

# DC surge protection devices Ex9UEP (N)



- DC Surge Protection Devices suitable for Photovoltaic systems
- PV T2 (Class II, Type 2, C) class SPDs
- Meet requirements of EN 61643
- Nominal discharge current  $I_n$  20 kA (8/20  $\mu$ s) per path
- Maximum discharge current  $I_{max}$  40 kA (8/20  $\mu$ s)
- Max. continuous operational voltage UCPV from 500 to 1500 V DC
- For grounded and ungrounded PV systems
- Plug-in module design with status indication
- Optional remote indication contact

DC Surge protection devices Ex9UEP are suitable for photovoltaic applications. These SPDs are designed and tested according PV T2 class from EN 61643 standard.

Indication front window helps users to know the status of device and remote-signal port is able to provide remote indication and alarm.

Plug-in module design make it convenient to change module without device disconnection.

## Type Key

Ex9	UEP		20	R	3P	1200		(N)
Product family	Product	Class	Current	Signaling contact	Module width	Max. oper. voltage	Plug-in module	Version
Ex9	UEP: DC Surge Protective Devices	_ : PV T2 class II C T2	$I_n$ (8/20 $\mu$ s) 20 kA	R: Yes _ : No	1P: 1 MU 2P: 2 MU 3P: 3 MU	500 V DC 600 V DC 750 V DC 1000 V DC 1200 V DC 1500 V DC	_ : Complete device M: Plug-in module only	(N): Meets requirements of EN 61643

## Certification marks



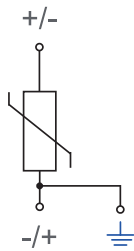
# DC surge protection devices Ex9UEP (N)

## Complete devices for grounded PV systems, 1-pole



Max. oper. voltage $U_{CPV}$	Connection configuration	Signaling contact	Article No.	Type	Packing
500 V DC	I	no	113230	Ex9UEP 20 1P 500 (N)	1/96
500 V DC	I	yes	113231	Ex9UEP 20R 1P 500 (N)	1/96
600 V DC	I	no	112888	Ex9UEP 20 1P 600 (N)	1/96
600 V DC	I	yes	112889	Ex9UEP 20R 1P 600 (N)	1/96
750 V DC	I	no	112900	Ex9UEP 20 1P 750 (N)	1/96
750 V DC	I	yes	112901	Ex9UEP 20R 1P 750 (N)	1/96

Connection diagram:

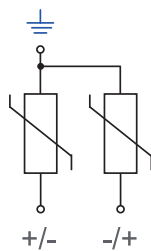


## Complete devices for ungrounded PV systems, 2-pole



Max. oper. voltage $U_{CPV}$	Connection configuration	Signaling contact	Article No.	Type	Packing
500 V DC	U	no	113232	Ex9UEP 20 2P 500 (N)	1/81
500 V DC	U	yes	113233	Ex9UEP 20R 2P 500 (N)	1/81
600 V DC	U	no	112890	Ex9UEP 20 2P 600 (N)	1/81
600 V DC	U	yes	112891	Ex9UEP 20R 2P 600 (N)	1/81
750 V DC	U	no	112902	Ex9UEP 20 2P 750 (N)	1/81
750 V DC	U	yes	112903	Ex9UEP 20R 2P 750 (N)	1/81

Connection diagram:



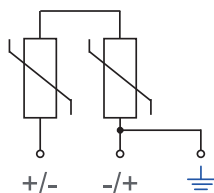
# DC surge protection devices Ex9UEP (N)

## Complete devices for grounded PV systems, 2-pole



Max. oper. voltage $U_{CPV}$	Connection configuration	Signaling contact	Article No.	Type	Packing
1000 V DC	U	no	112904	Ex9UEP 20 2P 1000 (N)	1/81
1000 V DC	U	yes	112905	Ex9UEP 20R 2P 1000 (N)	1/81
1200 V DC	U	no	112892	Ex9UEP 20 2P 1200 (N)	1/81
1200 V DC	U	yes	112893	Ex9UEP 20R 2P 1200 (N)	1/81
1500 V DC	U	no	112908	Ex9UEP 20 2P 1500 (N)	1/81
1500 V DC	U	yes	112909	Ex9UEP 20R 2P 1500 (N)	1/81

Connection diagram:

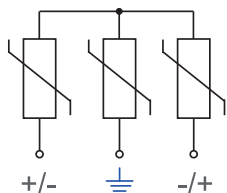


## Complete devices for ungrounded PV systems, 3-pole



Max. oper. voltage $U_{CPV}$	Connection configuration	Signaling contact	Article No.	Type	Packing
1000 V DC	Y	no	112906	Ex9UEP 20 3P 1000 (N)	1/54
1000 V DC	Y	yes	112907	Ex9UEP 20R 3P 1000 (N)	1/54
1200 V DC	Y	no	112894	Ex9UEP 20 3P 1200 (N)	1/54
1200 V DC	Y	yes	112895	Ex9UEP 20R 3P 1200 (N)	1/54
1500 V DC	Y	no	112910	Ex9UEP 20 3P 1500 (N)	1/54
1500 V DC	Y	yes	112911	Ex9UEP 20R 3P 1500 (N)	1/54

Connection diagram:



## Spare plug-in module



Max. oper. voltage $U_{CPV}$	Suitable for device	Article No.	Type	Packing
500 V DC	Ex9UEP 20 1P 500 (N)	113234	Ex9UEP 20 1P 500M (N)	1
600 V DC	Ex9UEP 20 1P 600 (N)	112896	Ex9UEP 20 1P 600 M (N)	1
750 V DC	Ex9UEP 20 1P 750 (N)	112912	Ex9UEP 20 1P 750 M (N)	1
500 V DC	Ex9UEP 20 2P 500 (N)	113235	Ex9UEP 20 2P 500M (N)	1
600 V DC	Ex9UEP 20 2P 600 (N)	112897	Ex9UEP 20 2P 600 M (N)	1
750 V DC	Ex9UEP 20 2P 750 (N)	112913	Ex9UEP 20 2P 750 M (N)	1
1000 V DC	Ex9UEP 20 2P 1000 (N)	112914	Ex9UEP 20 2P 1000 M (N)	1
1200 V DC	Ex9UEP 20 2P 1200 (N)	112898	Ex9UEP 20 2P 1200 M (N)	1
1500 V DC	Ex9UEP 20 2P 1500 (N)	112916	Ex9UEP 20 2P 1500 M (N)	1
1000 V DC	Ex9UEP 20 3P 1000 (N)	112915	Ex9UEP 20 3P 1000 M (N)	1
1200 V DC	Ex9UEP 20 3P 1200 (N)	112899	Ex9UEP 20 3P 1200 M (N)	1
1500 V DC	Ex9UEP 20 3P 1500 (N)	112917	Ex9UEP 20 3P 1500 M (N)	1

# Technical Data Ex9UEP (N)

## DC surge protection devices PV T2, $I_n = 20 \text{ kA}$ (8/20 $\mu\text{s}$ )

### General parameters

Designed and suitable for photovoltaic applications
Modular devices, plug-in module design
Indication window helps users to know the status of device
Optional remote-signaling contact

### Electrical parameters

	Ex9UEP 20(R) 1P (N) 500 / 600 / 750V			Ex9UEP 20(R) 2P (N) 500 / 600 / 750V		
Tested according to	EN 61643					
Classified type (test class)	PV T2 (Class II, C, Type 2)					
Technology	MOV (Varistor)					
Protection function	thermal					
Protection mode	+ → PE - → PE + ↔ -					
Connection configuration	I			U		
Rated operational DC voltage $U_n$	500 V	600 V	750 V	500 V	600 V	750 V
Max. continuous op. DC voltage $U_{CPV}$ + → PE, - → PE + ↔ -	500 V 500 V	600 V 600 V	750 V 750 V	500 V 1000 V	600 V 1200 V	750 V 1500 V
Max. system voltage $U_{OCmax}$ (according to general design rules IEC 62548, IEC/HD 60364-7-712)	455 V	545 V	680 V	455 V	545 V	680 V
Nominal frequency $f$	DC					
Nominal discharge current $I_n$ (8/20 $\mu\text{s}$ )	20 kA					
Max. discharge current $I_{max}$ (8/20 $\mu\text{s}$ )	40 kA					
Total discharge current $I_{TOTAL}$ (8/20 $\mu\text{s}$ )	-			40 kA		
Protection voltage $U_p$ at $I_n$ + → PE, - → PE + ↔ -	2.0 kV 2.0 kV	2.3 kV 2.3 kV	2.5 kV 2.5 kV	2.0 kV 3.8 kV	2.3 kV 4.2 kV	2.5 kV 5 kV
Residual current $I_{PE}$ at $U_{REF}$ DC	< 50 $\mu\text{A}$					
Residual current $I_{PE}$ at $U_{REF}$ AC	< 1 mA					
Short-circuit current rating $I_{SCPV}$	1000 A					
Number of ports	1					
Type of LV system	DC, grounded PV systems			DC, ungrounded PV systems		
SPD overload behaviour mode	OCM					
Remote contact (optional)	1 changeover (CO)					
Remote contact op. voltage / current AC $U_{max} / I_{max}$ DC $U_{max} / I_{max}$	250 V AC / 0.5 A 250 V DC / 0.1 A; 75 V DC / 0.5 A					

# Technical Data Ex9UEP (N)

## DC surge protection devices PV T2, $I_n = 20 \text{ kA}$ (8/20 $\mu\text{s}$ )

### Electrical parameters

	Ex9UEP 20(R) 2P (N) 1000 / 1200 / 1500V			Ex9UEP 20(R) 3P (N) 1000 / 1200 / 1500V		
Tested according to	EN 61643					
Classified type (test class)	PV T2 (Class II, C, Type 2)					
Technology	MOV (Varistor)					
Protection function	thermal					
Protection mode	+ → PE - → PE + ↔ -					
Connection configuration	U			Y		
Rated operational DC voltage $U_n$	1000 V	1200 V	1500 V	1000 V	1200 V	1500 V
Max. continuous op. DC voltage $U_{CPV}$ + → PE, - → PE + ↔ -	1000 V 1000 V	1200 V 1200 V	1500 V 1500 V	1000 V 1000 V	1200 V 1200 V	1500 V 1500 V
Max. system voltage $U_{OC,max}$ (according to general design rules IEC 62548, IEC/HD 60364-7-712)	905 V	1090 V	1365 V	905 V	1090 V	1365 V
Nominal frequency f	DC					
Nominal discharge current $I_n$ (8/20 $\mu\text{s}$ )	20 kA					
Max. discharge current $I_{max}$ (8/20 $\mu\text{s}$ )	40 kA					
Total discharge current $I_{TOTAL}$ (8/20 $\mu\text{s}$ )	40 kA					
Protection voltage $U_p$ at $I_n$ + → PE, - → PE + ↔ -	3.8 kV 3.8 kV	4.2 kV 4.2 kV	5 kV 5 kV	3.8 kV 3.8 kV	4.2 kV 4.2 kV	5 kV 5 kV
Residual current $I_{PE}$ at $U_{REF}$ DC	< 50 $\mu\text{A}$					
Residual current $I_{PE}$ at $U_{REF}$ AC	< 1 mA					
Short-circuit current rating $I_{SCPV}$	1000 A					
Number of ports	1					
Type of LV system	DC, grounded PV systems			DC, ungrounded PV systems		
SPD overload behaviour mode	OCM					
Remote contact (optional)	1 changeover (CO)					
Remote contact op. voltage / current AC $U_{max} / I_{max}$ DC $U_{max} / I_{max}$	250 V AC / 0.5 A 250 V DC / 0.1 A; 75 V DC / 0.5 A					

### Table of tolerance zones at 1 mA

	Max. continuous operational voltage $U_c$	Voltage tolerance zone at 1mA
Ex9UEP 20 (N)	500/1000 V	643.5 - 786.5 V
	600/1200 V	738 - 902 V
	750/1500 V	950 - 1100 V

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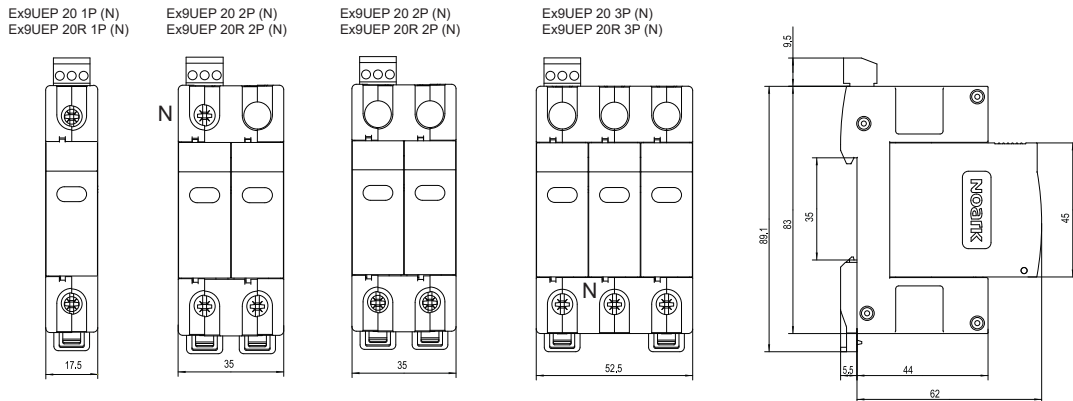
## Mechanical parameters

Device width	17.5 mm (per module)
Device height	83 mm (89 mm including rail clip)
Frame size	45 mm
Method of mounting	fixed
Mounting	easy fastening onto 35 mm device rail (DIN)
Mounting position	arbitrary
Degree of protection	IP40, terminals IP20
Terminals	lift, M5 screws
Terminal capacity	2.5 — 25 mm <sup>2</sup>
Fastening torque of terminals	2 — 3.5 Nm
Remote contact terminal capacity	0.14 — 1.5 mm <sup>2</sup>
Location	indoor
Installation class	III
Pollution degree	2
Accessibility	inaccessible
Ambient temperature	-40 — +70 °C
Altitude	≤ 2000 m
Relative humidity	5 — 95 %
Weight (per pole)	0.12 kg

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## Dimensions



## Connection diagrams, protection mode

