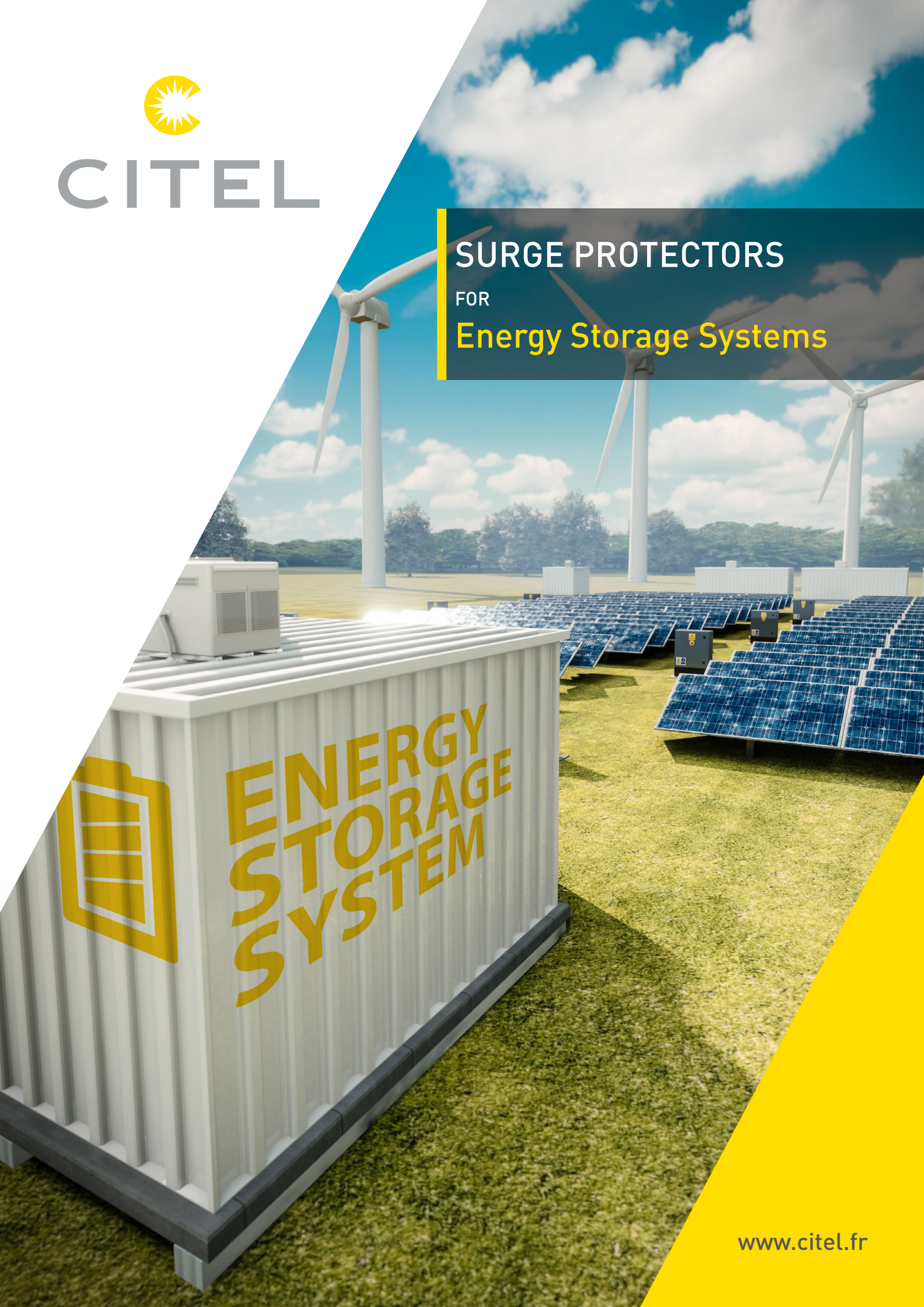
CITEL

SURGE PROTECTORS
FOR
Energy Storage Systems



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ESS : ENERGY STORAGE SYSTEM

WINDTURBINES

DACN1-25VGS

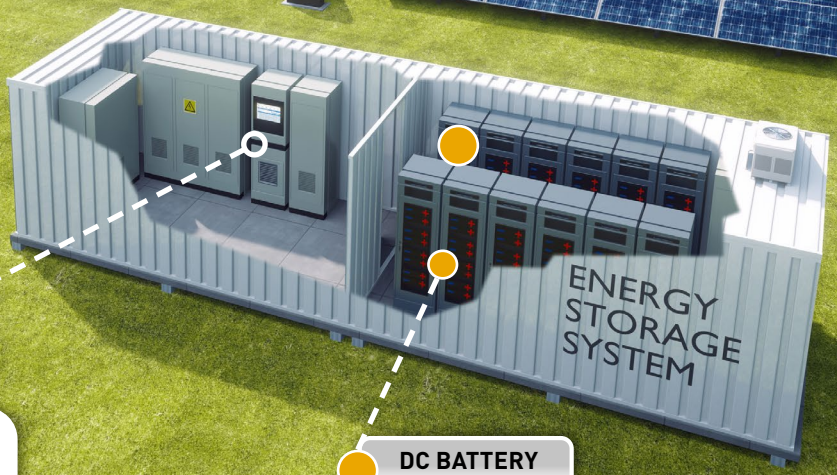
MAIN ELECTRICAL PANEL

DACN1-25VGS

DACN1-25CVGS

CONNECTED PV SITES

DPVN

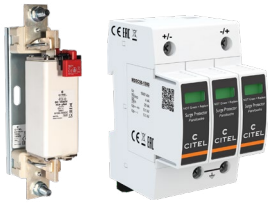


CONTROL SYSTEMS

MJ8

DLA

DC BATTERY PROTECTION



ESS KIT :
SPD + Associated fuse

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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.

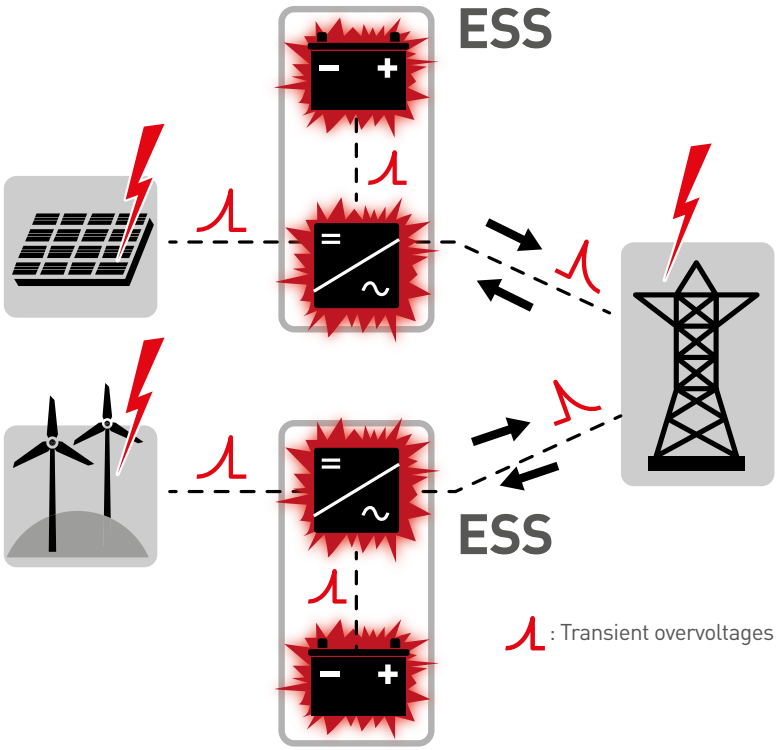
Through the energy storage system, green energy production becomes more efficient. The cost of facilities and the importance of the operation and efficiency of such equipment makes their loss of service unacceptable. Some measures must be taken to limit damages, due to external influences. One of the 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 (Uw) 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 : In 20 kA /Imax 50 kA
- Isccr : 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)
- Uc (max. operating voltage) > Umax of the DC network + 10%
- In (Nominal discharge current) > 5 kA
- Isccr (admissible short-circuit current) with associated fuse > Ip 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	Uc	1200 Vdc	1500 Vdc
Nominal discharge current	In	20 kA	20 kA
Max. discharge current	Imax	50 kA	50 kA
Protection level +/PE (-/PE)	Up	3.6 kV	5.1 kV
Admissible short circuit current	Isccr	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		DACN1-25CGVS-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	Uc	275 Vac	760 Vac
Nominal discharge current (8/20µs)	In	25 kV	35 kA
Impulse current by pole (10/350µs)	Iimp	25 kA	25 kA
Max. discharge current (8/20µs/pole)	Imax	100 kA	70 kA
Protection level +/PE (-/PE)	Up	1.5 kV	2.5kV
Admissible short-circuit current	Isccr	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	Ucpv	1200 Vdc	1500 Vdc
Nom. discharger current (8/20µs)	In	20 kA	20 kA
Lightning current (10/350µs)	Iimp	6.25 kA	6.25 kA
Total lightning current (10/350µs)	Itotal	12.5 kA	12.5 kA
Protection level	Up	4.3 kV	4.8 kV
Remote signaling		yes	yes
Standards		IEC 61643-31 / EN 61643-31 / UL1449 ed.5	

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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 curent (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 2 surge protector 3-phase+N - 400/690 Vac**	**Type 2 surge protector 3-phase+N - 400/690 Vac**
Max. DC operating voltage	Uc	440 Vac	20 kA
Nominal discharge current (8/20µs)	In	35 kA	50 kA
Max. discharge current (8/20µs)	Imax	70 kA	NA
Protection level +/PE (-/PE)	Up	2.5 kV	2.9 kV
Admissible short-circuit current	Isccr	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 (DATALINE)

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 *8/20µs Test x 10 - C2 Category*	In	5 kA	2 kA
Maximum discharge current *max. withstand @ 8/20 µs by pole*	Imax	20 kA	-
Impulse current *2 x 10/350µs Test - D1 Category*	Iimp	5 kA	0.5 kA
Standards		IEC 61643-21 / EN 61643-21 / UL497A	
Mounting		DIN rail	

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