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

2801160

https://www.phoenixcontact.com/us/products/2801160

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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, 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	2801160
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL01
Product key	CL1152
Catalog page	Page 50 (C-4-2019)
GTIN	4046356714334
Weight per piece (including packing)	401.2 g
Weight per piece (excluding packing)	378.94 g
Customs tariff number	85363030
Country of origin	DE

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.

Product properties

Product type	PV arrester
Product family	VALVETRAB MS
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
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

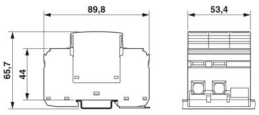
Insulation characteristics

Overvoltage category	III
Pollution degree	2

Connection data

Connection method	Screw connection
Screw thread	M5
Tightening torque	3 Nm (1.5 mm² ... 16 mm²)
	4.5 Nm (25 mm² ... 35 mm²)
Stripping length	16 mm
Conductor cross section flexible	1.5 mm² ... 25 mm²
Conductor cross section rigid	1.5 mm² ... 35 mm²
Conductor cross section AWG	15 ... 2
Connection method	Fork-type cable lug
Conductor cross section flexible	1.5 mm² ... 16 mm²

Dimensions

Dimensional drawing	
Width	53.4 mm
Height	89.8 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

Protective circuit

Mode of protection	(L+) - (L-)
	(L+) - PE
	(L-) - PE
Direction of action	(L+)-PE & (L-)-PE & (L+)-(L-)
Rated load current I_L	80 A
Residual current I_{PE}	≤ 20 µA DC
	≤ 350 µA AC
Standby power consumption P_C	≤ 25.00 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	≤ 3.5 kV
	≤ 3.5 kV (at I_n)

Residual voltage U_{res}	≤ 2.9 kV (at 5 kA)
	≤ 3.2 kV (at 10 kA)
	≤ 3.7 kV (at 20 kA)
	≤ 4.1 kV (at 30 kA)
	≤ 4.6 kV (at 40 kA)
Response time t_A	≤ 25 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}	≤ 975 V DC
Maximum discharge current I_{max} (8/20) µs	40 kA
Response time t_A	≤ 25 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 GΩ (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 µA
Maximum continuous operating voltage U_{CPV}	1170 V DC
Short-circuit current rating I_{SCPV}	2000 A
Residual voltage U_{res}	≤ 3.5 kV (at I_n)
	≤ 2.9 kV (at 5 kA)
	≤ 3.2 kV (at 10 kA)
	≤ 3.7 kV (at 20 kA)
	≤ 4.1 kV (at 30 kA)
	≤ 4.6 kV (at 40 kA)
Residual current I_{PE}	≤ 20 µA DC
	≤ 350 µA AC
Voltage protection level U_p	≤ 3.5 kV
Standby power consumption P_C	≤ 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	≤ 2000 m (amsl)

Permissible humidity (operation)	5 % ... 95 %
Shock (operation)	60g (Half-sine / 11 ms / 3x ±X, ±Y, ±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 connection data

Tightening torque	30 lb_f-in.
Conductor cross section AWG	14 ... 2

Standards and regulations

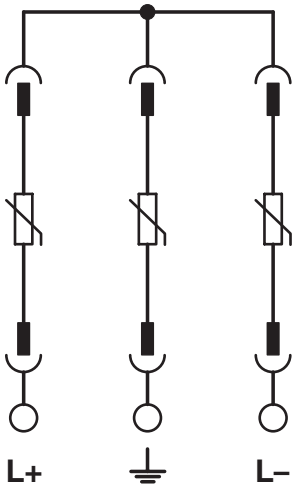
Standards/specifications	EN 61643-31
Note	2019
Standards/specifications	IEC 61643-31
Note	2018

Mounting

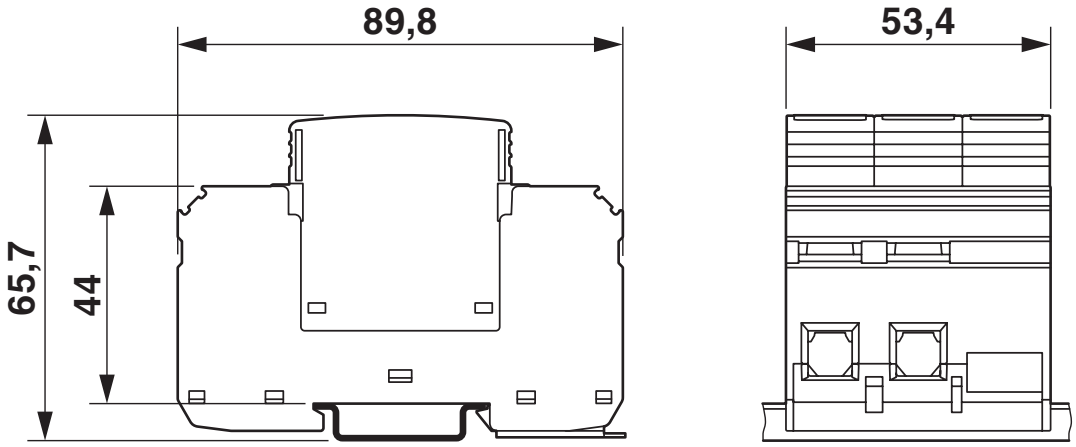
Mounting type	DIN rail: 35 mm

Drawings

Circuit diagram



Dimensional drawing



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

Classifications

ECLASS

ECLASS-11.0	27130802
ECLASS-13.0	27171401

ETIM

ETIM 9.0	EC000381

UNSPSC

UNSPSC 21.0	39121620

Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes, No exemptions

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%

Accessories

ZBN 18 CUS - Zack marker strip

0825059

https://www.phoenixcontact.com/us/products/0825059



Zack marker strip, can be ordered: Strip, white, labeled according to customer specifications, mounting type: snap into tall marker groove, for terminal block width: 18 mm, lettering field size: 18 x 5 mm, Number of individual labels: 5

ZBN 18,LGS:ERDE - Marker for terminal blocks

2749589

https://www.phoenixcontact.com/us/products/2749589



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/us/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

ZBN 18:UNBEDRUCKT - Zack marker strip

2809128

https://www.phoenixcontact.com/us/products/2809128



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

ATP-QTTCB - Partition plate

3206238

https://www.phoenixcontact.com/us/products/3206238

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



B-STIFT - Marker pen

1051993

https://www.phoenixcontact.com/us/products/1051993

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



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SZK PZ2 VDE - Screwdriver

1206463

https://www.phoenixcontact.com/us/products/1206463



Screwdriver, PZ crosshead, VDE insulated, size: PZ 2 x 100 mm, 2-component grip, with non-slip grip

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

2801162

https://www.phoenixcontact.com/us/products/2801162



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

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