



CITEL

SURGE PROTECTORS

FOR

Energy Storage Systems



ENERGY STORAGE SYSTEM

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ESS : ENERGY STORAGE SYSTEM

WINDTURBINES



DAC50S-31-760-2600DC

MAIN ELECTRICAL PANEL



DS254VG-300/G

CONNECTED PV SITES



DS50VGPV

DC BATTERY PROTECTION



DDC50-21Y

AC POWER + AIR CONDITIONING



DAC50-31-275

CONTROL SYSTEMS



DLA

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.

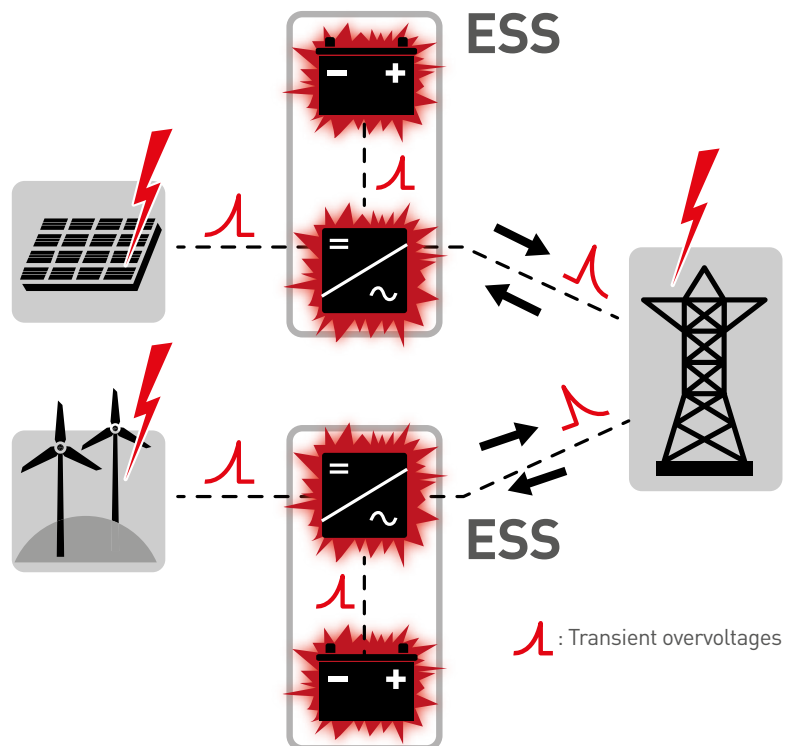
Through the energy storage system, green energy production becomes more efficient. The cost of facilities and the importance of the operation and efficiency of such equipment makes their loss of service unacceptable. Some measures must be taken to limit damages, due to external influences. One of the 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



DDC50-21Y-1500

CITEL model		DDC50-21Y-500	DDC50-21Y-800	DDC50-21Y-1200	DDC50-21Y-1500
Part number		828511253	828511353	828511553	828511653
Max. DC operating voltage	U_c	500 Vdc	800 Vdc	1200 Vdc	1500 Vdc
Nominal discharge current	I_n	20 kA			
Max. discharge current	I_{max}	50 kA			
Protection level +/-PE (-/PE)	U_p	2.1 kV	2.5 kV	3.6 kV	5 kV
Admissible short-circuit current	I_{sccr}	100 000 A			
Standards		prIEC 61443-41 - IEC 61643-11			
Remote signaling		Option DDC50S-21Y-500	Option DDC50S-21Y-800	Option DDC50S-21Y-1200	Option DDC50S-21Y-1500

PROTECT THE WHOLE EQUIPMENT OF THE INSTALLATION

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

MAIN ELECTRICAL PANEL



DS254VG-300/G

CITEL model		DS254VG-300/G
Part number		2756
Network		3-phase+N
Type of SPD		Type 1+2+3 - DIN Rail
Max. AC operating voltage	U_c	255 Vac
Nominal discharge current	I_n	30 kA
Impulse current by pole	I_{imp}	25 kA
Protection level	U_p	≤ 1.5 kV
Admissible short-circuit current	I_{sccr}	50 000 A
Standards		IEC 61643-11 / NF EN 61643-11 / UL1449 ed.4

AC POWER + AIR CONDITIONING



DAC50-31-275

CITEL model		DAC50-31-275
Part number		821110234
Network		3-phase+N
Type of SPD		Type 2 - pluggable - DIN Rail
Max. AC operating voltage	U_c	275 Vac
Nominal discharge current	I_n	20 kA
Max. discharge current	I_{max}	50 kA
Protection level +/-PE (-/PE)	U_p	1.25 kV / 1.5 kV
Admissible short-circuit current	I_{sccr}	50 000 A
Standards		IEC 61643-11 / NF EN 61643-11 / UL1449 ed.4
Remote signaling		option DAC50S-31-275

SURGE PROTECTOR FOR CONNECTED PV SITES



DS50VGPV-1000G/12KT1

CITEL model	DS50PV-1000G/12KT1	DS50VGPV-1000G/12KT1
Part number		482383
Type of SPD		Type 1
Maximum DC operating voltage	Ucpv	1200 Vdc
Nom. discharger current (8/20µs)	In	15 kA
Lightning current (10/350µs)	Iimp	6.25 kA
Total lightning current (10/350µs)	Itotal	12.5 kA
Protection level	Up	2.6/4.6 kV*
Standards	EN 50539-11 / IEC 61643-31	
Remote signalling	Option DS50PVS-1000G/12KT1	Option DS50VGPVS-1000G/12KT1

- *) Common mode (+/PE or -/PE)/Differential mode (+/-)



DS50VGPV-1500G/51

CITEL model	DS50PV-500/51	DS50PV-600/51	DS50PV-800G/51	DS50PV-1000G/51
Part number	480121	480421	480281	480381
Type of SPD	Type 2	Type 2	Type 2	Type 2
Maximum DC operating voltage	Ucpv	600 Vdc	720 Vdc	960 Vdc
Nom. discharge current (8/20µs)	In	15 kA	15 kA	15 kA
Protection level	Up	2.2 kV*	2.8 kV*	2/3.6 kV*
Standards	EN 50539-11 / IEC 61643-31			
Remote signalling	Option DS50PVS-500/51	Option DS50PVS-600/51	Option DS50PVS-800G/51	Option DS50PVS-1000G/51

- *) Common mode (+/PE or -/PE)/Differential mode (+/-)

- Specific version DS50VGPV available : total suppression of operating and leakage currents.



DS50PV-800G/51

SURGE PROTECTOR FOR WIND TURBINE



DAC50S-31-760-2600DC

CITEL model	DAC50S-31-760-2600DC	
Part number	821115544	
Network	3-phase+N	
Type of SPD	Type 2 - pluggable - DIN Rail	
Max. DC operating voltage	Uc	800 Vac
Nominal discharge current	In	20 kA
Max. discharge current	I _{max}	50 kA
Protection level +/PE (-/PE)	Up	≤ 4 kV
Admissible short-circuit current	I _{sccr}	50 000 A
Remote signaling	output on changeover contact	
Standards	IEC 61643-11 / EN 61643-11 / UL1449 ed.4	

SURGE PROTECTORS FOR CONTROL SYSTEMS (DATALINE)



DLA-24D3

CITEL model		DLA range
Typical application		RS485, 4-20mA
Configuration		1pair+shield
Nominal line voltage	Un	12 V, 24 V
Max. load current	IL	300 mA
Nominal discharge current <i>8/20μs Test x 10 - C2 Category</i>	In	5 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>	limp	5 kA
Standards		IEC 61643-21 / NF EN 61643-21 / UL497A
Mounting		DIN rail

France

Headquarters

Sales department

Tél. : +33 1 41 23 50 23

e-mail : contact@citel.fr

Web : www.citel.fr

Factory

Reims

Tél. : +33 3 26 85 74 00

e-mail : contact@citel.fr

Germany

Bochum

Tél. : +49 234 54 72 10

e-mail : info@citel.de

Web : www.citel.de

USA

Miramar

Tel : (954) 430 6310

e-mail : info@citel.us

Web : www.citel.us

China

Sales department

Shanghai

Tél. : +86 21 58 12 25 25

e-mail : info@citelsh.com

Web : www.citel.cn

Factory

Tél. : +86 21 58 12 80 67

Russia

Moscou

Tél. : +7 499 391 47 64

e-mail : info@citel.ru

Web : www.citel.ru

India

New Delhi

Tél. : +91 11 4001 81 31

e-mail : indiacitel@gmail.com

Web : www.citel.in

Thailand

Bangkok

Tél. : +66 (0) 2 104 9214

Web : www.citel.fr