

VAL-MS-T1/T2 600DC-PV/2+V-FM - Lightning/surge arrester type 1/2



2801164

<https://www.phoenixcontact.com/us/products/2801164>

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Lightning current arrester / surge protective device for 2-pos. isolated and grounded 600 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	2801164
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL01
Product key	CL1152
Catalog page	Page 50 (C-4-2019)
GTIN	4046356714297
Weight per piece (including packing)	368.4 g
Weight per piece (excluding packing)	340.62 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

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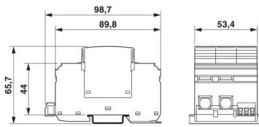
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Stripping length	16 mm
Conductor cross section flexible	1.5 mm ² ... 25 mm ²
Conductor cross section rigid	1.5 mm ² ... 35 mm ²
Conductor cross section AWG	15 ... 2
Connection method	Fork-type cable lug
Conductor cross section flexible	1.5 mm ² ...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

Remote fault indicator contact

Connection method	Plug-in/screw connection via COMBICON
Screw thread	M2
Tightening torque	0.25 Nm
Stripping length	7 mm
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	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	(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}	$\leq 20 \mu\text{A DC}$
	$\leq 350 \mu\text{A AC}$
Standby power consumption P_C	$\leq 25.00 \text{ mVA}$
Nominal discharge current I_n (8/20) 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	7 kA
Voltage protection level U_p	$\leq 2.6 \text{ kV}$
Residual voltage U_{res}	$\leq 2.6 \text{ kV}$ (at I_n)
	$\leq 2 \text{ kV}$ (at 5 kA)
	$\leq 2.3 \text{ kV}$ (at 10 kA)
	$\leq 2.8 \text{ kV}$ (at 20 kA)
	$\leq 3.1 \text{ kV}$ (at 30 kA)
	$\leq 3.6 \text{ kV}$ (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}	$\leq 600 \text{ V DC}$
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	7 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}	720 V DC
Short-circuit current rating I_{SCPV}	2000 A

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Residual voltage U_{res}	≤ 2.6 kV (at I_n)
	≤ 2 kV (at 5 kA)
	≤ 2.3 kV (at 10 kA)
	≤ 2.8 kV (at 20 kA)
	≤ 3.1 kV (at 30 kA)
	≤ 3.6 kV (at 40 kA)
Residual current I_{PE}	≤ 20 μ A DC
	≤ 350 μ A AC
Voltage protection level U_p	≤ 2.6 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 $\pm$ X, $\pm$ Y, $\pm$ Z)
Vibration (operation)	7.5g (5-500 Hz/2.5 h/XYZ)

Approvals

UL specifications

Maximum continuous operating voltage MCOV	800 V DC
Short-circuit current rating (SCCR)	50 kA
Voltage protection rating VPR	2 kV
Nominal discharge current I_n	20 kA
Mode of protection	(L+) - (L-)
	(L+) - G
	(L-) - G
Nominal voltage	800 V DC
Power distribution system	DC PV
SPD Type	1

UL indicator/remote signaling

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

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

Mounting

Mounting type	DIN rail: 35 mm
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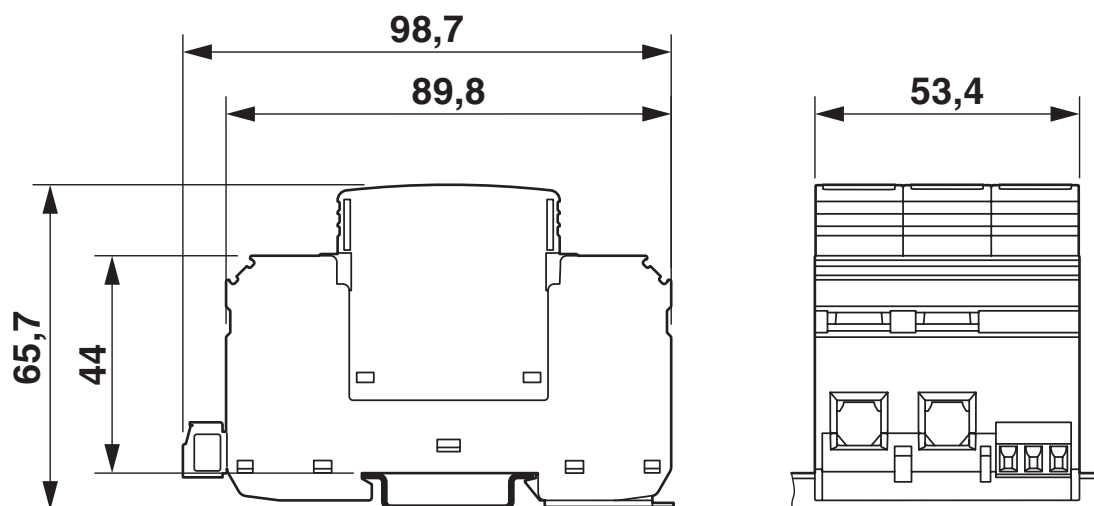
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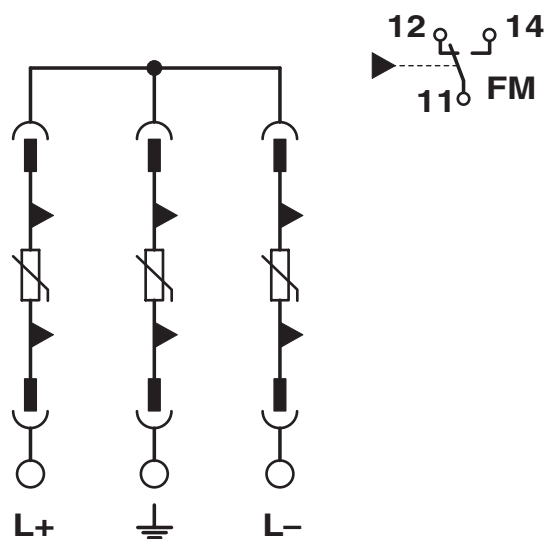
<https://www.phoenixcontact.com/us/products/2801164>

Drawings

Dimensional drawing



Circuit diagram



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Approvals

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EAC

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



KEMA-KEUR

Approval ID: 71-123544 REV.2



UL Listed

Approval ID: FILE E 330181



cUL Listed

Approval ID: FILE E 330181



IECEE CB Scheme

Approval ID: NL-81006/A1

CCA

Approval ID: NTR-NL 7937

UAE-RoHS

Approval ID: 23-10-88705

cULus Listed

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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

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%

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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

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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

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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 600DC-PV-ST - Type 1/2 surge protection plug

2801165

<https://www.phoenixcontact.com/us/products/2801165>



Replacement plug for PV arrester combinations from the VAL-MS-T1/T2 600DC-PV-... product range

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