



CITEL

SURGE PROTECTORS

FOR

Energy Storage Systems



ENERGY STORAGE SYSTEM

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ESS : ENERGY STORAGE SYSTEM



ESS SURGE PROTECTORS AGAINST TRANSIENT OVERVOLTAGES

The Energy Storage System (ESS) respond, either, to a financial issue to improve energy management (peak management/frequency regulation) or to an ecological issue pushing for energetic transition phenomena.

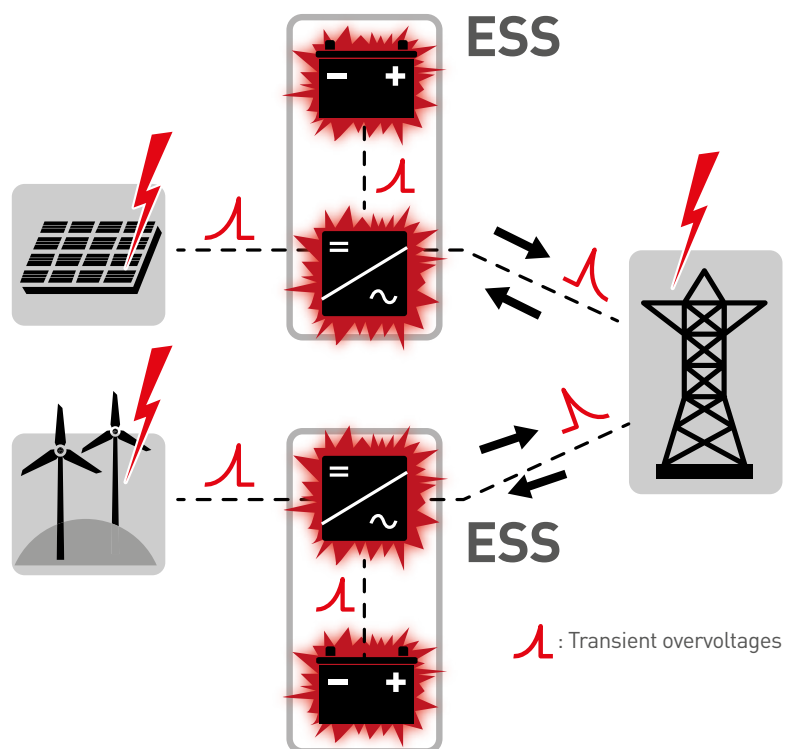
Through the energy storage system, green energy production becomes more efficient. The cost of facilities and the importance of the operation and efficiency of such equipment makes their loss of service unacceptable. Some measures must be taken to limit damages, due to external influences. One of the risks to be taken into account is the possible default due to transient overvoltages generated by the lightning or by the switching operations.

THE RISK OF “SURGE VOLTAGES”

The risk of surge voltage can impact all the components of the installation, as well the solar panels as the batteries or the network, which means protecting the installations from this phenomenon.

Moreover, specialists in ESS equipment have noted a reduced robustness in impulse over-voltage (U_w) of these materials, in particular battery systems, and due to the imperative continuity of service, they recommend the use of surge protectors at their terminals.

Surge protectors on the AC part are also recommended, as well as air conditioning to cool the batteries.



SURGE PROTECTION OF ESS EQUIPEMENT

The critical point is the protection of the battery storage system, for this reason and with the following consequences:

- Maximum DC operating voltage very high (1000 Vdc until 1500 V)
- A specific Surge Protection Device is necessary, it must be compatible with his voltages and in conformity with the forth coming IEC61643-41 (Test methods for surge protector for DC low voltage powerline)

CITEL's R&D teams have developed specific products to protect your ESS equipment against overvoltages. As for our standardization experts, they have ensured that CITEL products comply with the future test standard for DC surge protectors.

- DC power Type 2 SPD
- Pluggable modules
- Internal disconnectors, signaling and remote disconnection
- Max operating voltages: 500, 800, 1200, 1500 Vdc
- Discharge current : I_n 20 kA / I_{max} 50 kA
- I_{sccr} : 100 kA with associated fuses 50 A rating
- prIEC 61643-41 compliance

SELECT YOUR ESS SPD

The key criteria of selection for DC SPD :

- Type 2 Surge Protector (no proven risk of direct lightning discharge)
- U_c (max. operating voltage) > U_{max} of the DC network + 10%
- I_n (Nominal discharge current) > 5 kA
- I_{sccr} (admissible short-circuit current) with associated fuse > I_p at the installation point

DC BATTERY PROTECTION



SFD50-1500DC

DDC50-21Y-1500

CITEL model		ESS KIT DDC50S-21Y-1200	ESS KIT DDC50S-21Y-1500
Part number		64146	64147
Description		ESS kit : Surge protector + Associated fuse	
Max. DC operating voltage	U_c	1200 Vdc	1500 Vdc
Nominal discharge current	I_n	20 kA	20 kA
Max. discharge current	I_{max}	50 kA	50 kA
Protection level +/PE (-/PE)	U_p	3.6 kV	5.1 kV
Admissible short circuit current	I_{sccr}	100 000 A	
Backfuse breaking capacity		100 000 A	
Remote signaling		yes	
Standards		prIEC 61443-41 - IEC 61643-11	

PROTECT THE WHOLE EQUIPMENT OF THE INSTALLATION

To ensure a full efficiency against surge voltages, SPDs must used also on the various networks of the ESS installation

MAIN ELECTRICAL PANEL



DACN1-25CVGS-31-275/SC



CITEL model		DACN1-25CVGS-31-275/SC	DACN1-25VGS-30-760
Part number		-	29223012
Description		Type 1+2+3 AC SPD with integrated counter VG Technology	Type 1+2+3 AC SPD high energy VG Technology
Max. AC operating voltage	U_c	275 Vac	760 Vac
Nominal discharge current (8/20 μ s)	I_n	25 kV	35 kA
Impulse current by pole (10/350 μ s)	I_{imp}	25 kA	25 kA
Max. discharge current (8/20 μ s/pole)	I_{max}	100 kA	70 kA
Protection level +/PE (-/PE)	U_p	1.5 kV	2.5kV
Admissible short-circuit current	I_{sccr}	50 000 A	50 000 A
Remote signaling		yes	yes
Standards		IEC 61643-11 / EN 61643-11 / UL1449 ed.5	

SURGE PROTECTORS FOR CONNECTED PV SITES



DPVN1-6CVGS-21Y-1200



CITEL model		DPVN1-6CVGS-21Y-1200	DPVN1-6CVGS-21Y-1500
Part number		65222102	65222103
Description		Type 1+2+3 Photovoltaic surge protector CTC Technology (Central Thermal Control) VG Technology	
Maximum DC operating voltage	U_{cpv}	1200 Vdc	1500 Vdc
Nom. discharger current (8/20 μ s)	I_n	20 kA	20 kA
Lightning current (10/350 μ s)	I_{imp}	6.25 kA	6.25 kA
Total lightning current (10/350 μ s)	I_{total}	12.5 kA	12.5 kA
Protection level	U_p	4.3 kV	4.8 kV
Remote signaling		yes	yes
Standards		IEC 61643-31 / EN 61643-31 / UL1449 ed.5	

SURGE PROTECTORS FOR CONNECTED PV SITES



DPVN40CVGS-21Y-1200



CITEL model	DPVN40CVGS-21Y-1200	DPVN40CVGS-21Y-1500	
Part number	65122102	65122103	
Description	Type 2+3 Photovoltaic surge protector CTC Technology (Central Thermal Control) VG Technology		
Max. DC operating voltage	Ucpv	1200 Vdc	1500 Vdc
Nominal discharge current (8/20µs)	In	20 kA	20 kA
Max. discharge current (8/20µs)	Imax	40 kA	40 kA
Total discharge current (8/20µs)	Itotal	60 kA	60 kA
Protection level +/-PE (-/PE)	Up	4.3 kV	4.8 kV
Remote signaling	oui		oui
Standards	IEC 61643-31 / EN 61643-31 / UL1449 ed.5		

SURGE PROTECTORS FOR WIND TURBINE



DACN1-25VGS-30-760

CITEL model	DACN1-25VGS-30-760	DAC50S-40-760	
Part number	29223012	821110724	
Description	Type 1+2+3 surge protector 3-phase+N - 400/690 Vac	Type 2 surge protector 3-phase+N - 400/690 Vac	
Max. DC operating voltage	Uc	760 Vac	760 Vac
Nominal discharge current (8/20µs)	In	35 kA	20 kA
Max. discharge current (8/20µs)	Imax	70 kA	50 kA
Protection level +/-PE (-/PE)	Up	2.5 kV	2.9 kV
Admissible short-circuit current	Iscpr	50 000 A	50 000 A
Remote signaling	yes		yes
Standards	IEC 61643-11 / EN 61643-11 / UL1449 ed.5		

SURGE PROTECTORS FOR CONTROL SYSTEMS (DATA LINE)



DLA-24D3



MJ8-POE-C6A

CITEL model	DLA range	MJ8 range	
Typical application	RS485, 4-20mA	Ethernet (PoE)	
Configuration	1pair+shield	RJ45	
Nominal line voltage	Un	12 V, 24 V	48 Vdc
Max. load current	IL	300 mA	2000 mA
Nominal discharge current <i>8/20µs Test x 10 - C2 Category</i>	In	5 kA	2 kA
Maximum discharge current <i>max. withstand @ 8/20 µs by pole</i>	Imax	20 kA	-
Impulse current <i>2 x 10/350µs Test - D1 Category</i>	Iimp	5 kA	0.5 kA
Standards	IEC 61643-21 / EN 61643-21 / UL497A		
Mounting	DIN rail		

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