$\leq 3.2$ kV (at 10 kA)
	$\leq 3.7$ kV (at 20 kA)
	$\leq 4.1$ kV (at 30 kA)
	$\leq 4.6$ kV (at 40 kA)
Residual current $I_{PE}$	$\leq 20$ $\mu$ A DC
	$\leq 350$ $\mu$ A AC
Voltage protection level $U_p$	$\leq 3.5$ kV
Standby power consumption $P_C$	$\leq 25.00$ mVA

## 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)	60g (Half-sine / 11 ms / 3x $\pm$ X, $\pm$ Y, $\pm$ Z)
Vibration (operation)	7.5g (5-500 Hz/2.5 h/XYZ)

## Approvals

### UL specifications

Maximum continuous operating voltage MCOV	1170 V DC
Short-circuit current rating (SCCR)	50 kA
Voltage protection rating VPR	3 kV
Nominal discharge current $I_n$	10 kA
Mode of protection	(L+) - (L-)
	(L+) - G
	(L-) - G
Nominal voltage	1170 V DC
Power distribution system	DC PV
SPD Type	1CA

### 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	EN 61643-31
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Note	2019
Standards/specifications	IEC 61643-31
Note	2018

## Mounting

Mounting type	DIN rail: 35 mm
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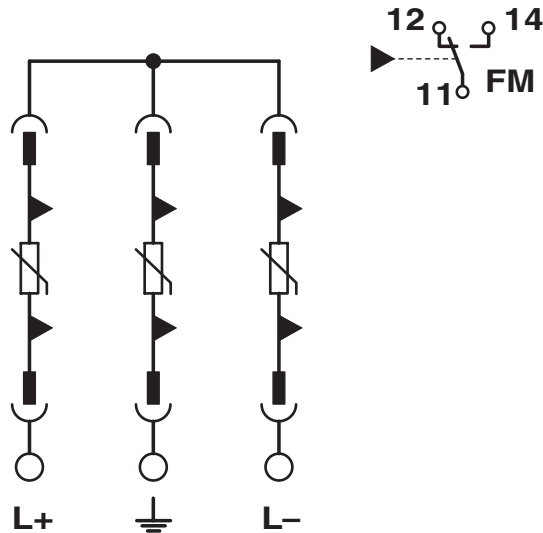
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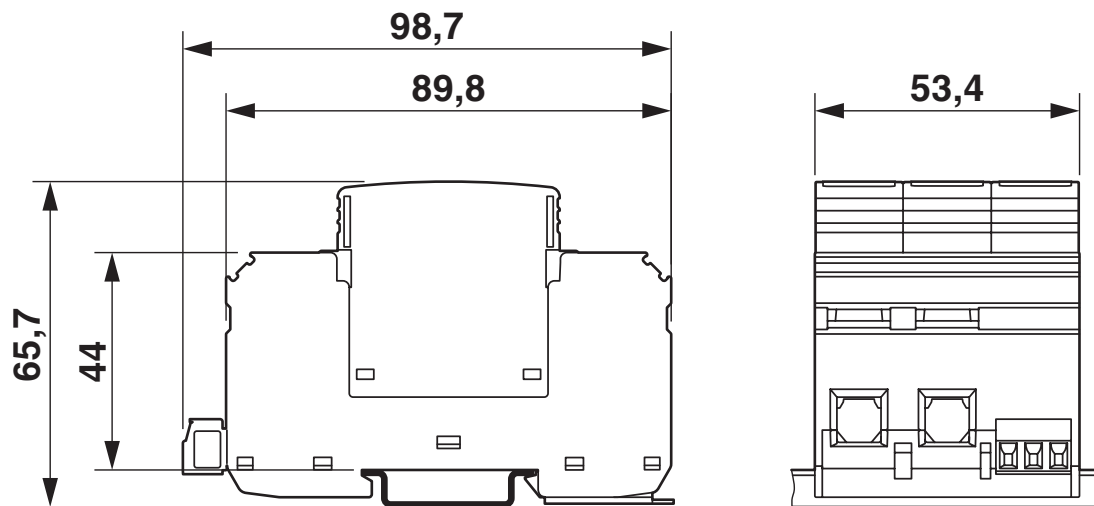
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## Drawings

Circuit diagram



Dimensional drawing



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## Approvals

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



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



**EAC**  
Approval ID: RU C-DE.\*09.B.00169



**KEMA-KEUR**  
Approval ID: 71-123544 REV.2



**IECEE CB Scheme**  
Approval ID: NL-81006/A1

**CCA**

Approval ID: NTR-NL 7937

**UAE-RoHS**

Approval ID: 23-10-88705

**cULus Recognized**



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## Classifications

### ECLASS

ECLASS-11.0	27130802
ECLASS-13.0	27171401

### ETIM

ETIM 9.0	EC000381
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### UNSPSC

UNSPSC 21.0	39121620
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## Environmental product compliance

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

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