

# 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



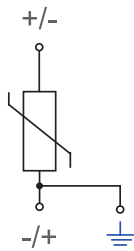
# DC surge protection devices Ex9UEP (N)

## 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	850000	Ex9UEP 20 1P 500 (N)	1/96
500 V DC	I	yes	850001	Ex9UEP 20R 1P 500 (N)	1/96
600 V DC	I	no	850004	Ex9UEP 20 1P 600 (N)	1/96
600 V DC	I	yes	850005	Ex9UEP 20R 1P 600 (N)	1/96
750 V DC	I	no	850018	Ex9UEP 20 1P 750 (N)	1/96
750 V DC	I	yes	850019	Ex9UEP 20R 1P 750 (N)	1/96

Connection diagram:

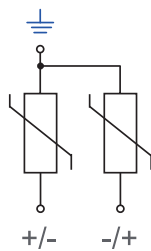


## Complete devices for ungrounded PV systems, 2-pole



Max. oper. voltage $U_{cpv}$	Connection configuration	Signaling contact	Article No.	Type	Packing
500 V DC	U	no	850002	Ex9UEP 20 2P 500 (N)	1/81
500 V DC	U	yes	850003	Ex9UEP 20R 2P 500 (N)	1/81
600 V DC	U	no	850006	Ex9UEP 20 2P 600 (N)	1/81
600 V DC	U	yes	850007	Ex9UEP 20R 2P 600 (N)	1/81
750 V DC	U	no	850020	Ex9UEP 20 2P 750 (N)	1/81
750 V DC	U	yes	850021	Ex9UEP 20R 2P 750 (N)	1/81

Connection diagram:



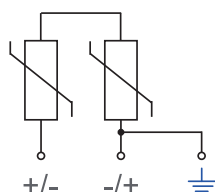
# DC surge protection devices Ex9UEP (N)

## 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	850022	Ex9UEP 20 2P 1000 (N)	1/81
1000 V DC	U	yes	850023	Ex9UEP 20R 2P 1000 (N)	1/81
1200 V DC	U	no	850008	Ex9UEP 20 2P 1200 (N)	1/81
1200 V DC	U	yes	850009	Ex9UEP 20R 2P 1200 (N)	1/81
1500 V DC	U	no	850026	Ex9UEP 20 2P 1500 (N)	1/81
1500 V DC	U	yes	850027	Ex9UEP 20R 2P 1500 (N)	1/81

Connection diagram:

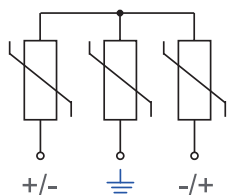


## Complete devices for ungrounded PV systems, 3-pole



Max. oper. voltage $U_{CPV}$	Connection configuration	Signaling contact	Article No.	Type	Packing
1000 V DC	Y	no	850024	Ex9UEP 20 3P 1000 (N)	1/54
1000 V DC	Y	yes	850024	Ex9UEP 20R 3P 1000 (N)	1/54
1200 V DC	Y	no	850010	Ex9UEP 20 3P 1200 (N)	1/54
1200 V DC	Y	yes	850011	Ex9UEP 20R 3P 1200 (N)	1/54
1500 V DC	Y	no	850028	Ex9UEP 20 3P 1500 (N)	1/54
1500 V DC	Y	yes	850029	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)	850012	Ex9UEP 20 1P 500M (N)	1
600 V DC	Ex9UEP 20 1P 600 (N)	850014	Ex9UEP 20 1P 600 M (N)	1
750 V DC	Ex9UEP 20 1P 750 (N)	850030	Ex9UEP 20 1P 750 M (N)	1
500 V DC	Ex9UEP 20 2P 500 (N)	850013	Ex9UEP 20 2P 500M (N)	1
600 V DC	Ex9UEP 20 2P 600 (N)	850015	Ex9UEP 20 2P 600 M (N)	1
750 V DC	Ex9UEP 20 2P 750 (N)	850031	Ex9UEP 20 2P 750 M (N)	1
1000 V DC	Ex9UEP 20 2P 1000 (N)	850032	Ex9UEP 20 2P 1000 M (N)	1
1200 V DC	Ex9UEP 20 2P 1200 (N)	850016	Ex9UEP 20 2P 1200 M (N)	1
1500 V DC	Ex9UEP 20 2P 1500 (N)	850034	Ex9UEP 20 2P 1500 M (N)	1
1000 V DC	Ex9UEP 20 3P 1000 (N)	850033	Ex9UEP 20 3P 1000 M (N)	1
1200 V DC	Ex9UEP 20 3P 1200 (N)	850017	Ex9UEP 20 3P 1200 M (N)	1
1500 V DC	Ex9UEP 20 3P 1500 (N)	850035	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 $U_{OC \text{ max}}$ (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 $I_{\text{max}}$ (8/20 $\mu\text{s}$ )	40 kA					
Total discharge current $I_{\text{TOTAL}}$ (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 $U_{\text{max}} / I_{\text{max}}$ DC $U_{\text{max}} / I_{\text{max}}$	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

# Technical Data Ex9UEP (N)

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

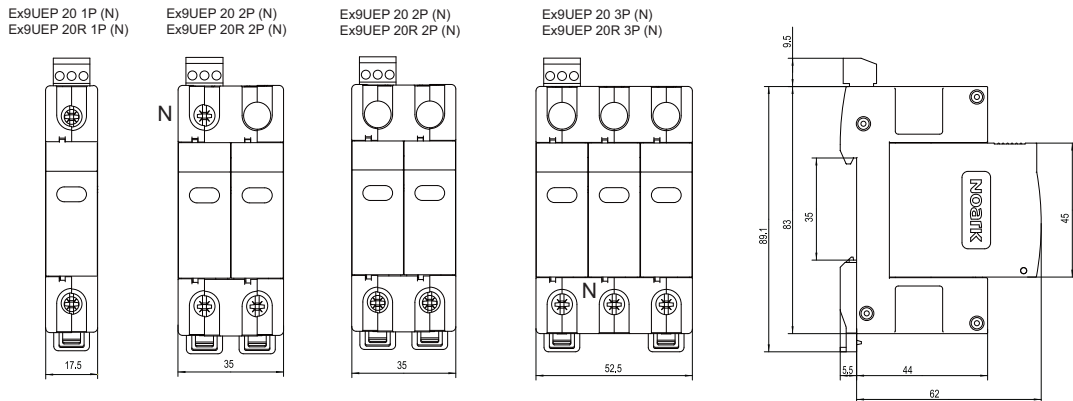
## Mechanical parameters

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

# Technical Data Ex9UEP (N)

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

## Dimensions



## Connection diagrams, protection mode

