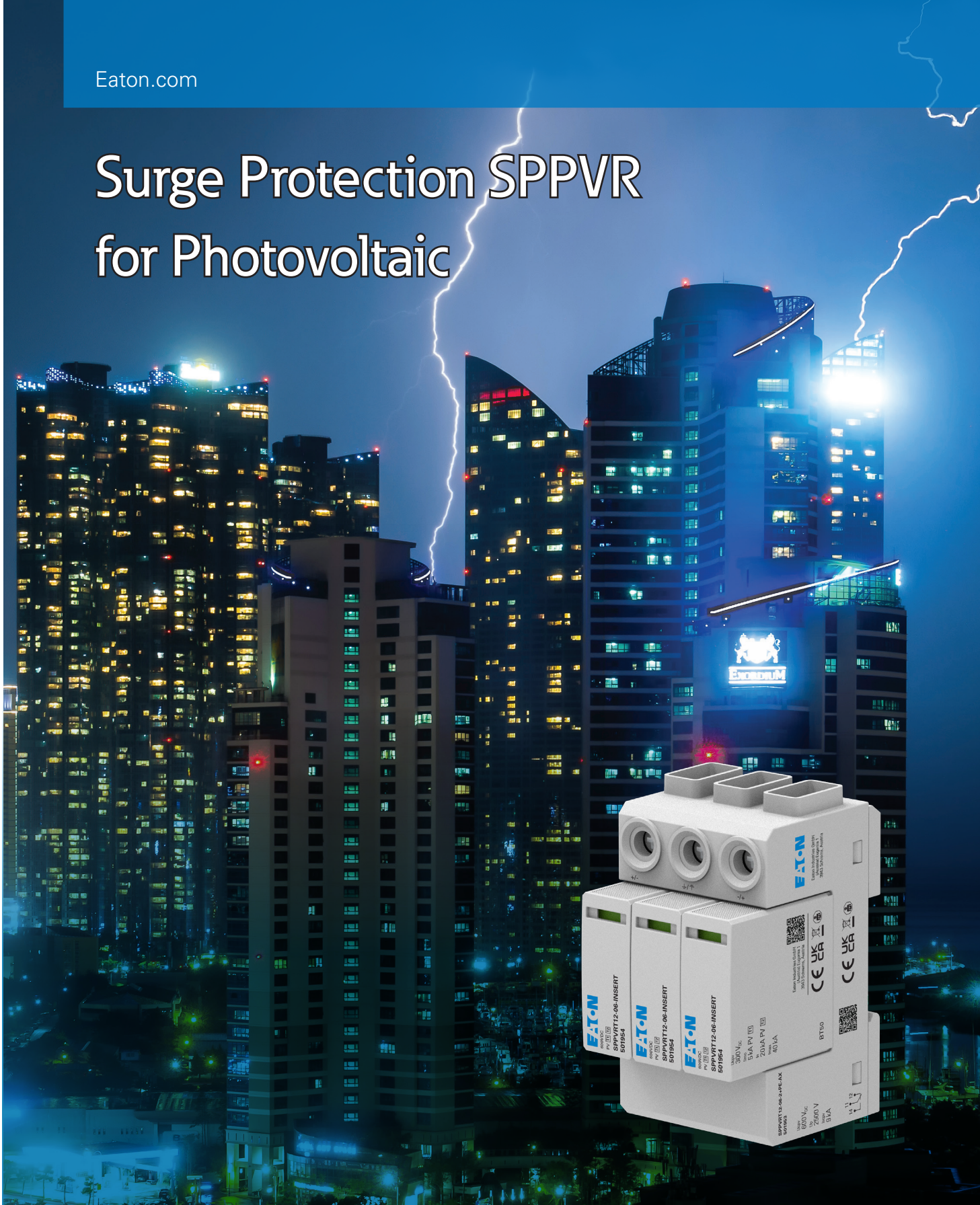


# Surge Protection SPPVR for Photovoltaic



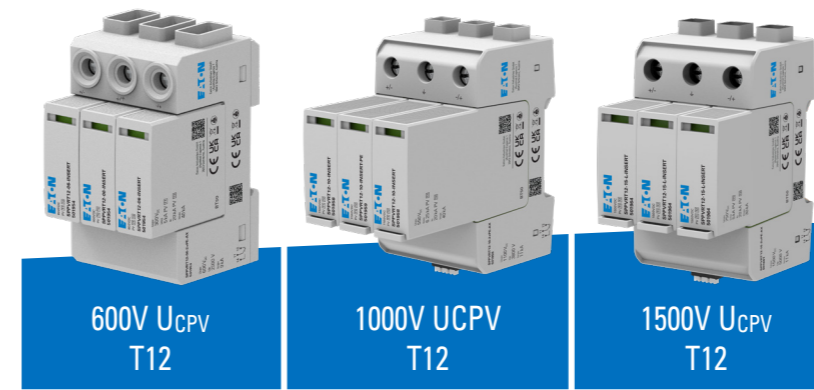
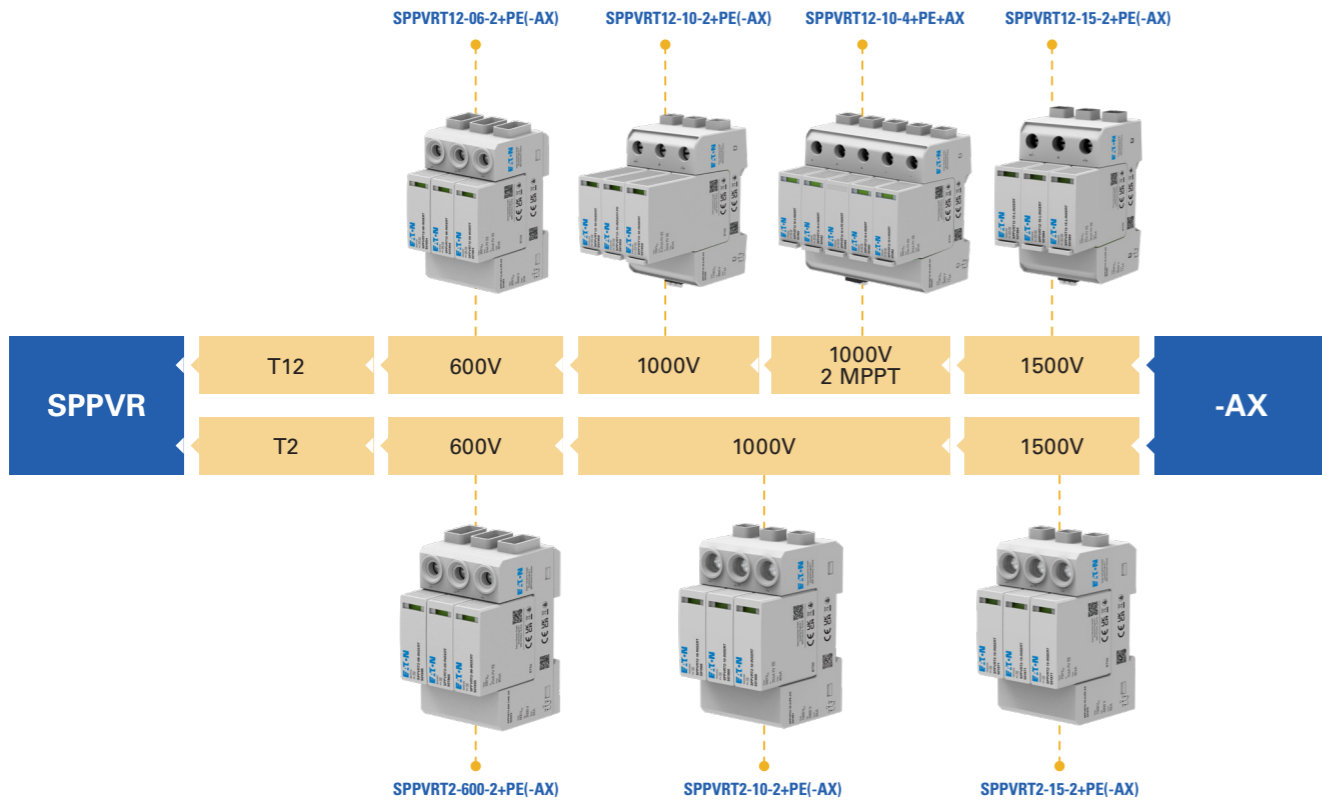
Powering Business Worldwide

SPPVR Family Overview

The SPPVR family of surge protection devices (SPD) is Eaton's answer to the rising need for safe and reliable PV installations in residential and commercial applications.

Powerful protection for your inverter is the first step to ensure a long lifetime of your equipment and inverter: Surge protection ensures that your system is not damaged by any overvoltage event that this happening on the DC side of your PV application.

With the SPPVR family Eaton enables you to establish a PV application from one source, specialized for decades on providing you safety above the standard in a sustainable way.



Description

- DC Surge Protection Devices (SPD) for photovoltaic systems
- Versatile product range covering 600 - 1500 V DC applications
- Test class 1 and 2 combined devices for applications with a risk of damage from direct lightning strikes
- Remote contact available for all types (-AX)

Types

SPPVR - "AX"

- These types come with an auxiliary contact

### Test class 1 and 2 combined SPD for 600 V DC applications

- Powerful yet compact solution for 600 V DC applications
- Perfect fit for enclosures such as CI-Safety
- Replacement plugs available
- Available as -AX type which comes already equipped with an auxiliary contact
- Operational temperature range up to 85°C to perform well under harsh conditions

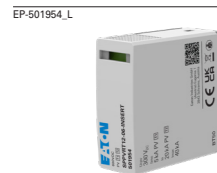
$U_{CPV}$ (Voltage per MPPT)	Test class	Type Designation	Article No.	Units per package (Pcs.)
600 V	T12	SPPVRT12-06-2+PE	EP-501952	1
600 V	T12	SPPVRT12-06-2+PE-AX	EP-501953	1

#### -AX type with integrated auxiliary contact



#### Replacement inserts for SPPVRT-12-06-2+PE(-AX)

Configuration	Type	Article No.	Units per package
(+) / (-) / PE	SPPVRT12-06-INSERT	EP-501954	1

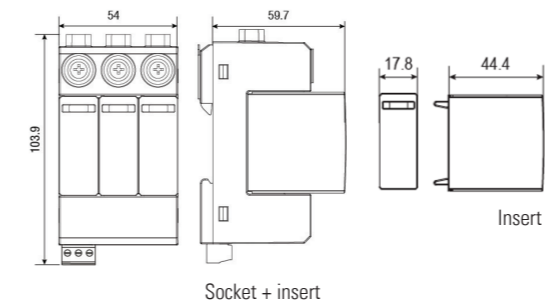


### Technical Data

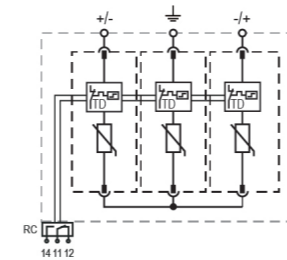
SPPVRT12-06-2+PE(-AX)		
<b>General data</b>		
Standards/regulations	IEC 61643-31:2018 EN 61643-31:2019	
Pollution degree	2	
Housing material	UL 94 V-0 (Thermoplastic)	
Degree of protection	IP20	
Ambient temperature (operation)	$T_a$	-40°C up to +85 °C
Permissible humidity (operation)	RH	5% up to 95%
Max. altitude	2000 m	
<b>Electric data</b>		
Mode of Protection	(+) – PE / (-) – PE / (+) – (-)	
Number of Ports	1	
Nominal Voltage	$U_{CPV}$	600 V DC
Nominal Discharge Current (8/20 $\mu$ s)	$I_n$	20 kA
Maximum Discharge Current (8/20 $\mu$ s)	$I_{max}$	40 kA
Impulse Discharge Current (10/350 $\mu$ s)	$I_{imp}$	5 kA
Total Discharge Current (8/20 $\mu$ s)	$I_{total}$	40 kA
Total Discharge Current (10/350 $\mu$ s)	$I_{total}$	5 kA
Rated short circuit current rating	$I_{SCPV}$	9 kA
Specific energy	W/R	1.56 kJ/ $\Omega$
Charge	Q	1.25 As
Response Time	tA	< 25 ns
Voltage protection level	(+) - (-)	< 2.5 kV
	(+) - PE	< 2.5 kV
	(-) – PE	< 2.5 kV
Thermal Protection	Yes (integrated)	

SPPVRT12-06-2+PE(-AX)		
<b>Electric data (-AX contact)</b>		
Switching capabilities	AC	1 A @ 120 – 250 V
	DC	0.5 A @ 12 – 48 V
Permissible conductor cross section (max)	Solid	1.5 mm <sup>2</sup>
<b>Technical data</b>		
Mounting	Din-Rail (35 mm, EN 60715)	
Connections	1x (+), 1x (-), 1x PE	
Permissible conductor cross section (max)	Solid	6 mm <sup>2</sup>
	Stranded	35 mm <sup>2</sup>
	Flexible	25 mm <sup>2</sup>

### Dimensions (mm)



### Internal Configuration





Test class 1 and 2 combined SPD for 1000 V DC applications

- Powerful yet compact solution for 1000 V DC applications
- High  $I_{imp} / I_{total}$  rating to omit the need for a risk assessment of the application
- Perfect fit for enclosures such as CI-Safety
- Replacement plugs available
- Available as -AX type which comes already equipped with an auxiliary contact
- Operational temperature range up to 85°C to perform well under harsh conditions
- Could be mounted in:
  - xEnergy Safety Ci: Types AV...-200
  - xEnergy Basic EWK: Types EWK-G...
  - xComfort IKA: Types IKA-1/12... or bigger, only when mounted in middle position

$U_{CPV}$ (Voltage per MPPT)	Test class	Type Designation	Article No.	Units per package (Pcs.)
<b>-AX type with integrated auxiliary contact</b>				
1000 V	T12	SPPVRT12-10-2+PE	EP-501955	1
1000 V	T12	SPPVRT12-10-2+PE-AX	EP-501956	1



Replacement inserts for SPPVRT-12-10-2+PE(-AX)

(+) / (-)	SPPVRT12-10-INSERT	EP-501958	1
PE	SPPVRT12-10-INSERT-PE	EP-501959	1

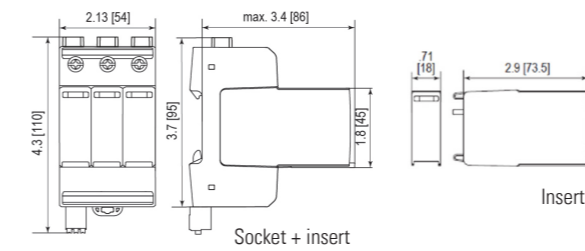


Technical Data

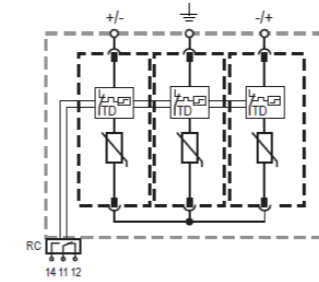
SPPVRT12-10-2+PE(-AX)	
<b>General data</b>	
Standards/regulations	IEC 61643-31:2018 EN 61643-31:2019
Pollution degree	2
Housing material	UL 94 V-0 (Thermoplastic)
Degree of protection	IP20
Ambient temperature (operation)	Ta -40°C up to +85 °C
Permissible humidity (operation)	RH 5% up to 95%
Max. altitude	4000 m
<b>Electric data</b>	
Mode of Protection	(+) – PE / (-) – PE / (+) – (-)
Number of Ports	1
Nominal Voltage	$U_{CPV}$ 1100 V DC
Nominal Discharge Current (8/20 μs)	$I_n$ 20 kA
Maximum Discharge Current (8/20 μs)	$I_{max}$ 40 kA
Impulse Discharge Current (10/350 μs)	$I_{imp}$ 6.25 kA
Total Discharge Current (8/20 μs)	$I_{total}$ 50 kA
Total Discharge Current (10/350 μs)	$I_{total}$ 12.5 kA
Rated short circuit current rating	$I_{SCPV}$ 11 kA
Specific energy	W/R 9.77 kJ/Ω
Charge	Q 3.12 As
Response Time	$t_A$ < 25 ns
Voltage protection level	(+) - (-) < 3.8 kV (+) - PE < 3.8 kV (-) – PE < 3.8 kV
Thermal Protection	Yes (integrated)

SPPVRT12-10-2+PE(-AX)	
<b>Electric data (-AX contact)</b>	
Switching capabilities	AC 1 A @ 120 – 250 V DC 0.5 A @ 12 – 48 V
Permissible conductor cross section (max)	Solid 1.5 mm <sup>2</sup>
<b>Technical data</b>	
Mounting	Din-Rail (35 mm, EN 60715)
Connections	1x (+), 1x (-), 1x PE
Permissible conductor cross section (max)	Solid 35 mm <sup>2</sup> Stranded 35 mm <sup>2</sup> Flexible 25 mm <sup>2</sup>

Dimensions (mm)



Internal Configuration



### Test class 1 and 2 combined SPD for 1500 V DC applications

- Powerful yet compact solution for 1500 V DC applications
- High  $I_{imp} / I_{total}$  rating to omit the need for a risk assessment of the application
- Perfect fit for enclosures such as CI-Safety
- Replacement plugs available
- Available as -AX type which comes already equipped with an auxiliary contact
- Operational temperature range up to 85°C to perform well under harsh conditions

$U_{CPV}$ (Voltage per MPPT)	Test class	Type Designation	Article No.	Units per package (Pcs.)
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#### -AX type with integrated auxiliary contact

1500 V	T12	SPPVRT12-15-2+PE	EP-501960	1
1500 V	T12	SPPVRT12-15-2+PE-AX	EP-501961	1

EP-501961\_L



#### Replacement inserts for SPPVRT-12-10-2+PE(-AX)

(+) / (-) / PE		SPPVRT12-15-L-INSERT	EP-501964	1
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EP-501964\_L



### Technical Data

		SPPVRT12-15-2+PE(-AX)
<b>General data</b>		
Standards/regulations		IEC 61643-31:2018 EN 61643-31:2019
Pollution degree		2
Housing material		UL 94 V-0 (Thermoplastic)
Degree of protection		IP20
Ambient temperature (operation)	Ta	-40°C up to +85 °C
Permissible humidity (operation)	RH	5% up to 95%
Max. altitude		4000 m
<b>Electric data</b>		
Mode of Protection		(+) – PE / (-) – PE / (+) – (-)
Number of Ports		1
Nominal Voltage	$U_{CPV}$	1500 V DC
Nominal Discharge Current (8/20 $\mu$ s)	$I_n$	20 kA
Maximum Discharge Current (8/20 $\mu$ s)	$I_{max}$	30 kA
Impulse Discharge Current (10/350 $\mu$ s)	$I_{imp}$	5 kA
Total Discharge Current (8/20 $\mu$ s)	$I_{total}$	40 kA
Total Discharge Current (10/350 $\mu$ s)	$I_{total}$	5 kA
Rated short circuit current rating	$I_{SCPV}$	11 kA
Specific energy	W/R	6.25 kJ/ $\Omega$
Charge	Q	2.5 As
Response Time	$t_A$	< 25 ns
Voltage protection level	(+) - (-)	< 5 kV
	(+) - PE	< 5 kV
	(-) – PE	< 5 kV
Thermal Protection		Yes (integrated)

### SPPVRT12-15-2+PE(-AX)

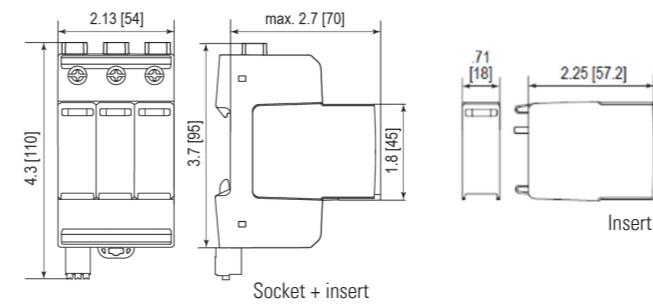
#### Electric data (-AX contact)

Switching capabilities	AC	1 A @ 120 – 250 V
	DC	0.5 A @ 12 – 48 V
Permissible conductor cross section (max)	Solid	1.5 mm <sup>2</sup>

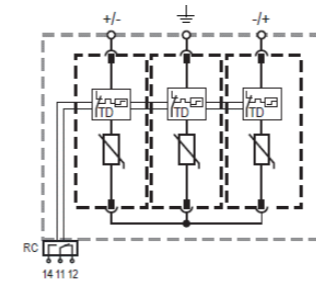
#### Technical data

Mounting	Din-Rail (35 mm, EN 60715)	
Connections	1x (+), 1x (-), 1x PE	
Permissible conductor cross section (max)	Solid	35 mm <sup>2</sup>
	Stranded	35 mm <sup>2</sup>
	Flexible	25 mm <sup>2</sup>

#### Dimensions (mm)



#### Internal Configuration





#### Description

- DC Surge Protection Device (SPD) for photovoltaic systems
- One SPD protects 2 MPPT, offering a compact yet powerful solution
- Test class 1 and 2 combined tested device for applications with a risk of damage from direct lightning strikes
- Remote contact integrated

#### Type SPPVR-“AX”

- These types come with an auxiliary contact

#### Test class 1 and 2 combined 2 MPPT SPD for 1000 V DC applications

- Powerful yet compact solution for 1000 V DC applications
- Space saving solution to protect 2 MPPT in one protection device
- Replacement plugs available for easy replacement
- This type already comes equipped with an auxiliary contact

$U_{CPV}$ (Voltage per MPPT)	Test class	Type Designation	Article No.	Units per package (Pcs.)
<b>-AX type with integrated auxiliary contact</b>				
1100 V	T12	SPPVRT12-10-4+PE+AX	EP-501957	1

EP-501957\_L



#### Replacement inserts for SPPVRT-12-10-4+PE+AX

(+) / (-)	SPPVRT12-10-4-INSERT	EP-501962	1
PE	SPPVRT12-10-4-PE-INSERT	EP-501963	1

EP-501962\_L

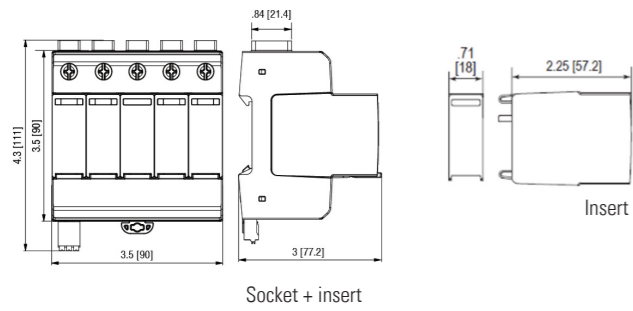


#### Technical Data

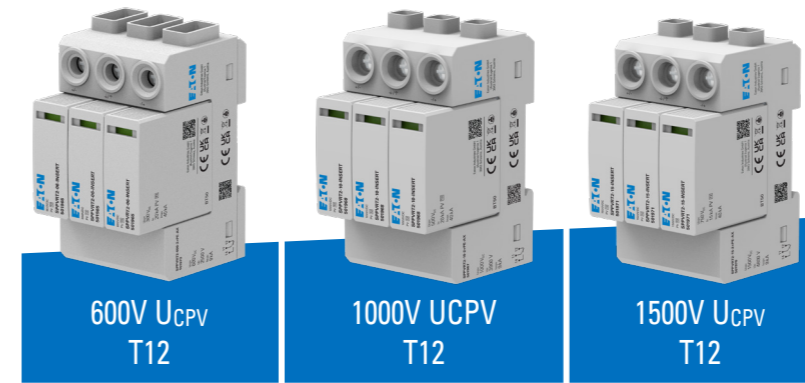
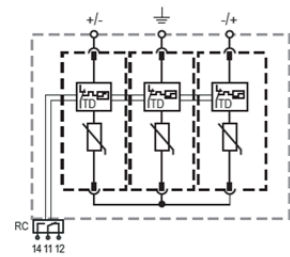
		<b>SPPVRT12-10-4+PE+AX</b>	
<b>General data</b>			
Standards/regulations		IEC 61643-31:2018 EN 61643-31:2019	
Pollution degree		2	
Housing material		UL 94 V-0 (Thermoplastic)	
Degree of protection		IP20	
Ambient temperature (operation)	Ta	-40°C up to +70 °C	
Permissible humidity (operation)	RH	5% up to 95%	
Max. altitude		4000 m	
<b>Electric data</b>			
Mode of Protection		(+) – PE / (-) – PE / (+) – (-)	
Number of Ports		1	
Nominal Voltage	$U_{CPV}$	1100 V DC	
Nominal Discharge Current (8/20 $\mu$ s)	$I_n$	20 kA	
Maximum Discharge Current (8/20 $\mu$ s)	$I_{max}$	40 kA	
Impulse Discharge Current (10/350 $\mu$ s)	$I_{imp}$	5 kA	
Total Discharge Current (8/20 $\mu$ s)	$I_{total}$	50 kA	
Total Discharge Current (10/350 $\mu$ s)	$I_{total}$	10 kA	
Rated short circuit current rating	$I_{SCPV}$	11 kA	
Specific energy	W/R	6.25 kJ/ $\Omega$	
Charge	Q	2.5 As	
Response Time	$t_A$	< 25 ns	
Voltage protection level	(+) - (-)	< 3.8 kV	
	(+) - PE	< 3.8 kV	
	(-) – PE	< 3.8 kV	
Thermal Protection		Yes (integrated)	

SPPVRT12-10-4+PE+AX		
<b>Electric data (-AX contact)</b>		
Switching capabilities	AC	1 A @ 120 – 250 V
	DC	0.5 A @ 12 – 48 V
Permissible conductor cross section (max)	Solid	1.5 mm <sup>2</sup>
<b>Technical data</b>		
Mounting	Din-Rail (35 mm, EN 60715)	
Connections	2x (+), 2x (-), 1x PE	
Permissible conductor cross section (max)	Solid	35 mm <sup>2</sup>
	Stranded	35 mm <sup>2</sup>
	Flexible	25 mm <sup>2</sup>

### Dimensions (mm)



### Internal Configuration



### Description

- DC Surge Protection Devices (SPD) for photovoltaic systems
- Versatile product range covering 600 - 1500 V DC applications
- Class 2 tested devices for the majority of applications
- Remote contact available for all types (-AX)

### Types

#### SPPVR – “AX”

- These types come with an auxiliary contact

### Test class 2 SPD for 600 V DC applications

- Powerful yet compact solution for 600 V DC applications
- Perfect fit for enclosures such as IKA, CI-Safety or similar
- Replacement plugs available
- Available as -AX type which comes already equipped with an auxiliary contact
- Operational temperature range up to 85°C to perform well under harsh conditions

$U_{CPV}$ (Voltage per MPPT)	Test class	Type Designation	Article No.	Units per package (Pcs.)
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#### -AX type with integrated auxiliary contact

600 V	T2	SPPVRT2-600-2+PE	EP-501972	1
600 V	T2	SPPVRT2-600-2+PE-AX	EP-501973	1



#### Replacement inserts for SPPVRT-2-600-2+PE(-AX)

(+) / (-) / PE		SPPVRT2-06-INSERT	EP-501965	1
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### Technical Data

SPPVRT2-600-2+PE(-AX)	
<b>General data</b>	
Standards/regulations	IEC 61643-31:2018 EN 61643-31:2019
Pollution degree	2
Housing material	UL 94 V-0 (Thermoplastic)
Degree of protection	IP20
Ambient temperature (operation)	Ta -40°C up to +85 °C
Permissible humidity (operation)	RH 5% up to 95%
Max. altitude	2000 m
<b>Electric data</b>	
Mode of Protection	(+) – PE / (-) – PE / (+) – (-)
Number of Ports	1
Nominal Voltage	$U_{CPV}$ 600 V DC
Nominal Discharge Current (8/20 $\mu$ s)	$I_n$ 20 kA
Maximum Discharge Current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Total Discharge Current (8/20 $\mu$ s)	$I_{total}$ 40 kA
Rated short circuit current rating	$I_{SCPV}$ 9 kA
Response Time	$t_A$ < 25 ns
Voltage protection level	(+) - (-) < 2.5 kV (+) - PE < 2.5 kV (-) – PE < 2.5 kV
Thermal Protection	Yes (integrated)

### SPPVRT2-600-2+PE(-AX)

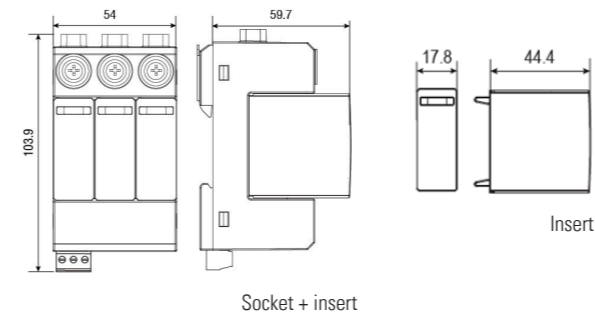
#### Electric data (-AX contact)

Switching capabilities	AC	1 A @ 120 – 250 V
	DC	0.5 A @ 12 – 48 V
Permissible conductor cross section (max)	Solid	1.5 mm <sup>2</sup>

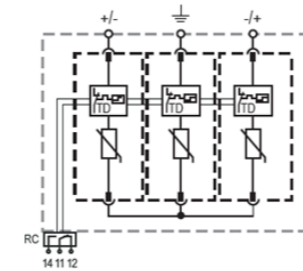
#### Technical data

Mounting	Din-Rail (35 mm, EN 60715)	
Connections	1x (+), 1x (-), 1x PE	
Permissible conductor cross section (max)	Solid	6 mm <sup>2</sup>
	Stranded	35 mm <sup>2</sup>
	Flexible	25 mm <sup>2</sup>

### Dimensions (mm)



### Internal Configuration





### Test class 2 SPD for 1000 V DC applications

- Powerful yet compact solution for 1000 V DC applications
- Perfect fit for enclosures such as IKA, CI-Safety or similar
- Replacement plugs available
- Available as -AX type which comes already equipped with an auxiliary contact
- Operational temperature range up to 85°C to perform well under harsh conditions

$U_{CPV}$ (Voltage per MPPT)	Test class	Type Designation	Article No.	Units per package (Pcs.)
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#### -AX type with integrated auxiliary contact

EP-501967_L	1000 V	T2	SPPVRT2-10-2+PE	EP-501966	1
	1000 V	T2	SPPVRT2-10-2+PE-AX	EP-501967	1



#### Replacement inserts for SPPVRT2-10-2+PE(-AX)

EP-501968_L	(+) / (-) / PE		SPPVRT2-10-INSERT	EP-501968	1
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#### SPPVRT2-10-2+PE(-AX)

General data	
Standards/regulations	IEC 61643-31:2018 EN 61643-31:2019
Pollution degree	2
Housing material	UL 94 V-0 (Thermoplastic)
Degree of protection	IP20
Ambient temperature (operation)	Ta -40°C up to +85 °C
Permissible humidity (operation)	RH 5% up to 95%
Max. altitude	2000 m

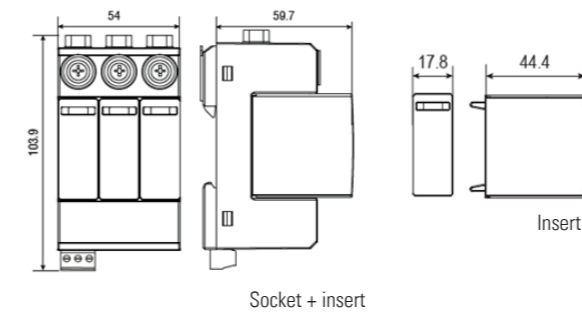
Electric data	
Mode of Protection	(+) – PE / (-) – PE / (+) – (-)
Number of Ports	1
Nominal Voltage	$U_{CPV}$ 1000 V DC
Nominal Discharge Current (8/20 $\mu$ s)	$I_n$ 20 kA
Maximum Discharge Current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Total Discharge Current (8/20 $\mu$ s)	$I_{total}$ 40 kA
Rated short circuit current rating	$I_{SCPV}$ 9 kA
Response Time	$t_A$ < 25 ns
Voltage protection level	(+) - (-) < 3.9 kV (+) - PE < 3.9 kV (-) – PE < 3.9 kV
Thermal Protection	Yes (integrated)

#### SPPVRT2-10-2+PE(-AX)

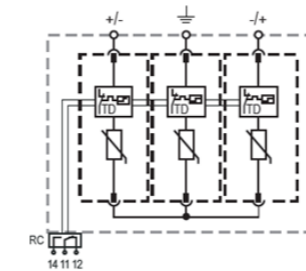
Electric data (-AX contact)	
Switching capabilities	AC 1 A @ 120 – 250 V DC 0.5 A @ 12 – 48 V
Permissible conductor cross section (max)	Solid 1.5 mm <sup>2</sup>

Technical data	
Mounting	Din-Rail (35 mm, EN 60715)
Connections	1x (+), 1x (-), 1x PE
Permissible conductor cross section (max)	Solid 6 mm <sup>2</sup> Stranded 35 mm <sup>2</sup> Flexible 25 mm <sup>2</sup>

#### Dimensions (mm)



#### Internal Configuration



### Test class 2 SPD for 1500 V DC applications

- Powerful yet compact solution for 1500 V DC applications
- Perfect fit for enclosures such as IKA, CI-Safety or similar
- Replacement plugs available
- Available as -AX type which comes already equipped with an auxiliary contact
- Operational temperature range up to 85°C to perform well under harsh conditions

$U_{CPV}$ (Voltage per MPPT)	Test class	Type Designation	Article No.	Units per package (Pcs.)
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#### -AX type with integrated auxiliary contact

EP-501970_L	1500 V	T2	SPPVRT2-15-2+PE	EP-501969	1
	1500 V	T2	SPPVRT2-15-2+PE-AX	EP-501970	1



#### Replacement inserts for SPPVRT2-15-2+PE(-AX)

EP-501971_L	(+) / (-) / PE		SPPVRT2-15-INSERT	EP-501971	1
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#### SPPVRT2-15-2+PE(-AX)

General data	
Standards/regulations	IEC 61643-31:2018 EN 61643-31:2019
Pollution degree	2
Housing material	UL 94 V-0 (Thermoplastic)
Degree of protection	IP20
Ambient temperature (operation)	Ta -40°C up to +85 °C
Permissible humidity (operation)	RH 5% up to 95%
Max. altitude	2000 m

Electric data	
Mode of Protection	(+) – PE / (-) – PE / (+) – (-)
Number of Ports	1
Nominal Voltage	$U_{CPV}$ 1000 V DC
Nominal Discharge Current (8/20 $\mu$ s)	$I_n$ 20 kA
Maximum Discharge Current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Total Discharge Current (8/20 $\mu$ s)	$I_{total}$ 40 kA
Rated short circuit current rating	$I_{SCPV}$ 9 kA
Response Time	$t_A$ < 25 ns
Voltage protection level	(+) - (-) < 4.8 kV (+) - PE < 4.8 kV (-) – PE < 4.8 kV
Thermal Protection	Yes (integrated)

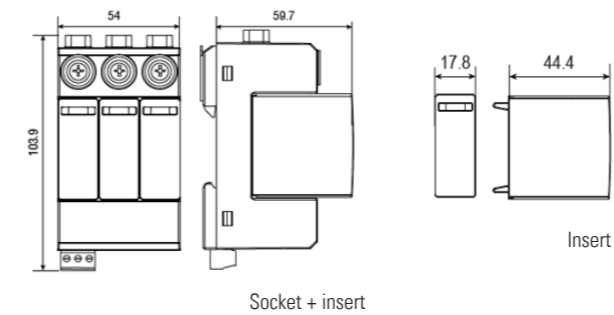
#### SPPVRT2-15-2+PE(-AX)

Electric data (-AX contact)	
Switching capabilities	AC 1 A @ 120 – 250 V DC 0.5 A @ 12 – 48 V
Permissible conductor cross section (max)	Solid 1.5 mm <sup>2</sup>

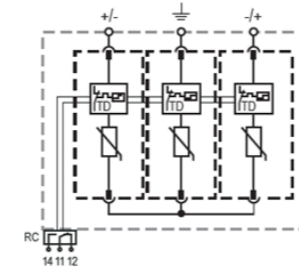
#### Technical data

Mounting	Din-Rail (35 mm, EN 60715)
Connections	1x (+), 1x (-), 1x PE
Permissible conductor cross section (max)	Solid 6 mm <sup>2</sup> Stranded 35 mm <sup>2</sup> Flexible 25 mm <sup>2</sup>

#### Dimensions (mm)



#### Internal Configuration



Eaton's electrical business is a global leader with deep regional application expertise in power distribution and circuit protection; power quality, backup power and energy storage; control and automation; life safety and security; structural solutions; and harsh and hazardous environment solutions. Through end-to-end services, channel and an integrated digital platform & insights Eaton is powering what matters across industries and around the world, helping customers solve their most critical electrical power management challenges.

For more information, visit [Eaton.com](https://www.eaton.com).



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