

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



2801161

<https://www.phoenixcontact.com/in/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	CL1
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	IN

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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 ² ... 16 mm ²) 4.5 Nm (25 mm ² ... 35 mm ²)

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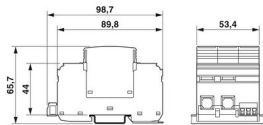
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Stripping length	16 mm
Conductor cross section flexible	1.5 mm ² ... 25 mm ²
Conductor cross section rigid	1.5 mm ² ... 35 mm ²
Conductor cross section AWG	15 ... 2
Connection method	Fork-type cable lug
Conductor cross section flexible	1.5 mm ² ... 16 mm ²

Remote fault indicator contact

Connection method	Plug-in/screw connection via COMBICON
Screw thread	M2
Tightening torque	0.25 Nm
Conductor cross section flexible	0.14 mm ² ... 1.5 mm ²
Conductor cross section rigid	0.14 mm ² ... 1.5 mm ²
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	jet 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

Mode of protection	(DC+) - (DC-) (DC+/DC-) - PE
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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	$\leq 25 \text{ mVA}$
Nominal discharge current I_n (8/20) μs	15 kA
Maximum discharge current I_{max} (8/20) μs	40 kA
Impulse discharge current (10/350) μs , charge	2.5 As
Impulse discharge current (10/350) μs , specific energy	6.25 kJ/ Ω
Impulse discharge current (10/350) μs , peak value I_{imp}	5 kA
Total discharge current I_{total} (8/20) μs	40 kA
Total discharge current I_{total} (10/350) μs	5 kA
Voltage protection level U_p	$\leq 3.5 \text{ kV}$
Residual voltage U_{res}	$\leq 3.5 \text{ kV (at } I_n)$
	$\leq 2.9 \text{ kV (at } 5 \text{ kA)}$
	$\leq 3.2 \text{ kV (at } 10 \text{ kA)}$
	$\leq 3.7 \text{ kV (at } 20 \text{ kA)}$
	$\leq 4.1 \text{ kV (at } 30 \text{ kA)}$
	$\leq 4.6 \text{ kV (at } 40 \text{ kA)}$
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) μs	40 kA
Response time t_A	$\leq 25 \text{ ns}$
Impulse discharge current (10/350) μs , charge	2.5 As
Impulse discharge current (10/350) μs , specific energy	6.25 kJ/ Ω
Impulse discharge current (10/350) μs , peak value I_{imp}	5 kA
Total discharge current I_{total} (8/20) μs	40 kA
Total discharge current I_{total} (10/350) μs	5 kA
Insulation resistance R_{iso}	$> 5 \text{ G}\Omega$ (at 500 V DC)
Nominal discharge current I_n (8/20) μs	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
Residual voltage U_{res}	$\leq 3.5 \text{ kV (at } I_n)$
	$\leq 2.9 \text{ kV (at } 5 \text{ kA)}$
	$\leq 3.2 \text{ kV (at } 10 \text{ kA)}$

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	≤ 3.7 kV (at 20 kA)
	≤ 4.1 kV (at 30 kA)
	≤ 4.6 kV (at 40 kA)
Residual current I_{PE}	≤ 20 μ A DC
	≤ 350 μ A AC
Voltage protection level U_p	≤ 3.5 kV
Standby power consumption P_C	≤ 25 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	≤ 2000 m (amsl (above mean sea level))
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

AC operating voltage	125 V AC
AC operating current	1 A AC

UL connection data

Tightening torque	30 lb _F in.
Conductor cross section AWG	14 ... 2

Standards and regulations

Standards/specifications	EN 61643-31
Standards/specifications	IEC 61643-31

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Mounting

Mounting type	DIN rail: 35 mm
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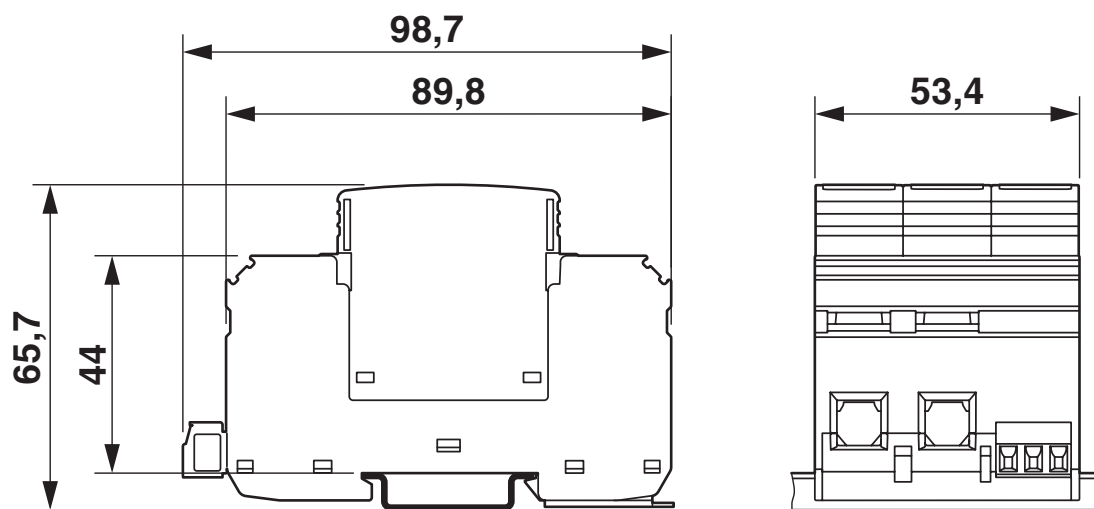
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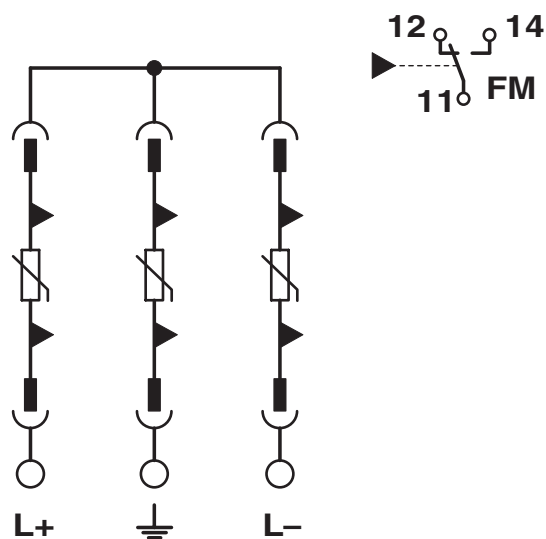
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Drawings

Dimensional drawing



Circuit diagram



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Approvals



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

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Classifications

ECLASS

ECLASS-11.0	27130802
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ETIM

ETIM 8.0	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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Accessories

ZBN 18,LGS:ERDE - Marker for terminal blocks

2749589

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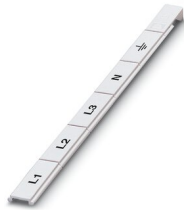


Marker for terminal blocks, Strip, white, labeled, horizontal: Grounding symbol, mounting type: snapped, for terminal block width: 18 mm, lettering field size: 18 x 5 mm, Number of individual labels: 5

ZBN 18,LGS:L1-N,ERDE - Marker for terminal blocks

2749576

<https://www.phoenixcontact.com/in/products/2749576>



Marker for terminal blocks, Strip, white, labeled, horizontal: L1, L2, L3, N, GND, mounting type: snapped, for terminal block width: 18 mm, lettering field size: 18 x 5 mm, Number of individual labels: 5

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ZBN 18:UNBEDRUCKT - Zack marker strip

2809128

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Zack marker strip, Strip, white, unlabeled, can be labeled with: CMS-P1-PLOTTER, PLOTMARK, mounting type: snapped, for terminal block width: 18 mm, lettering field size: 18 x 5 mm, Number of individual labels: 5

B-STIFT - Marker pen

1051993

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Marker pen, for manual labeling of unprinted Zack strips, smear-proof and waterproof, line thickness 0.5 mm

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ATP-QTTCB - Partition plate

3206238

<https://www.phoenixcontact.com/in/products/3206238>

Partition plate, length: 102 mm, width: 2 mm, height: 54 mm, color: gray



VAL-MS-T1/T2 1000DC-PV-ST - Type 1/2 surge protection plug

2801162

<https://www.phoenixcontact.com/in/products/2801162>

Replacement plug for PV arrester combinations from the VAL-MS-T1/T2 1000DC-PV-... product range



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